Vermilion Local School District

Course of Study

K-12 Math

Adopted July, 2023

VLSD Board of Education

Courses of study are created and adopted in accordance with VLSD policies listed below:

PO 2141-Assessment of Educational Resources
PO 2210-Curriculum Development
PO 2220-Adoption of Courses of Study
PO 2510-Adoption of Textbooks
PO 2520-Selection of Instructional Materials and Equipment
PO 2623-Student Assessment and Academic Intervention Services

This course of study is current as of the date above and is subject to change due to varying policy, law or curriculum material availability. Instructional unit sequence and length within classes is approximate and subject to change.

Math - PK 3/4

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: September	*5 lessons*
Unit 2: October	*1 lessons*
Unit 3: November	*1 lessons*
Unit 4: December	*1 lessons*
Unit 5: January	*1 lessons*
Unit 6: February	*1 lessons*
Unit 7: March	*1 lessons*
Unit 8: April	*1 lessons*
Unit 9: May	*1 lessons*

Unit 1: September

Math - PK 3/4 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Number concepts
-

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Counting Calendar daily using pointer
- 1-1 correspondence with snack (setting the napkin and cup)
- Explicitly counting objects (bears, legos, cheerios, etc)
- Decorate Numbers 1-5 with stickers (1 a week)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Begins to verbally count to 10
• Begins to count up to five objects accurately, using one number name for each object
• Begins to recognize and name the number of items in a small set (up to five) instantly
• Recognizes and names a few numerals
Begins to combine and separate up to five objects

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 2: October

Math - PK 3/4 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Spatial relationships and shapes

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Boom cards
- Shape ID daily at circle time
- Tracing shapes
- Shape match
- Exploring shapes and talking about their sides/what they look like
- Shape pictures, identifying different shapes within pictures
- Using geometric shapes on pattern paper to build pictures

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Follows simple directions related to proximity (beside, between, next to)
• Begins to identify a few basic shapes (circle, square, triangle)

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 3: November

Math - PK 3/4 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Measurement

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Measure objects using unconventional materials (measure feet with paperclips, turkeys with feathers)
- Which is larger game
- Coloring the bigger object
- Put objects in order by size
- Review daily schedule
- Putting Turkeys in order by size

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Makes simple comparisons between two objects
• Compares and orders a small set of objects as appropriate according to size, length, weight, area, or volume
• Knows the usual sequence of basic daily events
• Knows a few ordinal numbers

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 4: December

Math - PK 3/4 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Patterns

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Daily pattern at circle time during calendar
- Building christmas themed patterns
- Winter boom pattern cards

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

• Begins to copy simple repeating patterns
• Begins to copy simple repeating patterns

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 5: January

Math - PK 3/4 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Number concepts
- Spatial Relationships/shapes

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Daily counting at calendar
- Count to 20 3X (song)
- Calendar helper points to each num ber to work on 1;1 correspondence
- Finger game (students close eyes, when they open them they must yell the number of fingers I'm holding up instantly)
- Look at numbers 1-10 daily.
- Write numbers 1-10
- Repeat the date (ex: today is January 3rd)
- Number search with dabbers
- NumberID boom cards
- countings/tens frame boom cards

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

• Begins to combine and separate up to five objects and describe the parts
• Begins to identify numerals to 5 by name and connect each to counted objects

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 6: February

Math - PK 3/4 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Number concepts
- Spatial Relationships/
  shapes

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Shapes hunt (identifying shapes within pictures)
- Look at 2d/3d shapes. Holding them physically, describing what it looks like, looking at objects in classroom and describing if 2d/3d-flat/solid
- Positional words smart board game

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

• Begins to use and respond appropriately to positional words indicating location, direction, and distance
• Begins to describe basic two- and three dimensional shapes by using own words
• Begins to recognize basic shapes when they are presented in a new orientation

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 7: March

Math - PK 3/4 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Measurements and Patterns

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Lucky charm patterning
- Use rulers/ yardsticks to measure objects in the room in small groups measure
- Measure with blocks/marshmallows

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Begins to use multiples of the same unit to measure
- Begins to use numbers to compare
- Begins to know the purpose of standard measuring tools

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 8: April

Math - PK 3/4 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Measurements and Patterns

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Weather patterns
- Weather measuring/counting
- Counting raindrops-which has more

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Begins to use multiples of the same unit to measure
• Begins to use numbers to compare
• Begins to know the purpose of standard measuring tools

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 9: May

Math - PK 3/4 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Number Concepts
- Spatial Relationships & Shapes
- Measurement
- Patterning

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Daily calendar
- Count to 20
- Suummer patterns
- Measuring with lays
- Comparing flowers (sizes/# of pedals)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Begins to describe basic two- and three dimensional shapes by using own words
• Begins to recognize basic shapes when they are presented in a new orientation
• Begins to use numbers to compare
• Copies simple repeating patterns

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Math - PK 4/5

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: September	*5 lessons*
Unit 2: October	*1 lessons*
Unit 3: November	*1 lessons*
Unit 4: December	*1 lessons*
Unit 5: January	*1 lessons*
Unit 6: February	*1 lessons*
Unit 7: March	*1 lessons*
Unit 8: April	*1 lessons*
Unit 9: May	*1 lessons*

Unit 1: September

Math - PK 4/5 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Number Concepts

1. Beginning counting orally to 20
2. Identifying and describing 2D shapes
3. Copies and extends patterns
4. Counting objects with 1 to 1 correspondence

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Daily counting at circle time/calendar
- Explicitly counting clocks, legos, erasers during small group instruction
- Finding what # comes next while counting the days on the calendar

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Begins to count verbally to 20
- Begins to count 10–20 objects accurately
- Begins to know the last number states how many in all
- Begins to tell what number (1–10) comes next in order by counting
- Recognizes and names the number of items in a small set (up to five) instantly
- Identifies numerals to 5 by name and connects each to counted objects

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 2: October

Math - PK 4/5 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Number Concepts

1. Beginning counting orally to 20
2. Copies and extends patterns
3. Counting objects with 1 to 1 correspondence

Spatial Relationships & Shapes

1. Identifying and describing 2D shapes
2. Categorizing shapes

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Shape ID daily at circle time
- Explicitly working with and creating 2D and 3D shapes during small group instruction (playdoh, tiles, drawing, waxy sticks)
- Building cubes with toothpicks and marshmallows
- Tactile- touching 3D shapes and identifying ones that we may see. Globe, ball, tissue box, ice cream cone, cereal box, etc.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Begins to use and respond appropriately to positional words indicating location, direction, and distance
- Begins to describe basic two- and three dimensional shapes by using own words

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 3: November

Math - PK 4/5 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Number Concepts

1. Beginning counting orally to 20
2. Copies and extends patterns
3. Counting objects with 1 to 1 correspondence

Spatial Relationships & Shapes

1. Identifying and describing 2D shapes
2. Categorizing shapes

Subtilizing up to 5

Breaking 5 objects into 2 groups, completing a set up to 5

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Sorting different objects by size- small, medium, large.
- Sorting different shapes by size- both 2D and 3D
- Use daily schedule for students to learn the sequence of basic daily events at school

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Compares and orders a small set of objects as appropriate according to size, length, weight, area, or volume
- Knows usual sequence of basic daily events

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 4: December

Math - PK 4/5 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Number Concepts

1. Copies and extends patterns
2. Counting objects with 1 to 1 correspondence
3. Counting orally to 20

Spatial Relationships & Shapes

1. Identifying and describing 2D shapes
2. Categorizing shapes

Subtilizing up to 5

Breaking 5 objects into 2 groups, completing a set up to 5

Patterning: Copying

Compares and orders a small set of objects according to size/ length/weight/ area/volume

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- During small group instruction, students copy the pattern that the teacher made from erasers
- Copy patterns using chips on the SmartBoard
- Copying patterns with bears/clear magnetic chips in whole group instruction

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Copies simple repeating patterns

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 5: January

Math - PK 4/5 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Number Concepts

1. Copies and extends patterns
2. Counting objects with 1 to 1 correspondence
3. Orally counting to 20
4. Begins to identify numerals to 10 by name
5. Counts to 15 accurately
6. Knows last numbers/states how many in all

1. **Spatial Relationships & Shapes**
2. Identifying and describing 2D shapes
3. Categorizing shapes

Subtilizing up to 5

Breaking 5 objects into 2 groups, completing a set up to 5

Patterning

Copying

Extends simple repeating patterns

Measurement

Compares and orders a small set of objects according to size/ length/weight/ area/volume

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Daily counting at circle time/calendar
- Explicitly counting clocks, legos, erasers during small group instruction- then tells the last number and knows it represents all of the objects at hand
- Finding what # comes next while counting the days on the calendar

- During whole group instruction- teacher models using describing words then students do. Describing both 3D and 2D shapes while holding shape in hands

Unit 5: January

Math - PK 4/5 - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Begins to verbally count to 20
- Begins to count 10–20 objects accurately
- Begins to know the last number states how many in all
- Begins to tell what number (1–10) comes next in order by counting

- Uses and responds appropriately to positional words indicating location, directions, and distance
- Begins to describe basic two- and three dimensional shapes by using own words

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 6: February

Math - PK 4/5 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Number Concepts

1. Copies and extends patterns
2. Counting objects with 1 to 1 correspondence
3. Orally counting to 20
4. Begins to identify numerals to 10 by name
5. Counts to 15 accurately
6. Knows last numbers/states how many in all
7. Begins to identify numerals to 10 by name and connects each to counted objects

1. **Spatial Relationships & Shapes**
2. Identifying and describing 2D shapes
3. Categorizing shapes

Subtilizing up to 5

Breaking 5 objects into 2 groups, completing a set up to 5

Patterning

Copying

Extends simple repeating patterns

Measurement

Compares and orders a small set of objects according to size/ length/weight/ area/volume

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Daily counting at circle time/calendar
- Explicitly counting clocks, legos, erasers during small group instruction- then tells the last number and knows it represents all of the objects at hand
- Finding what # comes next while counting the days on the calendar
- Tells which group of objects is more, less, or same during small group instruction
- Teacher models and points out shapes around the classroom and encourages students to do so as well

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Begins to make sets of 6–10 objects and then describe the parts
- Begins to identify which part has more, less (fewer), or the same (equal) •
- Begins to count all or count on to find out how many
- Begins to identify numerals to 10 by name and connect each to counted objects
- Begins to recognize basic shapes when they are presented in a new orientation

Unit 6: February

Math - PK 4/5 - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 7: March

Math - PK 4/5 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Number Concepts

1. Copies and extends patterns
2. Counting objects with 1 to 1 correspondence
3. Orally counting to 20
4. Begins to identify numerals to 10 by name
5. Counts to 15 accurately
6. Knows last numbers/states how many in all
7. Begins to identify numerals to 10 by name and connects each to counted objects
8. Makes a set of 6-10 and then describe the parts/identify which part has more, less, or the same

1. **Spatial Relationships & Shapes**
2. Identifying and describing 2D shapes
3. Categorizing shapes

Subtilizing up to 5

Breaking 5 objects into 2 groups, completing a set up to 5

Patterning

Copying

Extends simple repeating patterns

Measurement

Compares and orders a small set of objects according to size/ length/weight/ area/volume

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Measure animals with paper clips
- Who has more _____? On SmartBoard
- During small group instruction, have students extend on teachers patterns and create their own

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Uses multiples of the same unit to measure •
- Uses numbers to compare
- Extends and creates simple repeating patterns

Unit 7: March

Math - PK 4/5 - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 8: April

Math - PK 4/5 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Number Concepts

1. Copies and extends patterns
2. Counting objects with 1 to 1 correspondence
3. Orally counting to 20
4. Begins to identify numerals to 10 by name
5. Counts to 15 accurately
6. Knows last numbers/states how many in all
7. Begins to identify numerals to 10 by name and connects each to counted objects
8. Makes a set of 6-10 and then describe the parts/identify which part has more, less, or the same
9. Begins to show addition and subtraction problems
10. Knows the last number, states how many in all
11. Tells what number (0-10) comes next in order by counting
12. Begins to show word problems of whole numbers within 10

Spatial Relationships & Shapes

Identifying and describing 2D shapes

Categorizing shapes

Subtilizing up to 5

Breaking 5 objects into 2 groups, completing a set up to 5

Patterning

Copying

Extends simple repeating patterns

Begins to recognize and create more complex repeating and simple growth patterns

Measurement

Compares and orders a small set of objects according to size/ length/weight/ area/volume

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Uses ruler and yardstick to measure desks
- During small group instruction, have students create their own patterns with various objects (erasers, counting bears, chips, Lucky Charms)

Unit 8: April

Math - PK 4/5 - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Knows the purpose of standard measuring tools •
- Begins to relate time to daily routines and schedule
- Extends and creates simple repeating patterns

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Unit 9: May

Math - PK 4/5 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Number Concepts

1. Copies and extends patterns
2. Counting objects with 1 to 1 correspondence
3. Orally counting to 20
4. Begins to identify numerals to 10 by name
5. Counts to 15 accurately
6. Knows last numbers/states how many in all
7. Begins to identify numerals to 10 by name and connects each to counted objects
8. Makes a set of 6-10 and then describe the parts/identify which part has more, less, or the same
9. Begins to show addition and subtraction problems
10. Knows the last number, states how many in all
11. Tells what number (0-10) comes next in order by counting
12. Begins to show word problems of whole numbers within 10

Spatial Relationships & Shapes

Identifying and describing 2D shapes & 3D

Describes basic 2 and 3 dimensional shapes using own words recognizing basic shapes in new orientation

Categorizing shapes

Subtilizing up to 5

Breaking 5 objects into 2 groups, completing a set up to 5

Patterning

Copying

Extends simple repeating patterns

Begins to recognize and create more complex repeating and simple growth patterns

Measurement

Compares and orders a small set of objects according to size/ length/weight/ area/volume

Begins to create and read simple graphs using simple comparison and ordinal terms to describe findings

Unit 9: May

Math - PK 4/5 - *Last Updated on June 30, 2023*

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Daily counting at circle time/calendar
- Explicitly counting clocks, legos, erasers during small group instruction- then tells the last number and knows it represents all of the objects at hand
- Finding what # comes next while counting the days on the calendar
- Tells which group of objects is more, less, or same during small group instruction
- Teacher models and points out shapes around the classroom and encourages students to do so as well
- Small group instruction of adding and subtracting objects using a tens frame

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Verbally counts to 20 •
- Counts 10–20 objects accurately
- Knows that the last number states how many in all •
- Tells what number (1–10) comes next in order by counting •
- Makes sets of 6–10 objects and then describes the parts •
- Identifies which part has more, less, or the same (equal) •
- Counts all or counts on to find out how many •
- Identifies numerals to 10 by name and connects each to counted objects •
- Begins to solve addition and subtraction problems within 10
- Describes basic two- and three dimensional shapes by using own words
- Recognizes basic shapes when they are presented in a new orientation
- Begins to use measurement words and some standard measuring tools accurately •
- Begins to recognize, create, and explain more complex repeating and simple growing patterns

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- ELA Data
- Teacher Observation
- Checklists

STANDARDS

Math - Kindergarten

Vermilion Local School District

UNITS (4/4 SELECTED)	SUGGESTED DURATION
Unit 1: UNIT 1 SEPT./OCT.	*5 lessons*
Unit 2: UNIT 2 NOV./DEC./JAN.	*1 lessons*
Unit 3: Unit 3 Feb. March	*1 lessons*
Unit 4: April May June	*1 lessons*

Unit 1: UNIT 1 SEPT./OCT.

Math - Kindergarten - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1 2-D Shape Recognition

2 Rote count to 100 (goal is 100 by the end of the 4th quarter)

3 Count Forward from a given number up to 17.

4 1:1 correspondence to 10

5 Positional Words

6 Measurement (length, weight,height, capacity)

7 Number Recognition (1-10)

8 Patterns

9 Ten Frames

10 Bar graph
(not a standard)

11 ORDINAL Numbers
(this is not a kindergarten standard)

12 Writing Numbers

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

MyMath curriculum, cross-curriculum Wonders Big Book/vocab. and comprehension, videos. Wiki-Stix, magnet, shapes, paint, shape man project, bingo-dabber shape work-sheet, various work-sheet, Ipad app.,

Videos, calendar, counters, 100 number grid

MNM probes, work sheets, calendar, hidden number on number grid, Ipad ,

Practice counting with counters. Count out loud with the student and move their hand with the counter, one number to one hand movement. Playdough balls, count and smash the balls. Egg crate with ten spots. Place one counter in each spot, count out loud.

MyMAth curriculum, using students at the front of the class as models, use stuffed animals to show position videos

Hands on - measure objects with manipulatives (linking cubes, teddy bear counters etc), capacity- various containers,balance scale, videos, Ipad app. , make pumpkin pie

Videos, calendar, number lines, morning work, play-dough , BINGO, various centers, paint, salt tray, ipad, shaving cream, small group work,

Calendar, videos, books, counting bears, pom-poms in test-tubes, worksheets,

Egg crates, erasers, playdough, smartboard, worksheets,

Weather bar graph, work sheets

Calendar, MyMath, centers, manipulatives,
Sequencing and labeling from a story

Unit 1: UNIT 1 SEPT./OCT.

Math - Kindergarten - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Student will be able to identify a shape when given shapes to name. Five 2-D shapes -rectangle, circle, hexagon, triangle and square. I also teach vertices, straight lines and curved line

Student will be able to count to 100 w no prompts or visual aides.

Student will be able to count on (next three numbers) from a given number 1-17

Student will be able to count to ten using counters. One number for each counter in order.

Student will be able to use the words, above, below, beside, next to, in front and behind to describe the position of objects

Student will be able to “line-up” objects to obtain a shorter/longer/taller/ description when comparing objects. Student will also understand that length is horizontal measure and height is vertical. Capacity is for measuring volume

Student will be able to recognize and say the number when shown number flash cards in mixed order.

Student will be able to recognize a simple pattern by assigning a letter to each object or picture

Student will be able to use a ten frame to count, figure adding to ten and subtracting from ten

Student will be able to place data,manipulate data and make conclusions about the data

Student will be able to use ordinal numbers when appropriate

Unit 1: UNIT 1 SEPT./OCT.

Math - Kindergarten - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Student given 5 wooden 2-d shapes and are prompted “Show me the circle” etc.

Student will count out loud 1:1 with teacher

Student will verbally count on from a given number 1:1 with teacher

Student will count to ten using counters.

Class discussion and MyMath worksheets (can use review , or check understanding worksheets)

Student will have a review or check my progress MyMath worksheet as well class discussion

1:1 with teacher and flashcards

1:1 with teacher and class discussion.

Not a standard, but I use to help with number sense, the many ways to make number 10, how to fill left to right and top to bottom. Assess whole group with a clip board roster.

No formal assessment

Class discussion, observe with class work

STANDARDS

Ohio - Kindergarten - Math
K.CC.1
Count to 100 by ones and by tens.
K.CC.2
Count forward within 100 beginning from any given number other than 1.
K.CC.4.a
When counting objects, establish a one-to-one relationship by saying the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
K.CC.4
Understand the relationship between numbers and quantities; connect counting to cardinality using a variety of

objects including pennies.
K.CC.4.b
Understand that the last number name said tells the number of objects counted and that the number of objects is the same regardless of their arrangement or the order in which they were counted.
K.CC.4.c
Understand that each successive number name refers to a quantity that is one larger.
K.MD.1
Identify and describe measurable attributes (length, weight, and height) of a single object using vocabulary terms such as long/short, heavy/light, or tall/short.
K.MD.2
Directly compare two objects with a measurable attribute in common to see which object has “more of” or “less of” the attribute, and describe the difference. For example, directly compare the heights of two children, and describe one child as taller/shorter.
K.G.2
Correctly name shapes regardless of their orientations or overall size.

Unit 2: UNIT 2 NOV./DEC./JAN.

Math - Kindergarten - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1. ID 2 d shapes

2 Rote count to 100
3. Count forward
4. 1:1 correspondence
5 Positional words
6 Measurement- height, weight, capacity, length
7 Number Recognition
8. Patterns
9 ten frames
10 bar graphs
11 ordinal numbers
12 writing numbers 1-20
13 Match Number to set
14 Compare 2 groups of objects , which groups are equal, less, greater
15 Measurable attribute- tall, short, heavy, lightest

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Flash cards, videos, calendar, various tactile writing, 100 grid, number line work, magnets, smartboard games, ipad,

Counting, calendar, number line work, 100 chart, touching and counting manipulatives, ipad games, smartboard games, matching games,

Counting, number-line, review vocab-more, less and equal, smartboard games, ipad, MyMAth

MyMath, ipad, cross- curriculum books, comparing objects in the classroom

MyMath curriculum, cross-curriculum Wonders Big Book/vocab. and comprehension, videos. Wiki-Stix, magnet, shapes, paint, shape man project, bingo-dabber shape work-sheet, various work-sheet, Ipad app.,

Videos, calendar, counters, 100 number grid

MNM probes, work sheets, calendar, hidden number on number grid, Ipad ,

Practice counting with counters. Count out loud with the student and move their hand with the counter, one number to one hand movement. Playdough balls, count and smash the balls. Egg crate with ten spots. Place one counter in each spot, count out loud.

MyMAth curriculum, using students at the front of the class as models, use stuffed animals to show position videos

Calendar, videos, books, counting bears, pom-poms in test-tubes, worksheets,

Prepare a Gingerbread Cake

Unit 2: UNIT 2 NOV./DEC./JAN.

Math - Kindergarten - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Student will be able to ID numbers 1-20 in mixed order.

Student will be able to match a numeral (1-10) with a the corresponding amount of dots.

Student will be able to look at two groups of objects and decide which group is more, which group is less and which groups are equal.

Student will be able to compare objects and decide which is heaviest, lightest, tallest, shortest. Must also understand what the words mean.

Student will be able to identify a shape when given shapes to name. Five 2-D shapes -rectangle, circle, hexagon, triangle and square. I also teach vertices, straight lines and curved line

Student will be able to count to 100 w no prompts or visual aides.

Student will be able to count on (next three numbers) from a given number 1-17

Student will be able to count to ten using counters. One number for each counter in order.

Student will be able to count to ten using counters. One number for each counter in order.

Student will be able to use the words, above, below, beside, next to, in front and behind to describe the position of objects

Student will be able to recognize a simple pattern by assigning a letter to each object or picture
Student will be able to compare capacity of various measuring cups

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

1:1 with teacher and a set of flashcards.

Observe student(I do this with 2-3- students at a time on the floor). Student will look at star, apple, gingerbread die-cut with black dots and lay the matching numeral card on the die-cut.

1:1 with teacher and worksheet.

1:1 with teacher and a worksheet depicting the objects. Student will point to the correct object when the adjective is given.

Student given 5 wooden 2-d shapes and are prompted “Show me the circle” etc.

Student will count out loud 1:1 with teacher

Student will verbally count on from a given number 1:1 with teacher

Student will count to ten using counters.

Class discussion and MyMath worksheets (can use review , or check understanding worksheets)

1:1 with teacher and class discussion.

Observation of project

STANDARDS

Ohio - Kindergarten - Math
K.CC.1
Count to 100 by ones and by tens.
K.CC.2
Count forward within 100 beginning from any given number other than 1.
K.CC.4
Understand the relationship between numbers and quantities; connect counting to cardinality using a variety of objects including pennies.
K.CC.4.a
When counting objects, establish a one-to-one relationship by saying the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
K.CC.4.b
Understand that the last number name said tells the number of objects counted and that the number of objects is the same regardless of their arrangement or the order in which they were counted.
K.CC.4.c
Understand that each successive number name refers to a quantity that is one larger.
K.MD.1
Identify and describe measurable attributes (length, weight, and height) of a single object using vocabulary terms such as long/short, heavy/light, or tall/short.
K.MD.2
Directly compare two objects with a measurable attribute in common to see which object has “more of” or “less of” the attribute, and describe the difference. For example, directly compare the heights of two children, and describe one child as taller/shorter.
K.G.2
Correctly name shapes regardless of their orientations or overall size.
K.CC.6
Orally identify (without using inequality symbols) whether the number of objects in one group is greater/more than,

less/fewer than, or the same as the number of objects in another group, not to exceed 10 objects in each group.

Unit 3: Unit 3 Feb. March

Math - Kindergarten - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1. 2 d shapes/3 shapes
2 rote count to 100
3. count forward from a given number
4 1:1 correspondence
5. positional words
6 measurement-ht, wt, capacity, length
7 number recognition
8 patterns
9 ten frames
10 bar graphs
11 ordinal numbers
12 write numbers 1-20
13 match numbers to set
14 compare two groups of objects-less, equal, great
15 measurable attribute-tall, short, light, heavy
16 story problems addition and subtraction
17 base ten blocks
18 compare 2 numbers which is great or less

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Videos, calendar, counters, 100 number grid

MNM probes, work sheets, calendar, hidden number on number grid, Ipad ,

Practice counting with counters. Count out loud with the student and move their hand with the counter, one number to one hand movement. Playdough balls, count and smash the balls. Egg crate with ten spots. Place one counter in each spot, count out loud.

Manipulatives of the 3-d shapes, find the shapes in the room, MyMath, videos, smartboard, ipad

Flash cards, videos, calendar, various tactile writing, 100 grid, number line work, magnets, smartboard games, ipad,

Counting, calendar, number line work, 100 chart, touching and counting manipulatives, ipad games, smartboard games, matching
games,

Counting, number-line, review vocab-more, less and equal, smartboard games, ipad, MyMAth

Calendar, center games, video, smartboard games, 100 grid, numberline work, finger counting, counting and comparing tally marks-convert tally marks into a number, compare packer/buyer, weather graph-compare columns of data, work sheets,

Daily discussion using familiar topics. MyMath, concrete addition and subtraction taught first, teach key words to listen for to figure out if the problem is addition or subtraction-join, all together, are left, how many remain

. MyMath, ipad, cross- curriculum books, comparing objects in the classroom

Base ten manipulatives, calendar time-counting how many days we have been in school (I do this from the first day of school) , centers

Unit 3: Unit 3 Feb. March

Math - Kindergarten - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Student will be able to count to 100 w no prompts or visual aides.

Student will be able to count on (next three numbers) from a given number 1-17

Student will be able to count to 20 using counters. One number for each counter in order.

Student will be able to id the shape and say the name of the shape

Student will be able to ID numbers 1-20 in mixed order.

Student will be able to match a numeral (1-10) with a the corresponding amount of dots.
Student will be able to look at two groups of objects and decide which group is more, which group is less and which groups are equal.

Student will be able to compare two numbers up to ten and decide which number is more and which is less
Student will be able to understand a story problem and use counters to figure out the answer. Example- 4 kids were at the pool, 4 more joined, how many kids all together.

Student will be able to compare objects and decide which is heaviest, lightest, tallest, shortest.
Must also understand what the words mean.

Student will be able to use base ten blocks (cubes and longs/rods) to make numbers up to 100

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Student will count out loud 1:1 with teacher

Student will verbally count on from a given number 1:1 with teacher

Student will count to twenty using counters.

1:1 with the teacher -teacher show the wooden shape-student recite the name

1:1 with teacher and a set of flashcards.

Observe student(I do this with 2-3- students at a time on the floor). Student will look at star, apple, gingerbread die-cut with black dots and lay the matching numeral card on the die-cut

1:1 with teacher and worksheet
Two assessment papers. One paper, student looks at 2 numbers up to and including 10 and must decide which number is more. On a second paper student decides when looking at a pair of numbers which is less

Student/s will be with teacher. I borrow "offices" from third grade and assess 3-4 students at a time. I read story problem, student listen for key words, use counters to follow the story and figure out the answer

1:1 with teacher and a worksheet depicting the objects. Student will point to the correct object when the adjective is given
Student will use base ten blocks to make numbers given by the teacher.

STANDARDS

Ohio - Kindergarten - Math
K.CC.1
Count to 100 by ones and by tens.
K.CC.2
Count forward within 100 beginning from any given number other than 1.
K.CC.4
Understand the relationship between numbers and quantities; connect counting to cardinality using a variety of objects including pennies.
K.CC.4.a
When counting objects, establish a one-to-one relationship by saying the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
K.CC.4.b
Understand that the last number name said tells the number of objects counted and that the number of objects is the same regardless of their arrangement or the order in which they were counted.
K.CC.4.c
Understand that each successive number name refers to a quantity that is one larger.
K.CC.6
Orally identify (without using inequality symbols) whether the number of objects in one group is greater/more than,

less/fewer than, or the same as the number of objects in another group, not to exceed 10 objects in each group.
K.CC.7
Compare (without using inequality symbols) two numbers between 0 and 10 when presented as written numerals.
K.OA.1
Represent addition and subtraction with objects, fingers, mental images, drawings, sounds such as claps, acting out situations, verbal explanations, expressions, or equations. Drawings need not show details, but should show the mathematics in the problem.
K.OA.2
Solve addition and subtraction problems (written or oral), and add and subtract within 10 by using objects or drawings to represent the problem.
K.MD.1
Identify and describe measurable attributes (length, weight, and height) of a single object using vocabulary terms such as long/short, heavy/light, or tall/short.
K.MD.2
Directly compare two objects with a measurable attribute in common to see which object has “more of” or “less of” the attribute, and describe the difference. For example, directly compare the heights of two children, and describe one child as taller/shorter.
K.G.2
Correctly name shapes regardless of their orientations or overall size.

Unit 4: April May June

Math - Kindergarten - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1. 2 d shapes/3 shapes
2 rote count to 100
3. count forward from a given number
4 1:1 correspondence
5. positional words
6 measurement-ht, wt, capacity, length
7 number recognition
8 patterns
9 ten frames
10 bar graphs
11 ordinal numbers
12 write numbers 1-20
13 match numbers to set
14 compare two groups of objects-less, equal, great
15 measurable attribute-tall, short, light, heavy
16 story problems addition and subtraction
17 base ten blocks
18 compare 2 numbers which is great or less
19 add and subtract with in 5
20 sort attribute blocks by color, shape, size

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Videos, calendar, counters, 100 number grid

MNM probes, work sheets, calendar, hidden number on number grid, Ipad ,

Practice counting with counters. Count out loud with the student and move their hand with the counter, one number to one hand movement. Playdough balls, count and smash the balls. Egg crate with ten spots. Place one counter in each spot, count out loud.
Manipulatives of the 3-d shapes, find the shapes in the room, MyMath, videos, smartboard, ipad

Flash cards, videos, calendar, various tactile writing, 100 grid, number line work, magnets, smartboard games, ipad,

Counting, calendar, number line work, 100 chart, touching and counting manipulatives, ipad games, smartboard games, matching games,
Videos, 100 grid, base ten blocks(rods/longs), centers, chant

Videos, flash cards, fingers,

Flash cards, videos, calendar, various tactile writing, 100 grid, number line work, magnets, smartboard games, ipad,

Calendar, center games, video, smartboard games, 100 grid, numberline work, finger counting, counting and comparing tally marks-convert tally marks into a number, compare packer/buyer, weather graph-compare columns of data, work sheets

Daily discussion using familiar topics. MyMath, concrete addition and subtraction taught first, teach key words to listen for to figure out if the problem is addition or subtraction-join, all together, are left, how many remain
Visual calendar, numberline, 100 grid, count out loud, videos, ipad , centers practice, various tactile-wikistix, salt etc

MyMath, class discussion, smartboard games, ipad games, manipulatives, centers, videos
calendar time-counting how many days we have been in school (I do this from the first day of school), centers,

Counting, number-line, review vocab-more, less and equal, smartboard games, ipad, MyMAth Videos, MyMath, centers, magnets, manipulatives

MyMath, ipad, cross- curriculum books, comparing objects in the classroom
Videos, MyMath, centers, magnets, manipulatives

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Student will be able to count to 100 w no prompts or visual aides.

Student will be able to count on (next three numbers) from a given number 1-17

Student will be able to count to 20 using counters. One number for each counter in order.

Student will be able to id the shape and say the name of the shape

Student will be able to ID numbers 1-20 in mixed order.

Student will be able to match a numeral (1-10) with a the corresponding amount of dots.
Student will be able to count to 100 by tens

Student will be able to
doubles count to 10

Student will be able to ID numbers 1-20 in mixed order.

Student will be able to compare two numbers up to ten and decide which number is more and which is less
Student will be able to understand a story problem and use counters to figure out the answer. Example- 4 kids were at the pool, 4 more joined, how many kids all together
Student will be able to write numbers 1-20

Student will be able to listen to an addition or subtraction problem using numbers 0-5, understand that addition means to add on and subtraction means to make less or take away. Student will listen to a problem and figure out the correct answer.

Student will be able to use base ten blocks (cubes and longs/rods) to make numbers up to 100

Student will be able to write numbers 1-20

Student will be able to look at two groups of objects and decide which group is more, which group is less and which groups are equal.

Student will be able to compare objects and
decide which is heaviest, lightest, tallest, shortest. Must also understand what the words mean.

Student will be able to sort blocks by color, size and shape

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Student will count out loud 1:1 with teacher

Student will verbally count on from a given number 1:1 with teacher

Student will count to twenty using counters.

1:1 with the teacher -teacher show the wooden shape-student recite the name

1:1 with teacher and a set of flashcards.

Observe student(I do this with 2-3- students at a time on the floor). Student will look at star, apple, gingerbread die-cut with black dots and lay the matching numeral card on the die-cut

Listen to student count to 100 by 10

Show number sentence or verbalize the problem and student answers

1:1 with teacher and a set of flashcards.

Two assessment papers. One paper, student looks at 2 numbers up to and including 10 and must decide which number is more. On a second paper student decides when looking at a pair of numbers which is less

Student/s will be with teacher. I borrow "offices" from third grade and assess 3-4 students at a time. I read story problem, student listen for key words, use
counters to follow the story and figure out the answer.

Student will be given lined paper and given instruction to write numbers 1-20, I do this whole group.

1:1 with student- teacher will verbalize an addition or subtraction and student will verbalize the answer

Student will use base ten blocks to make numbers given by the teacher.

1:1 with teacher and worksheet depicting the
objects. Student will point to the correct object when the adjective is given.

1:1 with teacher and manipulatives

STANDARDS

Ohio - Kindergarten - Math
K.CC.1
Count to 100 by ones and by tens.
K.CC.2
Count forward within 100 beginning from any given number other than 1.
K.CC.4
Understand the relationship between numbers and quantities; connect counting to cardinality using a variety of objects including pennies.
K.CC.3
Write numerals from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
K.CC.4.a
When counting objects, establish a one-to-one relationship by saying the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
K.CC.4.b
Understand that the last number name said tells the number of objects counted and that the number of objects is the same regardless of their arrangement or the order in which they were counted.

K.CC.4.c
Understand that each successive number name refers to a quantity that is one larger.
K.CC.6
Orally identify (without using inequality symbols) whether the number of objects in one group is greater/more than, less/fewer than, or the same as the number of objects in another group, not to exceed 10 objects in each group.
K.CC.7
Compare (without using inequality symbols) two numbers between 0 and 10 when presented as written numerals.
K.OA.1
Represent addition and subtraction with objects, fingers, mental images, drawings, sounds such as claps, acting out situations, verbal explanations, expressions, or equations. Drawings need not show details, but should show the mathematics in the problem.
K.OA.2
Solve addition and subtraction problems (written or oral), and add and subtract within 10 by using objects or drawings to represent the problem.
K.OA.5
Fluently add and subtract within 5.
K.MD.1
Identify and describe measurable attributes (length, weight, and height) of a single object using vocabulary terms such as long/short, heavy/light, or tall/short.
K.NBT.1
Compose and decompose numbers from 11 to 19 into a group of ten ones and some further ones by using objects and, when appropriate, drawings or equations; understand that these numbers are composed of a group of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
K.MD.2
Directly compare two objects with a measurable attribute in common to see which object has “more of” or “less of” the attribute, and describe the difference. For example, directly compare the heights of two children, and describe one child as taller/shorter.
K.G.2

Correctly name shapes regardless of their orientations or overall size.
K.MD.3
Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. The number of objects in each category should be less than or equal to ten. Counting and sorting coins should be limited to pennies.

Math - 1st grade

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: September	*5 lessons*
Unit 2: October	*1 lessons*
Unit 3: November	*1 lessons*
Unit 4: December	*1 lessons*
Unit 5: January	*1 lessons*
Unit 6: February	*1 lessons*
Unit 7: March	*1 lessons*
Unit 8: April	*1 lessons*
Unit 9: May	*1 lessons*

Unit 1: September

Math - 1st grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Id, counting to 120, addition, time to the hour, shapes, number words
Id, counting to 120, addition, time to the hour, shapes, number words

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games, flashcards, # magnets, # mini erasers, counters, linking cubes, dice, base 10 blocks, clocks, pattern blocks, dry erase boards, hands, videos, Math series, Math meeting, classroom displays, projects, booklets

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify #s, count to 120, construct addition # sentences, add #'s.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, exit tickets, written products, created products with manipulatives, IXL data, MAP data

STANDARDS

Ohio - Grade 1 - Math
1.OA.1
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.6
Add and subtract within 20, demonstrating fluency with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14; decomposing a number leading to a ten, e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9; using the relationship between addition and subtraction, e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4; and creating equivalent but easier or known sums, e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.
1.NBT.1
Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1.MD.3.a
Tell and write time in hours and half-hours using analog and digital clocks.

Unit 2: October

Math - 1st grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

#Id, counting to 120, addition & subtraction, time to the hour, shapes, 10s and 1s, comparing height & length, word problems, T/F (= sign)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games, flashcards, # magnets, # mini erasers, counters, linking cubes, dice, base 10 blocks, clocks, pattern blocks, dry erase boards, hands, videos, Math series, Math meeting, classroom displays, projects, booklets, Spiral Math sheets

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify #s, count to 120, construct addition & subtraction # sentences, add & subtract #'s, tell time to the hour, identify shapes, identify 10s & 1s in a given #, identify tallest, shortest, longest items.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, exit tickets, written products, created products with manipulatives, IXL data, MAP data

STANDARDS

Ohio - Grade 1 - Math
1.OA.1
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.4
Understand subtraction as an unknown-addend problem. For example, subtract 10 − 8 by finding the number that makes 10 when added to 8.
1.OA.6
Add and subtract within 20, demonstrating fluency with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14; decomposing a number leading to a ten, e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9; using the relationship between addition and subtraction, e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4; and creating equivalent but easier or known sums, e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.
1.OA.7
Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6; 7 = 8 – 1; 5 + 2 = 2 + 5; 4 + 1 = 5 + 2.

1.NBT.1
Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1.MD.3.a
Tell and write time in hours and half-hours using analog and digital clocks.

Unit 3: November

Math - 1st grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

#Id, counting to 120, addition & subtraction, using a number line, time to the hour, shapes, 10s and 1s, graphs, = sign, doubles, missing #

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games, flashcards, # magnets, # mini erasers, counters, linking cubes, dice, base 10 blocks, clocks, pattern blocks, dry erase boards, hands, videos, Math series, Math meeting, classroom displays, projects, booklets, Spiral Math sheets, number line

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify #s, count to 120, construct addition & subtraction # sentences, add & subtract #'s, tell time to the hour, identify shapes, identify 10s & 1s in a given #, identify tallest, shortest, longest items, correctly use a number line, interpret a graph.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, exit tickets, written products, created products with manipulatives, IXL data, MAP data

STANDARDS

Ohio - Grade 1 - Math
1.OA.1
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.4
Understand subtraction as an unknown-addend problem. For example, subtract 10 − 8 by finding the number that makes 10 when added to 8.
1.OA.6
Add and subtract within 20, demonstrating fluency with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14; decomposing a number leading to a ten, e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9; using the relationship between addition and subtraction, e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4; and creating equivalent but easier or known sums, e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.
1.OA.7
Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6; 7 = 8 – 1; 5 + 2 = 2 +

5; 4 + 1 = 5 + 2.
1.NBT.1
Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1.MD.3.a
Tell and write time in hours and half-hours using analog and digital clocks.

Unit 4: December

Math - 1st grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

#Id, counting to 120, addition & subtraction, using a number line, time to the hour, shapes, 10s and 1s, comparing height & length, graphs, word problems, add 3 #s

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games, flashcards, # magnets, # mini erasers, counters, linking cubes, dice, base 10 blocks, clocks, pattern blocks, dry erase boards, hands, videos, Math series, Math meeting, classroom displays, projects, booklets, Spiral Math sheets, number line

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify #s, count to 120, construct addition & subtraction # sentences, add & subtract #'s, tell time to the hour, identify shapes, identify 10s & 1s in a given #, identify tallest, shortest, longest items, correctly use a number line, interpret a graph.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, exit tickets, written products, created products with manipulatives, IXL data, MAP data

STANDARDS

Ohio - Grade 1 - Math
1.OA.1
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.NBT.1
Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1.OA.6
Add and subtract within 20, demonstrating fluency with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14; decomposing a number leading to a ten, e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9; using the relationship between addition and subtraction, e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4; and creating equivalent but easier or known sums, e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.

Unit 5: January

Math - 1st grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

#Id, counting to 120, addition & subtraction, time to the hour & ½ hour, shapes, 10s and 1s, graphs, missing addend, word problems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games, flashcards, # magnets, # mini erasers, counters, linking cubes, dice, base 10 blocks, clocks, pattern blocks, dry erase boards, hands, videos, Math series, Math meeting, classroom displays, projects, booklets, Spiral Math sheets, number line

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify #s, count to 120, construct addition & subtraction # sentences, add & subtract #'s, tell time to the hour, identify shapes, identify 10s & 1s in a given #, identify tallest, shortest, longest items, correctly use a number line, interpret a graph.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, exit tickets, written products, created products with manipulatives, IXL data, MAP data

STANDARDS

Ohio - Grade 1 - Math
1.OA.1
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.6
Add and subtract within 20, demonstrating fluency with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14; decomposing a number leading to a ten, e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9; using the relationship between addition and subtraction, e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4; and creating equivalent but easier or known sums, e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.
1.NBT.1
Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1.NBT.2
Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: 10 can be thought of as a bundle of ten ones — called a "ten;" the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones; and the numbers 10, 20,

30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
1.MD.3.a
Tell and write time in hours and half-hours using analog and digital clocks.
1.MD.4
Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Unit 6: February

Math - 1st grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

#Id, counting to 120, addition & subtraction, time to the hour & ½ hour, 10s and 1s (place value), 10+/10-, greater than/less than, graphs

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games, flashcards, # magnets, # mini erasers, counters, linking cubes, dice, base 10 blocks, clocks, pattern blocks, dry erase boards, hands, videos, Math series, Math meeting, classroom displays, projects, booklets, Spiral Math sheets, number line

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify #s, count to 120, construct addition & subtraction # sentences, add & subtract #'s, tell time to the hour, identify shapes, identify 10s & 1s in a given #, identify tallest, shortest, longest items, correctly use a number line, interpret a graph.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, exit tickets, written products, created products with manipulatives, IXL data, MAP data

STANDARDS

Ohio - Grade 1 - Math
1.OA.1
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.4
Understand subtraction as an unknown-addend problem. For example, subtract 10 − 8 by finding the number that makes 10 when added to 8.
1.OA.6
Add and subtract within 20, demonstrating fluency with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14; decomposing a number leading to a ten, e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9; using the relationship between addition and subtraction, e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4; and creating equivalent but easier or known sums, e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.
1.NBT.1
Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

1.NBT.2
Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: 10 can be thought of as a bundle of ten ones — called a “ten;” the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones; and the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
1.NBT.3
Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and < .
1.NBT.5
Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
1.MD.3.a
Tell and write time in hours and half-hours using analog and digital clocks.

Unit 7: March

Math - 1st grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

#Id, counting to 120, addition & subtraction, time to the hour & ½ hour, shapes, 10s and 1s, comparing height & length, graphs, count by 10, 5 and 1s, <>=

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games, flashcards, # magnets, # mini erasers, counters, linking cubes, dice, base 10 blocks, clocks, pattern blocks, dry erase boards, hands, videos, Math series, Math meeting, classroom displays, projects, booklets, Spiral Math sheets, number line

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify #s, count to 120, construct addition & subtraction # sentences, add & subtract #'s, tell time to the hour, identify shapes, identify 10s & 1s in a given #, identify tallest, shortest, longest items, correctly use a number line, interpret a graph.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, exit tickets, written products, created products with manipulatives, IXL data, MAP data

STANDARDS

Ohio - Grade 1 - Math
1.OA.1
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.4
Understand subtraction as an unknown-addend problem. For example, subtract 10 − 8 by finding the number that makes 10 when added to 8.
1.OA.6
Add and subtract within 20, demonstrating fluency with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14; decomposing a number leading to a ten, e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9; using the relationship between addition and subtraction, e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4; and creating equivalent but easier or known sums, e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.
1.NBT.1
Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

1.NBT.5
Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
1.MD.4
Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Unit 8: April

Math - 1st grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

#Id, counting to 120, addition & subtraction, time to the hour & ½ hour, shapes, 10s and 1s, comparing height & length, word problems, shape attributes, 2D and 3D shapes

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games, flashcards, # magnets, # mini erasers, counters, linking cubes, dice, base 10 blocks, clocks, pattern blocks, dry erase boards, hands, videos, Math series, Math meeting, classroom displays, projects, booklets, Spiral Math sheets, number line

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify #s, count to 120, construct addition & subtraction # sentences, add & subtract #'s, tell time to the hour, identify shapes, identify 10s & 1s in a given #, identify tallest, shortest, longest items, correctly use a number line, interpret a graph.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, exit tickets, written products, created products with manipulatives, IXL data, MAP data

STANDARDS

Ohio - Grade 1 - Math
1.OA.1
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.6
Add and subtract within 20, demonstrating fluency with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14; decomposing a number leading to a ten, e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9; using the relationship between addition and subtraction, e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4; and creating equivalent but easier or known sums, e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.
1.OA.4
Understand subtraction as an unknown-addend problem. For example, subtract 10 − 8 by finding the number that makes 10 when added to 8.
1.NBT.1
Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

1.NBT.2
Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: 10 can be thought of as a bundle of ten ones — called a “ten;” the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones; and the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
1.MD.1
Order three objects by length; compare the lengths of two objects indirectly by using a third object.
1.MD.2
Express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.
1.MD.3.a
Tell and write time in hours and half-hours using analog and digital clocks.
1.MD.4
Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
1.G.1
Distinguish between defining attributes, e.g., triangles are closed and three-sided, versus non-defining attributes, e.g., color, orientation, overall size; build and draw shapes that possess defining attributes.
1.G.2
Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. Students do not need to learn formal names such as right rectangular prism.

Unit 9: May

Math - 1st grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

#Id, counting to 120, addition & subtraction, time to the hour & ½ hour, shapes, 10s and 1s, comparing height & length, graphing, fractions, measurement, word problems, comparing #s, 2D & 3D shapes

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games, flashcards, # magnets, # mini erasers, counters, linking cubes, dice, base 10 blocks, clocks, pattern blocks, dry erase boards, hands, videos, Math series, Math meeting, classroom displays, projects, booklets, Spiral Math sheets, number line.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Identify #s, count to 120, construct addition & subtraction # sentences, add & subtract #'s, tell time to the hour, identify shapes, identify 10s & 1s in a given #, identify tallest, shortest, longest items, correctly use a number line, interpret a graph.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Observation, exit tickets, written products, created products with manipulatives, IXL data, MAP data

STANDARDS

Ohio - Grade 1 - Math
1.OA.1
Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.NBT.1
Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1.NBT.2
Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: 10 can be thought of as a bundle of ten ones — called a "ten;" the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones; and the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
1.OA.6
Add and subtract within 20, demonstrating fluency with various strategies for addition and subtraction within 10. Strategies may include counting on; making ten, e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14; decomposing a number leading to a ten, e.g., 13 − 4 = 13 − 3 − 1 = 10 − 1 = 9; using the relationship between addition and subtraction,

e.g., knowing that 8 + 4 = 12, one knows 12 − 8 = 4; and creating equivalent but easier or known sums, e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13.
1.OA.7
Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6; 7 = 8 – 1; 5 + 2 = 2 + 5; 4 + 1 = 5 + 2.
1.NBT.3
Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and < .
1.NBT.5
Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.
1.MD.1
Order three objects by length; compare the lengths of two objects indirectly by using a third object.
1.MD.2
Express the length of an object as a whole number of length units by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.
1.MD.3.a
Tell and write time in hours and half-hours using analog and digital clocks.
1.MD.4
Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
1.G.2
Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. Students do not need to learn formal names such as right rectangular prism.

1.G.3
Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of or four of the shares in real-world contexts. Understand for these examples that decomposing into more equal shares creates smaller shares.
1.G.1
Distinguish between defining attributes, e.g., triangles are closed and three-sided, versus non-defining attributes, e.g., color, orientation, overall size; build and draw shapes that possess defining attributes.

Math - 2nd grade

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: Bailey-Math September	*5 lessons*
Unit 2: Bailey-Math October	*1 lessons*
Unit 3: Bailey-Math November	*1 lessons*
Unit 4: Bailey-Math December	*1 lessons*
Unit 5: Bailey-Math January	*1 lessons*
Unit 6: Bailey-Math February	*1 lessons*
Unit 7: Bailey-Math March	*1 lessons*
Unit 8: Bailey-Math April	*1 lessons*
Unit 9: Bailey-Math May	*1 lessons*

Unit 1: Bailey-Math September

Math - 2nd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Ch. 1 Apply Addition and Subtraction Facts

STANDARDS

Ohio - Grade 2 - Math

2.OA.1

Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.OA.2

Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Whole group and small group instruction.
Using math, manipulatives. Instructing students how to add and subtract on a 100 chart. BrainpopJr or other instructional videos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solve and subtract within 100.

Solve addition and subtraction word problems within 100

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Chapter Test
Grade Level Assessments
Check My Progress
Fact Fluency Assessments
MAP testing

STANDARDS

Ohio - Grade 2 - Math

2.OA.1

Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.OA.2

Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two

one-digit numbers.
2.OA.3
Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
2.OA.4
Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
2.NBT.2
Count forward and backward within 1,000 by ones, tens, and hundreds starting at any number; skip-count by 5s starting at any multiple of 5.

Unit 2: Bailey-Math October

Math - 2nd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Ch. 2 Number patterns

Ch. 10 Time

STANDARDS

Ohio - Grade 2 - Math
2.MD.7
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
2.OA.3
Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
2.NBT.2
Count forward and backward within 1,000 by ones, tens, and hundreds starting at any number; skip-count by 5s starting at any multiple of 5.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Skip Count
Repeated Addition/ Arrays
Even and Odd

Telling TIme
Color in clock with “rooms” to use as a resource.
Make their own clock.
Use math manipulatives
Headband telling time game

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-Count within 1000; skip-count by 5s, 10s, and 100s
-Determine whether a group of objects has an odd or even number of members

Tell time to the nearest five minutes, using a.m. and p.m

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Chapter Test
Grade Level Assessments
Check My Progress
Fact Fluency Assessments

STANDARDS

Ohio - Grade 2 - Math
2.OA.1
Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.OA.2
Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
2.OA.3
Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
2.OA.4
Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.2
Count forward and backward within 1,000 by ones, tens, and hundreds starting at any number; skip-count by 5s starting at any multiple of 5.
2.MD.7
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Unit 3: Bailey-Math November

Math - 2nd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Ch. 10 Time (Finishing from the month before)

Ch. 5 Place Value

STANDARDS

Ohio - Grade 2 - Math
2.MD.7
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.1.a
100 can be thought of as a bundle of ten tens - called a “hundred.”
2.NBT.1.b
The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Instructional Videos
Brainpopjr
Place Value rap song with Mrs. Garcia
Place Value crafts
Base 10 blocks

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Tell time to the nearest five minutes, using a.m. and p.m

Understand three-digit numbers represent hundreds, tens, and ones

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Chapter Test
Grade Level Assessments
Check My Progress
Fact Fluency Assessments

STANDARDS

Ohio - Grade 2 - Math
2.OA.1
Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.OA.2
Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.1.a
100 can be thought of as a bundle of ten tens - called a “hundred.”
2.NBT.1.b
The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2.NBT.2
Count forward and backward within 1,000 by ones, tens, and hundreds starting at any number; skip-count by 5s starting at any multiple of 5.
2.NBT.3
Read and write numbers to 1,000 using base-ten numerals, number names, expanded form, and equivalent representations, e.g., 716 is 700 + 10 + 6, or 6 + 700 + 10, or 6 ones and 71 tens, etc.
2.NBT.4
Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.
2.MD.7
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Unit 4: Bailey-Math December

Math - 2nd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Ch. 3 Two digit Addition

STANDARDS

Ohio - Grade 2 - Math
2.NBT.5
Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.1.a
100 can be thought of as a bundle of ten tens - called a “hundred.”
2.NBT.1.b
The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Base 10 blocks
Practice on whiteboards.
Place Value Mat
Roll the dice 2 digit add game
Practice stacking the numbers sentences up and down
Spin and write 2 digit addition

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Fluently add and subtract within 100

Understand three-digit numbers represent hundreds, tens, and ones

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Chapter Test
Grade Level Assessments
Check My Progress
Fact Fluency Assessments
White board checks

STANDARDS

Unit 4: Bailey-Math December

Math - 2nd grade - *Last Updated on June 30, 2023*

Ohio - Grade 2 - Math
2.OA.1
Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.OA.2
Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.1.a
100 can be thought of as a bundle of ten tens - called a “hundred.”
2.NBT.5
Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.6
Add up to four two-digit numbers using strategies based on place value and properties of operations.
2.MD.7
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Unit 5: Bailey-Math January

Math - 2nd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Finish Ch. 3 Two Digit Addition

Ch. 4 Two Digit Subtraction

MAP testing

STANDARDS

Ohio - Grade 2 - Math
2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.1.a
100 can be thought of as a bundle of ten tens - called a “hundred.”
2.NBT.1.b
The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2.NBT.5
Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Finish Ch. 3 Two Digit Addition

Base 10 blocks
Practice on whiteboards.
Place Value Mat
Practice stacking the numbers sentences up and down.
Practice with regrouping/borrowing.
Spin and write 2 digit subtraction

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Fluently add and subtract within 100

Understand three-digit numbers represent hundreds, tens, and ones

Unit 5: Bailey-Math January

Math - 2nd grade - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Chapter Test
Grade Level Assessments
Check My Progress
Fact Fluency Assessments
MAP Testing

STANDARDS

Ohio - Grade 2 - Math
2.OA.1
Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.OA.2
Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.2
Count forward and backward within 1,000 by ones, tens, and hundreds starting at any number; skip-count by 5s starting at any multiple of 5.
2.NBT.7
Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, hundreds are added or subtracted from hundreds, tens are added or subtracted from tens, ones are added or subtracted from ones; and sometimes it is necessary to compose or decompose tens or hundreds.
2.MD.7
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Unit 6: Bailey-Math February

Math - 2nd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Ch. 8 Money

Ch. 6 Three Digit Addition

STANDARDS

Ohio - Grade 2 - Math
2.MD.8
Solve problems with money.
2.MD.8.a
Identify nickels and quarters by name and value.
2.MD.8.b
Find the value of a collection of quarters, dimes, nickels, and pennies.
2.MD.8.c
Solve word problems by adding and subtracting within 100, dollars with dollars and cents with cents (not using dollars and cents simultaneously) using the $ and ¢ symbols appropriately (not including decimal notation).
2.NBT.7
Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, hundreds are added or subtracted from hundreds, tens are added or subtracted from tens, ones are added or subtracted from ones; and sometimes it is necessary to compose or decompose tens or hundreds.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

-Introduce Money with BrainpopJr
-Money Poem
-Money cut and paste
-Complete money resource to keep in folder
-Working with coins in their hands
Identifying coins and counting them up.
Scoots around the room

Base 10 blocks
Practice on whiteboards.
Place Value Mat
Stacking numbers up and down.
Roll a dice/flip a card to create the number sentence

Unit 6: Bailey-Math February

Math - 2nd grade - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solve word problems involving dollar bills and coins

Add and subtract within 1000, using models or drawings

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Chapter Test
Grade Level Assessments
Check My Progress
Fact Fluency Assessments
MAP Testing

STANDARDS

Ohio - Grade 2 - Math
2.OA.1
Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.OA.2
Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.5
Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.7
Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, hundreds are added or subtracted from hundreds, tens are added or subtracted from tens, ones are added or subtracted from ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.MD.7
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
2.MD.8
Solve problems with money.
2.MD.8.a
Identify nickels and quarters by name and value.
2.MD.8.b
Find the value of a collection of quarters, dimes, nickels, and pennies.
2.MD.8.c
Solve word problems by adding and subtracting within 100, dollars with dollars and cents with cents (not using dollars and cents simultaneously) using the $ and ¢ symbols appropriately (not including decimal notation).
2.NBT.2
Count forward and backward within 1,000 by ones, tens, and hundreds starting at any number; skip-count by 5s starting at any multiple of 5.

Unit 7: Bailey-Math March

Math - 2nd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Ch. 7 Three Digit Subtraction

Ch. 12 Shapes/Geometry

STANDARDS

Ohio - Grade 2 - Math
2.G.1
Recognize and identify triangles, quadrilaterals, pentagons, and hexagons based on the number of sides or vertices. Recognize and identify cubes, rectangular prisms, cones, and cylinders.
2.G.2
Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.3
Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, or fourths and quarters, and use the phrases half of, third of, or fourth of and quarter of. Describe the whole as two halves, three thirds, or four fourths in real-world contexts. Recognize that equal shares of identical wholes need not have the same shape.
2.NBT.7
Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, hundreds are added or subtracted from hundreds, tens are added or subtracted from tens, ones are added or subtracted from ones; and sometimes it is necessary to compose or decompose tens or hundreds.

Unit 7: Bailey-Math March

Math - 2nd grade - *Last Updated on June 30, 2023*

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Base 10 blocks
Practice on whiteboards.
Place Value Mat
Practice stacking the numbers sentences up and down.
Practice with regrouping/borrowing.
3 digit subtraction games

Make resource together in class to keep in folders to remember 2D and 3D.
Class discussions.
Instructional videos of shapes
2d and 3d shapes
Fractions
Area
Scoots, worksheets, cut and paste.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Add and subtract within 1000, using models or drawings

Recognize and draw shapes having specified attributes.

Partition circles and rectangles into 2, 3, or 4 equal shares

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Chapter Test
Grade Level Assessments
Check My Progress
Fact Fluency Assessments

STANDARDS

Ohio - Grade 2 - Math
2.OA.1
Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.OA.2
Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
2.NBT.5
Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the

relationship between addition and subtraction.
2.NBT.7
Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, hundreds are added or subtracted from hundreds, tens are added or subtracted from tens, ones are added or subtracted from ones; and sometimes it is necessary to compose or decompose tens or hundreds.
2.MD.7
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
2.MD.8
Solve problems with money.
2.G.1
Recognize and identify triangles, quadrilaterals, pentagons, and hexagons based on the number of sides or vertices. Recognize and identify cubes, rectangular prisms, cones, and cylinders.
2.G.2
Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.3
Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, or fourths and quarters, and use the phrases half of, third of, or fourth of and quarter of. Describe the whole as two halves, three thirds, or four fourths in real-world contexts. Recognize that equal shares of identical wholes need not have the same shape.

Unit 8: Bailey-Math April

Math - 2nd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Finish Ch. 12 shapes

Ch. 9 Data

STANDARDS

Ohio - Grade 2 - Math
2.G.3
Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, or fourths and quarters, and use the phrases half of, third of, or fourth of and quarter of. Describe the whole as two halves, three thirds, or four fourths in real-world contexts. Recognize that equal shares of identical wholes need not have the same shape.
2.G.2
Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.1
Recognize and identify triangles, quadrilaterals, pentagons, and hexagons based on the number of sides or vertices. Recognize and identify cubes, rectangular prisms, cones, and cylinders.
2.MD.10
Organize, represent, and interpret data with up to four categories; complete picture graphs when single-unit scales are provided; complete bar graphs when single-unit scales are provided; solve simple put-together, take-apart, and compare problems in a graph.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Finish Chapter 12
Make resource together in class to keep in folders to remember 2d and 3d.
Class discussions.
Instructional videos of shapes
2d and 3d shapes
Fractions
Area
Scoots, worksheets, cut and paste.

Explain graphs
Instructional videos
Brainpopjr
Class data whole group activity
Scoots, worksheets, cut and paste.

Unit 8: Bailey-Math April

Math - 2nd grade - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Recognize and draw shapes having specified attributes.

Partition circles and rectangles into 2, 3, or 4 equal shares

Students will be able to interpret different graphs.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Chapter Test
Grade Level Assessments
Check My Progress
Fact Fluency Assessments

STANDARDS

Ohio - Grade 2 - Math
2.OA.1
Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.OA.2
Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.2
Count forward and backward within 1,000 by ones, tens, and hundreds starting at any number; skip-count by 5s starting at any multiple of 5.
2.NBT.5
Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.7
Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written

numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, hundreds are added or subtracted from hundreds, tens are added or subtracted from tens, ones are added or subtracted from ones; and sometimes it is necessary to compose or decompose tens or hundreds.
2.MD.10
Organize, represent, and interpret data with up to four categories; complete picture graphs when single-unit scales are provided; complete bar graphs when single-unit scales are provided; solve simple put-together, take-apart, and compare problems in a graph.
2.G.1
Recognize and identify triangles, quadrilaterals, pentagons, and hexagons based on the number of sides or vertices. Recognize and identify cubes, rectangular prisms, cones, and cylinders.
2.G.2
Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.3
Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, or fourths and quarters, and use the phrases half of, third of, or fourth of and quarter of. Describe the whole as two halves, three thirds, or four fourths in real-world contexts. Recognize that equal shares of identical wholes need not have the same shape.

Unit 9: Bailey-Math May

Math - 2nd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Ch. 11 Measurement
Map Testing

STANDARDS

Ohio - Grade 2 - Math
2.MD.9
Generate measurement data by measuring lengths of several objects to the nearest whole unit or by making repeated measurements of the same object. Show the measurements by creating a line plot, where the horizontal scale is marked off in whole number units.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

-Using a ruler, yardstick and tape measure correctly to measure an object.
-Go over how to find the difference between two measurements.
Brainpopjr
-Measuring inch worm activity.
-Measuring flowers activity.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Measure the length using appropriate tools.

Measure to determine how much longer one object is than another

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Chapter Test
Grade Level Assessments
Check My Progress
Fact Fluency Assessments
MAP Testing

STANDARDS

Ohio - Grade 2 - Math
2.OA.1
Use addition and subtraction within 100 to solve one- and two- step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
2.OA.2
Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

2.NBT.1
Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
2.NBT.2
Count forward and backward within 1,000 by ones, tens, and hundreds starting at any number; skip-count by 5s starting at any multiple of 5.
2.NBT.5
Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.7
Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; record the strategy with a written numerical method (drawings and, when appropriate, equations) and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, hundreds are added or subtracted from hundreds, tens are added or subtracted from tens, ones are added or subtracted from ones; and sometimes it is necessary to compose or decompose tens or hundreds.
2.MD.1
Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.4
Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
2.MD.7
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
2.MD.8
Solve problems with money.
2.G.1
Recognize and identify triangles, quadrilaterals, pentagons, and hexagons based on the number of sides or vertices. Recognize and identify cubes, rectangular prisms, cones, and cylinders.

2.G.2
Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.3
Partition circles and rectangles into two, three, or four equal shares; describe the shares using the words halves, thirds, or fourths and quarters, and use the phrases half of, third of, or fourth of and quarter of. Describe the whole as two halves, three thirds, or four fourths in real-world contexts. Recognize that equal shares of identical wholes need not have the same shape.

Math - 3rd grade

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: September- Place Value, Rounding, Addition and Subtraction	*28 lessons*
Unit 2: October-Multiplication and Division	*16 lessons*
Unit 3: November Multiplication and Division	*20 lessons*
Unit 4: December Multiplication and Division	*12 lessons*
Unit 5: January Fraction and Measurement	*19 lessons*
Unit 6: February Data Collection, Measurement, Area and Perimeter	*18 lessons*
Unit 7: March Geometry	*21 lessons*
Unit 8: April Equations	*1 lessons*
Unit 9: May Equations	*1 lessons*

Unit 1: September- Place Value, Rounding, Addition and Subtraction

Math - 3rd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Place Value/Comparing Numbers, Ordering Numbers,
Rounding

Addition

Subtraction

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

My Math Lessons
Base 10 Blocks
Place Value Charts
IXL Lessons
Reflex Addition and Subtraction Fluency Practice

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Preparation for: using place value understanding to round whole numbers to the nearest 10 or 100, Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction, and multiply one-digit whole numbers by multiples of 10 in the range 10-90, e.g., 9 × 80, 5 × 60 using strategies based on place value
and properties of operations.

Place value understanding to round whole numbers to the nearest 10 or 100

Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between
addition and subtraction
Solve two-step word problems using the four operations. Represent these problems using equations with a letter or a symbol, which stands for the unknown quantity

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

My Math Chapter Tests

STANDARDS

Ohio - Grade 3 - Math
3.NBT.1
Use place value understanding to round whole numbers to the nearest 10 or 100.
3.NBT.2
Fluently add and subtract within 1,000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
3.OA.8
Solve two-step word problems using the four operations. Represent these problems using equations with a letter

or a symbol, which stands for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. This standard is limited to problems posed with whole numbers and having whole number answers. Students may use parentheses for clarification since algebraic order of operations is not expected.

Unit 2: October-Multiplication and Division

Math - 3rd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Intro to Multiplication & Division Concepts

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

My Math Lessons
Linking Cubes
Array Charts
IXL Lessons

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each

Interpret whole number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each

Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Solve two-step word problems using the four operations. Represent these problems using equations with a letter or a symbol, which stands for the unknown quantity

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

My Math Chapter Tests

STANDARDS

Ohio - Grade 3 - Math
3.OA.1
Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. (Note: These standards are written with the convention that a x b means a groups of b objects each; however, because of the commutative property, students may also interpret 5 x 7 as the total number of objects in 7 groups of 5 objects each).
3.OA.2
Interpret whole number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of

groups can be expressed as 56 ÷ 8.
3.OA.3
Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. Drawings need not show details, but should show the mathematics in the problem.
3.OA.8
Solve two-step word problems using the four operations. Represent these problems using equations with a letter or a symbol, which stands for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. This standard is limited to problems posed with whole numbers and having whole number answers. Students may use parentheses for clarification since algebraic order of operations is not expected.

Unit 3: November Multiplication and Division

Math - 3rd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Multiplication and Division

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

My Math Lessons
Linking Cubes
Multiplication/Division Strategy Charts
IXL Lessons
Reflex Multiplication and Division Fluency Practice

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Determine the unknown whole number in a multiplication or division equation relating three whole numbers

Apply properties of operations as strategies to multiply and divide

Understand division as an unknown-factor problem

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

Solve two-step word problems using the four operations. Represent these problems using equations with a letter or a symbol, which stands for the unknown quantity

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

My Math Chapter Tests

STANDARDS

Ohio - Grade 3 - Math
3.OA.3
Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. Drawings need not show details, but should show the mathematics in the problem.
3.OA.4
Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
3.OA.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division, e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8, or properties of operations. Limit to division without remainders. By the end of Grade 3, know from memory all products of two one-digit numbers.
3.OA.6
Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.

Unit 3: November Multiplication and Division

Math - 3rd grade - *Last Updated on June 30, 2023*

3.OA.1
Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. (Note: These standards are written with the convention that a x b means a groups of b objects each; however, because of the commutative property, students may also interpret 5 x 7 as the total number of objects in 7 groups of 5 objects each).
3.OA.2
Interpret whole number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.
3.OA.8
Solve two-step word problems using the four operations. Represent these problems using equations with a letter or a symbol, which stands for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. This standard is limited to problems posed with whole numbers and having whole number answers. Students may use parentheses for clarification since algebraic order of operations is not expected.

Unit 4: December Multiplication and Division

Math - 3rd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Multiplication and Division

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

My Math Lessons
Linking Cubes
Multiplication/Division Strategy Charts
IXL Lessons
Reflex Multiplication and Division Fluency Practice

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Determine the unknown whole number in a multiplication or division equation relating three whole numbers

Apply properties of operations as strategies to multiply and divide

Understand division as an unknown-factor problem

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

Solve two-step word problems using the four operations. Represent these problems using equations with a letter or a symbol, which stands for the unknown quantity

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

My Math Chapter Tests

STANDARDS

Ohio - Grade 3 - Math
3.OA.3
Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. Drawings need not show details, but should show the mathematics in the problem.
3.OA.4
Determine the unknown whole number in a multiplication or division equation relating three whole numbers.
3.OA.7
Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division, e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8, or properties of operations. Limit to division without remainders. By the end of Grade 3, know from memory all products of two one-digit numbers.
3.OA.6

Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.
3.OA.1
Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. (Note: These standards are written with the convention that a x b means a groups of b objects each; however, because of the commutative property, students may also interpret 5 x 7 as the total number of objects in 7 groups of 5 objects each).
3.OA.2
Interpret whole number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.
3.NBT.3
Multiply one-digit whole numbers by multiples of 10 in the range 10-90, e.g., 9 × 80, 5 × 60 using strategies based on place value and properties of operations.
3.OA.8
Solve two-step word problems using the four operations. Represent these problems using equations with a letter or a symbol, which stands for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. This standard is limited to problems posed with whole numbers and having whole number answers. Students may use parentheses for clarification since algebraic order of operations is not expected.

Unit 5: January Fraction and Measurement

Math - 3rd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Fractions
Measurement

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

My Math Lessons
Fraction Strips
Fraction Models
IXL Lessons

My Math Lessons
Measuring cups and spoons, eye droppers,
Clocks
IXL Lessons

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Understand a fraction 1
/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b

Understand a fraction as a number on the number line; represent fractions on a number line diagram

Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size

Measure and estimate liquid volumes and masses of objects using standard units of grams, kilograms, and liters

Tell and write time to the nearest minute. Measure time intervals in minutes (within 90 minutes). Solve real-world problems
involving addition and subtraction of time intervals (elapsed time) in minutes, e.g., by representing the problem on a number
line diagram or clock

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

My Math Chapter Tests

STANDARDS

Ohio - Grade 3 - Math
3.NF.1
Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.
3.NF.2
Understand a fraction as a number on the number line; represent fractions on a number line diagram.
3.NF.2.a

Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
3.NF.3
Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
3.NF.3.a
Understand two fractions as equivalent (equal) if they are the same size or the same point on a number line.
3.NF.3.b
Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.
3.NF.3.c
Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.
3.NF.3.d
Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols > , = , or < , and justify the conclusions, e.g., by using a visual fraction model.
3.MD.1
Work with time and money.
3.MD.1.a
Tell and write time to the nearest minute. Measure time intervals in minutes (within 90 minutes). Solve real-world problems involving addition and subtraction of time intervals (elapsed time) in minutes, e.g., by representing the problem on a number line diagram or clock.
3.MD.2
Measure and estimate liquid volumes and masses of objects using standard units of grams, kilograms, and liters. Add, subtract, multiply, or divide whole numbers to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. Excludes multiplicative comparison problems involving notions of times as much.
3.NF.2.b

Represent a fraction a/b (which may be greater than 1) on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

Unit 6: February Data Collection, Measurement, Area and Perimeter

Math - 3rd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Data
Area & Perimeter

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

My Math Lessons
Rulers
Graphs
IXL Lessons

My Math Lessons

Rulers
IXL Lessons

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Create scaled picture graphs to represent a data set with several categories. Create scaled bar graphs to represent a data set with several categories. Solve two-step “how many more” and “how many less” problems using information presented in the scaled graphs

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by
creating a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

Solve real -world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters

Recognize area as an attribute of plane figures and understand concepts of area measurement.

Measure areas by counting unit squares

Relate area to the operations of multiplication and addition

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

My Math Chapter Tests

STANDARDS

Ohio - Grade 3 - Math
3.MD.3
Create scaled picture graphs to represent a data set with several categories. Create scaled bar graphs to represent a data set with several categories. Solve two-step “how many more” and “how many less” problems using information presented in the scaled graphs. For example, create a bar graph in which each square in the bar

graph might represent 5 pets, then determine how many more/less in two given categories.
3.MD.4
Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by creating a line plot, where the horizontal scale is marked off in appropriate units - whole numbers, halves, or quarters.
3.MD.8
Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
3.MD.7.d
Recognize area as additive. Find the area of figures composed of rectangles by decomposing into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real-world problems.
3.MD.7.c
Use tiling to show in a concrete case that the area of a rectangle with whole number side lengths a and b + c is the sum of a × b and a × c (represent the distributive property with visual models including an area model).
3.MD.7.b
Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real-world and mathematical problems, and represent whole number products as rectangular areas in mathematical reasoning.
3.MD.7.a
Find the area of a rectangle with whole number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
3.MD.7
Relate area to the operations of multiplication and addition.
3.MD.6
Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
3.MD.5.b
A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n

square units.
3.MD.5.a
A square with side length 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area.
3.MD.5
Recognize area as an attribute of plane figures and understand concepts of area measurement.

Unit 7: March Geometry

Math - 3rd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Geometry

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

My Math Lessons
IXL Lessons
Shape Stencils, “Shape Town Project”

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Draw and describe triangles, quadrilaterals (rhombuses, rectangles, and squares), and polygons (up to 8 sides) based on the
number of sides and the presence or absence of square corners (right angles)

Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

My Math Chapter Tests

STANDARDS

Ohio - Grade 3 - Math
3.G.1
Draw and describe triangles, quadrilaterals (rhombuses, rectangles, and squares), and polygons (up to 8 sides) based on the number of sides and the presence or absence of square corners (right angles).
3.G.2
Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.

Unit 8: April Equations

Math - 3rd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Equations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

My Math Lessons
IXL Lessons
Multiplication and Division Strategy Mats
Linking Cubes
Reflex Multiplication and Division Fluency Practice

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Apply properties of operations as strategies to multiply and divide.

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

My Math Chapter Tests

STANDARDS

Ohio - Grade 3 - Math
3.OA.5
Apply properties of operations as strategies to multiply and divide. For example, if 6 × 4 = 24 is known, then 4 × 6 = 24 is also known (Commutative Property of Multiplication); 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30 (Associative Property of Multiplication); knowing that 8 × 5 = 4 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56 (Distributive Property). Students need not use formal terms for these properties.

Unit 9: May Equations

Math - 3rd grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Equations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

My Math Lessons
IXL Lessons
Multiplication and Division Strategy Mats
Linking Cubes
Reflex Multiplication and Division Fluency Practice

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Apply properties of operations as strategies to multiply and divide.

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

My Math Chapter Tests

STANDARDS

Ohio - Grade 3 - Math
3.OA.5
Apply properties of operations as strategies to multiply and divide. For example, if 6 × 4 = 24 is known, then 4 × 6 = 24 is also known (Commutative Property of Multiplication); 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30 (Associative Property of Multiplication); knowing that 8 × 5 = 4 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56 (Distributive Property). Students need not use formal terms for these properties.

Math - 4th grade

Vermilion Local School District

UNITS (10/10 SELECTED)	SUGGESTED DURATION
Unit 1: Place Value	*15 lessons*
Unit 2: Addition and Subtraction of Whole Numbers	*15 lessons*
Unit 3: Understand Multiplication and Division	*8 lessons*
Unit 4: Multiply with One Digit Numbers	*15 lessons*
Unit 5: Multiply with Two Digit Numbers	*20 lessons*
Unit 6: Divide by a One-digit Number.	*25 lessons*
Unit 7: Fractions	*25 lessons*
Unit 8: Fractions and Decimals and Metric Measurement.	*12 lessons*
Unit 9: Geometry	*25 lessons*
Unit 10: Patterns and Sequences	*10 lessons*

Unit 1: Place Value

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Place Value
*Fluency - addition and subtraction
*Place Value;
*Add & Subtract Whole Numbers

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

*Reflex(addition & subtraction), MyMath, Zearn,
*Simple Solutions.
*MyMath direct instruction and small group lessons. *Activities to practice addition and facts: Roll It, Yahtzee, and 3-Dice Challenge,
*Math journals used for new vocabulary and practicing skills.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*Read and Write Multi-Digit Numbers,
*Compare Numbers,
*Round Numbers up to nearest hundred thousand. *Add and subtract, using regrouping, number patterns and real-world problems.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Completing 4 Zearn lessons per week,
*Check My Progress(quizzes) *Review/Test from MyMath.
* CCSS (common core WS)

STANDARDS

Ohio - Grade 4 - Math
4.NBT.1
Recognize that in a multi-digit whole number a digit in one place represents ten times what it represents in the place to its right by applying the concepts of place value multiplication or division.
4.NBT.2
Read and write multi-digit whole numbers using standard form word form and expanded form. Compare two-multi-digit numbers based on meanings of the digits in each place using > < and = symbols to record the results of comparisons.
4.NBT.3
Use place value understanding to round multi-digit whole numbers to any place through 1 000 000.

Unit 2: Addition and Subtraction of Whole Numbers

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Add and Subtract Whole Numbers

*Understanding Multiplication and Division; Multiply with One-Digit Numbers

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

*Reflex (addition & subtraction),
*MyMath, Zearn, Simple Solutions.
*MyMath direct instruction and small group lessons. *Activities to practice addition and fact: Arrays practice,
*Multiplication Square Fact Practice with a partner, *Spiral in a small group.
*Math journals used for new vocabulary and practicing skills.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*Inverse operations with arrays,
*Comparison problems, properties & rules of multiplication.
*Fact families practice.
*Multiply by 10, 100, 1000, use models to multiply by one-digit,
*Distributive Property, multiplying by two and three digit numbers using regrouping. *
Real-world problem solving.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

* Completing 4 Zearn lessons per week,
*Check My Progress (quizzes)
 *Review/Test from MyMath.

STANDARDS

Ohio - Grade 4 - Math
4.OA.3
Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
4.NBT.4
Fluently add and subtract multi-digit whole numbers using a standard algorithm.

Unit 3: Understand Multiplication and Division

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Relate Multiplication and Division, Multiplication as Comparison, Compare to Solve Problems, Multiplication Properties and Division Rules, The Associative Property of Multiplication, Factors and Multiples, Problem-Solving Investigation

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

*Reflex (multiplication & division),
*MyMath,
*Zearn,
*Simple Solutions.
*MyMath direct instruction and small group lessons. *Activities to practice addition and fact: *Multiplication Square Fact Practice with a partner, *Spiral in a small group.
*Math journals used for new vocabulary and practicing skills.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*How to multiply by multiples of ten
*How to use distributive property,
*line up digits and multiply two by two-digits (include regrouping),
*multi-step word problems.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Completing 4 Zearn lessons per week,
*Check My Progress (quizzes) and
*Review/Test from MyMath.

STANDARDS

Ohio - Grade 4 - Math
4.NBT.2
Read and write multi-digit whole numbers using standard form word form and expanded form. Compare two-multi-digit numbers based on meanings of the digits in each place using > < and = symbols to record the results of comparisons.
4.NBT.3
Use place value understanding to round multi-digit whole numbers to any place through 1 000 000.
4.NBT.5
Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations rectangular arrays and/or area models.
4.OA.3

Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
4.NBT.6
Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors using strategies based on place value the properties of operations and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations rectangular arrays and/or area models.

Unit 4: Multiply with One Digit Numbers

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Multiply with two-digit numbers. (Ch 13) Perimeter and Area.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

*Reflex (multiplication & division),
*MyMath,
*Zearn, Simple Solutions. *MyMath direct instruction and small group lessons. *Activities to practice multiplication.
*Math journals used for new vocabulary and practicing skills.
*Activities to practice addition and fact: Multiplication Square Fact Practice with a partner, Spiral in a small group.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*How to multiply by multiples of ten
*how to use distributive property
*Line up digits and multiply two by two-digits (include regrouping)
*multi-step work problems.
*Finding perimeter of a rectangle/square, *understanding formula (2 x y) + (2 x Z).
*Finding Area of rectangles and squares.
*Combining perimeter and area of the same shape.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Completing 4 Zearn lessons per week,
* Check My Progress (quizzes) and
*Review/Test
*MyMath.

STANDARDS

Ohio - Grade 4 - Math
4.OA.2
Multiply or divide to solve word problems involving multiplicative comparison e.g. by using drawings and equations with a symbol for the unknown number to represent the problem distinguishing multiplicative comparison from additive comparison.
4.OA.4
Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is a prime or composite.
4.NBT.5
Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using

equations rectangular arrays and/or area models.
4.NBT.6
Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors using strategies based on place value the properties of operations and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations rectangular arrays and/or area models.

Unit 5: Multiply with Two Digit Numbers

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Multiply with two-digit numbers. (Ch 13) Perimeter and Area.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

*Reflex (multiplication & division),
*MyMath,
*Zearn, Simple Solutions. *MyMath direct instruction and small group lessons. *Activities to practice multiplication.
*Math journals used for new vocabulary and practicing skills.
*Activities to practice addition and fact: Multiplication Square Fact Practice with a partner, Spiral in a small group.

Unit 5: Multiply with Two Digit Numbers

Math - 4th grade - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*How to multiply by multiples of ten,
*how to use distributive property
*Line up digits and multiply two by two-digits (include regrouping),
*multi-step work problems.
*Finding perimeter of a rectangle/square, *understanding formula (2 x y) + (2 x Z).
*Finding Area of rectangles and squares.
*Combining perimeter and area of the same shape.

STANDARDS

Ohio - Grade 4 - Math
4.NBT.2
Read and write multi-digit whole numbers using standard form word form and expanded form. Compare two-multi-digit numbers based on meanings of the digits in each place using > < and = symbols to record the results of comparisons.
4.NBT.3
Use place value understanding to round multi-digit whole numbers to any place through 1 000 000.
4.NBT.5
Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations rectangular arrays and/or area models.
4.NBT.6
Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors using strategies based on place value the properties of operations and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations rectangular arrays and/or area models.
4.OA.3
Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Completing 4 Zearn lessons per week,
* Check My Progress (quizzes) and
*Review/Test
*MyMath.

STANDARDS

Unit 5: Multiply with Two Digit Numbers

Math - 4th grade - *Last Updated on June 30, 2023*

Ohio - Grade 4 - Math
4.OA.2
Multiply or divide to solve word problems involving multiplicative comparison e.g. by using drawings and equations with a symbol for the unknown number to represent the problem distinguishing multiplicative comparison from additive comparison.
4.OA.4
Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is a prime or composite.
4.NBT.5
Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations rectangular arrays and/or area models.
4.NBT.6
Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors using strategies based on place value the properties of operations and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations rectangular arrays and/or area models.

Unit 6: Divide by a One-digit Number.

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Divide by a one-digit number.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

*Reflex (multiplication & division)
*MyMath,
*Zearn,
*Simple Solutions. *
MyMath direct instruction and small group lessons. Activities to practice division: Common Core Worksheets
Math journals used for new vocabulary and practicing skills.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*Make a model for division, *dividing mentally,
*dividing with and without remainders,
*interpreting remainders, *solving division real-world problems.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Completing 4 Zearn lessons per week,
*Check My Progress (quizzes)
*Review/Test from MyMath.

STANDARDS

Ohio - Grade 4 - Math
4.OA.2
Multiply or divide to solve word problems involving multiplicative comparison e.g. by using drawings and equations with a symbol for the unknown number to represent the problem distinguishing multiplicative comparison from additive comparison.
4.NBT.6
Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors using strategies based on place value the properties of operations and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations rectangular arrays and/or area models.

Unit 7: Fractions

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Fractions and Operations with Fractions (Ch 8-9)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Reflex (multiplication & division), MyMath, Zearn, Simple Solutions. MyMath direct instruction and small group lessons. Activities to practice multiplication.
Math journals used for new vocabulary and practicing skills.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*Finding factor pairs of whole numbers
*modeling and creating equivalent fractions
* recognizing and comparing benchmark fractions. *Recognizing mixed numbers and improper fractions by decomposing them into whole numbers and the sum of the fractions. *Adding, subtracting and multiplying with fractions, *mixed numbers and improper fractions.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Completing 4 Zearn lessons per week,
*Check My Progress (quizzes)
*Review/Test from MyMath.

STANDARDS

Ohio - Grade 4 - Math
4.OA.2
Multiply or divide to solve word problems involving multiplicative comparison e.g. by using drawings and equations with a symbol for the unknown number to represent the problem distinguishing multiplicative comparison from additive comparison.
4.OA.3
Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
4.OA.4
Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is a prime or composite.
4.NF.1
Explain why a fraction a/b is equivalent to a fraction (nxa)/(nxb) by using visual fraction models with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this

principle to recognize and generate equivalent fractions.
4.NF.2
Compare two fractions with different numerators and different denominators e.g. by creating common denominators or numerators or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbolys > < =. and justify the conclusions e.g. by using a visual fraction model.
4.NF.3
Understand a fraction a/b with a>1 as a sum of fractions 1/b.
4.NF.3a
Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
4.NF.3b
Decompose a fraction into a sum of fractions with the same denominator in more than one way recording each decomposition by an equation. Justify decompositions e.g. by using a visual fraction model.
4.NF.3c
Add and subtract mixed numbers with like denominators e.g. by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction.

Unit 8: Fractions and Decimals and Metric Measurement.

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Fractions and Decimals and Metric Measurement.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Reflex (multiplication & division), MyMath, Zearn, Simple Solutions. MyMath direct instruction and small group lessons. Activities to practice multiplication.
Math journals used for new vocabulary and practicing skills.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*Place Value chart to tenths and hundredths, using models,
*comparing decimals, equivalency of fractions to decimals, adding fractions with tenths and hundredths.
*Understanding and measuring metric length, capacity mass including estimates.
*Converting within the metric system.
*Real-world problems involving metric measurements.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Completing 4 Zearn lessons per week,
*Check My Progress (quizzes)
*Review/Test from Weekly Reflex reports and charting, *Completing 4 Zearn lessons per week,
*Check My Progress (quizzes)
*Review/Test from MyMath.

STANDARDS

Ohio - Grade 4 - Math
4.OA.2
Multiply or divide to solve word problems involving multiplicative comparison e.g. by using drawings and equations with a symbol for the unknown number to represent the problem distinguishing multiplicative comparison from additive comparison.
4.OA.3
Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
4.NF.1
Explain why a fraction a/b is equivalent to a fraction (nxa)/(nxb) by using visual fraction models with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
4.NF.2

Compare two fractions with different numerators and different denominators e.g. by creating common denominators or numerators or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbolys > < =. and justify the conclusions e.g. by using a visual fraction model.
4.NF.3
Understand a fraction a/b with a>1 as a sum of fractions 1/b.
4.NF.3a
Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
4.NF.3b
Decompose a fraction into a sum of fractions with the same denominator in more than one way recording each decomposition by an equation. Justify decompositions e.g. by using a visual fraction model.
4.NF.3c
Add and subtract mixed numbers with like denominators e.g. by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction.
4.NF.3d
Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators e.g. by using visual fraction models and equations to represent the problem.
4.NF.4
Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
4.NF.4a
Understand a fraction a/b as a multiple of 1/b.
4.NF.4b
Understand a multiple of a/b as a multiple of 1/b and use this understanding to multiply a fraction by a whole number.

Unit 9: Geometry

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Geometry

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Reflex (multiplication & division), MyMath, Zearn, Simple Solutions. MyMath direct instruction and small group lessons. Activities to practice multiplication.
Math journals used for new vocabulary and practicing skills.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*Drawing parallel and perpendicular lines and angles.
*Measuring angles. *Classifying triangles and four-sided quadrilaterals. Identifying lines of symmetry.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Completing 4 Zearn lessons per week,
*Check My Progress (quizzes) *
Review/Test from MyMath.

STANDARDS

Ohio - Grade 4 - Math
4.MD.1
Know relative sizes of the metric measurement units within one system of units. Metric units include kilometer meter centimeter and millimeter; kilogram and gram; liter and milliliter. Express a larger measurement unit in a smaller unit. Record measurement conversions in a two-column table.
4.MD.3
Develop efficient strategies to determine the area and perimeter of rectangles in real-world situations and mathematical problems.
4.MD.5a
Understand that an angle is measured with reference to a circle with its center at the comon endpoint of the rays by considering the fraction of the circular arc between the points where the two rays interesect the circle. An angle that turns through 1/360 of a circle is called a one-degree angle and can be used to measure angles.
4.MD.5b
Understand an angle that turns through n one-degree angles is said to have an angle measure of n degrees.
4.G.1
Draw points lines line segments rays angles (right acute and obtuse) and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.2
Classify two-dimensional figures based on the presence of absence of parallel or perpendicular lines or the presence or absence of angles of a specified size.

Unit 10: Patterns and Sequences

Math - 4th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Patterns and Sequences

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Reflex (multiplication & division), MyMath, Zearn, Simple Solutions. MyMath direct instruction and small group lessons. Activities to practice multiplication.
Math journals used for new vocabulary and practicing skills.

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

*Adding and Subtracting patterns,
*Input/Output with equations,
*order of operations,
*using multiple operations in a table to solve equations.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Completing 4 Zearn lessons per week,
*Check My Progress (quizzes)
*Review/Test from MyMath.

STANDARDS

Ohio - Grade 4 - Math
4.OA.2
Multiply or divide to solve word problems involving multiplicative comparison e.g. by using drawings and equations with a symbol for the unknown number to represent the problem distinguishing multiplicative comparison from additive comparison.
4.OA.3
Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
4.OA.5
Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.

Math - 5th grade

Vermilion Local School District

UNITS (8/8 SELECTED)	SUGGESTED DURATION
Unit 1: Place Value	*1 lessons*
Unit 2: Add and Subtract Decimals	*1 lessons*
Unit 3: Multiply and Divide Whole Numbers	*1 lessons*
Unit 4: Multiply and Divide Decimals	*1 lessons*
Unit 5: Fractions	*1 lessons*
Unit 6: Operations and Algebraic Thinking	*1 lessons*
Unit 7: Geometry	*1 lessons*
Unit 8: Measurement and Data	*1 lessons*

Unit 1: Place Value

Math - 5th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Place and Value
Understand the value of digits in a large number
Compare decimals to the thousandths place
Represent decimals in different forms
Exponents and powers of 10
Multiply and divide by powers of ten
Rounding Decimals to nearest whole number, tenth, or hundredth
Shifting place value

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Distinction of place and value of a large whole number
Vocabulary
Whiteboard practice
Introduce decimal numbers and how to read (Whole group instruction, small group, centers, khan)
Notes/Interactive notebooks
Task cards/Scoot
Whiteboard practice
Small group/Whole group
Kahoot/Quizizz
Interactive notebook pages
Practice shifting with hands on tools
Whiteboard practice
Whole group/centers
Practice rounding with number line
Quizizz
Task cards
Exit Ticket
Khan
Digital Resources-Mystery Picture
Puzzle Pieces Center

Unit 1: Place Value

Math - 5th grade - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to explain patterns in the number of zeros of the product when multiplying a number by powers of 10.

Students will be able to explain patterns in the placement of the decimal point when multiplying and dividing by powers of 10.

Students will read, write and compare decimals to the thousandths.

Students will read and write decimals to the thousandths in word and expanded form.

Students will be able to compare two decimals.

Students will be able to recognize patterns in a multi-digit number and that one place is 10 times as much as the place to its right.

Students will be able to round decimals.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit Tickets
Independent worksheets
Weekly quizzes
Standard assessments

STANDARDS

Ohio - Grade 5 - Math
5.NBT.2
Explain patterns in the number of zeros of the product when multipling a number by powers of 10 and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
5.NBT.3
Read write and compare decimals to thousandths.
5.NBT.3a
Read and write decimals to thousandths using base-ten numerals number names and expanded form.

5.NBT.3b
Compare two decimals to thousandths based on meanings of the digits in each place using . < and = symbols to record the results of comparisons.
5.NBT.1
Recognize that in a multi-digit number a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
5.NBT.4
Use place value understanding to round decimals to any place millions through hundredths.

Unit 2: Add and Subtract Decimals

Math - 5th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Add and Subtract Decimals

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Interactive notebook pages
Safari Restaurant Activity
Math Antics
Notes
Guided Practice
Small Group
Centers
Khan

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to add and subtract decimals, including decimals with whole numbers.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit Tickets
Independent Worksheet
Weekly Quizzes
Standard Assessment page
Google Form
Google Slide

STANDARDS

Ohio - Grade 5 - Math
5.NBT.7
Solve real-world problems by adding subtracting multiplying and dividing decimals using concrete models or drawings and strategies based on place value properties of operations and/or the relationship between addition and subtraction or multiplication and division; relate the strategy to a written method and explain the reasoning used.
5.NBT.7a
Add and subtract decimals including decimals with whole numbers (whole numbers through the hundreds place and decimals through the hundredths place).

Unit 3: Multiply and Divide Whole Numbers

Math - 5th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Begin multiplication
Basic Facts
Multiply large numbers using the standard algorithm
Begin long division
Work up to dividing a four digit number by a two digit number

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Practice properties of multiplication:
Notes
Interactive websites
Practice pages
Practice basic facts
Fact drills
Multiplication patterns-My Math pages
Vocab Cards
Centers
Khan
Quizizz
Guided Practice
Math Antics Videos with Interactive note pages
Kaboom Activity
Review Divisibility Rules
Small Group
Escape Room Activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to multiply multi-digit numbers using the standard algorithm.

Students will be able to divide whole numbers with up to four digit dividends and two digit divisors.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit Tickets
Independent Worksheet
Weekly Quizzes
Standard Assessment page
Google Forms
Google Slides

STANDARDS

Ohio - Grade 5 - Math
5.NBT.5

Fluently multiply multi-digit whole numbers using a standard algorithm.
5.NBT.6
Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors using the strategies based on place value the properties of operations and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations rectangular arrays and/or area models.

Unit 4: Multiply and Divide Decimals

Math - 5th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Continue multiplication and division skills

Multiply decimals

Divide decimals

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Interactive websites
Practice pages
Practice basic facts
Fact drills
Centers
Khan
Quizizz
Guided Practice
Math Antics Videos with Interactive note pages
Small Group

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to multiply whole numbers by decimals.

Students will be able to divide whole numbers by decimals and decimals by whole numbers.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit Tickets
Independent Worksheet
Weekly Quizzes
Standard Assessment page
Google Form
Google Slide

STANDARDS

Ohio - Grade 5 - Math
5.NBT.7b
Multiply whole numbers by decimals (whole numbers through the hundreds place and decimals through the hundredths place).
5.NBT.7c
Divide whole numbers by decimals and decimals by whole numbers (whole numbers through the tens place and

decimals less than one through the hundredths place using numbers whose division can be readily modeled.

Unit 5: Fractions

Math - 5th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Begin Fractions Unit
Greatest Common Factor
Least Common Multiples
Simplifying Fractions Equivalent Fractions
Add and subtract with like denominators
Add and subtract fractions with unlike denominators
Addition and subtraction fraction word problems

Multiply a fraction by a whole number
Multiply two fractions and solve for the product
Divide a whole number by a fraction
Divide a fraction by a whole number
Convert mixed numbers into improper fractions
Add/Subtract mixed numbers
Area/Scaling

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Introduce Greatest Common Factor
Practice problems
Interactive notebook
Vocabulary
Badge Buddies Activity
Small Group
Introduce Least Common Multiples
Bingo
My Math Book pages
Math Antics with interactive notes
Guided practice
Task cards
Begin with array models
Guided practice
Interactive notes
Kahoot
Math Antics
My Math pages
Centers
Khan
ALEKS
Mixed Up Kings Activity
Task Cards
Blooket
Fraction Packet

Unit 5: Fractions

Math - 5th grade - *Last Updated on June 30, 2023*

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to add and subtract fractions with unlike denominators, including mixed numbers.

Students will be able to find equivalent fractions.

Students will be able to solve word problems involving addition and subtraction of fractions.

Students will be able to multiply a fraction by a whole number or a whole number by a fraction.

Students will be able to interpret fractions as scaling.

Students will be able to solve real world problems involving multiplication of fractions and mixed numbers.

Students will be able to divide unit fractions by whole numbers and whole numbers by fractions.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit Tickets
Independent Worksheet
Weekly Quizzes
Standard Assessment page
Google Form
Google Slide

STANDARDS

Ohio - Grade 5 - Math

5.NF.1

Add and subtract fractions with unlike denominators (including mixed numbers and fractions greater than 1) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

5.NF.2

Solve word problems involving addition and subtraction of fractions referring to the same whole including cases of unlike denominators. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

5.NF.3
Interpret a fraction as division of the numerator by the denominator. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.
5.NF.4
Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
5.NF.4a
Interpret the product (a/b) x q as a parts of a parition of q into b equal parts equivalently as the result of a sequence of operations (a x q)/b.
5.NF.4b
Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate fraction side lengths and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles and represent fraction products as rectangular areas.
5.NF.5
Interpret multiplication as scaling (resizing)
5.NF.5a
Compare the size of a product to the size of one factor on the basis of the size of the other factor without performing the indicated multiplication.
5.NF.5b
Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (nxa)/(nxb) to the effect of multiplying a/b by 1.
5.NF.6
Solve real-world problems involving multiplication of fractions and mixed numbers e.g. by using fraction models or equations to represent the problem.
5.NF.7
Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. In general students able to multiply fractions can develop strategies to divide fractions by reasoning about the relationship between multiplication and division but division of a fraction by a fraction is not

a requirement at this grade.
5.NF.7a
Interpret division of a unit fraction by a non-zero whole number and compute such quotients.
5.NF.7b
Interpret division of a whole number by a unit fraction and compute such quotients.
5.NF.7c
Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions e.g. by using visual fraction models and equations to represent the problem.

Unit 6: Operations and Algebraic Thinking

Math - 5th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Order of Operations
Algebraic Expressions
Patterns
Plot points with coordinate plane

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Algebra packet
Interactive notebook
Guided notes
My Math pages
Centers
Small Group
Khan
Numberock video

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will be able to use parentheses in numerical expressions and evaluate expressions with that symbol.

Students will be able to complete order of operations.

Students will be able to write simple expressions with numbers and interpret numerical expressions without evaluating them.

Students will generate two numerical patterns using two given rules.

Students will be able to use a pair of perpendicular lines, called axes, to define a coordinate system and locate an order pair.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit Tickets
Independent Worksheet
Weekly Quizzes
Standard Assessment page
Google Form
Google Slide

STANDARDS

Ohio - Grade 5 - Math
5.OA.1
Use parentheses in numerical expressions and evaluate expressions with this symbol. Formal use of algebraic

order of operations is not necessary.
5.OA.2
Write simple expressions that record calculations without numbers and interpret numerical expressions without evaluating them.
5.OA.3
Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns and graph the ordered pairs on a coordinate plane.
5.G.1
Use a pair of perpendicular number lines called axes to define a coordinate system with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers called its coordinates. Understand the the first number indicates how far to travel from the origin in the direction of one axis and the second number indicates how far to travel in the direction of the second axis with the convention that the names of the two axes and the coordinates correspond e.g. e-axis and x-coordinate y-axis and y-coordinate.

Unit 7: Geometry

Math - 5th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Begin Geometry
Types of Polygons
Types of triangles
Shape attributes/types of quadrilaterals

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Math antics video with notes
Interactive notebook
My Math book
Guided practice
Polygon flow chart
Kahoot
Polygon board game
Polygon picture

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will identify and describe commonalities and differences between types of triangles.

Students will be able to identify and describe commonalities and differences between types of quadrilaterals based on angle measures, side lengths and either parallel or perpendicular lines.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit Tickets
Independent Worksheet
Weekly Quizzes
Standard Assessment page
Google Form
Google Slide

STANDARDS

Ohio - Grade 5 - Math
5.G.3
Identify and describe commonalities and differences between types of triangles based on angle measures and side lengths.
5.G.4
Identify and describe commonalities and differences between types of quadrilaterals based on angle measures side lengths and the presence or absence of parallel and perpendicular lines.

5.G.2
Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation.

Unit 8: Measurement and Data

Math - 5th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Begin Volume
Introduction to Metric System
Conversions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Base 10 blocks practice
Board game
Khan
Guided Practice
Small Group
Centers
Independent Activities
Measure animal activity

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will know relative sizes of US customary units of measure.

Students will be able to covert between units of measure.

Students will be able to measure volume by counting unit cubes.

Students will be able to find the volume using the formula; V=l x w x h

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit Tickets
Independent Worksheet
Weekly Quizzes
Standard Assessment page
Google Form
Google Slide

STANDARDS

Ohio - Grade 5 - Math
5.MD.5c
Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts applying this technique to solve real-world problems.
5.MD.5b
Apply the formulas V=l x w x h and V=B x h for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real-world and mathematical problems.
5.MD.5a

Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths equivalently by mulitplying the height by the area of the base. Represent threefold whole-number products as volumes e.g. to represent the Associative Property of Multiplication.
5.MD.5
Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume.
5.MD.4
Measure volumes by counting unit cubes usic cubic centimeters cubic inches cubic feet and improvised units.
5.MD.3b
A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n unit cubes.
5.MD.3a
A cube with side length of one unit called a unit cube is said to have one cubic unit of volume and can be used to measure volume.
5.MD.3
Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
5.MD.1
Know relative sizes of these U.S. customary measurement units: pounds, ounces, miles, yards, feet, inches, gallons, quarts, pints, cups, fluid ounces, hours, minutes, seconds. Convert between: pounds/ounces, miles/feet, yards/feet/inches, gallons/quarts/pints/cups/fluid ounces, hours/minutes/seconds.
5.MD.2
Display and interpret data in graphs (picture graphs bar graphs and line plots) to solve problems using numbers and operations for this grade e.g. including U.S. customary units in fractions 1/2 1/4 1/8 and decimals.

Math - 6th grade

Vermilion Local School District

UNITS (11/11 SELECTED)	SUGGESTED DURATION
Unit 1: Ratios & Rates	*25 lessons*
Unit 2: Unit 2: Fraction, Decimals, & Percents	*14 lessons*
Unit 3: Compute with Multi-Digit Numbers and Fractions	*17 lessons*
Unit 4: Integers, Rational Numbers, and the Coordinate Plane	*17 lessons*
Unit 5: Numerical & Algebraic Expressions	*20 lessons*
Unit 6: Equations & Inequalities	*15 lessons*
Unit 7: Relationships Between Two Variables	*11 lessons*
Unit 8: Area	*10 lessons*
Unit 9: Volume and Surface Area	*9 lessons*
Unit 10: TEST PREP	*10 lessons*
Unit 11: Statistical Measures and Displays	*15 lessons*

Unit 1: Ratios & Rates

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1-1 Understand Ratios
1-2 Tables of Equivalent Ratios
1-3 Graphs of Equivalent Ratios
1-4 Compare Ratio Relationships
1-5 Solve Ratio Problems
1-6 Convert Customary Measurement Units
1-7 Understand Rates and Unit Rates
1-8 Solve Rate Problems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Whole group, Partner, then Individual

Ratio Scoot

Graphing & Table Worksheet Practice

Small group Intervention

Ratio Tables
Graphs
Double Bar Lines
Equivalent Fractions
Unit Rates

Module 1 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can you describe how two quantities are related?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Khan Ratio Assignments
Ratio Scoot
1-1 Quiz
1-2 Quiz
1-3 Quiz
1-4 Quiz
ALEKS 1-1 - 1-4 Quiz
POW 1
Unit Rate - Better Buy Partner Grade
POW 2
1-7-1-8 ALEKS Quiz
Module 1 Rates & Ratio Test
**POW represents Problem of the Week - Released State Test Questions

STANDARDS

Unit 1: Ratios & Rates

Math - 6th grade - *Last Updated on June 30, 2023*

Ohio - Grade 6 - Math
6.RP.1
Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
6.RP.2
Understand the concept of a unit rate associated with a ratio and use rate language in the context of a ratio relationship.
6.RP.3
Use ratio and rate reasoning to solve real-world and mathematical problems by reasoning about tables of equivalent ratios tape diagrams double number line diagrams or equations.
6.RP.3a
Make tables of equivalent ratios relating quantities with whole-number measurements; find missing values in the tables; and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
6.RP.3b
Solve unit rate problems including those involving unit pricing and constant speed.
6.RP.3d
Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Unit 2: Unit 2: Fraction, Decimals, & Percents

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

2-1 Understand Percents

2-2 Percents Greater Than 100% and Less Than 1%

2-3 Relate Fractions, Decimals, and Percents

2-4 Find the Percent of a Number

2-5 Estimate the Percent of a Number

2-6 Find the Whole

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Whole group, Partner, then Individual

Percent Discovery

Module 2 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can you use fractions, decimals, and percents to solve everyday problems?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Khan Academy Percents

POW 3

POW 4
POW 5

Percent Quiz

2-1 - 2-3 Quiz

Module 2 Test

STANDARDS

Ohio - Grade 6 - Math
6.RP.3c

Find a percent of a quantity as a rate per 100; solve problems involving finding the whole given a part and the percent.
6.RP.3
Use ratio and rate reasoning to solve real-world and mathematical problems by reasoning about tables of equivalent ratios tape diagrams double number line diagrams or equations.

Unit 3: Compute with Multi-Digit Numbers and Fractions

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

3-1 Divide Multi-Digit Whole Numbers

3-2 Compute with Multi-Digit Decimals

3-3 Divide Whole Numbers by Fractions

3-4 Divide Fractions by Fractions

3-5 Divide with Whole and Mixed Numbers

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Add, Subtract, Multiply Decimals

Decimal Halloween Story Problems

Decimal Practice

Fraction Division Practice

Story Problem Practice

Graphing pictures on a coordinate plane

Module 3 Study Guide

Thanksgiving Meal

Graph the Turkey

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are operations with fractions and decimals related to operations with whole numbers?

Unit 3: Compute with Multi-Digit Numbers and Fractions

Math - 6th grade - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Khan Decimal Operations

POW 6

POW 7

POW 8

Decimal Operations Quiz

Dividing Decimal Quiz

Module 3 Test

STANDARDS

Ohio - Grade 6 - Math
6.NS.2
Fluenlty divide multi-digit numbers using a standard algorithm
6.NS.3
Fluently add subtract multiply and divide multi-digit decimals using a standard algorithm for each operation.
6.NS.1
Interpret and compute quotients of fractions and solve word problems involving division of fractions by fractions by using visual fraction models and equations to represent the problem.

Unit 4: Integers, Rational Numbers, and the Coordinate Plane

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

4-1 Represent Integers

4-2 Opposites and Absolute Value

4-3 Compare and Order Integers

4-4 Rational Numbers

4-5 The Coordinate Plane

4-6 Graph Reflections of Points

4-7 Absolute Value and Distance

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Integer Identification on a number line

Cards - what is higher
Cards - What has a higher absolute value

Comparing and Ordering Rational Numbers on Number lines

Module 4 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are integers and rational numbers related to the coordinate plane?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

POW 9

POW 10

POW 11

4-1 - 4-3 Quiz

Khan Integers and Absolute Value

4-7 Book Quiz

Module 4 Test

STANDARDS

Ohio - Grade 6 - Math
6.NS.5
Understand that positive and negative numbers are used together to describe quantities having opposite directions or values.
6.NS.6
Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
6.NS.6a
Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself
6.NS.6b
Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two rdered pairs differ only by signs the locations of the points are relate by reflections across one or both axes.
6.NS.6c
Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
6.NS.7
Understand ordering and absolute value of rational numbers.
6.NS.7a
Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
6.NS.7b
Write interpret and explain statements of order for rational numbers in real-world contexts.
6.NS.7c
Understand that absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.
6.NS.7d

Distinguish comparisons of absolute value from statements about order.
6.NS.8
Solve real-world and mathematical problems by graphing points in all 4 quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Unit 5: Numerical & Algebraic Expressions

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

5-1 Powers & Exponents

5-2 Numerical Expressions
5-3 Write Algebraic Expressions

5-4 Evaluate Algebraic Expressions

5-5 Factors and Multiples

5-6 Use the Distributive Property

5-7 Equivalent Algebraic Expressions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Exponent Practice

Order of Operations Practice

Algebraic Expressions Scoot

Factor Trees

Distributive Property Practice

What's the difference between expressions, equations, & inequalities?
- Sort activity

Is it a solution practice?

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can we communicate algebraic relationships with mathematical symbols?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Module 5 Test

Khan Numeric & Algebraic Expressions

POW 12
POW 13
POW 14
POW 15

STANDARDS

Unit 5: Numerical & Algebraic Expressions

Math - 6th grade - *Last Updated on June 30, 2023*

Ohio - Grade 6 - Math
6.EE.1
Write and evaluate numerical expressions involving whole-number exponents.
6.EE.2
Write read and evaluate expressions in which letters stand for numbers.
6.EE.2a
Write expressions that record operations with numbers and with letters standing for numbers.
6.EE.2b
Identify parts of an expression using mathematical terms; view one or more parts of an expression as a single entity.
6.EE.2c
Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations including those involving whole-number exponnts using the algebraic order of operations when there are no parenthese to specify a particular order.
6.EE.3
Apply the properties of operations to generate equivalent expressions.
6.EE.4
Identify when two expressions are equivalent i.e. when the two expressions name the same number regardless of which value is substituted into them.
6.EE.6
Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number or depending on the purpose at hand any number in a specified set.
6.NS.4
Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

Unit 6: Equations & Inequalities

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

6-1 Use substitution to solve one-step equations
6-2 One step Addition Equations
6-3 One Step Subtraction Equations
6-4 One Step Multiplication Equations
6-5 One Step Division Equations
6-6 Inequalities

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

What's the difference between expressions, equations, & inequalities?
- Sort activity

Solving Equations Practice
Equations with Decimals and Fractions
Module 6 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are the solutions of equations and inequalities different?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Khan Equations & Inequalities

Solving Equations Quiz with whole numbers

Solving Equations Quiz with Fractions and Decimals

Inequalities Quiz

Module 6 Test

STANDARDS

Ohio - Grade 6 - Math
6.EE.5
Understand solving an equation or inequaity as a process of answering a question: which values from a specified set if any make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
6.EE.6
Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number or depending on the purpose at hand any number in a specified set.
6.EE.7

Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in qhich p q and x are all nonnegative rational numbers.
6.EE.8
Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Unit 7: Relationships Between Two Variables

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

7-1 Relationships between two variables

7-2 Write Equations to represent relationships represented in tables

7-3 Graph Relationships

7-4 Multiple Representations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Writing Equations from Tables & Story Problem Practice
Graph Relationships practice
Module 7 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

What are the ways in which a relationship between two variables can be displayed?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Khan Graphing
Module 7 Test

POW 16

POW 17

POW 18

STANDARDS

Ohio - Grade 6 - Math
6.EE.9
Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity thought of as the dependent variable in terms of the other quantity thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the equation.
6.EE.2c
Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations including those involving whole-number exponnts using the algebraic order of operations when there are no parenthese to specify a particular order.
6.EE.6

Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number or depending on the purpose at hand any number in a specified set.
6.EE.7
Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in qhich p q and x are all nonnegative rational numbers.
6.RP.3a
Make tables of equivalent ratios relating quantities with whole-number measurements; find missing values in the tables; and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
6.NS.6c
Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

Unit 8: Area

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

8-1 Area of Parallelograms
8-2 Area of Triangles
8-3 Area of Trapezoids
8-4 Area of Regular Polygons
8-5 Polygons on the Coordinate Plane

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Area using blocks

How are different shapes related discovery Activity

Module 8 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are the areas of triangles and rectangles used to find the areas of other polygons?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Khan Area

Parallelograms & Triangles Quiz

Trapezoids & Regular Polygons Quiz

Module 8 Assessment

POW 19

POW 20

POW 21

POW 22

STANDARDS

Ohio - Grade 6 - Math
6.G.1
Through composition into rectangles or decomposition into triangles find the area of right triangles other triangles special quadrilaterals and polygons; apply these techniques in the context of solving real-world and mathematical problems.

6.G.3
Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
6.EE.2
Write read and evaluate expressions in which letters stand for numbers.
6.EE.2c
Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations including those involving whole-number exponnts using the algebraic order of operations when there are no parenthese to specify a particular order.

Unit 9: Volume and Surface Area

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

9-1 Volume of Rectangular Prisms

9-2 Surface Area of Rectangular Prisms

9-3 Surface Area of Triangular Prisms

9-4 Surface Area of Pyramids

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Volume vs. Surface Area — What is the difference?

Nets of Polygons

Module 9 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can you describe the size of a three-dimensional figure?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Khan Volume & Surface Area

Module 9 Assessment

STANDARDS

Ohio - Grade 6 - Math
6.G.2
Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V=lxwxh and V=Bxh to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world problems
6.G.4
Represent three-dimensional figures using nets made up of rectangles and triangles and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world problems
6.EE.6
Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number or depending on the purpose at hand any number in

a specified set.

Unit 10: TEST PREP

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Review All Standards

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Games: Jeopardy, Kahoot, Quizzes, Whole Group & Partner

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are all standards from the year related?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Test Prep Worksheets based off of released questions - Review old pows

STANDARDS

Unit 11: Statistical Measures and Displays

Math - 6th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

10-1 Statistical Questions

10-2 Dot Plots & Histograms

10-3 Measures of Center

10-4 Interquartile Range & Box Plots

10-5 Mean Absolute Deviation

10-6 Outliers

10-7 Interpret Graphical Displays

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Why are Statistics important?

Identify statistical questions - create your own survey & analyze

Create Graphs

Module 10 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Why is data collected and analyzed and how can it be displayed?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Survey & Graphing Project

Khan - Stats

Module 10 Assessment

STANDARDS

Ohio - Grade 6 - Math
6.SP.1
Develop statistical reasoning by using the GAISE Model.
6.SP.4

Display numerical data in plots on a number line including dot plots histograms and box plots.
6.SP.5a
Report the number of observations.
6.SP.3
Recognize that a measure of center for a numerical data set summarizes all of its values with a single number while a measure of variation describes how its values vary with a single number.
6.SP.5b
Describe the nature of the attribute under investigation including how it was measured and its units of measurement
6.SP.5c
Find the quantitative measure of center for a numerical data set and recognize that this value summarizes the data set with a single number. Interpret mean as an equal or fair share. Find measures of variability (range and interquartile range) as well as informally describe the shape and the presence of clusters gaps peaks and outliers in a distribution.
6.SP.2
Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center spread and overall shape.
6.SP.5d
Choose the measures of central tendancy and variability based on the shape of the data distribution and the context in which the data were gathered.
6.SP.1d
Interpret results: draw logical conclusions from the data based on the original question (GAISE Model step 4)
6.SP.1c
Analyze data: select appropriate graphical methods and numerical measures to analyze data by displaying variability with a group comparing individual to individual and comparing individual to group. (GAISE Model step 3)
6.SP.1b
Collect data: design and use a plan to collect appropriate data to answer a statistical question. (GAISE Model step 2)

6.SP.1a
Formulate questions: recognize and formulate a statistical question as one that anticipates variability and can be answered with quantitative data. (GAISE Model step 1)

Math - 7th grade

Vermilion Local School District

UNITS (11/11 SELECTED)	SUGGESTED DURATION
Unit 1: Math Beursken Proportional Relationships	*20 lessons*
Unit 2: Math Beursken Solving Percent Problems	*13 lessons*
Unit 3: Math Beursken Operations with Integers	*15 lessons*
Unit 4: Math Beursken Operations with Rational Numbers	*12 lessons*
Unit 5: Math Beursken Simplify Algebraic Expressions	*13 lessons*
Unit 6: Math Beursken Write and Solve Equations	*17 lessons*
Unit 7: Math Beursken Write and Solve Inequalities	*13 lessons*
Unit 8: Math Beursken Geometric Figures	*13 lessons*
Unit 9: Math Beursken Measure Figures	*13 lessons*
Unit 10: Math Beursken Probability	*10 lessons*
Unit 11: Math Beursken Sampling and Statistics	*10 lessons*

Unit 1: Math Beursken Proportional Relationships

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1. Unit Rates Involving Ratios of Fractions
2. Understand Proportional Relationships
3. Tables of Proportional Relationships
4. Graphs of Proportional Relationships
5. Equations of Proportional Relationships
6. Solve word problems involving proportional relationships

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Small group
Whole Group
Aleks
Color By Numbers WS
Explore Activities
Keynotes
Task Cards
Scoot Activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

What does it mean for two quantities to be in a proportional relationship?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson quizzes.

Unit Comprehension Test or
Performance Based Assessment
Aleks Assessments
Scoot Activity
Exit tickets

STANDARDS

Ohio - Grade 7 - Math
7.RP.1
Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.
7.RP.2
Recognize and represent proportional relationships between quantities.
7.RP.2.a
Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or

graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
7.RP.2.b
Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
7.RP.2.c
Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.
7.RP.2.d
Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.
7.RP.3
Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Unit 2: Math Beursken Solving Percent Problems

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 2 (About 13 days)

1. Percent of Increase/Decrease
2. Tax
3. Tips and Markups
4. Discounts
5. Interest
6. Commission/Fees
7. Percent Error

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Small Group
Whole Group
Modeling
Khan Videos
YouTube videos
Explore activities
Sketchpad
Sales Ads
Car Ads

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can percent describe the change of a quantity?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit/entrance tickets
Lesson quizzes.
Unit Comprehension Test or
Performance Based Assessment
Task Cards
Aleks assessments

STANDARDS

Ohio - Grade 7 - Math
7.RP.3
Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
7.EE.3
Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example, if a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to

place a towel bar 9 ¾ inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Unit 3: Math Beursken Operations with Integers

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 3 (15 days)

1. Add Integers
2. Subtract Integers
3. Multiply Integers
4. Divide Integers
5. Apply Integer Operations to word problems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Small Group
Whole Group
Coloring pages
Virtual manipulatives
Integer chips
Modeling with Tiles
Number Lines
Scoot Activity
Task cards

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are operations with integers related to operations with whole numbers?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit/entrance tickets
Lesson quizzes.
Unit Comprehension Test or
Performance Based Assessment
Task Cards
Aleks assessments

STANDARDS

Ohio - Grade 7 - Math
7.NS.1
Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
7.NS.1.a
Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.
7.NS.1.b
Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses).

Interpret sums of rational numbers by describing real-world contexts.
7.NS.1.d
Apply properties of operations as strategies to add and subtract rational numbers.
7.NS.1.c
Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real- world contexts.
7.NS.2
Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
7.NS.2.a
Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
7.NS.2.b
Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
7.NS.2.c
Apply properties of operations as strategies to multiply and divide rational numbers.
7.NS.2.d
Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
7.NS.3
Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.
7.EE.3
Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any

form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example, if a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 ¾ inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Unit 4: Math Beursken Operations with Rational Numbers

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 4: (about 12 days)

1. Writing Rational Numbers as Decimals
2. Add Rational Numbers
3. Subtract Rational Numbers
4. Multiply Rational Numbers
5. Divide Rational Numbers
6. Apply Rational Numbers to Word Problems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Small Group
Whole Group
Alek's
Thatquiz.org
Khan Mappers
Coloring Worksheets
Task Cards
Bar diagrams
Pie charts

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are operations with rational numbers related to operations with integers?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Exit Tickets
Lesson quizzes.
Labs/Demonstrations/Model
Unit Comprehension Test or
Performance Based Assessment

STANDARDS

Ohio - Grade 7 - Math
7.NS.2.a
Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (−1)(−1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
7.NS.2.b
Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then −(p/q) = (−p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts.

7.NS.2.d
Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
7.NS.1.a
Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.
7.NS.1.b
Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
7.NS.1.d
Apply properties of operations as strategies to add and subtract rational numbers.
7.EE.3
Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example, if a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 ¾ inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
7.NS.1.c
Understand subtraction of rational numbers as adding the additive inverse, p − q = p + (−q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real- world contexts.
7.NS.2.c
Apply properties of operations as strategies to multiply and divide rational numbers.
7.NS.3
Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

Unit 5: Math Beursken Simplify Algebraic Expressions

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 5: (about 12 days)

1. Simplify Algebraic Expressions
2. Add Linear Expressions
3. Subtract Linear Expressions
4. Factor Linear Expressions
5. Combine Linear Expressions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

whole Group
Small Group
Coloring pages
Uncover the hidden picture (computer)
Aleks
Khan Mappers
Virtual Manipulatives
Models

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Why is it beneficial to rewrite expressions in different forms?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson quizzes.
Math Labs, Demonstrations/Model
Unit Comprehension Test or
Performance Based Assessment

STANDARDS

Ohio - Grade 7 - Math
7.EE.1
Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.2
In a problem context, understand that rewriting an expression in an equivalent form can reveal and explain properties of the quantities represented by the expression and can reveal how those quantities are related. For example, a discount of 15% (represented by p − 0.15p) is equivalent to (1 − 0.15)p, which is equivalent to 0.85p or finding 85% of the original price.

Unit 6: Math Beursken Write and Solve Equations

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 6: (about 17 days)

1. Write and Solve One Step Equations
2. Solve Two Step Equations with bar diagrams and tiles
3. Write Two Step Equations (pos/neg) px + q = r
4. Solve Two Step Equations p(x + q) = r
5. Write and Solve Two Step Equations in real world situations.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Small group
Whole group
Foldable
Coloring pages
Games
Tiles
Bar diagrams
Alek's
Thatquiz.org

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can equations be used to solve everyday problems?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson quizzes.
Labs/Demonstrations/Model
Unit Comprehension Test or
Performance Based Assessment

STANDARDS

Ohio - Grade 7 - Math
7.NS.3
Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.
7.EE.4.b
Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example, as a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.
7.EE.4
Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

Unit 7: Math Beursken Write and Solve Inequalities

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 7: (about 13 days)

1. Solve One-step Addition/Subtraction Inequalities
2. Write and Solve One Step Addition/SubtractionInequalities
3. Solve One-step Multiplication and Division Inequalities with positive coefficients
4. Solve One-step Multiplication and Division Inequalities with negative coefficients
5. Write and Solve One Step Multiplication/Division Inequalities
6. Write and Solve Two Step Inequalities

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Whole Group
Small group
Manipulatives
Whiteboards
Foldable
Task Cards
Scoot game
Coloring page
Thatquiz.org
Sketchpad(Graphing)

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are the solutions to Inequalities different from the solutions to equations?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson quizzes.
Labs/Demonstrations/Model
Unit Comprehension Test or
Performance Based Assessment

STANDARDS

Ohio - Grade 7 - Math
7.EE.4.b
Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example, as a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.
7.EE.4
Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

Unit 8: Math Beursken Geometric Figures

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 8: (about 13 days)

1. Vertical and Adjacent Angles
2. Complementary and Supplementary Angle pairs
3. Triangles
4. Scale Drawings
5. Three Dimensional Figures

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Whole Group
Task cards
Scoot
Sketchpad
Manipulatives
Scale Project
3D shapes
Maps
Play do cross sections

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How does geometry help to describe objects?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson quizzes.
Labs/Demonstrations/Model
Unit Comprehension Test or
Performance Based Assessment

STANDARDS

Ohio - Grade 7 - Math
7.G.5
Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
7.G.2.a
Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
7.G.1.a
Compute actual lengths and areas from a scale drawing and reproduce a scale drawing at a different scale.
7.G.3

Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

7.EE.3

Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example, if a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 ¾ inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

7.EE.4.b

Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example, as a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

7.RP.2.a

Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

7.RP.2.b

Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

7.RP.3

Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

7.NS.3

Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

Unit 9: Math Beursken Measure Figures

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 9: (about 13 days)

1. Circumference of Circle
2. Area of Circles
3. Area of Composite Figures
4. Volume of Prisms and Pyramids
5. Surface Area of Prisms and Pyramids
6. Volume and Surface Area of Composite Figures

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Whole Group
Small GroupTask Cards
Alek's
keynote
Thatquiz.org
models
Coloring pages
3D shapes
Peardeck
Sketchpad
Foldables

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can we measure objects to solve problems?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson quizzes.
Labs/Demonstrations/Model
Unit Comprehension Test or
Performance Based Assessment

STANDARDS

Ohio - Grade 7 - Math
7.G.4.b
Know and use the formulas for the area and circumference of a circle and use them to solve real-world and mathematical problems.
7.G.6
Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Unit 10: Math Beursken Probability

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 10: (about 10 days)
1. Find Likelihoods of Chance Events
2. Relative Frequency of Simple Events
3. Theoretical Probability of Simple Events

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Sketchpad
Bar graphs
Virtual Interactive manipulatives

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can probability be used to predict future events?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson quizzes.
Labs/Demonstrations/Model
Unit Comprehension Test or
Performance Based Assessment

STANDARDS

Ohio - Grade 7 - Math
7.SP.5
Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event; a probability around 1/2 indicates an event that is neither unlikely nor likely; and a probability near 1 indicates a likely event.
7.SP.6
Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long- run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.
7.SP.7
Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
7.SP.7.b
Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a

tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?
7.SP.7.a
Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.
7.SP.8
Find probabilities of compound events using organized lists, tables, tree diagrams, and simulations.
7.SP.8.a
Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
7.SP.8.b
Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language, e.g., “rolling double sixes,” identify the outcomes in the sample space which compose the event.
7.SP.8.c
Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

Unit 11: Math Beursken Sampling and Statistics

Math - 7th grade - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Unit 11 (about 10 days)
1. Biased/Unbiased Samples
2. Making Predictions
3. Generating Samples

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Bar graphs
Circle Graphs

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can you use a sample to gain information about a population?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Lesson quizzes.
Labs/Demonstrations/Model
Unit Comprehension Test or
Performance Based Assessment

STANDARDS

Ohio - Grade 7 - Math
7.SP.1.a
Differentiate between a sample and a population.
7.SP.2.a
Formulate Questions: Recognize and formulate a statistical question as one that anticipates variability and can be answered with quantitative data. For example, “How do the heights of seventh graders compare to the heights of eighth graders?” (GAISE Model, step 1)
7.SP.3.b
Informally assess the degree of visual overlap of two numerical data distributions with roughly equal variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot (line plot), the separation between the two distributions of heights is noticeable.
7.RP.2.a
Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

7.RP.3
Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Math - Pre-Algebra

Vermilion Local School District

UNITS (13/13 SELECTED)	SUGGESTED DURATION
Unit 1: Proportional Relationships	*14 lessons*
Unit 2: Solve Percent Problems	*16 lessons*
Unit 3: Operations with Integers and Rational Numbers	*26 lessons*
Unit 4: Exponents & Scientific Notation	*15 lessons*
Unit 5: Real Numbers	*9 lessons*
Unit 6: Algebraic Expressions	*10 lessons*
Unit 7: Equations & Inequalities	*16 lessons*
Unit 8: Module 11: Geometric Figures	*9 lessons*
Unit 9: Module 12: Area, Surface Area, and Volume	*14 lessons*
Unit 10: Module 9: Probability	*9 lessons*
Unit 11: Module 10: Sampling and Statistics	*10 lessons*
Unit 12: Module 8: Linear Relationships and Slope	*10 lessons*
Unit 13: Transformations	*9 lessons*

Unit 1: Proportional Relationships

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Unit Rates Involving Complex Fractions
- Understanding Proportional Relationships
- Tables of Proportional Relationships
- Graphs of Proportional Relationships
- Equations of Proportional Relationships
- Solving Problems Involving Proportional Relationships

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Review Unit Rates & Dividing Fractions from 5th and 6th grade.
Whole group, Partner, Individual Practice
ALEKS Assignments
Khan Academy
HW Practice
Proportions
Tables, Graphs, and Equations

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

What does it mean for two quantities to be in a proportional relationship?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Rates ALEKS

1-1 - 1-3 Quiz

1-1 - 1-5 Quiz

Khan Academy Proportional Relationship Assignments

1-6 ALEKS Quiz

POW 1

**POW represents Problem of the Week - Released State Test Questions

STANDARDS

Ohio - Grade 7 - Math
7.RP.1
Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate

as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.
7.RP.2
Recognize and represent proportional relationships between quantities.
7.RP.2.a
Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
7.RP.2.b
Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
7.RP.2.d
Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.
7.RP.2.c
Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.

Unit 2: Solve Percent Problems

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Percent Change
- Tax
- Tips & Markups
- Discounts
- Interest
- Commission and Fees
- Percent Error

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

% Application Partner Practice
Percents - add/subtract after vs add/subtract first
Percent practice & Application

Module 2 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can percent describe the change of a quantity?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Khan- Percents
Percent Application Partner Project - with check register
Module 2 Test
POW 2
POW 3
ALEKS Percent Application

STANDARDS

Ohio - Grade 7 - Math
7.RP.3
Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
7.EE.3
Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example, if a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 ¾ inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
7.EE.2

In a problem context, understand that rewriting an expression in an equivalent form can reveal and explain properties of the quantities represented by the expression and can reveal how those quantities are related. For example, a discount of 15% (represented by $p - 0.15p$) is equivalent to $(1 - 0.15)p$, which is equivalent to $0.85p$ or finding 85% of the original price.

Unit 3: Operations with Integers and Rational Numbers

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Add Integers
- Subtract Integers
- Multiply Integers
- Divide Integers
- Apply Integer Operations
- Rational Numbers
- Add & Subtract Rational Numbers
- Multiply & Divide Rational Numbers
- Apply Rational Number Operations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Integer Operations with Playing Cards
Chips & Number Lines
Playing Cards for fractions and decimal problems
Module 3 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are operations with rational numbers related to operations with integers?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

NS.1 & NS. 2 Integer Assessment
Integer Maze
Spooky Order of Operations with Integers
Khan - Integer Operations
Khan Fractions & Decimals
Integer Performance Assessment
POW 4
POW 5
Rational Number Cut & Paste
NS.3 Integer Assessment
Rational Number Identification Quiz
Module 3 Test

STANDARDS

Ohio - Grade 7 - Math
7.NS.1
Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
7.NS.1.a
Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.

7.NS.1.b
Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
7.NS.1.d
Apply properties of operations as strategies to add and subtract rational numbers.
7.NS.1.c
Understand subtraction of rational numbers as adding the additive inverse, p − q = p + (−q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real- world contexts.
7.NS.2
Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
7.NS.2.a
Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (−1)(−1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
7.NS.2.b
Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then −(p/q) = (−p)/q = p/(–q). Interpret quotients of rational numbers by describing real-world contexts.
7.NS.2.c
Apply properties of operations as strategies to multiply and divide rational numbers.
7.NS.2.d
Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
7.NS.3
Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

7.EE.3
Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example, if a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 ¾ inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Ohio - Grade 8 - Math

8.NS.1
Know that real numbers are either rational or irrational. Understand informally that every number has a decimal expansion which is repeating, terminating, or is non-repeating and non-terminating.

Unit 4: Exponents & Scientific Notation

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Powers and Exponents
- Multiply and Divide Monomials
- Powers of Monomials
- Zero & Negative Exponents
- Scientific Notation
- Compute with Scientific Notation

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Exponent & Scientific Notation Notes & Graphic Organizer

Module 3 Study Guide

Exponent witch worksheet

Exponent Quizzes

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Why are exponents useful when working with very large or very small numbers?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Khan Scientific Notation
Khan Exponents
Scientific Notation Computation Quiz
Scientific Notation Conversion Quiz
Module 4 Assessment
POW 9
Exponent Puzzle
Scientific Notation Rudolph Puzzle

STANDARDS

Ohio - Grade 8 - Math
8.EE.1
Understand, explain, and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
8.EE.3
Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10^8; and the population of the world as 7×10^9; and determine that the world population is more than 20 times larger.

8.EE.4
Perform operations with numbers expressed in scientific notation, including problems where both decimal notation and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities, e.g., use millimeters per year for seafloor spreading. Interpret scientific notation that has been generated by technology.

Unit 5: Real Numbers

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Roots
- Real Numbers
- Estimate Irrational Numbers
- Compare and Order Real Numbers

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Types of Numbers Graphic Organizer
Rational vs. Irrational - Practice worksheets
Module 5 Review Slides

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Why do we classify numbers?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Rational vs. Irrational Quiz
Module 5 Assessment
Khan Types of Numbers
ALEKS Assessment - Identify different types of numbers
POW 9,10,11

STANDARDS

Ohio - Grade 8 - Math
8.EE.2
Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
8.EE.1
Understand, explain, and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
8.NS.2
Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions, e.g., π^2. For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
8.NS.1
Know that real numbers are either rational or irrational. Understand informally that every number has a decimal expansion which is repeating, terminating, or is non-repeating and non-terminating.

Unit 6: Algebraic Expressions

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Simplify Algebraic Expressions
- Add Linear Expressions
- Subtract Linear Expressions
- Factor Linear Expressions
- Combine Operations with Linear Expressions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Combining Like Terms Sort
Race to the Top
Geometry with Combining Like Terms
Blocks & Chips to Factor
Module 6 Review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Why is it beneficial to rewrite expressions in different forms?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Combining Like Terms Geometry 2 Worksheet
POW 12,13,14
Khan Expressions & Equations
Module 6 Assessment

STANDARDS

Ohio - Grade 7 - Math
7.EE.1
Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.2
In a problem context, understand that rewriting an expression in an equivalent form can reveal and explain properties of the quantities represented by the expression and can reveal how those quantities are related. For example, a discount of 15% (represented by p − 0.15p) is equivalent to (1 − 0.15)p, which is equivalent to 0.85p or finding 85% of the original price.

Unit 7: Equations & Inequalities

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Write and Solve Two Step Equations
- Write and Solve equations with variables on both sides
- Write and solve multi-step equations
- Determine the number of solutions
- Write and solve one step inequalities
- Write and Solve Two step Inequalities

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Quizzes Solving Equations

Solving Equations Practice - White Board – Identify the variable & do the opposite – integers, fractions & Decimals

Inequality vs. Equation

Inequality discovery activity

Module 7 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can equations be used to solve everyday problems?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Solving multistep equations assessment

Writing and solving story problems assessment

Simplifying & Factory Expressions Assessment
Module 7 Assessment

Khan Inequalities

Angle Equations Assessment

STANDARDS

Ohio - Grade 7 - Math
7.EE.4
Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
7.EE.4.a

Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
7.EE.4.b
Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example, as a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.
Ohio - Grade 8 - Math
8.EE.7
Solve linear equations in one variable.
8.EE.7.a
Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
8.EE.7.b
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Unit 8: Module 11: Geometric Figures

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Vertical & Adjacent Angles
- Complementary and Supplementary Angles
- Angle Relationships and Parallel Lines
- Triangles
- Angle Relationships and Triangles
- Scale Drawings
- Three Dimensional Figures

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Angle & Triangle notes

Angle Challenge Problems

Scale Drawing Practice

Play-dough cross sections

Module 8 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How does geometry help to describe objects?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Angle Equations Assessment

Triangles Equation Assessment

Module 8 Assessment

POW 16,17, 18

STANDARDS

Ohio - Grade 7 - Math
7.G.5
Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
7.G.2
Draw (freehand, with ruler and protractor, and with technology) geometric figures with given conditions.

7.G.2.a
Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
7.G.1
Solve problems involving similar figures with right triangles, other triangles, and special quadrilaterals.
7.G.3
Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
7.EE.3
Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example, if a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 ¾ inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
7.EE.4
Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
7.EE.4.a
Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
7.RP.2
Recognize and represent proportional relationships between quantities.
7.RP.2.b
Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
7.RP.3

Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
7.G.1.a
Compute actual lengths and areas from a scale drawing and reproduce a scale drawing at a different scale.
7.G.1.b
Represent proportional relationships within and between similar figures.
7.G.2.b
Focus on constructing quadrilaterals with given conditions noticing types and properties of resulting quadrilaterals and whether it is possible to construct different quadrilaterals using the same conditions.
Ohio - Grade 8 - Math
8.G.5
Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

Unit 9: Module 12: Area, Surface Area, and Volume

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Circumference of Circles
- Area of Circles
- Area of Composite Figures
- Volume & Surface Area of Prisms and Pyramids
- Volume of Cylinders, Cones, Spheres
- Volume and Surface Area of Composite Solids

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Pi - Day Activities

Pi & Circumference Discovery Activities

Nets of Figures

Module 12 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can we measure objects to solve problems?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

POW 19,20,21,22

Khan - Circles

Volume & Area of Composite Figures

12-1 - 12-5 Assessment

Module 12 Assessment

STANDARDS

Ohio - Grade 7 - Math
7.G.4
Work with circles.
7.G.4.a
Explore and understand the relationships among the circumference, diameter, area, and radius of a circle.
7.G.4.b

Know and use the formulas for the area and circumference of a circle and use them to solve real-world and mathematical problems.
7.G.6
Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
Ohio - Grade 8 - Math
8.G.9
Solve real-world and mathematical problems involving volumes of cones, cylinders, and spheres.

Unit 10: Module 9: Probability

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Find Likelihoods
- Relative Frequency of Simple Events
- Theoretical Probability of Simple Events
- Compare Probabilities of Simple Events
- Probability of Compound Events
- Simulate Chance Events

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Experiments - what should vs. what does happen

Probability comparison and practice

Tree Diagrams

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can probability be used to predict future events

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

State Testing Worksheets
Khan Probability & Statistics

Experimental vs Theoretical Assessment

Module 9 Assessment

STANDARDS

Ohio - Grade 7 - Math
7.SP.5
Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event; a probability around 1/2 indicates an event that is neither unlikely nor likely; and a probability near 1 indicates a likely event.
7.SP.6
Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long- run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.

7.SP.7
Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
7.SP.7.a
Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.
7.SP.7.b
Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?
7.SP.8
Find probabilities of compound events using organized lists, tables, tree diagrams, and simulations.
7.SP.8.a
Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
7.SP.8.b
Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language, e.g., “rolling double sixes,” identify the outcomes in the sample space which compose the event.
7.SP.8.c
Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

Unit 11: Module 10: Sampling and Statistics

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Biased and Unbiased Samples
- Made Predictions
- Generate Multiple Samples
- Compare Two Populations
- Assess Visual Overlap

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Types of samples notes

How does probability and sampling relate to ratios and proportions

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How can you use a sample to gain information about a population?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unbiased Sampling Project

Module 10 Assessment

STANDARDS

Ohio - Grade 7 - Math
7.SP.1
Understand that statistics can be used to gain information about a population by examining a sample of the population.
7.SP.1.a
Differentiate between a sample and a population.
7.SP.1.b
Understand that conclusions and generalizations about a population are valid only if the sample is representative of that population. Develop an informal understanding of bias.
7.SP.2
Broaden statistical reasoning by using the GAISE model:
7.SP.2.a
Formulate Questions: Recognize and formulate a statistical question as one that anticipates variability and can be answered with quantitative data. For example, “How do the heights of seventh graders compare to the heights of eighth graders?” (GAISE Model, step 1)

7.SP.2.b
Collect Data: Design and use a plan to collect appropriate data to answer a statistical question. (GAISE Model, step 2)
7.SP.2.c
Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual, and comparing individual to group. (GAISE Model, step 3)
7.SP.2.d
Interpret Results: Draw logical conclusions and make generalizations from the data based on the original question. (GAISE Model, step 4)
7.SP.3
Describe and analyze distributions.
7.SP.3.a
Summarize quantitative data sets in relation to their context by using mean absolute deviation (MAD), interpreting mean as a balance point.
7.SP.3.b
Informally assess the degree of visual overlap of two numerical data distributions with roughly equal variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot (line plot), the separation between the two distributions of heights is noticeable.
7.RP.2
Recognize and represent proportional relationships between quantities.
7.RP.3
Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Unit 12: Module 8: Linear Relationships and Slope

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Proportional Relationships and Slope
- Slope of a Line
- Similar Triangles and Slopes
- Direct Variation
- Slope-Intercept Form
- Graph Linear Equations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

What is slope? - Relate to Constant of Proportionality

Match lines to graphs

Graph on White Boards

Module 8 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

How are linear relationships related to proportional relationships?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Stained Glass

Graphing Picture Practice

Khan - Slope & Graphing

Module 8 Assessment

STANDARDS

Ohio - Grade 8 - Math
8.EE.5
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.EE.6
Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

Unit 13: Transformations

Math - Pre-Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

- Translations
- Reflections
- Rotations
- Dilations
- Congruence and Transformations
- Similarity and Transformations
- Indirect Measurement

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Shadow Problems

Module 13 Study Guide

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

What does it mean to perform a transformation on a figure?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

ALEKS transformations assessment
Khan - Transformations
Module 13 Assessment

STANDARDS

Ohio - Grade 8 - Math
8.G.1
Verify experimentally the properties of rotations, reflections, and translations (include examples both with and without coordinates).
8.G.1.a
Lines are taken to lines, and line segments are taken to line segments of the same length.
8.G.3
Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.1.b
Angles are taken to angles of the same measure.
8.G.1.c
Parallel lines are taken to parallel lines.

8.G.2
Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. (Include examples both with and without coordinates.)
8.G.5
Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
8.G.4
Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two- dimensional figures, describe a sequence that exhibits the similarity between them. (Include examples both with and without coordinates.)

Math - Algebra 1

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: Chapter 1 - Expressions	*18 lessons*
Unit 2: Chapter 2 - Multistep Equations and Inequalities	*21 lessons*
Unit 3: Chapter 3 - Relations & Functions	*13 lessons*
Unit 4: Chapter 4 - Linear Equations	*20 lessons*
Unit 5: Chapter 5 - Systems of Equations and Inequalities	*18 lessons*
Unit 6: Chapter 6 - Exponent rules	*16 lessons*
Unit 7: Chapter 7 - Polynomials and Factoring	*20 lessons*
Unit 8: Chapter 8 - Quadratic Equations	*24 lessons*
Unit 9: Chapter 9 - Statistics	*16 lessons*

Unit 1: Chapter 1 - Expressions

Math - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

The Real Number System

Properties

Order of Operations & Absolute Value

Evaluating Expressions

Matrices

Combining Like Terms

Simplifying Expressions (Distribute/Combine)

Translating Expressions/Equations/Inequalities

Solving Two-Step Equations

Solving & Graphing Two-Step Inequalities

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

understanding numeric expressions, algebraic expressions, properties of real numbers, operations with rational numbers, distributive property, expressions involving absolute value, descriptive modeling and accuracy

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On Quizzes and unit test students will show understanding of numeric expressions, algebraic expressions, properties of real numbers, operations with rational numbers, distributive property, expressions involving absolute value, descriptive modeling and accuracy

STANDARDS

Ohio - High School - Math - Algebra
A.SSE.1
Interpret expressions that represent a quantity in terms of its context.
Ohio - High School - Algebra 1 (Course)
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.

Unit 2: Chapter 2 - Multistep Equations and Inequalities

Math - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Multi-Step Equations

Multi-Step Equations with Variables on Both Sides

Multi-Step Equations with Infinite & No Solution Equations

Algebraic Proportions

Absolute Value Equations

Multi-Variable (Literal) Equations

Word Problems

Multi-Step Inequalities

Compound Inequalities

Absolute Value Inequalities

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solving one-step inequalities, solving multi-step inequalities, solving compound inequalities, solving absolute value inequalities, graphing in two variables

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will solve one-step inequalities, solve multi-step inequalities, solve compound inequalities, solve absolute value inequalities, graph in two variables.

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
A.REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A.REI.1
Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ Focus on formulas in which the variable of interest is linear or square.

Unit 3: Chapter 3 - Relations & Functions

Math - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Relations

Functions

Domain

Range

Identifying Zeros of a function

Sequences

analyzing graphs

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Writing and interpreting equations, solving one-step equations, solving multi-step equations, solving equations with the variable on each side, solving equations with absolute value, solving proportions, using formulas, representing relations, graphing functions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will write and interpret equations, solve one-step equations, solve multi-step equations, solve equations with the variable on each side, solve equations with absolute value, solve proportions, use formulas, represent relations, graph functions

STANDARDS

Ohio - High School - Algebra 1 (Course)
N.Q.1
Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. ★
F.IF.1
Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
F.IF.2
Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.
F.IF.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★ b. Focus on linear, quadratic, and exponential functions.
F.IF.9
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). b. Focus on linear, quadratic, and exponential functions.
F.LE.3
Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★
A.REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

Unit 4: Chapter 4 - Linear Equations

Math - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Slope from a Graph & Slope Formula

Linear Equations: Slope-Intercept Form & Standard Form

Graphing Linear Equations (Using Slope-Intercept Form)

x- and y-Intercepts

Vertical & Horizontal Lines

The Point-Slope Formula (Given Point and Slope)

Point-Slope Formula (Given Two Points)

Writing Equations of Lines Review

Parallel and Perpendicular Lines

Linear Equation Word Problems

Scatter Plots, Line of Best Fit, and Linear Regression

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solving one-step inequalities, solving multi-step inequalities, solving compound inequalities, solving absolute value inequalities, graphing in two variables

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will solve one-step inequalities, solve multi-step inequalities, solve compound inequalities, solve absolute value inequalities, graph in two variables

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.
F.LE.5

Interpret the parameters in a linear or exponential function in terms of a context.★

A.CED.2

Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.

F.LE.1

Distinguish between situations that can be modeled with linear functions and with exponential functions.★ a. Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★ F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★

F.BF.2

Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★

F.BF.3

Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);

F.BF.1

Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression, a recursive process, or steps for calculation from context. i. Focus on linear and exponential functions. ii. Focus on situations that exhibit quadratic or exponential relationships.

F.LE.2

Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★

F.IF.4

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or

negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.

Unit 5: Chapter 5 - Systems of Equations and Inequalities

Math - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solving Systems of Equations by Graphing

Solving Systems of Equations by Substitution

Solving Systems of Equations by Elimination

Word Problems

Linear Inequalities

Systems of Linear Inequalities

Systems of Linear Inequalities Word Problems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Graphing systems of equations, substitution, elimination using multiplication, addition and subtraction, systems of inequalities

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will graphing systems of equations, execute the substitution method, use the elimination method using multiplication, addition and subtraction, and solve systems of inequalities.

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
S.ID.7
Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.★
Ohio - High School - Math - Algebra
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

Unit 6: Chapter 6 - Exponent rules

Math - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Monomials: Add, Subtract, Multiply (Product Rule)

Product Rule & Geometric Applications

Quotient Rule

Negative Exponents

Scientific Notation

Geometric Sequences

Exponential Growth and Decay

Simplifying Radicals: Square and Cube Roots

Monomial Square Roots

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Multiplication properties of exponents, division properties of exponents, negative exponents, rational exponents, simplifying radical expressions, operations with radical expressions, sums and products of rational and irrational numbers, exponential equations

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will simplify using multiplication properties of exponents, division properties of exponents, negative exponents, rational exponents, simplifying radical expressions, operations with radical expressions, sums and products of rational and irrational numbers, exponential equations.

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★

A.REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A.REI.12
Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
S.ID.6
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★ c. Fit a linear function for a scatterplot that suggests a linear association.
S.ID.8
Compute (using technology) and interpret the correlation coefficient of a linear fit.★
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.
F.IF.3
Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n + 1) = f(n) + f(n − 1) for n ≥ 1.
F.LE.1
Distinguish between situations that can be modeled with linear functions and with exponential functions.★ a. Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★ F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★
F.BF.3
Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both

positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);

F.LE.2

Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★

A.SSE.3

Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.

F.IF.8

Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. i. Focus on completing the square to quadratic functions with the leading coefficient of 1. b. Use the properties of exponents to interpret expressions for exponential functions. i. Focus on exponential functions evaluated at integer inputs.

F.BF.2

Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★

Unit 7: Chapter 7 - Polynomials and Factoring

Math - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Intro to Polynomials: Classify, Add, Subtract

Multiplying a Monomial and a Polynomial

Multiplying Binomials and Trinomials

Dividing Polynomials by a Monomial

Factoring Polynomials: Greatest Common Factor

Factoring Polynomials: Difference of Squares

Factoring Polynomials: Trinomials (x2+ bx + c)

Factoring Polynomials: Grouping

Dividing Polynomials by a Binomial

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Adding and subtracting polynomials, multiplying polynomials by monomials, multiplying polynomials, specials products, using the distributive property, proving the elimination method, factoring quadratic trinomials, factoring special products

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit tests students will add and subtract polynomials, multiply polynomials by monomials, multiply polynomials, specials products, using the distributive property, proving the elimination method, factoring quadratic trinomials, factoring special products

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.REI.6
Solve systems of linear equations algebraically and graphically. a. Limit to pairs of linear equations in two variables.
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
A.REI.5

Verify that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
A.REI.12
Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
A.SSE.1.
Interpret expressions that represent a quantity in terms of its context. ★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.
A.APR.1
Understand that polynomials form a system analogous to the integers, namely, that they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. a. Focus on polynomial expressions that simplify to forms that are linear or quadratic.

Unit 8: Chapter 8 - Quadratic Equations

Math - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Introduction to Quadratic Equations: Standard Form, Axis of Symmetry, Vertex, Minimum, Maximum

Graphing Quadratic Equations

Vertex Form of a Quadratic Equation; Transformations

Quadratic Roots and the Discriminant

Solving Quadratics by Factoring

Compare Vertex Form, Standard Form, and Factored Form

Solving Quadratics by Square Roots

Solving Quadratics by Completing the Square

Solving Quadratics by the Quadratic Formula

Applications: Area and Consecutive Integer Problems

Applications: Projectile Motion

Linear vs. Quadratic Regression

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Graphing quadratic functions, transforming quadratic functions, solving quadratic equations by graphing, factoring, completing the square, using the quadratic formula, solving systems of linear and quadratic equations, modeling and curve fitting, exponential growth patterns, combining functions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit tests students will graph quadratic functions, transform quadratic functions, solve quadratic equations by graphing, factor, complete the square, use the quadratic formula, solve systems of linear and quadratic equations, model and curve fitting, exponential growth patterns, combining functions

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.
A.SSE.3
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

c. Use the properties of exponents to transform expressions for exponential functions.

F.IF.4

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.

F.IF.7

Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.

F.IF.8

Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. i. Focus on completing the square to quadratic functions with the leading coefficient of 1. b. Use the properties of exponents to interpret expressions for exponential functions. i. Focus on exponential functions evaluated at integer inputs.

F.BF.3

Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);

A.REI.4

Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x − p)2 = q that has the same solutions. b. Solve quadratic equations as appropriate to the initial form of the equation by inspection, e.g., for x2 = 49; taking square roots; completing the square; applying the quadratic formula; or utilizing the Zero-Product Property after factoring. (+) c. Derive the quadratic formula using the method of completing the square.

A.CED.1

Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.

A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.REI.7
Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
F.BF.1
Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression, a recursive process, or steps for calculation from context. i. Focus on linear and exponential functions. ii. Focus on situations that exhibit quadratic or exponential relationships.

Unit 9: Chapter 9 - Statistics

Math - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Mean

Median

Mode

Quartiles

Range

Minimum

Maximum

Interquartile Range

5 number summary

Constructing Box-and-whisker plots

Steam and Leaf Plots

Histogram

Variance

standard deviation

z-scores

Normal Distributions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Measures of center, representing data, using data, measures of spread, distributions of data, summarizing categorical data

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will show measures of center, represent data, use data, use measures of spread, use distributions of data, summarize categorical data

STANDARDS

Ohio - High School - Algebra 1 (Course)
S.ID.2
In the context of real-world applications by using the GAISE model, use statistics appropriate to the shape of the data distribution to compare center (median and mean) and spread (mean absolute deviationG, interquartile rangeG, and standard deviation) of two or more different data sets. ★

S.ID.1
Represent data with plots on the real number line (dot plotsG, histograms, and box plots) in the context of real-world applications using the GAISE model.★
S.ID.3
In the context of real-world applications by using the GAISE model, interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ★
S.ID.5
Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of thedata (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.★
N.Q.1
Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. ★

Math - Algebra

Vermilion Local School District

UNITS (10/10 SELECTED)	SUGGESTED DURATION
Unit 1: Order of operations & Average	*10 lessons*
Unit 2: Real Number System	*12 lessons*
Unit 3: Solving Equations 1 variable	*21 lessons*
Unit 4: Solving Equations with Variables on both sides	*10 lessons*
Unit 5: Exponents & Scientific Notation	*34 lessons*
Unit 6: Linear relationships / Slope	*19 lessons*
Unit 7: Intro to Functions	*18 lessons*
Unit 8: Systems of Equations	*21 lessons*
Unit 9: Pythagorean's Theorem	*14 lessons*
Unit 10: Area & Volume	*11 lessons*

Unit 1: Order of operations & Average

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Knowledge of the order of operations

Calculate average

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-how to calculate with real numbers
-calculate average

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-how to calculate with real numbers
-calculate average

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Unit 2: Real Number System

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Know definitions of the Real number system

Know & use the correct order of operations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-types of numbers
-types of decimals
-how to calculate with real numbers

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-types of numbers
-types of decimals
-how to calculate with real numbers

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.NS.1
Know that real numbers are either rational or irrational. Understand informally that every number has a decimal expansion which is repeating, terminating, or is non-repeating and non-terminating.
8.NS.2
Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions, e.g., π^2. For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
8.EE.2
Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p

is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

Unit 3: Solving Equations 1 variable

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Show ability to solve equations with variables on 1 side

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-solve 1step to multi-step equations when the variable is on 1 side
-word problems involving

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-solve 1step to multi-step equations when the variable is on 1 side
-word problems involving

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.7
Solve linear equations in one variable.
8.EE.7.b
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Unit 4: Solving Equations with Variables on both sides

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Show ability to solve equations with variables on both side of the equation

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-solve multi-step equations when the variable is on both sides
-word problems involving

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-solve multi-step equations when the variable is on both sides
-word problems involving

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.7
Solve linear equations in one variable.
8.EE.7.b
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Unit 5: Exponents & Scientific Notation

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Know how to use and compute with exponents & scientific notation

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-properties of exponents
-definition & computations with scientific notation

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-properties of exponents
-definition & computations with scientific notation

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.3
Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities and to express how many times as much one is than the other. For example, estimate the population of the United States as 3 × 108; and the population of the world as 7 × 109; and determine that the world population is more than 20 times larger.
8.EE.4
Perform operations with numbers expressed in scientific notation, including problems where both decimal notation and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities, e.g., use millimeters per year for seafloor spreading. Interpret scientific notation that has been generated by technology.
8.EE.1
Understand, explain, and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

Unit 6: Linear relationships / Slope

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Know what linear relationships are
Show knowledge of slope

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-slope formula
-point-slope
-slope-intercept
-write linear equations
-graph linear equations

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-slope formula
-point-slope
-slope-intercept
-write linear equations
-graph linear equations

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.5
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.EE.6
Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

8.EE.7.a
Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
8.EE.7.b
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Unit 7: Intro to Functions

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Know the basic concepts of functions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-identify functions
-create functions from different data

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-identify functions
-create functions from different data

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.F.1
Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Function notation is not required in Grade 8.
8.F.2
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
8.F.3
Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s^2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

8.F.4
Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
8.F.5
Describe qualitatively the functional relationship between two quantities by analyzing a graph, e.g., where the function is increasing or decreasing, linear or nonlinear. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Unit 8: Systems of Equations

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solve systems of equations through different methods

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-graphing
-substitution
-elimination
-word problems involving

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-graphing
-substitution
-elimination
-word problems involving

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.8.a
Understand that the solution to a pair of linear equations in two variables corresponds to the point(s) of intersection of their graphs, because the point(s) of intersection satisfy both equations simultaneously.
8.EE.8.b
Use graphs to find or estimate the solution to a pair of two simultaneous linear equations in two variables. Equations should include all three solution types: one solution, no solution, and infinitely many solutions. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.
8.EE.8.c
Solve real-world and mathematical problems leading to pairs of linear equations in two variables. For example,

given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair. (Limit solutions to those that can be addressed by graphing.)
8.EE.8
Analyze and solve pairs of simultaneous linear equations graphically.

Unit 9: Pythagorean's Theorem

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Apply and solve problems involving right triangle

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-Pythagoreans theorem & it's converse
-right triangle relationships

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-Pythagoreans theorem & it's converse
-right triangle relationships

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.G.6
Analyze and justify an informal proof of the Pythagorean Theorem and its converse.
8.G.7
Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.8
Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Unit 10: Area & Volume

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Apply formulas to solve volume problems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-formulas for volume of cones, cylinders, & spheres
-find missing dimensions
-find volume of composite figures

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-formulas for volume of cones, cylinders, & spheres
-find missing dimensions
-find volume of composite figures

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.G.9
Solve real-world and mathematical problems involving volumes of cones, cylinders, and spheres.
Solve
real-world and mathematical problems involving volume of cylinders, cones, and spheres.

Math 8

Vermilion Local School District

UNITS (7/7 SELECTED)	SUGGESTED DURATION
Unit 1: Operations with real numbers	*8 lessons*
Unit 2: Exponents, radicals, and exponent properties	*12 lessons*
Unit 3: introduction of variables and calculation of equations	*8 lessons*
Unit 4: Representing Linear Functions	*14 lessons*
Unit 5: Comparing linear equations and their uses	*10 lessons*
Unit 6: Polygons on a coordinate plane	*10 lessons*
Unit 7: intro to geometry concepts	*10 lessons*

Unit 1: Operations with real numbers

Math 8 - *Last Updated on January 9, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Essential topics for this unit are as follows:

- Rational and irrational numbers
- Integers, whole numbers
- Operations with positive and negative integers
- Order of Operations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teaching methods for this unit:

- Teacher lecture
- Individualized note taking
- ALEKS Activities
- Around the world classroom activities
- Activities and games related to calculation and order of operation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will need to:

- Classify rational and irrational numbers
- Identify types of decimals
- Calculate addition and subtraction problems with positive and negative integers
- Calculate multiplication and division problems with positive and negative integers
- Calculate multi step operations following the order of operations
- Identify the Order of Operations

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Students will demonstrate learning using the following methods:

- Homework assignments
- Worksheets
- Quizizz assignments
- Classroom assessments
- Classroom activities
- Developing a mnemonic poster for the order of operations

STANDARDS

Unit 1: Operations with real numbers

Math 8 - *Last Updated on January 9, 2023*

Ohio - Grade 8 - Math
8.NS.1
Know that real numbers are either rational or irrational. Understand informally that every number has a decimal expansion which is repeating, terminating, or is non-repeating and non-terminating.
8.NS.2
Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions, e.g., π^2. For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
8.EE.1
Understand, explain, and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

Unit 2: Exponents, radicals, and exponent properties

Math 8 - *Last Updated on January 9, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Essential topics for this unit are as follows:

- Identifying rational and irrational numbers
- Scientific Notation
  - Writing and converting between Scientific and standard notation
  - comparing and calculating with two numbers in scientific notation.
- Exponents and Radicals
  - exponents and radicals as inverse operations
- Exponent rules
  - Product of powers
  - Quotient of powers
  - Power of Powers
  - Zero Power
  - Negative Exponents

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teaching methods for this unit

- Teacher lecture
- Individualized note taking
- ALEKS Activities
- Lego Exponents activities
- Classroom activities for manipulation of exponents and exponent rules
- Legends of Learning for Exponent games

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will need to:

- Classify rational and irrational numbers
- Convert numbers between scientific and standard notation
- Identify the inverse operation of exponents and radicals
- identify and use the following exponent rules
  - Product of powers
  - Quotient of powers
  - Power of Powers
  - Zero Power
  - Negative Exponents

Unit 2: Exponents, radicals, and exponent properties

Math 8 - *Last Updated on January 9, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Students will demonstrate learning using the following methods:

- Homework assignments
- Worksheets
- Quizizz assignments
- Classroom assessments
- Classroom activities
- Construct a 3d model of an exponential representation

STANDARDS

Ohio - Grade 8 - Math
8.NS.1
Know that real numbers are either rational or irrational. Understand informally that every number has a decimal expansion which is repeating, terminating, or is non-repeating and non-terminating.
8.NS.2
Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions, e.g., π^2. For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
8.EE.1
Understand, explain, and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
8.EE.2
Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
8.EE.3
Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities and to express how many times as much one is than the other. For example, estimate the population of the United States as 3 × 108; and the population of the world as 7 × 109; and determine that the world population is more than 20 times larger.
8.EE.4

Perform operations with numbers expressed in scientific notation, including problems where both decimal notation and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities, e.g., use millimeters per year for seafloor spreading. Interpret scientific notation that has been generated by technology.

Unit 3: introduction of variables and calculation of equations

Math 8 - *Last Updated on January 9, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Essential topics for this unit are as follows:

- Introduction of variables
- Solving for a Variable
  - Single step
  - Multiple steps
  - Distributive property
  - Equations on both sides
- One solution, infinite solutions, and no solutions
- Perform operations to balance equations with variables

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teaching methods for this unit:

- Teacher lecture
- Individualized note taking
- ALEKS Activities
- Classroom activities for steps to solve for a variable
- Classroom posters for distributive property, solving for a variable, and number of solutions

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will need to:

- Identify and substitute a variable into an equation
- Solve for a variable in different forms of equations
- Determine whether an equation would have one solution, infinite solutions, or no solution
- Isolate a variable in a given equation

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Students will demonstrate learning using the following methods:

- Homework assignments
- Worksheets
- Quizizz assignments
- Classroom assessments
- Classroom activities
- Construct a poster to describe the distributive property, solving for a variable, or the number of solutions

STANDARDS

Unit 3: introduction of variables and calculation of equations

Math 8 - *Last Updated on January 9, 2023*

Ohio - Grade 8 - Math
8.EE.3
Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities and to express how many times as much one is than the other. For example, estimate the population of the United States as 3 × 108; and the population of the world as 7 × 109; and determine that the world population is more than 20 times larger.
8.EE.4
Perform operations with numbers expressed in scientific notation, including problems where both decimal notation and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities, e.g., use millimeters per year for seafloor spreading. Interpret scientific notation that has been generated by technology.
8.EE.7
Solve linear equations in one variable.
8.EE.7.a
Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).

Unit 4: Representing Linear Functions

Math 8 - *Last Updated on February 17, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Essential topics for this unit are as follows:

- Recognize proportional relationships between sets of numbers
- Graphs, Tables, Maps, Lists of points
- Determine if a set of numbers are a function
  - Repeating x values
  - Vertical line test
- Graphing proportional relations
- Determine Slope
  - Slope formula
  - Slope Triangles
  - "rise over run"

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teaching methods for this unit:

-

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will need to:

- Homework assignments
- Worksheets
- Quizizz assignments
- Classroom assessments
- Classroom activities

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Students will demonstrate learning using the following methods:

-

STANDARDS

Ohio - Grade 8 - Math
8.EE.7
Solve linear equations in one variable.
8.EE.7.a

Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
8.EE.7.b
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
8.EE.8.c
Solve real-world and mathematical problems leading to pairs of linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair. (Limit solutions to those that can be addressed by graphing.)
8.F.2
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
8.F.3
Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
8.F.1
Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Function notation is not required in Grade 8.
8.EE.5
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.EE.6
Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.
8.SP.4

Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Unit 5: Comparing linear equations and their uses

Math 8 - *Last Updated on February 17, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Essential topics for this unit are as follows:

- Solve linear equations
- Graph two equations on the same coordinate plane
- Identify patterns between the graphical representations of two lines
  - Identify intersections between points as their Coordinate pairs.
  - Identify when equations are similar through graphing
  - Determine if there is one solution, no solution or infinite solutions to a graph.
- Develop solutions to real world problems relating to a system of equations.
-

STANDARDS

Ohio - Grade 8 - Math
8.EE.7.b
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
8.EE.8
Analyze and solve pairs of simultaneous linear equations graphically.
8.EE.8.a
Understand that the solution to a pair of linear equations in two variables corresponds to the point(s) of intersection of their graphs, because the point(s) of intersection satisfy both equations simultaneously.
8.EE.8.b
Use graphs to find or estimate the solution to a pair of two simultaneous linear equations in two variables. Equations should include all three solution types: one solution, no solution, and infinitely many solutions. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.
8.EE.8.c
Solve real-world and mathematical problems leading to pairs of linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair. (Limit solutions to those that can be addressed by graphing.)

Unit 5: Comparing linear equations and their uses

Math 8 - *Last Updated on February 17, 2023*

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teaching methods for this unit:

•

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will need to:

- Homework assignments
- Worksheets
- Quizizz assignments
- Classroom assessments
- Classroom activities

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Students will demonstrate learning using the following methods:

•

STANDARDS

Ohio - Grade 8 - Math
8.F.2
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
8.F.4
Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
8.F.5
Describe qualitatively the functional relationship between two quantities by analyzing a graph, e.g., where the function is increasing or decreasing, linear or nonlinear. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
8.SP.1

Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering; outliers; positive, negative, or no association; and linear association and nonlinear association. (GAISE Model, steps 3 and 4)
8.SP.2
Understand that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. (GAISE Model, steps 3 and 4)
8.SP.3
Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height. (GAISE Model, steps 3 and 4)
8.EE.8.c
Solve real-world and mathematical problems leading to pairs of linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair. (Limit solutions to those that can be addressed by graphing.)
8.EE.8.b
Use graphs to find or estimate the solution to a pair of two simultaneous linear equations in two variables. Equations should include all three solution types: one solution, no solution, and infinitely many solutions. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.
8.EE.8.a
Understand that the solution to a pair of linear equations in two variables corresponds to the point(s) of intersection of their graphs, because the point(s) of intersection satisfy both equations simultaneously.
8.EE.8
Analyze and solve pairs of simultaneous linear equations graphically.

Unit 6: Polygons on a coordinate plane

Math 8 - *Last Updated on January 9, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Essential topics for this unit are as follows:

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Teaching methods for this unit:

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Students will need to;

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Students will demonstrate learning using the following methods:

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METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teaching methods for this unit:

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COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will need to:

- Homework assignments
- Worksheets
- Quizizz assignments
- Classroom assessments
- Classroom activities

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Students will demonstrate learning using the following methods:

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STANDARDS

Ohio - Grade 8 - Math

8.G.3
Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.4
Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two- dimensional figures, describe a sequence that exhibits the similarity between them. (Include examples both with and without coordinates.)
8.G.5
Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
8.G.1.c
Parallel lines are taken to parallel lines.
8.G.1.b
Angles are taken to angles of the same measure.
8.G.1.a
Lines are taken to lines, and line segments are taken to line segments of the same length.
8.G.2
Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. (Include examples both with and without coordinates.)
8.G.1
Verify experimentally the properties of rotations, reflections, and translations (include examples both with and without coordinates).

Unit 7: intro to geometry concepts

Math 8 - *Last Updated on January 9, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Essential topics for this unit are as follows:

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Students will need to:

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Students will demonstrate learning using the following methods:

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METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teaching methods for this unit:

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COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students will need to:

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SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Students will demonstrate learning using the following methods:

- Homework assignments
- Worksheets
- Quizizz assignments
- Classroom assessments
- Classroom activities

STANDARDS

Ohio - Grade 8 - Math
8.G.9
Solve real-world and mathematical problems involving volumes of cones, cylinders, and spheres.

Solve
real-world and mathematical problems involving volume of cylinders, cones, and spheres.
8.G.5
Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
8.G.4
Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two- dimensional figures, describe a sequence that exhibits the similarity between them. (Include examples both with and without coordinates.)
8.G.6
Analyze and justify an informal proof of the Pythagorean Theorem and its converse.
8.G.7
Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.8
Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Math - HS - Algebra 1, Part 1

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: Prior knowledge assessment and foundational skills	*10 lessons*
Unit 2: Module 1: Expression	*24 lessons*
Unit 3: Module 2: Equations in one variable	*24 lessons*
Unit 4: Module 3: Relations and functions	*24 lessons*
Unit 5: Review and mid-year assessment	*10 lessons*
Unit 6: Module 4: Linear and nonlinear functions	*23 lessons*
Unit 7: Module 5: Creating linear equations	*23 lessons*
Unit 8: Module 6: Linear Inequalities	*23 lessons*
Unit 9: Review and prepare for final exam	*10 lessons*

Unit 1: Prior knowledge assessment and foundational skills

Math - HS - Algebra 1, Part 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Prior knowledge assessment and foundational skills

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Individual presentations/explanations of problems

STANDARDS

Unit 2: Module 1: Expression

Math - HS - Algebra 1, Part 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Expression

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Direct instruction/modeling, individual practice, group work, stations, student presented work with peer evaluation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Write numerical expressions
- Evaluate numerical expressions
- Use the order of operations
- Write algebraic expressions
- Identify properties of equality
- Apply the identity and inverse properties to evaluate expressions
- Apply the commutative, associative, and distributive properties to evaluate expressions
- Write and evaluate absolute value expressions
- Use descriptive modeling to describe real-world situations
- Choose a level of accuracy appropriate to limitations on measurements

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

- Write numerical expressions
- Evaluate numerical expressions
- Use the order of operations
- Write algebraic expressions
- Identify properties of equality
- Apply the identity and inverse properties to evaluate expressions
- Apply the commutative, associative, and distributive properties to evaluate expressions
- Write and evaluate absolute value expressions
- Use descriptive modeling to describe real-world situations
- Choose a level of accuracy appropriate to limitations on measurements

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.SSE.1.
Interpret expressions that represent a quantity in terms of its context. ★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.
A.SSE.3
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity

represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.
A.APR.1
Understand that polynomials form a system analogous to the integers, namely, that they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. a. Focus on polynomial expressions that simplify to forms that are linear or quadratic.
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.

Unit 3: Module 2: Equations in one variable

Math - HS - Algebra 1, Part 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Equations in one variable

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Direct instruction/modeling, individual practice, group work, stations, student presented work with peer evaluation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Write equations to represent relationships
- Interpret equations that represent relationships
- Solve one-step equations by using addition and subtraction
- Solve one-step equations by using multiplication and division
- Solve multi-step equations
- Solve equations with variables on each side
- Solve equation by applying distributive property
- Solve equations that involve absolute value
- Solve proportions
- Solve an equation with more than one variable for a specific variable
- Convert units of measure by using dimensional analysis

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

- Write equations to represent relationships
- Interpret equations that represent relationships
- Solve one-step equations by using addition and subtraction
- Solve one-step equations by using multiplication and division
- Solve multi-step equations
- Solve equations with variables on each side
- Solve equation by applying distributive property
- Solve equations that involve absolute value
- Solve proportions
- Solve an equation with more than one variable for a specific variable
- Convert units of measure by using dimensional analysis

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.CED.3

Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ Focus on formulas in which the variable of interest is linear or square.
A.REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A.REI.1
Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Unit 4: Module 3: Relations and functions

Math - HS - Algebra 1, Part 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Relations and functions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Direct instruction/modeling, individual practice, group work, stations, student presented work with peer evaluation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Represent relations using ordered pairs, tables, graphs and mappings
- Analyze graphs of relations
- Choose and interpret the scale on a coordinate graph
- Determine whether relations are functions
- Use function notation
- Determine whether a graph is discrete, continuous or neither
- Determine whether a function is linear or nonlinear
- Write linear function in standard form
- Find x- and y-intercepts of a graph
- Interpret intercepts of graphs of functions
- Determine whether a graph has line symmetry
- Identify where a graph is increasing and where it is decreasing
- Find extrema of a function
- Describe the end behavior of a function
- Sketch graphs of function
- Solve equations by graphing

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

- Represent relations using ordered pairs, tables, graphs and mappings
- Analyze graphs of relations
- Choose and interpret the scale on a coordinate graph
- Determine whether relations are functions
- Use function notation
- Determine whether a graph is discrete, continuous or neither
- Determine whether a function is linear or nonlinear
- Write linear function in standard form
- Find x- and y-intercepts of a graph
- Interpret intercepts of graphs of functions
- Determine whether a graph has line symmetry
- Identify where a graph is increasing and where it is decreasing
- Find extrema of a function
- Describe the end behavior of a function
- Sketch graphs of function
- Solve equations by graphing

STANDARDS

Ohio - High School - Algebra 1 (Course)
F.IF.2
Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.
F.IF.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★ b. Focus on linear, quadratic, and exponential functions.
F.IF.1
Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
A.REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
N.Q.1
Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. ★
F.IF.9
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). b. Focus on linear, quadratic, and exponential functions.
A.REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

F.LE.1
Distinguish between situations that can be modeled with linear functions and with exponential functions.★ a. Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★ F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★

Unit 5: Review and mid-year assessment

Math - HS - Algebra 1, Part 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Review and mid-year assessment

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Review activities, games, and quizzes. Practice test and unit tests review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Mid-year exam with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their competence on all the skills they have learned throughout the first semester.

STANDARDS

Unit 6: Module 4: Linear and nonlinear functions

Math - HS - Algebra 1, Part 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Linear and nonlinear functions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Direct instruction/modeling, individual practice, group work, stations, student presented work with peer evaluation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Graph linear equation by using a table
- Graph linear equation by using intercepts
- Find rates of change
- Determine slopes of linear equations
- Write linear equations in slope-intercept form
- Graph linear function in slope-intercept form
- Translate, dilate, and reflect linear functions
- Identify and find missing terms in arithmetic sequences
- Write arithmetic sequences as linear functions
- Model and use piecewise functions, step functions, and absolute value functions
- Translate absolute value functions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

- Graph linear equation by using a table
- Graph linear equation by using intercepts
- Find rates of change
- Determine slopes of linear equations
- Write linear equations in slope-intercept form
- Graph linear function in slope-intercept form
- Translate, dilate, and reflect linear functions
- Identify and find missing terms in arithmetic sequences
- Write arithmetic sequences as linear functions
- Model and use piecewise functions, step functions, and absolute value functions
- Translate absolute value functions

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
S.ID.7

Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.★

F.BF.2

Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★

F.LE.1

Distinguish between situations that can be modeled with linear functions and with exponential functions.★ a. Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★ F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★

F.BF.3

Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);

F.IF.7

Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.

F.LE.5

Interpret the parameters in a linear or exponential function in terms of a context.★

A.CED.2

Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.

F.BF.1

Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression, a recursive process, or steps for calculation from context. i. Focus on linear and exponential functions. ii. Focus on

situations that exhibit quadratic or exponential relationships.
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.

Unit 7: Module 5: Creating linear equations

Math - HS - Algebra 1, Part 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

creating linear equations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Direct instruction/modeling, individual practice, group work, stations, student presented work with peer evaluation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Write linear equation in slope-intercept form when given the slope and the coordinates of a point
- Write linear equations in slope-intercept form when given the coordinates of two points on the line
- Write linear equations in standard form
- Write linear equations in point-slope form
- Write equations of parallel and perpendicular lines
- Examine scatter plots to describe relationships between quantities
- Make and evaluate predictions by fitting linear functions to sets of data
- Distinguish between correlation and causation
- Write equation of best-fit lines
- Plot and analyze residuals
- Find inverses of linear relations and functions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

- Write linear equation in slope-intercept form when given the slope and the coordinates of a point
- Write linear equations in slope-intercept form when given the coordinates of two points on the line
- Write linear equations in standard form
- Write linear equations in point-slope form
- Write equations of parallel and perpendicular lines
- Examine scatter plots to describe relationships between quantities
- Make and evaluate predictions by fitting linear functions to sets of data
- Distinguish between correlation and causation
- Write equation of best-fit lines
- Plot and analyze residuals
- Find inverses of linear relations and functions

STANDARDS

Ohio - High School - Algebra 1 (Course)
S.ID.6
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★ c. Fit a linear function for a scatterplot that suggests a linear association.
F.BF.4

Find inverse functions. a. Informally determine the input of a function when the output is known.
S.ID.8
Compute (using technology) and interpret the correlation coefficient of a linear fit.★
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
S.ID.7
Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.★
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★

Unit 8: Module 6: Linear Inequalities

Math - HS - Algebra 1, Part 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Linear Inequalities

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Direct instruction/modeling, individual practice, group work, stations, student presented work with peer evaluation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Graph linear inequalities
- Solve one-step linear inequalities using addition and subtraction
- Solve one-step linear inequalities using multiplication and division
- Solve multi-step linear inequalities
- Solve compound linear inequalities
- Solve absolute value linear inequalities
- Graph inequalities in two-variables

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

- Graph linear inequalities
- Solve one-step linear inequalities using addition and subtraction
- Solve one-step linear inequalities using multiplication and division
- Solve multi-step linear inequalities
- Solve compound linear inequalities
- Solve absolute value linear inequalities
- Graph inequalities in two-variables

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A.REI.12
Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.

A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
S.ID.6
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★ c. Fit a linear function for a scatterplot that suggests a linear association.
S.ID.8
Compute (using technology) and interpret the correlation coefficient of a linear fit.★

Unit 9: Review and prepare for final exam

Math - HS - Algebra 1, Part 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Review and prepare for final exam

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Review activities, games, and quizzes. Practice test and unit tests review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Final exam with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their competence on all the skills they have learned throughout the first and second semesters.

STANDARDS

Math - HS - Algebra 1

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: Chapter 1 - Expressions	*18 lessons*
Unit 2: Chapter 2 - Multistep Equations and Inequalities	*21 lessons*
Unit 3: Chapter 3 - Relations & Functions	*13 lessons*
Unit 4: Chapter 4 - Linear Equations	*20 lessons*
Unit 5: Chapter 5 - Systems of Equations and Inequalities	*18 lessons*
Unit 6: Chapter 6 - Exponent rules	*16 lessons*
Unit 7: Chapter 7 - Polynomials and Factoring	*20 lessons*
Unit 8: Chapter 8 - Quadratic Equations	*24 lessons*
Unit 9: Chapter 9 - Statistics	*16 lessons*

Unit 1: Chapter 1 - Expressions

Math - HS - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

The Real Number System

Properties

Order of Operations & Absolute Value

Evaluating Expressions

Matrices

Combining Like Terms

Simplifying Expressions (Distribute/Combine)

Translating Expressions/Equations/Inequalities

Solving Two-Step Equations

Solving & Graphing Two-Step Inequalities

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

understanding numeric expressions, algebraic expressions, properties of real numbers, operations with rational numbers, distributive property, expressions involving absolute value, descriptive modeling and accuracy

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On Quizzes and unit test students will show understanding of numeric expressions, algebraic expressions, properties of real numbers, operations with rational numbers, distributive property, expressions involving absolute value, descriptive modeling and accuracy

STANDARDS

Ohio - High School - Math - Algebra
A.SSE.1
Interpret expressions that represent a quantity in terms of its context.
Ohio - High School - Algebra 1 (Course)
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.

Unit 2: Chapter 2 - Multistep Equations and Inequalities

Math - HS - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Multi-Step Equations

Multi-Step Equations with Variables on Both Sides

Multi-Step Equations with Infinite & No Solution Equations

Algebraic Proportions

Absolute Value Equations

Multi-Variable (Literal) Equations

Word Problems

Multi-Step Inequalities

Compound Inequalities

Absolute Value Inequalities

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solving one-step inequalities, solving multi-step inequalities, solving compound inequalities, solving absolute value inequalities, graphing in two variables

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will solve one-step inequalities, solve multi-step inequalities, solve compound inequalities, solve absolute value inequalities, graph in two variables.

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
A.REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A.REI.1
Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ Focus on formulas in which the variable of interest is linear or square.

Unit 3: Chapter 3 - Relations & Functions

Math - HS - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Relations

Functions

Domain

Range

Identifying Zeros of a function

Sequences

analyzing graphs

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Writing and interpreting equations, solving one-step equations, solving multi-step equations, solving equations with the variable on each side, solving equations with absolute value, solving proportions, using formulas, representing relations, graphing functions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will write and interpret equations, solve one-step equations, solve multi-step equations, solve equations with the variable on each side, solve equations with absolute value, solve proportions, use formulas, represent relations, graph functions

STANDARDS

Ohio - High School - Algebra 1 (Course)
N.Q.1
Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. ★
F.IF.1
Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
F.IF.2
Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.
F.IF.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★ b. Focus on linear, quadratic, and exponential functions.
F.IF.9
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). b. Focus on linear, quadratic, and exponential functions.
F.LE.3
Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★
A.REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

Unit 4: Chapter 4 - Linear Equations

Math - HS - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Slope from a Graph & Slope Formula

Linear Equations: Slope-Intercept Form & Standard Form

Graphing Linear Equations (Using Slope-Intercept Form)

x- and y-Intercepts

Vertical & Horizontal Lines

The Point-Slope Formula (Given Point and Slope)

Point-Slope Formula (Given Two Points)

Writing Equations of Lines Review

Parallel and Perpendicular Lines

Linear Equation Word Problems

Scatter Plots, Line of Best Fit, and Linear Regression

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solving one-step inequalities, solving multi-step inequalities, solving compound inequalities, solving absolute value inequalities, graphing in two variables

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will solve one-step inequalities, solve multi-step inequalities, solve compound inequalities, solve absolute value inequalities, graph in two variables

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.
F.LE.5

Interpret the parameters in a linear or exponential function in terms of a context.★

A.CED.2

Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.

F.LE.1

Distinguish between situations that can be modeled with linear functions and with exponential functions.★ a. Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★ F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★

F.BF.2

Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★

F.BF.3

Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);

F.BF.1

Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression, a recursive process, or steps for calculation from context. i. Focus on linear and exponential functions. ii. Focus on situations that exhibit quadratic or exponential relationships.

F.LE.2

Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★

F.IF.4

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or

negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.

Unit 5: Chapter 5 - Systems of Equations and Inequalities

Math - HS - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solving Systems of Equations by Graphing

Solving Systems of Equations by Substitution

Solving Systems of Equations by Elimination

Word Problems

Linear Inequalities

Systems of Linear Inequalities

Systems of Linear Inequalities Word Problems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Graphing systems of equations, substitution, elimination using multiplication, addition and subtraction, systems of inequalities

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will graphing systems of equations, execute the substitution method, use the elimination method using multiplication, addition and subtraction, and solve systems of inequalities.

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
S.ID.7
Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.★
Ohio - High School - Math - Algebra
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

Unit 6: Chapter 6 - Exponent rules

Math - HS - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Monomials: Add, Subtract, Multiply (Product Rule)

Product Rule & Geometric Applications

Quotient Rule

Negative Exponents

Scientific Notation

Geometric Sequences

Exponential Growth and Decay

Simplifying Radicals: Square and Cube Roots

Monomial Square Roots

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Multiplication properties of exponents, division properties of exponents, negative exponents, rational exponents, simplifying radical expressions, operations with radical expressions, sums and products of rational and irrational numbers, exponential equations

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will simplify using multiplication properties of exponents, division properties of exponents, negative exponents, rational exponents, simplifying radical expressions, operations with radical expressions, sums and products of rational and irrational numbers, exponential equations.

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★

A.REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A.REI.12
Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
S.ID.6
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★ c. Fit a linear function for a scatterplot that suggests a linear association.
S.ID.8
Compute (using technology) and interpret the correlation coefficient of a linear fit.★
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.
F.IF.3
Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n + 1) = f(n) + f(n − 1) for n ≥ 1.
F.LE.1
Distinguish between situations that can be modeled with linear functions and with exponential functions.★ a. Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★ F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★
F.BF.3
Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both

positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);
F.LE.2
Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★
A.SSE.3
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.
F.IF.8
Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. i. Focus on completing the square to quadratic functions with the leading coefficient of 1. b. Use the properties of exponents to interpret expressions for exponential functions. i. Focus on exponential functions evaluated at integer inputs.
F.BF.2
Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★

Unit 7: Chapter 7 - Polynomials and Factoring

Math - HS - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Intro to Polynomials: Classify, Add, Subtract

Multiplying a Monomial and a Polynomial

Multiplying Binomials and Trinomials

Dividing Polynomials by a Monomial

Factoring Polynomials: Greatest Common Factor

Factoring Polynomials: Difference of Squares

Factoring Polynomials: Trinomials (x2+ bx + c)

Factoring Polynomials: Grouping

Dividing Polynomials by a Binomial

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Adding and subtracting polynomials, multiplying polynomials by monomials, multiplying polynomials, specials products, using the distributive property, proving the elimination method, factoring quadratic trinomials, factoring special products

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit tests students will add and subtract polynomials, multiply polynomials by monomials, multiply polynomials, specials products, using the distributive property, proving the elimination method, factoring quadratic trinomials, factoring special products

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.REI.6
Solve systems of linear equations algebraically and graphically. a. Limit to pairs of linear equations in two variables.
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
A.REI.5

Verify that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
A.REI.12
Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
A.SSE.1.
Interpret expressions that represent a quantity in terms of its context. ★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.
A.APR.1
Understand that polynomials form a system analogous to the integers, namely, that they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. a. Focus on polynomial expressions that simplify to forms that are linear or quadratic.

Unit 8: Chapter 8 - Quadratic Equations

Math - HS - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Introduction to Quadratic Equations: Standard Form, Axis of Symmetry, Vertex, Minimum, Maximum

Graphing Quadratic Equations

Vertex Form of a Quadratic Equation; Transformations

Quadratic Roots and the Discriminant

Solving Quadratics by Factoring

Compare Vertex Form, Standard Form, and Factored Form

Solving Quadratics by Square Roots

Solving Quadratics by Completing the Square

Solving Quadratics by the Quadratic Formula

Applications: Area and Consecutive Integer Problems

Applications: Projectile Motion

Linear vs. Quadratic Regression

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Graphing quadratic functions, transforming quadratic functions, solving quadratic equations by graphing, factoring, completing the square, using the quadratic formula, solving systems of linear and quadratic equations, modeling and curve fitting, exponential growth patterns, combining functions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit tests students will graph quadratic functions, transform quadratic functions, solve quadratic equations by graphing, factor, complete the square, use the quadratic formula, solve systems of linear and quadratic equations, model and curve fitting, exponential growth patterns, combining functions

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.
A.SSE.3
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

c. Use the properties of exponents to transform expressions for exponential functions.

F.IF.4

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.

F.IF.7

Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.

F.IF.8

Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. i. Focus on completing the square to quadratic functions with the leading coefficient of 1. b. Use the properties of exponents to interpret expressions for exponential functions. i. Focus on exponential functions evaluated at integer inputs.

F.BF.3

Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);

A.REI.4

Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x − p)2 = q that has the same solutions. b. Solve quadratic equations as appropriate to the initial form of the equation by inspection, e.g., for x2 = 49; taking square roots; completing the square; applying the quadratic formula; or utilizing the Zero-Product Property after factoring. (+) c. Derive the quadratic formula using the method of completing the square.

A.CED.1

Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.

A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.REI.7
Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
F.BF.1
Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression, a recursive process, or steps for calculation from context. i. Focus on linear and exponential functions. ii. Focus on situations that exhibit quadratic or exponential relationships.

Unit 9: Chapter 9 - Statistics

Math - HS - Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Mean

Median

Mode

Quartiles

Range

Minimum

Maximum

Interquartile Range

5 number summary

Constructing Box-and-whisker plots

Steam and Leaf Plots

Histogram

Variance

standard deviation

z-scores

Normal Distributions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, homework, activities, review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Measures of center, representing data, using data, measures of spread, distributions of data, summarizing categorical data

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and unit test students will show measures of center, represent data, use data, use measures of spread, use distributions of data, summarize categorical data

STANDARDS

Ohio - High School - Algebra 1 (Course)
S.ID.2
In the context of real-world applications by using the GAISE model, use statistics appropriate to the shape of the data distribution to compare center (median and mean) and spread (mean absolute deviationG, interquartile rangeG, and standard deviation) of two or more different data sets. ★

S.ID.1
Represent data with plots on the real number line (dot plotsG, histograms, and box plots) in the context of real-world applications using the GAISE model.★
S.ID.3
In the context of real-world applications by using the GAISE model, interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ★
S.ID.5
Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of thedata (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.★
N.Q.1
Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. ★

Math - Algebra

Vermilion Local School District

UNITS (10/10 SELECTED)	SUGGESTED DURATION
Unit 1: Order of operations & Average	*10 lessons*
Unit 2: Real Number System	*12 lessons*
Unit 3: Solving Equations 1 variable	*21 lessons*
Unit 4: Solving Equations with Variables on both sides	*10 lessons*
Unit 5: Exponents & Scientific Notation	*34 lessons*
Unit 6: Linear relationships / Slope	*19 lessons*
Unit 7: Intro to Functions	*18 lessons*
Unit 8: Systems of Equations	*21 lessons*
Unit 9: Pythagorean's Theorem	*14 lessons*
Unit 10: Area & Volume	*11 lessons*

Unit 1: Order of operations & Average

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Knowledge of the order of operations

Calculate average

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-how to calculate with real numbers
-calculate average

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-how to calculate with real numbers
-calculate average

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Unit 2: Real Number System

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Know definitions of the Real number system

Know & use the correct order of operations

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-types of numbers
-types of decimals
-how to calculate with real numbers

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-types of numbers
-types of decimals
-how to calculate with real numbers

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.NS.1
Know that real numbers are either rational or irrational. Understand informally that every number has a decimal expansion which is repeating, terminating, or is non-repeating and non-terminating.
8.NS.2
Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions, e.g., π^2. For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
8.EE.2
Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p

is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

Unit 3: Solving Equations 1 variable

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Show ability to solve equations with variables on 1 side

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-solve 1step to multi-step equations when the variable is on 1 side
-word problems involving

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-solve 1step to multi-step equations when the variable is on 1 side
-word problems involving

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.7
Solve linear equations in one variable.
8.EE.7.b
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Unit 4: Solving Equations with Variables on both sides

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Show ability to solve equations with variables on both side of the equation

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-solve multi-step equations when the variable is on both sides
-word problems involving

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-solve multi-step equations when the variable is on both sides
-word problems involving

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.7
Solve linear equations in one variable.
8.EE.7.b
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Unit 5: Exponents & Scientific Notation

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Know how to use and compute with exponents & scientific notation

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-properties of exponents
-definition & computations with scientific notation

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-properties of exponents
-definition & computations with scientific notation

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.3
Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities and to express how many times as much one is than the other. For example, estimate the population of the United States as 3 × 108; and the population of the world as 7 × 109; and determine that the world population is more than 20 times larger.
8.EE.4
Perform operations with numbers expressed in scientific notation, including problems where both decimal notation and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities, e.g., use millimeters per year for seafloor spreading. Interpret scientific notation that has been generated by technology.
8.EE.1
Understand, explain, and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.

Unit 6: Linear relationships / Slope

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Know what linear relationships are
Show knowledge of slope

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-slope formula
-point-slope
-slope-intercept
-write linear equations
-graph linear equations

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-slope formula
-point-slope
-slope-intercept
-write linear equations
-graph linear equations

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.5
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.EE.6
Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

8.EE.7.a
Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
8.EE.7.b
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

Unit 7: Intro to Functions

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Know the basic concepts of functions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-identify functions
-create functions from different data

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-identify functions
-create functions from different data

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.F.1
Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Function notation is not required in Grade 8.
8.F.2
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
8.F.3
Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s^2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

8.F.4
Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
8.F.5
Describe qualitatively the functional relationship between two quantities by analyzing a graph, e.g., where the function is increasing or decreasing, linear or nonlinear. Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Unit 8: Systems of Equations

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solve systems of equations through different methods

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-graphing
-substitution
-elimination
-word problems involving

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-graphing
-substitution
-elimination
-word problems involving

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.EE.8.a
Understand that the solution to a pair of linear equations in two variables corresponds to the point(s) of intersection of their graphs, because the point(s) of intersection satisfy both equations simultaneously.
8.EE.8.b
Use graphs to find or estimate the solution to a pair of two simultaneous linear equations in two variables. Equations should include all three solution types: one solution, no solution, and infinitely many solutions. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.
8.EE.8.c
Solve real-world and mathematical problems leading to pairs of linear equations in two variables. For example,

given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair. (Limit solutions to those that can be addressed by graphing.)
8.EE.8
Analyze and solve pairs of simultaneous linear equations graphically.

Unit 9: Pythagorean's Theorem

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Apply and solve problems involving right triangle

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-Pythagoreans theorem & it's converse
-right triangle relationships

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-Pythagoreans theorem & it's converse
-right triangle relationships

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.G.6
Analyze and justify an informal proof of the Pythagorean Theorem and its converse.
8.G.7
Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.8
Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Unit 10: Area & Volume

Math - Algebra - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Apply formulas to solve volume problems

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Teacher lecture
Group work
Self note taking
Desmos

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

-formulas for volume of cones, cylinders, & spheres
-find missing dimensions
-find volume of composite figures

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Show mastery of the given standards:
-formulas for volume of cones, cylinders, & spheres
-find missing dimensions
-find volume of composite figures

through:

Tests
Quizzes
Homework assignments
Quizziz assignments

STANDARDS

Ohio - Grade 8 - Math
8.G.9
Solve real-world and mathematical problems involving volumes of cones, cylinders, and spheres.
Solve
real-world and mathematical problems involving volume of cylinders, cones, and spheres.

Math - HS - Geometry

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: 1st unit; weeks 1-4	*23 lessons*
Unit 2: 2nd unit - weeks 5-8	*21 lessons*
Unit 3: 3rd unit - weeks 9-12	*20 lessons*
Unit 4: 4th unit - weeks 13-15	*12 lessons*
Unit 5: 5th unit - weeks 16-19	*19 lessons*
Unit 6: 6th unit - weeks 20-23	*18 lessons*
Unit 7: 7th unit - weeks 24-27	*21 lessons*
Unit 8: 8th unit - weeks 28-30	*14 lessons*
Unit 9: 9th unit - weeks 31-34	*22 lessons*

Unit 1: 1st unit; weeks 1-4

Math - HS - Geometry - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Know precise definitions of ray, angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and arc length.
Prove and apply theorems about lines and angles. Theorems include but are not restricted to the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Formative assessments
  - Peardeck
  - Quizziz
  - Group work
  - starters

- Class lecture
- Partner practice
- ALEKS
- DESMOS
- Class Discussion
- Student research and investigation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Identify, define, & use information concerning undefined terms
- Find measures of segments
- Apply distance formula
- Define and use points on segments
- Find midpoints and bisected segments
- Apply definitions of angles and parts of angles
- Concepts of complementary/supplementary
- Characteristics of perpendicular lines
- Make and analyze conjectures
- Determine truth values
- Write and analyze conditional statements
- Logic of laws of detachment & syllogism
- Relationships of angle pairs
- Use of parallel & perpendicular lines and slope
- Distances, parallel, perpendicular

Unit 1: 1st unit; weeks 1-4

Math - HS - Geometry - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Vocab Quiz
- Chapter Assessment
  - All assessments will directly measure the level of comprehension over the following:
  -
    - Identify, define, & use information concerning undefined terms
    - Find measures of segments
    - Apply distance formula
    - Define and use points on segments
    - Find midpoints and bisected segments
    - Apply definitions of angles and parts of angles
    - Concepts of complementary/supplementary
    - Characteristics of perpendicular lines
    - Make and analyze conjectures
    - Determine truth values
    - Write and analyze conditional statements
    - Logic of laws of detachment & syllogism
    - Relationships of angle pairs
    - Use of parallel & perpendicular lines and slope
    - Distances, parallel, perpendicular

STANDARDS

Ohio - High School - Geometry (Course)
G.CO.1
Know precise definitions of ray, angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and arc length.
G.CO.9
Prove and apply theorems about lines and angles. Theorems include but are not restricted to the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
G.GPE.5
Justify the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems, e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point.
G.MG.1
Use geometric shapes, their measures, and their properties to describe objects, e.g., modeling a tree trunk or a human torso as a cylinder.★

Unit 2: 2nd unit - weeks 5-8

Math - HS - Geometry - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

*Classify two-dimensional figures in a hierarchy based on properties.
*Prove and apply theorems about triangles.
*Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent
*Justify the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems, e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point.
*Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using items such as graph paper, tracing paper, or geometry software.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Formative assessments
  - Peardeck
  - Quizziz
  - Group work
  - starters

- Class lecture
- Partner practice
- ALEKS
- DESMOS
- Class Discussion
- Student research and investigation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Triangle Sum Theorem
- Exterior Angle Thm
- Show triangles congruent
- SSS, SAS, ASA, AAS, HL
- Solve problems with isosceles, equilateral
- Coordinate proofs
- Define rigid motions
- Reflect, rotate, translate, figures

Unit 2: 2nd unit - weeks 5-8

Math - HS - Geometry - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Quiz
*Demonstration presentation
*Chapter Assessments
*All assessments will directly measure the level of comprehension over the following:

- Triangle Sum Theorem
- Exterior Angle Thm
- Show triangles congruent
- SSS, SAS, ASA, AAS, HL
- Solve problems with isosceles, equilateral
- Coordinate proofs
- Define rigid motions
- Reflect, rotate, translate, figures

STANDARDS

Ohio - High School - Geometry (Course)
G.CO.14
Classify two-dimensional figures in a hierarchy based on properties.
G.SRT.4
Prove and apply theorems about triangles. Theorems include but are not restricted to the following: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.
G.SRT.5
Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures that can be decomposed into triangles.
G.CO.8
Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
G.CO.9
Prove and apply theorems about lines and angles. Theorems include but are not restricted to the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
G.CO.10
Prove and apply theorems about triangles. Theorems include but are not restricted to the following: measures of

interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
G.CO.2
Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not, e.g., translation versus horizontal stretch. G.CO.3 Identify the symmetries of a figure, which are the rotations and reflections that carry it onto itself. a. Identify figures that have line symmetry; draw and use lines of symmetry to analyze properties of shapes. b. Identify figures that have rotational symmetry; determine the angle of rotation, and use rotational symmetry to analyze properties of shapes.
G.CO.4
Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
G.CO.5
Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using items such as graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
G.CO.6
Use geometric descriptions of rigid motionsG to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruentG.
G.GPE.5
Justify the slope criteria for parallel and perpendicular lines, and use them to solve geometric problems, e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point.
G.MG.2
Apply concepts of density based on area and volume in modeling situations, e.g., persons per square mile, BTUs per cubic foot.★

Unit 3: 3rd unit - weeks 9-12

Math - HS - Geometry - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Prove and apply theorems about triangles. Theorems include but are not restricted to the following: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point

Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Class Modeling
- Group work
- Formative assessments
  - Peardeck
  - Quizziz
  - Group work
  - starters

- Class lecture
- Partner practice
- ALEKS
- DESMOS
- Class Discussion
- Student research and investigation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Solve problems using perp bis, angle bis, medians, altitudes
- Points of concurrencies
- Inequalities in one triangle
- Inequalities in two triangles
- Construct a segment, angle, congruent segments and angles
- Bisect angles, segments
- Construct perpendicular bisectors
- Construct triangles, PoC

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

*Quiz
*Demonstration presentation
*Chapter Assessments:

*All assessments will directly measure the level of comprehension over the following:

- Solve problems using perp bis, angle bis, medians, altitudes
- Points of concurrencies
- Inequalities in one triangle
- Inequalities in two triangles
- Construct a segment, angle, congruent segments and angles
- Bisect angles, segments
- Construct perpendicular bisectors
- Construct triangles, PoC

Unit 3: 3rd unit - weeks 9-12

Math - HS - Geometry - *Last Updated on June 30, 2023*

STANDARDS

Ohio - High School - Geometry (Course)
G.CO.12
Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.
G.CO.6
Use geometric descriptions of rigid motionsG to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruentG.
G.CO.7
Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
G.CO.8
Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
G.CO.9
Prove and apply theorems about lines and angles. Theorems include but are not restricted to the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
G.CO.10
Prove and apply theorems about triangles. Theorems include but are not restricted to the following: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
G.SRT.4
Prove and apply theorems about triangles. Theorems include but are not restricted to the following: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.
G.SRT.5

Unit 3: 3rd unit - weeks 9-12

Math - HS - Geometry - *Last Updated on June 30, 2023*

Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures that can be decomposed into triangles.

Unit 4: 4th unit - weeks 13-15

Math - HS - Geometry - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

*Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
*Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).
*Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Class Modeling
- Group work
- Formative assessments
  - Peardeck
  - Quizziz
  - Group work
  - starters

- Class lecture
- Partner practice
- ALEKS
- DESMOS
- Class Discussion
- Student research and investigation

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Construct a segment, angle, congruent segments and angles
- Bisect angles, segments
- Construct perpendicular bisectors
- Construct triangles, PoC
- Define characteristics of polygons
- Define and identify in analytic geometry characteristics of quadrilaterals

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Mid chapter quiz
- Chapter assessment
  - All assessments will directly measure the level of comprehension over the following:
    - - Construct a segment, angle, congruent segments and angles
      - Bisect angles, segments
      - Construct perpendicular bisectors
      - Construct triangles, PoC
      - Define characteristics of polygons
      - Define and identify in analytic geometry characteristics of quadrilaterals

STANDARDS

Ohio - High School - Geometry (Course)
G.CO.12

Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.
G.CO.13
Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
G.CO.7
Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
G.CO.9
Prove and apply theorems about lines and angles. Theorems include but are not restricted to the following: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
G.CO.10
Prove and apply theorems about triangles. Theorems include but are not restricted to the following: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.

Unit 5: 5th unit - weeks 16-19

Math - HS - Geometry - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Prove and apply theorems about triangles. Theorems include but are not restricted to the following: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point

*Identify and apply segments in triangles and their points of concurrency

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Class Modeling
- Group work
- Formative assessments
  - Peardeck
  - Quizziz
  - Group work
  - starters

- Class lecture
- Partner practice
- ALEKS
- DESMOS
- Class Discussion
- Student research and investigation
- Flipped Classroom
- Blended Learning

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Explore concepts of Similarity
- Identify Characteristics of similar polygons
- Prove triangles similar
- Triangle proportionality thm
- Review radical rules
- Review simplifying radicals
- Pythagorean thms
- Identify special right triangles and appy their formulas and proportions
- Applying trig to angles of elevation and depression

Unit 5: 5th unit - weeks 16-19

Math - HS - Geometry - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Mid chapter quizzes
- Chapter assessment
  - All assessments will directly measure the level of comprehension over the following:
    - - Explore concepts of Similarity
      - Identify Characteristics of similar polygons
      - Prove triangles similar
      - Triangle proportionality thm
      - Review radical rules
      - Review simplifying radicals
      - Pythagorean thms
      - Identify special right triangles and appy their formulas and proportions
      - Applying trig to angles of elevation and depression

STANDARDS

Ohio - High School - Geometry (Course)
G.CO.10
Prove and apply theorems about triangles. Theorems include but are not restricted to the following: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
G.CO.11
Prove and apply theorems about parallelograms. Theorems include but are not restricted to the following: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.
G.C.3
Construct the inscribed and circumscribed circles of a triangle; prove and apply the property that opposite angles are supplementary for a quadrilateral inscribed in a circle.
G.GPE.4
Use coordinates to prove simple geometric theorems algebraically and to verify geometric relationships algebraically, including properties of special triangles, quadrilaterals, and circles.

Unit 6: 6th unit - weeks 20-23

Math - HS - Geometry - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

* Verify experimentally the properties of dilationsG given by a center and a scale factor:
* Given two figures, use the definition of similarity in terms of similarity transformationsG to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
*Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
* Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures that can be decomposed into triangles.
*Solve problems involving right triangles.★ a. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems if one of the two acute angles and a side length is given.
*Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Class Modeling
- Group work
- Formative assessments
  - Peardeck
  - Quizziz
  - Group work
  - starters

- Class lecture
- Partner practice
- ALEKS
- DESMOS
- Class Discussion
- Student research and investigation
- Flipped Classroom
- Blended Learning

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Explore concepts of Similarity
- Identify Characteristics of similar polygons
- Prove triangles similar
- Triangle proportionality thm
- Review radical rules
- Review simplifying radicals
- Pythagorean thms
- Identify special right triangles and appy their formulas and proportions
- Applying trig to angles of elevation and depression

~~~~~~~~~~~(carry over from first semester what wasn't covered)

- Circumference and Area
- Define and identify parts of a circle
- Utilize measurements of parts of circles
- Write equations of circles
- Be able to use equations with coordinate plane
~~~~~~~~~~~

Unit 6: 6th unit - weeks 20-23

Math - HS - Geometry - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Mid chapter quizzes
- Chapter assessment
  - All assessments will directly measure the level of comprehension over the following:
    - - Explore concepts of Similarity
      - Identify Characteristics of similar polygons
      - Prove triangles similar
      - Triangle proportionality thm
      - Review radical rules
      - Review simplifying radicals
      - Pythagorean thms
      - Identify special right triangles and appy their formulas and proportions
      - Applying trig to angles of elevation and depression
        ~~~~~~~~~~~~(carry over from first semester what wasn't covered)
      - Circumference and Area
      - Define and identify parts of a circle
      - Utilize measurements of parts of circles
      - Write equations of circles
      - Be able to use equations with coordinate plane

STANDARDS

Ohio - High School - Geometry (Course)
G.SRT.1
Verify experimentally the properties of dilationsG given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
G.SRT.2
Given two figures, use the definition of similarity in terms of similarity transformationsG to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
G.SRT.3
Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
G.SRT.5
Use congruence and similarity criteria for triangles to solve problems and to justify relationships in geometric figures that can be decomposed into triangles.
G.SRT.6
Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to
        ~~~~~~~~~~~~

definitions of trigonometric ratios for acute angles.
G.SRT.7
Explain and use the relationship between the sine and cosine of complementary angles.
G.SRT.4
Prove and apply theorems about triangles. Theorems include but are not restricted to the following: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.

Unit 7: 7th unit - weeks 24-27

Math - HS - Geometry - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Identify and apply formal characteristics of polygons

Use formulas to calculate area of different types of polygons

Identify and apply the characteristics of circles and related vocabulary

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Class Modeling
- Group work
- Formative assessments
  - Peardeck
  - Quizziz
  - Group work
  - starters

- Class lecture
- Partner practice
- ALEKS
- DESMOS
- Class Discussion
- Student research and investigation
- Flipped Classroom
- Blended Learning
- STATE TEST REVIEWS

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Identify and utilize area formulas for circles, quadrilaterals, arc lengths and sector area
- Identify 3-D shapes and their corresponding nets
- Identify and utilize Surface Area & volume Formulas

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Mid chapter quizzes
- Chapter assessment
  - All assessments will directly measure the level of comprehension over the following:
    - Identify and utilize area formulas for circles, quadrilaterals, arc lengths and sector area
    - Identify 3-D shapes and their corresponding nets
    - Identify and utilize Surface Area & volume Formulas

STANDARDS

Ohio - High School - Geometry (Course)

G.GMD.1

Give an informal argument for the formulas for the circumference of a circle, area of a circle, and volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.

G.GMD.3
Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★
G.GMD.4
Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
G.GMD.5
Understand how and when changes to the measures of a figure (lengths or angles) result in similar and non-similar figures.
G.GPE.6
Find the point on a directed line segment between two given points that partitions the segment in a given ratio.
G.GPE.4
Use coordinates to prove simple geometric theorems algebraically and to verify geometric relationships algebraically, including properties of special triangles, quadrilaterals, and circles.
G.GPE.7
Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.★
G.GMD.6
When figures are similar, understand and apply the fact that when a figure is scaled by a factor of k, the effect on lengths, areas, and volumes is that they are multiplied by k, k2, and k3, respectively.
G.C.1
Prove that all circles are similar using transformational arguments.
G.C.2
Identify and describe relationships among angles, radii, chords, tangents, and arcs and use them to solve problems. Include the relationship between central, inscribed, and circumscribed angles and their intercepted arcs; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
G.C.4
Construct a tangent line from a point outside a given circle to the circle.

G.C.5
Find arc lengths and areas of sectors of circles. a. Apply similarity to relate the length of an arc intercepted by a central angle to the radius. Use the relationship to solve problems. b. Derive the formula for the area of a sector, and use it to solve problems.
G.GPE.1
Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

Unit 8: 8th unit - weeks 28-30

Math - HS - Geometry - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

*Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).
*Understand that two events A and B are independent if and only if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent
* Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.
*Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
*Find the conditional probability of A given B as the fraction of B’s outcomes that also belong to A, and interpret the answer in terms of the model.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Group work
- Formative assessments
  - Peardeck
  - Quizziz
  - Group work
  - starters

- Class lecture
- Partner practice
- ALEKS
- DESMOS
- Class Discussion
- Student research and investigation
- Flipped Classroom
- Blended Learning
- STATE TEST REVIEWS

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Explore Sample Spaces
- Probability and Counting principle
- Permutations and Combinations
- Multiplication Rules
- Addition Rule
- Conditional Probabilities

Unit 8: 8th unit - weeks 28-30

Math - HS - Geometry - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Mid chapter quizzes
- Chapter assessment
  - All assessments will directly measure the level of comprehension over the following:
    -
      - Explore Sample Spaces
      - Probability and Counting principle
      - Permutations and Combinations
      - Multiplication Rules
      - Addition Rule
      - Conditional Probabilities

STANDARDS

Ohio - High School - Geometry (Course)
S.CP.1
Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).★
S.CP.2
Understand that two events A and B are independent if and only if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.★
S.CP.3
Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.★
S.CP.5
Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
S.CP.6
Find the conditional probability of A given B as the fraction of B’s outcomes that also belong to A, and interpret the answer in terms of the model.★
S.CP.4
Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.
S.CP.7

Apply the Addition Rule, P(A or B) = P(A) + P(B) − P(A and B), and interpret the answer in terms of the model.★

Unit 9: 9th unit - weeks 31-34

Math - HS - Geometry - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Students will explore the extensions of right triangle trig

Students will explore the extensions of area, volume, surface area and compositions

Students will review material for final exam

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

- Group work
- Formative assessments
  - Peardeck
  - Quizziz
  - Group work
  - starters

- Class lecture
- Partner practice
- ALEKS
- DESMOS
- Class Discussion
- Student research and investigation
- Flipped Classroom
- Blended Learning
- Final Exam Review

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students will explore extensions of trig ratios; Law of Sines and Cosines
- Students will explore extensions of angles of elevation and depression
- Composition and applications of surface area and volume

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

- Mid chapter quizzes
- Chapter assessment
  - All assessments will directly measure the level of comprehension over the following:
    - Students will explore extensions of trig ratios; Law of Sines and Cosines
    - Students will explore extensions of angles of elevation and depression
    - Composition and applications of surface area and volume
- Final Exam:
  - Cumulative

STANDARDS

Ohio - High School - Geometry (Course)
G.GMD.3
Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.★

Math - HS Honors Algebra 1

Vermilion Local School District

UNITS (14/14 SELECTED)	SUGGESTED DURATION
Unit 1: Expressions	*5 lessons*
Unit 2: One Variable Equations	*8 lessons*
Unit 3: Relations and Functions	*10 lessons*
Unit 4: Linear and Non-Linear Functions	*10 lessons*
Unit 5: Creating Linear Equations	*12 lessons*
Unit 6: Linear Inequalities	*10 lessons*
Unit 7: Systems of Linear Equations	*10 lessons*
Unit 8: Exponents and Roots	*12 lessons*
Unit 9: Polynomials	*10 lessons*
Unit 10: Quadratic Functions	*12 lessons*
Unit 11: Exponential Functions	*13 lessons*
Unit 12: End of Course Test Review	*10 lessons*
Unit 13: Statistics	*12 lessons*
Unit 14: Pythagorean Theorem and Trigonometry	*12 lessons*

Unit 1: Expressions

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Look at algebraic and numerical expressions
Work with definitions of properties of real numbers
Understand distributive property
Evaluate absolute value expressions

From Reveal Algebra 1 -- this covers sections 1.1 - 1.5

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students write and evaluate numerical and algebraic expressions.
- Students simplify expressions using the Distributive Property.
- Students evaluate absolute value expressions.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Unit 1: Expressions

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

Ohio - High School - Algebra 1 (Course)
N.Q.2
Define appropriate quantities for the purpose of descriptive modeling.★
A.SSE.1.
Interpret expressions that represent a quantity in terms of its context. ★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.

Unit 2: One Variable Equations

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Writing, interpreting, and solving equations in one variable

Solving Proportions

Utilizing Formulas

Solving Absolute Value Equations

This follows Reveal Algebra 1 Modules 2.1 - 2.7

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students solve linear equations in one variable.
- Students solve proportions.
- Students use formulas to solve real-world problems.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:
Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
N.Q.1
Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. ★

A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ Focus on formulas in which the variable of interest is linear or square.
A.REI.1
Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
A.REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Unit 3: Relations and Functions

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Discussing the difference between relations and functions

What is continuity and linearity?

Finding intercepts and shapes of graphs

Sketching and comparing functions

From Reveal Algebra 1 Modules 3.1 - 3.6

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students represent relations, and determine whether a relation is a function.
- Students use function notation, and find function values.
- Students graph linear and nonlinear functions, and identify their attributes.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
N.Q.1
Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. ★

A.REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
F.IF.1
Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).
F.IF.2
Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.
F.IF.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★ b. Focus on linear, quadratic, and exponential functions.
F.IF.9
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). b. Focus on linear, quadratic, and exponential functions.

Unit 4: Linear and Non-Linear Functions

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Graphing linear and non-linear functions

Determining rate of change and slope

Slope-intercept form

Arithmetic sequences

Absolute Value Functions

This covers Reveal Algebra 1 4.1 - 4.7 (excluding 4.6)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students graph linear, piecewise-defined, and absolute value functions.
- Students find and interpret the rate of change and slope of lines.
- Students identify the effects of transformations on the graphs of linear and absolute value functions.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)

F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.
F.BF.1
Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression, a recursive process, or steps for calculation from context. i. Focus on linear and exponential functions. ii. Focus on situations that exhibit quadratic or exponential relationships.
F.BF.2
Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★
F.BF.3
Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);
F.LE.1
Distinguish between situations that can be modeled with linear functions and with exponential functions.★ a. Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★ F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★
F.LE.2

Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★
F.LE.5
Interpret the parameters in a linear or exponential function in terms of a context.★
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
Ohio - High School - Math - Functions
F.IF.6
Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

Unit 5: Creating Linear Equations

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Putting equations into slope-intercept form
Standard form and point-slope form
Looking at scatter plots and lines of best fit
Correlation and causation

This follows Reveal Algebra 1 5.1 - 5.5 (omit inverses)

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students create linear equations in slope-intercept, point-slope, and standard forms.
- Students use scatter plots to make and evaluate predictions, and use best-fit lines and correlation coefficients to determine how well linear functions fit sets of data.
- Students determine whether a situation illustrates correlation or causation.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.2

Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
S.ID.6
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★ c. Fit a linear function for a scatterplot that suggests a linear association.
S.ID.7
Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.★
S.ID.8
Compute (using technology) and interpret the correlation coefficient of a linear fit.★
Ohio - High School - Math - Statistics and Probability
S.ID.9
Distinguish between correlation and causation.

Unit 6: Linear Inequalities

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solving linear inequalities
Graphing linear inequalities
Working with compound linear inequalities, solving absolute value inequalities, two variable inequalities

This follows Reveal Algebra 1 Modules 6.1 - 6.5

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students write and solve linear inequalities.
- Students graph linear inequalities in two variables.
- Students apply linear inequalities in problem-solving situations.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.

A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
A.REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A.REI.12
Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Unit 7: Systems of Linear Equations

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solving systems of linear equations using multiple methods (graphing, substitution, elimination)

Solving systems of inequalities

This follows Modules 7.1 - 7.5 in Reveal Algebra 1

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students solve systems of equations using a variety of methods.
- Students solve systems of equations using graphing technology.
- Students graph the solution sets of systems of linear inequalities.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.★
A.REI.5

Verify that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
A.REI.6
Solve systems of linear equations algebraically and graphically. a. Limit to pairs of linear equations in two variables.
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
A.REI.12
Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Unit 8: Exponents and Roots

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Understanding exponent rules

Simplifying exponent expressions

Simplifying radical expressions

Solving and working with exponential equations

This follows Reveal Algebra 1 8.1 - 8.7

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students apply the properties of exponents to simplify expressions.
- Students simplify radical expressions.
- Students solve exponential equations.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.

A.SSE.3
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.
Ohio - High School - Math - Number and Quantity
N.RN.1
Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 because we want $(51/3)^3 = 5(1/3)^3$ to hold, so $(51/3)^3$ must equal 5.
N.RN.2
Rewrite expressions involving radicals and rational exponents using the properties of exponents.
N.RN.3
Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Unit 9: Polynomials

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Operations with polynomials (adding, subtracting, multiplying, basic division)
Distributing polynomials (Polynomial multiplication
Factoring polynomials to visualize alternate methods of writing expressions

This follows Reveal Algebra 1 Modules 10.1 - 10.7

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students add, subtract, and multiply polynomials.
- Students factor polynomials, including in the case of special products.
- Students understand how polynomials are related to special products.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.SSE.1.
Interpret expressions that represent a quantity in terms of its context. ★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.
A.SSE.2

Use the structure of an expression to identify ways to rewrite it.
A.APR.1
Understand that polynomials form a system analogous to the integers, namely, that they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. a. Focus on polynomial expressions that simplify to forms that are linear or quadratic.
A.REI.5
Verify that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

Unit 10: Quadratic Functions

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Graphing quadratic functions
Transforming quadratic functions
Solving quadratic functions utilizing multiple methods (square root, factoring, graphing, completing the square, quadratic formula)

This follows Reveal Algebra 1 Modules 11.1-11.7

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students graph quadratic functions and their transformations.
- Students solve quadratic equations using a variety of methods.
- Students solve systems of linear and quadratic equations.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.SSE.1.
Interpret expressions that represent a quantity in terms of its context. ★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.

A.SSE.3
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ a. Focus on applying linear and simple exponential expressions. b. Focus on applying simple quadratic expressions.
A.REI.1
Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
A.REI.4
Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x − p)2 = q that has the same solutions. b. Solve quadratic equations as appropriate to the initial form of the equation by inspection, e.g., for x2 = 49; taking square roots; completing the square; applying the quadratic formula; or utilizing the Zero-Product Property after factoring. (+) c. Derive the quadratic formula using the method of completing the square.
A.REI.7
Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
A.REI.10
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key

features include the following: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★ b. Focus on linear, quadratic, and exponential functions.

F.IF.5

Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★ b. Focus on linear, quadratic, and exponential functions.

F.IF.7

Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.

F.IF.8

Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. i. Focus on completing the square to quadratic functions with the leading coefficient of 1. b. Use the properties of exponents to interpret expressions for exponential functions. i. Focus on exponential functions evaluated at integer inputs.

F.IF.9

Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). b. Focus on linear, quadratic, and exponential functions.

F.BF.1

Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression, a recursive process, or steps for calculation from context. i. Focus on linear and exponential functions. ii. Focus on situations that exhibit quadratic or exponential relationships.

F.BF.3

Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);

F.LE.1

Distinguish between situations that can be modeled with linear functions and with exponential functions.★ a. Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★ F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★
F.LE.3
Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. ★
F.LE.5
Interpret the parameters in a linear or exponential function in terms of a context.★
S.ID.6
Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.★ c. Fit a linear function for a scatterplot that suggests a linear association.

Unit 11: Exponential Functions

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Analyzing exponential growth and decay
Finding growth factors of exponential situations
Transforming exponential functions
Determining and working with geometric sequences and recursive formulas

This follows Reveal Algebra 1 Modules 9.1- 9.6

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students write and solve exponential functions.
- Students graph and transform exponential functions.
- Students understand geometric sequences.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
A.SSE.3
Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★ a. Factor a quadratic expression to reveal the zeros of the function it defines. b.

Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.

F.IF.3

Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n + 1) = f(n) + f(n − 1) for n ≥ 1.

F.IF.7

Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. b. Graph quadratic functions and indicate intercepts, maxima, and minima.e. Graph simple exponential functions, indicating intercepts and end behavior.

F.IF.8

Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. i. Focus on completing the square to quadratic functions with the leading coefficient of 1. b. Use the properties of exponents to interpret expressions for exponential functions. i. Focus on exponential functions evaluated at integer inputs.

F.BF.2

Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★

F.BF.3

Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. a. Focus on transformations of graphs of quadratic functions, except for f(kx);

F.LE.1

Distinguish between situations that can be modeled with linear functions and with exponential functions.★ a. Show that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★ F.LE.3 Observe using graphs and tables that a quantity increasing exponentially eventually

exceeds a quantity increasing linearly or quadratically. ★
F.LE.2
Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).★
F.LE.5
Interpret the parameters in a linear or exponential function in terms of a context.★

Unit 12: End of Course Test Review

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Review all standards and prepare for End of Course Test

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Restart Readiness

Strength and Weakness Analysis

Review Packets

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Students should understand and be able to find success on the end of course test

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

End of Course Test Results

STANDARDS

Unit 13: Statistics

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Students will understand how to look at measurements of center and spread for a data set

Comparing and contrasting data sets

Looking at distributions of data

This follows Reveal Algebra 1 Modules 12.1- 12.7

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

- Students represent data using numerical statistics and graphical methods.
- Students analyze the shapes of distributions.
- Students summarize and interpret categorical data using frequency tables.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

Unit tests

Short cycle quizzes via THATQuiz

Problems of the Weeks

ALEKs Assignments and Topic Mastery

STANDARDS

Ohio - High School - Algebra 1 (Course)
N.Q.1
Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. ★
S.ID.1

Represent data with plots on the real number line (dot plotsG, histograms, and box plots) in the context of real-world applications using the GAISE model.★
S.ID.2
In the context of real-world applications by using the GAISE model, use statistics appropriate to the shape of the data distribution to compare center (median and mean) and spread (mean absolute deviationG, interquartile rangeG, and standard deviation) of two or more different data sets. ★
S.ID.3
In the context of real-world applications by using the GAISE model, interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). ★
S.ID.5
Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of thedata (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.★

Unit 14: Pythagorean Theorem and Trigonometry

Math - HS Honors Algebra 1 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Understand how to solve right triangles based upon their side lengths

Understand how to solve right triangles based on their angles

Apply trigonometric ratios to solve for unknown sides of a triangle

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes
Computer applications (Desmos)
computer competencies (ALEKS and ConnectED)
Small group and Whole group activities
Butcher paper group projects

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles similar to the end of course exam and giving students multiple opportunities to demonstrate their ability to:

STANDARDS

Math - HS - Algebra 2

Vermilion Local School District

UNITS (10/10 SELECTED)	SUGGESTED DURATION
Unit 1: Week 1 to Week 4	*20 lessons*
Unit 2: Week 5 to Week 8	*20 lessons*
Unit 3: Week 9 to Week 12	*20 lessons*
Unit 4: Week 13 to Week 16	*15 lessons*
Unit 5: Week 17 and Week 18	*1 lessons*
Unit 6: Week 19 to Week 22	*10 lessons*
Unit 7: Week 23 to Week 26	*20 lessons*
Unit 8: Week 27 to Week 30	*20 lessons*
Unit 9: Week 31 to Week 34	*20 lessons*
Unit 10: Week 35 and Week 36	*1 lessons*

Unit 1: Week 1 to Week 4

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Functions and Continuity, Linearity, Intercepts, symmetry,Extrema and End Behavior, Graphing, Functions and Linear Inequalities, Transform Functions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Determine whether functions are one-to-one. Write domain and range using set-builder and interval notation. Identify linear and nonlinear functions by examining equations and graphs. Identify and Interpret intercepts. Identify extrema and end behavior of functions. Sketch graphs of functions and compare two functions represented in different ways. Sketch graphs of functions using key features. Graph linear functions and inequalities in two variables. Write and graph piecewise-defined, step, and absolute value functions. Identify and use transformations of functions.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Determine whether functions are one-to-one. Write domain and range using set-builder and interval notation. Identify linear and nonlinear functions by examining equations and graphs. Identify and Interpret intercepts. Identify extrema and end behavior of functions. Sketch graphs of functions and compare two functions represented in different ways. Sketch graphs of functions using key features. Graph linear functions and inequalities in two variables. Write and graph piecewise-defined, step, and absolute value functions. Identify and use transformations of functions.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★
F.IF.5

Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. ★ Emphasize the selection of a type of function for a model based on behavior of data and context.
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.
F.IF.9
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
F.BF.3
Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

Unit 2: Week 5 to Week 8

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solving Linear and Absolute Value Equations and Inequalities. Solve Systems of Equations and Inequalities. Solve Systems of Equations in Three Variables

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solve linear equations and inequalities in one variable.Solve equations and inequalities involving absolute value algebraically. Write linear equations in standard, slope-intercept, and point-slope forms. Solve systems of equations by graphing, substitution, and elimination. Solve systems of inequalities in two variables. Solve systems of equations in three variables.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Solve linear equations and inequalities in one variable.Solve equations and inequalities involving absolute value algebraically. Write linear equations in standard, slope-intercept, and point-slope forms. Solve systems of equations by graphing, substitution, and elimination. Solve systems of inequalities in two variables. Solve systems of equations in three variables.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ Extend to include more complicated function situations with the option to solve with technology.
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ Extend to include more complicated function situations with the option to graph with technology.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. While functions will often be linear, exponential, or

quadratic, the types of problems should draw from more complicated situations
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
F.IF.6
Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★
A.REI.6
Solve systems of linear equations algebraically and graphically. Extend to include solving systems of linear equations in three variables, but only algebraically.

Unit 3: Week 9 to Week 12

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Graphing Quadratic Functions. Complex Numbers. Solve Quadratic Equations by Graphing, Factoring, Completing the Square, and Quadratic Formula. Discriminant.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Use a sketch to explore graphing quadratic functions. Solve quadratic equations by graphing. Perform operations with pure imaginary and complex numbers. Solve quadratic equations by factoring. Simplify quadratic expressions by using the Square Root Property and completing the square.Use the Quadratic Formula and discriminant to solve quadratic equations and determine the number of real roots.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Use a sketch to explore graphing quadratic functions. Solve quadratic equations by graphing. Perform operations with pure imaginary and complex numbers. Solve quadratic equations by factoring. Simplify quadratic expressions by using the Square Root Property and completing the square.Use the Quadratic Formula and discriminant to solve quadratic equations and determine the number of real roots.

STANDARDS

Ohio - High School - Algebra 2 (Course)
N.CN.1
Know there is a complex number i such that i2 = −1, and every complex number has the form a + bi with a and b real.
N.CN.2
Use the relation i2= −1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
N.CN.7
Solve quadratic equations with real coefficients that have complex solutions.
N.CN.8
Extend polynomial identities to the complex numbers. For example, rewrite x2 + 4 as (x + 2 i)(x − 2 i).

A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ Extend to include more complicated function situations with the option to graph with technology.
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★
F.IF.6
Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★
A.SSE.1.
Interpret expressions that represent a quantity in terms of its context. ★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.
F.IF.8
Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.
A.APR.7
Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.
N.RN.3
Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Unit 4: Week 13 to Week 16

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Polynomial Functions, Analyzing Graphs of Polynomial Functions. Operations with Polynomials. Dividing Polynomials. Powers of Binomials.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Analyze polynomial functions by examining key features and graphing. Analyze the graphs of polynomial functions by identifying key features. Add. subtract, and multiply polynomials. Divide polynomials by using long division and synthetic division. Expand powers of binomials.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Analyze polynomial functions by examining key features and graphing. Analyze the graphs of polynomial functions by identifying key features. Add. subtract, and multiply polynomials. Divide polynomials by using long division and synthetic division. Expand powers of binomials.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.APR.1
Understand that polynomials form a system analogous to the integers, namely, that they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. b. Extend to polynomial expressions beyond those expressions that simplify to forms that are linear or quadratic.
A.APR.5
Know and apply the Binomial Theorem for the expansion of (x + y)n in powers of x and y for a positive integer n, where x and y are any numbers.
A.APR.6
Rewrite simple rational expressionsG in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in

terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★

F.IF.7

Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.

Unit 5: Week 17 and Week 18

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Midterm Review and Exam

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

STANDARDS

Unit 6: Week 19 to Week 22

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solving Polynomial Equations by Graphing. Solving Polynomial Equations Algebraically. The Remainder and Factor Theorems. Roots and Zeros.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solve polynomial equations by graphing. Solve polynomial equations by factoring and by writing them in quadratic form. Evaluate and factor functions by using the Remainder and Factor Theorems. Determine the numbers and types of roots of polynomial equations, find zeros, and use zeros to graph polynomial functions.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to: Solve polynomial equations by graphing. Solve polynomial equations by factoring and by writing them in quadratic form. Evaluate and factor functions by using the Remainder and Factor Theorems. Determine the numbers and types of roots of polynomial equations, find zeros, and use zeros to graph polynomial functions.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ Extend to include more complicated function situations with the option to solve with technology.
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
A.APR.2
Understand and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x − a is p(a). In particular, p(a) = 0 if and only if (x – a) is a factor of p(x).
F.IF.7

Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.
N.CN.9
Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
A.APR.3
Identify zeros of polynomials, when factoring is reasonable, and use the zeros to construct a rough graph of the function defined by the polynomial.
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.

Unit 7: Week 23 to Week 26

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Operations on Functions. Inverse Relations and Functions. Nth Roots and Rational Exponents. Operations with Radical Expressions. Solving Radical Equations.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Simplify and graph operations on functions, and determine compositions of functions. Graph and verify inverse functions. Simplify expressions involving radicals and rational exponents. Solve radical equations algebraically.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Simplify and graph operations on functions, and determine compositions of functions. Graph and verify inverse functions. Simplify expressions involving radicals and rational exponents. Solve radical equations algebraically.

STANDARDS

Ohio - High School - Algebra 2 (Course)
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.
F.BF.1
Write a function that describes a relationship between two quantities.★ b. Combine standard function types using arithmetic operations.
F.IF.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. ★ Emphasize the selection of a type of function for a model based on behavior of data and context.

F.BF.4
Find inverse functions.
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.
F.BF.3
Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
A.REI.2
Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.

Unit 8: Week 27 to Week 30

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Graphing Exponential Functions. Solving Exponential Equations and Inequalities. Special Exponential Functions. Geometric Sequences and Series

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solve exponential equations and inequalities algebraically and by graphing. Analyze expressions and functions involving the natural base e. Generate geometric series and find their sums.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Solve exponential equations and inequalities algebraically and by graphing. Analyze expressions and functions involving the natural base e. Generate geometric series and find their sums.

STANDARDS

Ohio - High School - Algebra 2 (Course)
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ Extend to include more complicated function situations with the option to solve with technology.
A.REI.11

Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ Extend to include more complicated function situations with the option to graph with technology.
F.IF.6
Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★
A.SSE.4
Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.

Unit 9: Week 31 to Week 34

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Logarithms and Logarithmic Functions. Properties of Logarithms. Common Logarithms. Natural Logarithms. Using Exponential and Logarithmic Functions.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Write and evaluate logarithms and graph logarithmic functions. Simplify logarithmic expressions and solve logarithmic equations. Simplify logarithmic expressions and solve exponential equations by using common logarithms. Simplify logarithmic expressions and solve exponential equations by using natural logarithms. Write exponential growth and decay equations and solve them by using logarithms.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Write and evaluate logarithms and graph logarithmic functions. Simplify logarithmic expressions and solve logarithmic equations. Simplify logarithmic expressions and solve exponential equations by using common logarithms. Simplify logarithmic expressions and solve exponential equations by using natural logarithms. Write exponential growth and decay equations and solve them by using logarithms.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ Extend to include more complicated function situations with the option to solve with technology.
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.
F.IF.7

Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.
F.LE.4
For exponential models, express as a logarithm the solution to abct =dwherea,c,anddarenumbersandthebasebis2,10,ore; evaluate the logarithm using technology.★
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.

Unit 10: Week 35 and Week 36

Math - HS - Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Final Exam Review and Final Exam

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

STANDARDS

Math - HS - Honors Algebra 2

Vermilion Local School District

UNITS (11/11 SELECTED)	SUGGESTED DURATION
Unit 1: Week 1 to Week 4	*20 lessons*
Unit 2: Week 5 to Week 8	*20 lessons*
Unit 3: Week 9 to Week 12	*20 lessons*
Unit 4: Week 13 to Week 15	*15 lessons*
Unit 5: Week 16 and Week 17	*10 lessons*
Unit 6: Week 18	*20 lessons*
Unit 7: Week 19 to Week 22	*20 lessons*
Unit 8: Week 23 to Week 26	*20 lessons*
Unit 9: Week 27 to Week 30	*20 lessons*
Unit 10: Week 31 to Week 34	*1 lessons*
Unit 11: Week 35 and Week 36	*1 lessons*

Unit 1: Week 1 to Week 4

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Functions and Continuity, Linearity, Intercepts, symmetry,Extrema and End Behavior, Graphing, Functions and Linear Inequalities, Transform Functions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Determine whether functions are one-to-one. Write domain and range using set-builder and interval notation. Identify linear and nonlinear functions by examining equations and graphs. Identify and Interpret intercepts. Identify extrema and end behavior of functions. Sketch graphs of functions and compare two functions represented in different ways. Sketch graphs of functions using key features. Graph linear functions and inequalities in two variables. Write and graph piecewise-defined, step, and absolute value functions. Identify and use transformations of functions.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Determine whether functions are one-to-one. Write domain and range using set-builder and interval notation. Identify linear and nonlinear functions by examining equations and graphs. Identify and Interpret intercepts. Identify extrema and end behavior of functions. Sketch graphs of functions and compare two functions represented in different ways. Sketch graphs of functions using key features. Graph linear functions and inequalities in two variables. Write and graph piecewise-defined, step, and absolute value functions. Identify and use transformations of functions.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★
F.IF.5

Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. ★ Emphasize the selection of a type of function for a model based on behavior of data and context.
F.BF.3
Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
F.IF.9
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.

Unit 2: Week 5 to Week 8

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solving Linear and Absolute Value Equations and Inequalities. Solve Systems of Equations and Inequalities. Solve Systems of Equations in Three Variables

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solve linear equations and inequalities in one variable.Solve equations and inequalities involving absolute value algebraically. Write linear equations in standard, slope-intercept, and point-slope forms. Solve systems of equations by graphing, substitution, and elimination. Solve systems of inequalities in two variables. Solve systems of equations in three variables.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Solve linear equations and inequalities in one variable.Solve equations and inequalities involving absolute value algebraically. Write linear equations in standard, slope-intercept, and point-slope forms. Solve systems of equations by graphing, substitution, and elimination. Solve systems of inequalities in two variables. Solve systems of equations in three variables.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ Extend to include more complicated function situations with the option to solve with technology.
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ Extend to include more complicated function situations with the option to graph with technology.
A.CED.3
Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations

A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
F.IF.6
Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★
A.REI.6
Solve systems of linear equations algebraically and graphically. Extend to include solving systems of linear equations in three variables, but only algebraically.

Unit 3: Week 9 to Week 12

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Graphing Quadratic Functions, Solve Quadratic Equations by Graphing, Factoring, Completing the Square, and Quadratic Formula. Discriminant.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Use a sketch to explore graphing quadratic functions. Solve quadratic equations by graphing. Perform operations with pure imaginary and complex numbers. Solve quadratic equations by factoring. Simplify quadratic expressions by using the Square Root Property and completing the square.Use the Quadratic Formula and discriminant to solve quadratic equations and determine the number of real roots.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Use a sketch to explore graphing quadratic functions. Solve quadratic equations by graphing. Perform operations with pure imaginary and complex numbers. Solve quadratic equations by factoring. Simplify quadratic expressions by using the Square Root Property and completing the square.Use the Quadratic Formula and discriminant to solve quadratic equations and determine the number of real roots.

STANDARDS

Ohio - High School - Algebra 2 (Course)
N.CN.1
Know there is a complex number i such that i2 = −1, and every complex number has the form a + bi with a and b real.
N.CN.2
Use the relation i2= −1 and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
N.CN.7
Solve quadratic equations with real coefficients that have complex solutions.
N.CN.8
Extend polynomial identities to the complex numbers. For example, rewrite x2 + 4 as (x + 2 i)(x − 2 i).

A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ Extend to include more complicated function situations with the option to graph with technology.
A.SSE.1.
Interpret expressions that represent a quantity in terms of its context. ★ a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★
F.IF.6
Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★
F.IF.8
Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.
N.RN.1
Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.
A.APR.7
Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

N.RN.3
Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Unit 4: Week 13 to Week 15

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Polynomial Functions, Analyzing Graphs of Polynomial Functions. Operations with Polynomials. Dividing Polynomials. Powers of Binomials.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Analyze polynomial functions by examining key features and graphing. Analyze the graphs of polynomial functions by identifying key features. Add. subtract, and multiply polynomials. Divide polynomials by using long division and synthetic division. Expand powers of binomials.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Analyze polynomial functions by examining key features and graphing. Analyze the graphs of polynomial functions by identifying key features. Add. subtract, and multiply polynomials. Divide polynomials by using long division and synthetic division. Expand powers of binomials.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.APR.1
Understand that polynomials form a system analogous to the integers, namely, that they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. b. Extend to polynomial expressions beyond those expressions that simplify to forms that are linear or quadratic.
A.APR.5
Know and apply the Binomial Theorem for the expansion of (x + y)n in powers of x and y for a positive integer n, where x and y are any numbers.
A.APR.6
Rewrite simple rational expressionsG in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in

terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★

F.IF.7

Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.

Unit 5: Week 16 and Week 17

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Solving Polynomial Equations by Graphing. Solving Polynomial Equations Algebraically. The Remainder and Factor Theorems. Roots and Zeros.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solve polynomial equations by graphing. Solve polynomial equations by factoring and by writing them in quadratic form. Evaluate and factor functions by using the Remainder and Factor Theorems. Determine the numbers and types of roots of polynomial equations, find zeros, and use zeros to graph polynomial functions.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Solve polynomial equations by graphing. Solve polynomial equations by factoring and by writing them in quadratic form. Evaluate and factor functions by using the Remainder and Factor Theorems. Determine the numbers and types of roots of polynomial equations, find zeros, and use zeros to graph polynomial functions.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ Extend to include more complicated function situations with the option to solve with technology.
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
A.APR.2
Understand and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x − a is p(a). In particular, p(a) = 0 if and only if (x – a) is a factor of p(x).
N.CN.9

Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
A.APR.3
Identify zeros of polynomials, when factoring is reasonable, and use the zeros to construct a rough graph of the function defined by the polynomial.
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.

Unit 6: Week 18

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Midterm Review and Exam

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

STANDARDS

Unit 7: Week 19 to Week 22

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Operations on Functions. Inverse Relations and Functions. Nth Roots and Rational Exponents. Operations with Radical Expressions. Solving Radical Equations.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Simplify and graph operations on functions, and determine compositions of functions. Graph and verify inverse functions. Simplify expressions involving radicals and rational exponents. Solve radical equations algebraically.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Simplify and graph operations on functions, and determine compositions of functions. Graph and verify inverse functions. Simplify expressions involving radicals and rational exponents. Solve radical equations algebraically.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.
A.REI.2
Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.
F.BF.1
Write a function that describes a relationship between two quantities.★ b. Combine standard function types using

arithmetic operations.
F.IF.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. ★ Emphasize the selection of a type of function for a model based on behavior of data and context.
F.BF.4
Find inverse functions.
F.BF.3
Identify the effect on the graph of replacing f(x) by f(x) + k, kf(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.
N.RN.1
Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5 because we want (51/3)3 = 5(1/3)3 to hold, so (51/3)3 must equal 5.
N.RN.2
Rewrite expressions involving radicals and rational exponents using the properties of exponents.
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.

Unit 8: Week 23 to Week 26

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Graphing Exponential Functions. Solving Exponential Equations and Inequalities. Special Exponential Functions. Geometric Sequences and Series

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Solve exponential equations and inequalities algebraically and by graphing. Analyze expressions and functions involving the natural base e. Generate geometric series and find their sums.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to :

Solve exponential equations and inequalities algebraically and by graphing. Analyze expressions and functions involving the natural base e. Generate geometric series and find their sums.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ Extend to include more complicated function situations with the option to solve with technology.
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ Extend to include more complicated function situations with the option to graph with technology.
A.SSE.4
Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.

F.IF.6
Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. ★
F.IF.4
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.

Unit 9: Week 27 to Week 30

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Logarithms and Logarithmic Functions. Properties of Logarithms. Common Logarithms. Natural Logarithms. Using Exponential and Logarithmic Functions.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Write and evaluate logarithms and graph logarithmic functions. Simplify logarithmic expressions and solve logarithmic equations. Simplify logarithmic expressions and solve exponential equations by using common logarithms. Simplify logarithmic expressions and solve exponential equations by using natural logarithms. Write exponential growth and decay equations and solve them by using logarithms.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Write and evaluate logarithms and graph logarithmic functions. Simplify logarithmic expressions and solve logarithmic equations. Simplify logarithmic expressions and solve exponential equations by using common logarithms. Simplify logarithmic expressions and solve exponential equations by using natural logarithms. Write exponential growth and decay equations and solve them by using logarithms.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.SSE.2
Use the structure of an expression to identify ways to rewrite it.
F.IF.7
Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior.f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midlineG, and amplitude. g. Graph rational functions, identifying zeros and asymptotes when factoring is reasonable, and indicating end behavior. h. Graph logarithmic functions, indicating intercepts and end behavior.
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and

inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ Extend to include more complicated function situations with the option to solve with technology.
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
F.LE.4
For exponential models, express as a logarithm the solution to abct =dwherea,c,anddarenumbersandthebasebis2,10,ore; evaluate the logarithm using technology.★
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.

Unit 10: Week 31 to Week 34

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Multiply, Divide, Add, and Subtracting Rational Expressions. Graph Reciprocal and Rational Functions. Variation, Solving Rational Equations and Inequalities.

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

notes, modeling, Desmos activities, ALEKS, small group and whole group discussion, calculator activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Simplify rational expressions by multiplying and dividing. Simplify Rational expressions by adding and subtracting. Use a sketch to explore how changing the parameters changes the graphs of reciprocal functions. Graph and analyze rational functions with oblique asymptotes. Use a sketch to explore variation functions. Use a graphing calculator to explore solving rational equations.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Unit Test with a variety of question styles giving students multiple opportunities to demonstrate their ability to:

Simplify rational expressions by multiplying and dividing. Simplify Rational expressions by adding and subtracting. Use a sketch to explore how changing the parameters changes the graphs of reciprocal functions. Graph and analyze rational functions with oblique asymptotes. Use a sketch to explore variation functions. Use a graphing calculator to explore solving rational equations.

STANDARDS

Ohio - High School - Algebra 2 (Course)
A.APR.7
Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.
F.IF.5
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. ★ Emphasize the selection of a type of function for a model based on behavior of data and context.
A.REI.11
Explain why the x-coordinates of the points where the graphs of the equation y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, making tables of values, or finding successive approximations.
F.IF.4

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★
A.CED.1
Create equations and inequalities in one variable and use them to solve problems. Include equations and inequalities arising from linear, quadratic, simple rational, and exponential functions. ★ Extend to include more complicated function situations with the option to solve with technology.
A.CED.2
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.★ Extend to include more complicated function situations with the option to graph with technology.
A.REI.2
Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
A.CED.4
Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.★ While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.

Unit 11: Week 35 and Week 36

Math - HS - Honors Algebra 2 - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

Final Exam Review and Final Exam

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

STANDARDS

Math - HS - Statistics

Vermilion Local School District

UNITS (9/9 SELECTED)	SUGGESTED DURATION
Unit 1: Chapter 1 - Introduction to Statistics	*21 lessons*
Unit 2: Chapter 2 - Descriptive Statistics	*30 lessons*
Unit 3: Chapter 3 - Probability	*29 lessons*
Unit 4: Chapter 1-3 Midterm & Review	*8 lessons*
Unit 5: Chapter 4 - Discrete Probability Distributions	*12 lessons*
Unit 6: Chapter 5 - Normal Probability Distributions	*20 lessons*
Unit 7: Chapter 6 - Confidence Intervals	*16 lessons*
Unit 8: Chapter 7 - Hypothesis Testing with one sample	*20 lessons*
Unit 9: Chapter 8 - Hypothesis Testing with two samples	*16 lessons*

Unit 1: Chapter 1 - Introduction to Statistics

Math - HS - Statistics - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

1.1 An Overview of Statistics

1.2 Data Classification

1.3 Data Collection and Experimental Design

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, Vocab, hands on research activities, presentations

Kahoot's;
1.1 Vocabulary Kahoot
1.2 Vocabulary Kahoot
1.3 Vocabulary Kahoot

ATTACHMENTS

- 1.1 Notes.notebook
- 1.2 Notes.notebook
- 1.3 Notes.notebook
- 1.3 Pre notes project
- 1.1 Pre-Notes Activity

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Understand basic definitions used in Statistics. Data Classification. Data Collection and Experimental Design.

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and tests students will understand basic definitions used in Statistics. Data Classification. Data Collection and Experimental Design.

ATTACHMENTS

- Quiz 1.3
- Quiz 1.2
- Quiz 1.1

STANDARDS

Unit 2: Chapter 2 - Descriptive Statistics

Math - HS - Statistics - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

2.1 Frequency Distributions and their graphs

2.2 More Graphs and Displays

2.3 Measures of Central Tendency

2.4 Measures of Variation

2.5 Measures of Position

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, Activites, research, presentations

ATTACHMENTS

- 2.5 Notes.notebook
- 2.4 Notesz.notebook
- 2.3 notes.notebook
- 2.2 Notes.notebook
- 2.1 Notes.notebook
- 2.5 Worksheet
- 2.4 Worksheet
- 2.3 Worksheet
- 2.2 worksheet
- 2.1 worksheet
- 2.3 Pre-Notes
- 2.2 Pre Notes
- 2.1 Activity

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Read frequency distributions and their graphs, construct graphs and displays, measures of central tendency, measures of variation, measures of position

Unit 2: Chapter 2 - Descriptive Statistics

Math - HS - Statistics - *Last Updated on June 30, 2023*

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On quizzes and tests students will read frequency distributions and their graphs, construct graphs and displays, measures of central tendency, measures of variation, measures of position

ATTACHMENTS

- Chapter 2 Test
- 2.5 Quiz
- 2.4 Quiz
- 2.3 Quiz
- 2.1 Quiz
- 2.2 Quiz

STANDARDS

Ohio Extended - Grades 9-12 - Stastics & Probability - Interpreting Categorical and Quantitative Data
SP.ID.912.1a
Create a bar graph to represent given or collected data.
SD.ID.912.2a
Compute mean, median and mode of a given or collected data set.
SP.ID.912.3a
Interpret a bar graph.
SP.ID.912.1b
Create a dot plot to represent given or collected data.
SP.ID.912.2b
Compute mean (average), median or mode of a given or collected data set involving numbers less than 100.
SP.ID.912.3b
Interpret a dot plot.
SP.ID.912.1c

Match a dot plot with a given data set.
SP.ID.912.2c
Identify the median and mode of a given data set involving numbers less than 100.
SP.ID.912.3c
Complete an incomplete dot plot (e.g., addingmissing labels and missing data points).
SP.ID.912.4a
Create a scatter plot to represent given or collected data and interpret the relation between the two variables as positive, negative or no correlation.
SP.ID.912.4c
Match a scatter plot with a given data set.

Unit 3: Chapter 3 - Probability

Math - HS - Statistics - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

3.1 Basic Concepts of Probability and Counting

3.2 Conditional Probability and the Multiplication Rule

3.3 The Addition Rule

3.4 Additional Topics in Probability and Counting

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, hands on activities, student research activities, real world examples

ATTACHMENTS

- 3.4 notes.notebook
- 3.3 notes.notebook
- 3.2 Notes.notebook
- 3.1 notes (1).notebook

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Understand basic concepts of probability and counting, conditional probability and the multiplication and addition rule

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

Worksheets, quizzes, presentations, on unit test students will understand basic concepts of probability and counting, conditional probability and the multiplication and addition rule

STANDARDS

Ohio Extended - Grades 9-12 - Stastics & Probability - Interpreting Categorical and Quantitative Data
SP.ID.912.2b
Compute mean (average), median or mode of a given or collected data set involving numbers less than 100.
SP.ID.912.2c
Identify the median and mode of a given data set involving numbers less than 100.
Ohio Extended - Grades 9-12 - Stastics & Probability - Making Inferences & Justifying Conculsions
SP.IC.912.2a
Understand a probability of 0 as impossible, probability of 1 as certain, probability near 0 as unlikely, near 1 as

likely, and near 1/2 as equally likely.
SP.IC.912.1b
Determine the likelihood (likely, impossible, unlikely, certain) of outcomes from a data-generating device.
SP.IC.912.2b
Understand a probability near 0 as unlikely and near 1 as likely.
SP.IC.912.1c
Determine the likelihood (likely or unlikely) of an outcome from a data-generating device.
SP.IC.912.2c
Understand a probability near 0 as unlikely and near 1 as likely using a number line.

Unit 4: Chapter 1-3 Midterm & Review

Math - HS - Statistics - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

STANDARDS

Unit 5: Chapter 4 - Discrete Probability Distributions

Math - HS - Statistics - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

4.1 Probability Distributions

4.2 Binomial Distributions

4.3 More Discrete Probability Distributions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, activities, individual self assessments

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Probability distributions, binomial distributions, discrete probability distributions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On unit test and quizzes students will construct and interperate probability distributions, binomial distributions, discrete probability distributions

STANDARDS

Unit 6: Chapter 5 - Normal Probability Distributions

Math - HS - Statistics - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

5.1 Introduction to Normal Distributions and the Standard Normal Distribution

5.2 Normal Distributions: Finding Probabilities

5.3 Normal Distributions: Finding Values

5.4 Sampling Distributions and the Central Limit Theorem

5.5 Normal Approximations to Binomial Distributions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, Independent work practicing constructing normal distributions, research

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Construct normal distributions and the standard normal distribution, finding probability and values on normal distributions, sampling distributions and the central limit theorem, normal approximation to binomial distributions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On unit test and quizzes students will construct normal distributions and the standard normal distribution, finding probability and values on normal distributions, sampling distributions and the central limit theorem, normal approximation to binomial distributions

STANDARDS

Unit 7: Chapter 6 - Confidence Intervals

Math - HS - Statistics - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

6.1 Confidence Intervals for the mean (large samples)

6.2 Confidence Intervals for the mean (small samples)

6.3 Confidence Intervals for population proportions

6.4 Confidence Intervals for Variance and Standard Deviation

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, research, activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Understand confidence intervals for the mean large and small samples, confidence intervals for population proportions, confidence intervals for variance and standard deviation

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On unit test and quizzes students will understand confidence intervals for the mean large and small samples, confidence intervals for population proportions, confidence intervals for variance and standard deviation

STANDARDS

Unit 8: Chapter 7 - Hypothesis Testing with one sample

Math - HS - Statistics - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

7.1 Introduction to Hypothesis Testing

7.2 Hypothesis Testing for the Mean (Large Samples)

7.3 Hypothesis testing for the Mean (Small Samples)

7.4 Hypothesis Testing for Proportions

7.5 Hypothesis Testing for Variance and Standard Deviation

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, research, activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Understand hypothesis testing, hypothesis testing for mean large and small samples, testing for proportions, hypothesis testing for variance and standard deviation

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On unit test and quizzes students will show understanding hypothesis testing, hypothesis testing for mean large and small samples, testing for proportions, hypothesis testing for variance and standard deviation

STANDARDS

Unit 9: Chapter 8 - Hypothesis Testing with two samples

Math - HS - Statistics - *Last Updated on June 30, 2023*

CONTENT: WHAT ESSENTIAL TOPICS DO I TEACH?

8.1 Testing the Difference Between Means (Large Independent Samples)

8.2 Testing the Difference Between Means (Small Independent Samples)

8.3 Testing the Difference Between Means (Dependent Samples)

8.4 Testing the Difference Between Proportions

METHODS: HOW DO I TEACH THE ESSENTIAL TOPICS?

Notes, research, activities

COMPREHENSION & SKILLS: WHAT WILL STUDENTS UNDERSTAND AND BE ABLE TO DO?

Testing the difference between means (large independent samples and small independent samples), testing the difference between samples, testing the difference between proportions

SUMMATIVE ASSESSMENTS: HOW WILL STUDENTS DEMONSTRATE LEARNING?

On unit test and quizzes students will test the difference between means (large independent samples and small independent samples), test the difference between samples, test the difference between proportions

STANDARDS