Township of Ocean Schools

Assistant Superintendent
Office of Teaching and Learning

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Curriculum Development Timeline

School: Township of Ocean Elementary Schools

Course: Mathematics, Grade 4

Department: Mathematics

Board Approval	Supervisor	Notes
August 2006	Justine Salvo	Born Date
November 2011	Christine Picerno	Revisions
December 2017	Christine Picerno	Revisions
March 2019	Christine Picerno	Review

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Marking Period 1		Marking Period 2	
1	Number & Operations in Base Ten	11	Number & Operations in Base Ten
2	Number & Operations in Base Ten	12	Number & Operations in Base Ten
3	Number & Operations in Base Ten	13	Number & Operations in Base Ten
4	Number & Operations in Base Ten	14	Number & Operations in Base Ten
5	Number & Operations in Base Ten	15	Operations & Algebraic Thinking
6	Number & Operations in Base Ten	16	Operations & Algebraic Thinking
7	Number & Operations in Base Ten	17	Operations & Algebraic Thinking
8	Number & Operations in Base Ten	18	Operations & Algebraic Thinking
9	Number & Operations in Base Ten	19	Number & Operations- Fractions
10	Number & Operations in Base Ten	20	Number & Operations- Fractions
Marking Period 3		**Marking Period 4**	
21	Number & Operations- Fractions	31	Number & Operations- Fractions
22	Number & Operations- Fractions	32	Number & Operations- Fractions
23	Number & Operations- Fractions	33	Number & Operations- Fractions
24	Number & Operations- Fractions	34	Number & Operations- Fractions
25	Number & Operations- Fractions	35	Measurement & Data
26	Number & Operations- Fractions	36	Geometry
27	Measurement & Data	37	Geometry
28	Measurement & Data	38	Geometry
29	Number & Operations- Fractions	39	Geometry
30	Number & Operations- Fractions	40	Geometry

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Time Frame	September through December (14 weeks)

Topic

Number and Operations in Base Ten

Essential Questions

- How are relationships helpful in mathematics?
- What makes a strategy for computing effective and efficient?
- How is math a language?
- What would be impossible if we had no numbers?
- Why is it useful to compose and decompose numbers?

Enduring Understandings

Students will understand that…

- Representing problems and situations mathematically can help us understand real life scenarios.
- Place value understanding is essential when reading, writing, modeling, comparing, rounding and computing with whole numbers.
- Estimation can be used to assess the reasonableness of answers

Alignment to NJSLS

4.NBT.A.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.
4.NBT.A.2 Read and write multi-digit whole numbers using base-ten numerals, number names, 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.A.3 Use place value understanding to round multi-digit whole numbers to any place.
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.
4.NBT.B.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.B.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.

Key Concepts and Skills

- Identify the place value of numbers through thousands.
- Read, write, and model numbers to thousands.
- Round and compare multi-digit whole numbers by value of the digits in each place.
- Identify the place value of numbers to one million.
- Compare and round multi-digit whole numbers.

- Add using estimation and mental math.
- Relate subtraction to addition.
- Use methods for ungrouping to subtract any size numbers.
- Add and subtract multi-digit numbers.
- Solve addition and subtraction word problems with greater numbers.
- To identify place value positions while calculating the 4 operations.
- To identify place value of a given number to make comparisons.
- Use the NJSLS and the Math Practices in a variety of of real world problems solving situations.

Learning Activities

In previous grades, students have developed an understanding of place value and addition and subtraction of numbers through one thousand. The uniformity of the base-ten system allows students to generalize their understanding of place value computation of lesser numbers to greater numbers. This unit broadens and deepens students' experiences with numbers through one million. Students have learned that the concepts of grouping and ungrouping numbers are a key step in performing multidigit addition and subtraction. The activities in this unit help students gain practical understanding of addition and subtraction and the relationship between the two operations. Estimation and mental math provide students with methods to validate their answers.

enVision Math 2.0 Units of Study

Topic 1 - Generalize Place Value Understanding
Topic 2 - Fluently Add and Subtract Multi-Digit
Topic 3 - Use Strategies and Properties to Multiply by 1-Digit Numbers
Topic 4 - Use Strategies and Properties to Multiply by 2-Digit Numbers

Curriculum Resources

Math Literature:

- Sold! A Mothematics Adventure by Bryn Barnard and Nathan Zimelman
- Rabbits Rabbits Everywhere: A Fibonacci Tale by Ann McCallum
- The King's Chessboard by David Birch
- A Remainder of One by Elinor J. Pinczes
- The Great Divide: A Mathematical Marathon by Dayle Ann Dodds

enVision Math 2.0 Resources:

- Realize Online Platform
- Math Center Challenges
- MDIS - Math Diagnostic and Intervention System
- Student Editions
- Response to Intervention Tiered Materials

Assessments

Formative Assessments

- Teacher Observation
- Exit Slips/Check for Understanding
- Games
- Anecdotal Records
- Oral Assessments/Conferencing
- Daily Classwork
- Pre-Assessment
- Homework pages
- Fluency Check
- Quick Quiz
- Student Activity Pages

Summative Assessments

- Quick Quiz
- Performance Task
- Unit Test

Alternative Assessments

- Can we move in the right path? – Theories behind chess
- How can we figure out the best groceries to buy? - Supermarket Challenge

Career Ready Practices

CRP 4. SW communicate clearly and effectively and with reason while working on groups on the Solve and Share portion of the lesson.

CRP 11. SW use technology to enhance productivity by accessing the Quick Check via the Pearson Platform.

Interdisciplinary Connections

Language Arts Learning Activities:

- Build a strong base of knowledge through content-rich texts
- Read, write, and speak grounded in evidence
- Construct viable arguments and critique the reasoning of others
- Engage in argument from evidence

Alignment to Standards:

- **NJSLSA.R1.** Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
- **NJSLSA.R9.** Analyze and reflect on how two or more texts address similar themes or

topics in order to build knowledge or to compare the approaches the authors take.

- **RL.4.1.** Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- **RF.4.4.** Read with sufficient accuracy and fluency to support comprehension.

Science Learning Activities:

● Model with mathematics
● Develop and use models
● Use mathematics, information and computer technology, and computational thinking

Alignment to Standards:

- **3-5-ETS1-1**. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Technology Integration

Technology Learning Activities:

- Students use Chromebooks to access Pearson Realize platform to practice and reinforce skills and concepts.
- Students will use Google Classroom to access links to: interactive activities and math games.
- Students will access various websites, such as, Prodigy, Arcademics, Cool Math and IXL to practice and reinforce math skills.

Alignment to Standards:

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively
- **TECH.8.2.2.C** The design process is a systematic approach to solving problems

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Time Frame	**January (4 weeks)**

Topic

Operations & Algebraic Thinking

Essential Questions

- How are relationships helpful in mathematics?
- What makes a strategy for computing effective and efficient?
- How is math a language?
- What would be impossible if we had no numbers?
- Why is it useful to compose and decompose numbers?

Enduring Understandings

Students will understand that…

- The four basic arithmetic operations are interrelated, and the properties of each may be used to understand the others.
- Knowledge of place value and properties of operations can help when computing with whole numbers.
- Estimation can be used to assess the reasonableness of answers.
- Developing number sense helps to solve problems in a variety of ways.

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Alignment to NJSLS

4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
4.OA.A.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.A.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.B.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 prime or composite.
4.OA.C.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. For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.

Key Concepts and Skills

- Make and interpret place value drawings.
- Identify the value of a digit.
- Use an understanding of place value to group and ungroup multidigit numbers and solve word problems.
- Identify numbers from scrambled value names and solve word problems.
- Round numbers to both the nearest ten and the nearest hundred to estimate sums and differences
- Apply and discuss multidigit addition methods with place value alignment..
- Decide when and how to group in multidigit addition.
- Identify and explain errors in addition and solve word problems.
- Explore methods for subtracting multi-digit numbers.
- Subtract with zeros in the top number.
- Subtract using two different methods.
- Relate grouping in addition and ungrouping in subtraction.
- Practice and discuss addition and subtraction methods.
- Solve word problems that involve two or more steps and assess reasonableness.
- Use the NJSLS and Math Practices in a variety of real world problem solving situations

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Learning Activities

The lessons in this unit develop multidigit addition and subtraction methods that are meaningful and easily used by students. Place-value activities build understanding of the base ten numeration system and provide the foundation to understand the grouping and ungrouping concepts that students use to add and subtract. Students use drawings to show grouping and ungrouping, and then describe and discuss the process. The activities in this unit help students gain practical understanding of addition and subtraction and the relationship between the two operations. They begin to see addition and subtraction as inverse operations and apply their knowledge of these concepts and skills to problem solving. Estimation provides students with methods to validate their answers.

enVision Math 2.0 Units of Study

Topic 5 - Use Strategies and Properties to Divide by 1-Digit Numbers
Topic 6 - Use Operations with Whole Numbers to Solve Problems
Topic 7 - Factors and Multiples
Topic 8 - Extend Understanding of Fraction Equivalence and Ordering

Curriculum Resources

Math Literature:

- One Less Fish by Kim Michelle Toft and Allan Sheather
- A Bundle of Beasts by Mark Steele and Patricia Hooper
- The Greatest Gymnast of All by Stuart J. Murphy

enVision Math 2.0 Resources:

- Realize Online Platform
- Math Center Challenges
- MDIS - Math Diagnostic and Intervention System
- Student Editions
- Response to Intervention Tiered Materials

Assessments

Formative Assessments

- Teacher Observation
- Exit Slips/Check for Understanding
- Games
- Anecdotal Records
- Oral Assessments/Conferencing
- Daily Classwork
- Pre-Assessment
- Homework pages
- Fluency Check
- Quick Quiz
- Student Activity Pages

Summative Assessments

- Quick Quiz
- Performance Task
- Unit Test

Alternative Assessments

- Creating a Gymnastic Competition – Accuracy of Participants – Scores
- Fish – Kingdoms – Grouping and Dividing the Sea

Career Ready Practices

CRP 4. SW communicate clearly and effectively and with reason while working on groups on the Solve and Share portion of the lesson.

CRP 11. SW use technology to enhance productivity by accessing the Quick Check via the Pearson Platform.

Interdisciplinary Connections

Language Arts Learning Activities:

- Build a strong base of knowledge through content-rich texts
- Read, write, and speak grounded in evidence
- Construct viable arguments and critique the reasoning of others
- Engage in argument from evidence

Alignment to Standards:

- **NJSLSA.R9.** Analyze and reflect on how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.
- **RL.4.1.** Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- **RF.4.4.** Read with sufficient accuracy and fluency to support comprehension.

Science Learning Activities:

- Model with mathematics
- Develop and use models
- Use mathematics, information and computer technology, and computational thinking

Alignment to Standards:

- **4-LS1-1**. Construct an argument that plants and animals have internal and external

structures that function to support survival, growth, behavior, and reproduction.

- **3-5-ETS1-1**. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Technology Integration

Technology Learning Activities:

- Students use Chromebooks to access Pearson Realize platform to practice and reinforce skills and concepts.
- Students will use Google Classroom to access links to: interactive activities and math games.
- Students will access various websites, such as, Prodigy, Arcademics, Cool Math and IXL to practice and reinforce math skills.

Alignment to Standards:

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively
- **TECH.8.2.2.C** The design process is a systematic approach to solving problems

Time Frame	May (3 weeks)

Topic

Measurement and Data

Essential Questions

- What is the connection between the type of data and the type of display?
- How does "what" is measured influence “how” it is measured?
- When can two people look at the same set of data and come up with different conclusions?
- How is mathematics used to quantify and compare situations, events, and phenomena?

Enduring Understandings

Students will understand that…

- Data displays convey information in a concise way.
- Time measurement is a means to organize and structure each day and our lives.
- Measurements can be used to describe, compare, and make sense of phenomena.

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Alignment to NJSLS

4.MD.A.1. Know relative sizes of measurement units within one system of units including km, m, cm. mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...

4.MD.A.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

4.MD.A.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

4.MD.B.4. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

4.MD.C.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

- **5a.** An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect 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.
- **5b.** An angle that turns through a one-degree angles is said to have an angle measure of n degrees. Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.

4.MD.C.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

4.MD.C.7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Key Concepts and Skills

- Measure lengths in inches, half inches, and quarter inches with rulers.
- Use customary units of liquid volume.
- Use metric units of liquid volume.
- Measure and estimate weight and mass.
- Solve world problems involving liquid volumes or masses using addition, subtraction, multiplication and division.
- Tell and write time to the minute, quarter-hour, half hour, and hour.

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- Tell and write the time before and after the hour to the nearest minute.
- Find elapsed time.
- Solve word problems involving addition and subtraction of time intervals in minutes.
- Draw scaled pictographs and bar graphs and solve comparison problems using data in pictographs and bar graphs.

Learning Activities

In this unit, students explore customary and metric measurement, time concepts, and graphing. Students extend their measurement skills for length, capacity, weight, and mass. They measure lengths to a quarter inch and add, subtract, multiply, and divide measurements to solve problems. Students learn to tell time to the hour, half hour, quarter hour, five minutes, and one minute, as well as find elapsed time. Students represent time on a clock as well as a number line and use these models to solve problems.

Additionally, this unit presents opportunities to explore categorical data displayed on tables, pictographs, bar graphs, and line plots. In Grade 3, students' work with data and time is closely related to fraction concepts, computations with the four operations, and the number line.

Finally, students find perimeter and area of various shapes and delve deeply into concepts of area of rectangular figures. They explore the relationship between perimeter and area by investigating rectangles with the same perimeter and different areas and rectangles with the same area and different perimeters.

enVision Math 2.0 Units of Study
Topic 9 - Understand Addition and Subtraction of Fractions
Topic 10 - Extend Multiplication Concepts to Fractions
Topic 11 - Represent and Interpret Data on Line Plots

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Curriculum Resources

Math Literature:

- Jumanji by Chris Van Allsburg
- Secret Treasures and Magical Measures by Chris Kensler
- How Much, How Many, How Far, How Heavy, How Long, How Tall is 1,000? by Helen Nolan

enVision Math 2.0 Resources:

- Realize Online Platform
- Math Center Challenges
- MDIS - Math Diagnostic and Intervention System
- Student Editions
- Response to Intervention Tiered Materials

Assessments

Formative Assessments

- Teacher Observation
- Exit Slips/Check for Understanding
- Games
- Anecdotal Records
- Oral Assessments/Conferencing
- Daily Classwork
- Pre-Assessment
- Homework pages
- Fluency Check
- Quick Quiz
- Student Activity Pages

Summative Assessments

- Quick Quiz
- Performance Task
- Unit Test

Alternative Assessments

- Long Jump – Data – Line Plots (Let's Challenge Our Jumping)
- Homemade Cookies – How Many Chips Do We Really Need? – Draw It Out!

21st-Century Skills

Career Ready Practices

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CRP 4. SW communicate clearly and effectively and with reason during the Solve and Share portion of the lesson.

CRP 8. SW utilize critical thinking to make sense of problems and persevere in solving independent practice problems.

CRP 11. SW use technology to enhance productivity by accessing the Pearson Platform.

Interdisciplinary Connections

Language Arts Learning Activities:

- Build a strong base of knowledge through content-rich texts
- Read, write, and speak grounded in evidence
- Construct viable arguments and critique the reasoning of others
- Engage in argument from evidence

Alignment to Standards:

- **RF.4.4.** Read with sufficient accuracy and fluency to support comprehension.
- **RI.4.7.** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
- **RI.4.2.** Determine the main idea of a text and explain how it is supported by key details; summarize the text.

Science Learning Activities:

- Model with mathematics
- Develop and use models
- Use mathematics, information and computer technology, and computational thinking

Alignment to Standards:

- **4-PS3-1.** Use evidence to construct an explanation relating the speed of an object to the energy of that object
- **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Technology Integration

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Technology Learning Activities:

- Students use Chromebooks to access Pearson Realize platform to complete their independent practice problems online.
- Students will use Google Classroom to access links to: interactive activities and math games.
- Students will access various websites, such as, Prodigy, Arcademics, Cool Math and IXL to practice and reinforce math skills during center related activities.

Alignment to Standards:

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively
- **TECH.8.2.2.C** The design process is a systematic approach to solving problems

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Time Frame	May-June (5 weeks)

Topic

Geometry

Essential Questions

- How can shapes be broken into simpler parts?
- How are shape and dimension used to draw, construct, model and represent real situations or solve problems?
- How does geometry depend on measurement in order to describe shapes?
- How can artists use what they have learned about geometry in their artwork?

Enduring Understandings

Students will understand that…

- Two dimensional shapes can belong to more than one category based on their attributes.
- Geometry offers ways to interpret and compare real-world objects.
- Everyday objects have a variety of attributes and can be measured in many ways.

Alignment to NJSLS

4.G.A.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
4.G.A.2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Key Concepts and Skills

- Understand the relationship among angles, triangles, and polygons.
- Explore the relationships among parallelograms, rectangles, squares, rhombuses, and trapezoids.
- Draw quadrilaterals.
- Describe the relationships among various types of quadrilaterals and draw quadrilaterals that match a description.

Learning Activities

In this unit, children learn to reason with shapes and their attributes. Visual models and real world situations are used throughout the unit to help children understand shapes and important fraction concepts.

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enVision Math 2.0 Units of Study
Topic 12 - Understand and Compare Decimals
Topic 13 - Measurement: Find Equivalence in Units of Measure
Topic 14 - Algebra: Generate and Analyze Patterns

Curriculum Resources

Math Literature:

- Grandfather Tang's Story: A Tale Told with Tangrams by Ann Tompert
- Spaghetti and Meatballs for All!: A Mathematical Story by Marilyn Burns

enVision Math 2.0 Resources:

- Realize Online Platform
- Math Center Challenges
- MDIS - Math Diagnostic and Intervention System
- Student Editions
- Response to Intervention Tiered Materials

Assessments

Formative Assessments

- Teacher Observation
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- Student Activity Pages

Summative Assessments

- Quick Quiz
- Performance Task
- Unit Test

Alternative Assessments

- How much are these toys really costing me?
- Patterns in Weather

21st-Century Skills

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Career Ready Practices

CRP 4. SW communicate clearly and effectively and with reason while working on groups on the Solve and Share portion of the lesson.

CRP 11. SW use technology to enhance productivity by accessing the Quick Check vis the Pearson Platform.

Interdisciplinary Connections

Language Arts Learning Activities:

- Build a strong base of knowledge through content-rich texts
- Read, write, and speak grounded in evidence
- Construct viable arguments and critique the reasoning of others
- Engage in argument from evidence

Alignment to Standards:

- **NJSLSA.R7.** Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
- **RL.4.4.** Determine the meaning of words and phrases as they are used in a text, including those that allude to significant characters found in literature.
- **RL.4.7.** Make connections between specific descriptions and directions in a text and a visual or oral representation of the text.

Science Learning Activities:

- Model with mathematics
- Develop and use models
- Use mathematics, information and computer technology, and computational thinking

Alignment to Standards:

- **4-ESS2-2.** Analyze and interpret data from maps to describe patterns of Earth's features. [
- **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Technology Integration

Technology Learning Activities:

- Students use Chromebooks to access Pearson Realize platform to practice and reinforce skills and concepts.
- Students will use Google Classroom to access links to: interactive activities and math games.

Alignment to Standards:

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively

Time Frame: February-May (14 weeks)

Topic

Number & Operations - Fractions

Essential Questions

- Why do we need different kinds of numbers (ordinal, fractions, decimals, etc)?
- How does explaining my process help me to understand a problem better?
- What do effective problem solvers do, and what do they do when they get stuck?

Enduring Understandings

Students will understand that…

- Fractions are numbers that represent equal parts of whole units.
- Equivalent fractions represent the same part of a whole.
- Fractions with different numerators and denominators can be compared by reasoning about their size.

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Alignment to NJSLS

4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) 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.A.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 symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.

- **3a** Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- **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. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8..
- **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.
- **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.B.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

- **4a** Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).
- **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. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)
- **4c** Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.4 For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.
4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
4.NF.C.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

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Key Concepts and Skills

- Develop a conceptual understanding of unit fractions and how they are used to build other fractions.
- Use fraction bars and number lines to represent fractions.
- Locate fractions on the number line.
- Use fraction bars and number lines to compare unit fractions.
- Use fraction circles to develop understanding of comparing fractions with the same denominator or with the same numerator.
- Develop understanding of equivalent fractions.
- Find two or more equivalent fractions using number lines.
- Use fraction concepts to solve real world problems
- Use the NJSLS and Math Practices in a variety of real world problem solving situations.

Learning Activities

In this unit, students study fraction concepts, beginning with unit fractions and what they represent. Students learn how non-unit fractions are built from unit fractions, and to count or add to find the value of a fraction. They model fractions in various ways as they compare fractions and find equivalent fractions. Visual models and real world situations are used throughout the unit to illustrate important fraction concepts.

enVision Math 2.0 Units of Study
Topic 15 - Geometric Measurement: Understand Concepts of Angles and Angle Measurement
Topic 16 - Lines, Angles, and Shapes
Stepping Up Lessons

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Curriculum Resources

Math Literature:

- Fraction Fun by David Adler and Nancy Tobin
- The Big Orange Splot by Daniel Manus
- ump, Kangaroo, Jump by Stuart J. Murphy
- Mega-Fun Fractions by Martin Lee and Marcia Miller
- The Fraction Family Heads West by Marti Dryk, Ph.D.
- A Remainder of One: A Mathematical Folktale by Elinor J. Pinczes
- The Great Divide by Dayle Ann Dodds

enVision Math 2.0 Resources:

- Realize Online Platform
- Math Center Challenges
- MDIS - Math Diagnostic and Intervention System
- Student Editions
- Response to Intervention Tiered Materials

Assessments

Formative Assessments

- Teacher Observation
- Exit Slips/Check for Understanding
- Games
- Anecdotal Records
- Oral Assessments/Conferencing
- Daily Classwork
- Pre-Assessment
- Homework pages
- Fluency Check
- Quick Quiz
- Student Activity Pages

Summative Assessments

- Quick Quiz
- Performance Task
- Unit Test

Alternative Assessments

- “Angle Hunt in My Classroom”
- Angles needed for the best slingshot – Slingshot Creation

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21st-Century Skills

9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

Career Ready Practices

CRP 8. SW utilize critical thinking to make sense of problems and persevere in solving problem solving problems.

CRP 11. SW use technology to enhance productivity by accessing various online skill based websites.

Interdisciplinary Connections

Language Arts Learning Activities:

- Build a strong base of knowledge through content-rich texts
- Read, write, and speak grounded in evidence
- Construct viable arguments and critique the reasoning of others
- Engage in argument from evidence

Alignment to Standards:

- **RI.4.1.** Refer to details and examples in a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- **RF.4.4.** Read with sufficient accuracy and fluency to support comprehension.
- **RL.4.7**. Make connections between specific descriptions and directions in a text and a visual or oral representation of the text

Science Learning Activities:

- Model with mathematics
- Develop and use models
- Use mathematics, information and computer technology, and computational thinking

Alignment to Standards:

- **4-PS3-1.** Use evidence to construct an explanation relating the speed of an object to the energy of that object.
- **3-5-ETS1-1.** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2.** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- **3-5-ETS1-3.** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. The performance expectations above were developed using the following elements from the

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Technology Integration

Technology Learning Activities:

- Students use Chromebooks to access Pearson Realize platform to practice and reinforce skills and concepts.
- Students will use Google Classroom to access links to: interactive activities and math games.
- Students will access various online websites to practice and reinforce math skills.

Alignment to Standards:

- **TECH.8.1.2** All students will use digital tools to access, manage, evaluate and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
- **TECH.8.1.2.A.CS2** Select and use applications effectively and productively
- **TECH.8.2.2.C** The design process is a systematic approach to solving problems

Modifications (ELL, Special Education, At-Risk Students, Gifted and Talented, and 504 Plans)

ELL:

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring
- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments
- Provide students with English Learner leveled readers.

Supports for Students With IEPs:

- Allow extra time to complete assignments or tests
- Guided notes and/or scaffold outline for written assignments
- Work in a small group
- Allow answers to be given orally or dictated

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- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications

At-Risk Students:

- Guided notes and/or scaffold outline for written assignments
- Introduce key vocabulary before lesson
- Work in a small group
- Lesson taught again using a differentiated approach
- Allow answers to be given orally or dictated
- Use visuals / Anchor Charts
- Leveled texts according to ability

Gifted and Talented:

- Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles)
- Provide options, alternatives and choices to differentiate and broaden the curriculum
- Organize and offer flexible small group learning activities
- Provide whole group enrichment explorations
- Teach cognitive and methodological skills
- Use center, stations, or contracts
- Organize integrated problem-solving simulations
- Propose interest-based extension activities
- Expose students to beyond level texts.

Supports for Students With 504 Plans:

- Follow all the 504 plan modifications
- Text to speech/audio recorded selections
- Amplification system as needed
- Leveled texts according to ability
- Fine motor skill stations embedded in rotation as needed
- Modified or constrained spelling word lists
- Provide anchor charts with high frequency words and phonemic patterns