7th Grade Math
Curriculum Resources

Curriculum Overview

The Alabama Course of Study: Mathematics (2019) provides the framework for the K-12 study of Mathematics in Alabama's public schools. Content standards in this document are minimum and required, fundamental and specific, but not exhaustive. The standards set high expectations for student learning in all grades.

Here are definitions to help understand this curriculum guide:

- **Units of Study:** A series of lessons, experiences, and assessments aligned to standards that may last two to six weeks.
- **Priority Standards:** These are the standards students must know and be able to do to be prepared for the next grade level or course.
- **Supporting Standards:** These standards support, connect to, or enhance priority standards.
- **Knowledge:** What students should know related to the standard.
- **Skills:** What students should be able to do related to the standard.
- **Bloom's Taxonomy:** This hierarchy helps describe the complexity and requirements of a standard.
- **Quad:** This framework has four parts that help determine the rigor and relevance of a standard: Acquisition, Application, Assimilation, Adaptation.
- **ACT:** This refers to ACT standards alignment.
- **Key Understandings:** Essential ideas students need to understand about the standard.
- **Key Vocabulary:** Keywords that should be taught to ensure understanding of the standard.
- **Formative Assessment:** Frequent and ongoing checks for understanding teachers can use throughout the unit.
- **Summative Assessment:** How students will be assessed at the end of a unit to demonstrate their level of mastery of the standards.
- **Activities & Resources:** Specific examples, lessons, and/or resources that may be used to support implementation of the standard.
- **RTI:** Response to Intervention - additional supports/resources teachers can use for students who need them.
- **Extensions:** Additional activities and resources to extend the learning experience, especially for accelerated students.

7th Grade Curriculum At A Glance - Pacing Calendar

Quarter	# Weeks	Unit Name	Priority Standards	Supporting Standards
	1	Launch Week	**Pre-Assessment**	
1	9	UNIT 1: Rational Numbers Operations	**7.4, 7.4a, 7.4b, 7.4c, 7.4d, 7.4e, 7.4f, 7.4g, 7.5**	
2	4	UNIT 2: Analyze and Use Proportional Relationships	**7.1, 7.2, 7.2a, 7.2b, 7.2c**	
2	2	UNIT 3: Analyze and Solve Percent Problems	**7.3**	**7.8, 7.9**
2 - 3	4	UNIT 4: Use Sampling to Draw Inferences About Populations	**7.10, 7.10a, 7.10b, 7.10c, 7.10d, 7.10e, 7.11, 7.12**	**7.1, 7.2, 7.6**
3	4	UNIT 5: Probability	**7.13, 7.14, 7.14a, 7.14b, 7.15, 7.15a, 7.16, 7.16a, 7.16b, 7.16c**	**7.2, 7.3, 7.6, 7.8**
3	3	UNIT 6: Generate Equivalent Expressions	**7.6, 7.7, 7.8**	**7.4**
4	4	UNIT 7: Solve Problems Using Equations and Inequalities	**7.9, 7.9a, 7.9b**	**7.2**
4	5	UNIT 8: Solve Problems Involving Geometry	**7.17, 7.18, 7.19, 7.20, 7.20a, 7.20b, 7.21, 7.22**	**7.1, 7.2, 7.3, 7.4, 7.6, 7.9, 7.9a, 7.9b**

UNIT 1: Rational Numbers Operations	DURATION: 9 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● 7.4 Apply and extend knowledge of operations of whole numbers, fractions, and decimals to add, subtract, multiply, and divide rational numbers including integers, signed fractions, and decimals. ○ 7.4a Identify and explain situations where the sum of opposite quantities is 0 and opposite quantities are defined as additive inverses. ○ 7.4b Interpret the sum of two or more rational numbers, by using a number line and in real-world contexts. ○ 7.4c Explain subtraction of rational numbers as addition of additive inverses. ○ 7.4d Use a number line to demonstrate 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. ○ 7.4e Extend strategies of multiplication to rational numbers to develop rules for multiplying signed numbers, showing that the properties of the operations are preserved. ○ 7.4f Divide integers and explain that division by zero is undefined. Interpret the quotient of integers (with a non-zero divisor) as a rational number. ○ 7.4g Convert a rational number to a decimal using long division, explaining that the decimal form of a rational number terminates or eventually repeats. ● 7.5 Solve real-world and mathematical problems involving the four operations of rational numbers, including complex fractions. Apply properties of operations as strategies where applicable.	SUPPORTING STANDARDS ● N/A

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
A number and its opposite have a sum of 0.		Understanding	B	

A number and its opposite are called additive inverses.		Remembering	A	
Strategies for adding and subtracting two or more numbers.		Applying	B	
Absolute value represents distance on a number line, therefore it is always non-negative.		Understanding	A	
Strategies for multiplying signed numbers.		Applying	B	
Every quotient of integers (with non-zero divisor) is a rational number.		Understanding	B	
If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$.		Understanding	B	
The decimal form of a rational number terminates or eventually repeats.		Understanding	B	
How to model real-world problems to include situations involving elevation, temperature changes, debits and credits, and proportional relationships with negative rates of change.		Applying	B	
How to evaluate numerical expressions with greater fluency, using the properties of operations when necessary.		Applying	B	
	Add rational numbers.	Understanding	A	
	Subtract rational numbers.	Understanding	A	
	Represent addition and subtraction on a number line diagram.	Applying	B	
	Describe situations in which opposite quantities combine to make 0.	Understanding	B	

	Find the opposite of a number.	**Understanding**	**A**	
	Interpret sums of rational numbers by describing real-world contexts.	**Applying**	**B**	
	Show that the distance between two rational numbers on the number line is the absolute value of their difference.	**Applying**	**B**	
	Use absolute value in real-world contexts involving distances.	**Applying**	**B**	
	Multiply and divide rational numbers.	**Remembering**	**A**	
	Convert a rational number to a decimal using long division.	**Remembering**	**A**	
	Solve real-world and mathematical problems involving the four operations with rational numbers.	**Applying**	**B**	

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

<u>Week 1:</u>

- **I can define integers, locate them on a number line, and use them to represent real-world situations.**
- **I can define opposites and explain why two numbers are opposite.**
- **I can define absolute value and explain the absolute value of rational numbers.**
- **I can explain how to relate integers, their opposites, and their absolute values.**

<u>Week 2:</u>

- **I can identify rational numbers.**
- **I can recall that a fraction can be written as a division problem.**
- **I can convert rational numbers expressed as fractions as decimals by dividing the numerator by the denominator.**
- **I can identify whether a decimal is terminating or repeating.**

<u>Week 3:</u>

KEY VOCABULARY

- **rational numbers**
- **integers**
- **additive inverses**
- **opposite quantities**
- **absolute value**
- **terminating decimals**
- **repeating decimals**
- **complex fractions**
- **multiplicative inverse**
- **properties of operations**

• I can identify zero pairs, or additive inverses with various models. • I can add integers with counters. • I can add integers on a vertical or horizontal number line. • I can derive the rules for adding integers. • I can apply sums of integer numbers to solve real-world problems. **Week 4:** • I can subtract integers with counters. • I can subtract integers on a vertical and horizontal number line. • I can use number lines to represent subtraction expressions. • I can understand subtraction of integers as adding the additive inverse, $p - q = p + (-q)$. • I can use addition and subtraction rules to solve real-world problems. **Week 5:** • I can multiply integers with counters. • I can divide integers with counters. • I can derive the rules for multiplying and dividing integers. • I can fluently multiply and divide integers. • I can apply integer multiplication to real-life applications. **Week 6:** • I can add and subtract fractions. • I can add and subtract mixed numbers. • I can add and subtract decimals. **Week 7:** • I can add and subtract rational numbers *(signed fractions and decimals)*. • I can apply my knowledge of adding and subtracting rational numbers to solve real-world problems. **Week 8:** • I can multiply and divide decimals. • I can multiply and divide fractions. • I can multiply and divide mixed numbers. **Week 9:** • I can multiply and divide rational numbers *(signed fractions and decimals)*. • I can use properties of operations with rational numbers to solve real-world problems. • I can solve multi-step problems with rational numbers.		

ESSENTIAL QUESTION(S)	PRIOR KNOWLEDGE
● How do operations with integers relate to the same operations with rational numbers? How can you determine the correct operation to use to solve problems?	● 7.4 ○ Define parentheses, braces, and brackets. ○ Recall addition and subtraction of fractions as joining and separating parts referring to the same whole. ○ Identify two fractions as equivalent (equal) if they are the same size or the same point on a number line. ○ 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. ○ Generate equivalent fractions. ○ Show on a number line that numbers that are equal distance from 0 and on opposite sides of 0 have opposite signs. ○ Define rational numbers. ○ Arrange integers and /or rational numbers on a horizontal or vertical number line. ○ Locate the position of integers and/or rational numbers on a horizontal or vertical number line. ○ Identify a rational number as a point on the number line. ● 7.5 ○ Recall addition and subtraction of fractions as joining and separating parts referring to the same whole. ○ Define rational numbers. ○ Arrange integers and/or rational numbers on a horizontal or vertical number line. ○ Locate the position of integers and/or rational numbers on a horizontal or vertical number line. ○ Identify a rational number as a point on the number line.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources	Other Resources Proficiency Scales 7.4a-d Proficiency Scales 7.4e-g Proficiency Scale 7.5	ACAP Resources ACAP Summative Resources

RTI	EXTENSION OPPORTUNITIES

UNIT 2: Analyze and Use Proportional Relationships	DURATION: 4 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● 7.1 Calculate unit rates of length, area, and other quantities measured in like or different units that include ratios or fractions. ● 7.2 Represent a relationship between two quantities and determine whether the two quantities are related proportionally. ○ 7.2a Use equivalent ratios displayed in a table or in a graph of the relationship in the coordinate plane to determine whether a relationship between two quantities is proportional. ○ 7.2b Identify the constant of proportionality (unit rate) and express the proportional relationship using multiple representations including tables, graphs, equations, diagrams, and verbal descriptions. ○ 7.2c Explain in context the meaning of a point (x,y) on the graph of a proportional relationship, with special attention to the points (0,0) and (1, r) where r is the unit rate.	SUPPORTING STANDARDS ● N/A

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
What a unit rate is and how to calculate it given a relationship between quantities.		Remembering	A	
Quantities compared in ratios are not always whole numbers but can be represented by fractions or decimals.		Understanding	B	
A fraction can be used to represent division.		Remembering	A	
(2a) How to explain whether a relationship is proportional.		Understanding	B	
(2b) That the constant of proportionality is the same as a unit rate. Students know: where the constant of proportionality can be found in a table, graph, equation or diagram.		Understanding	A	
(2c) That the constant of proportionality or unit rate can be found on a graph of a proportional relationship where the input value or x-coordinate is 1.		Understanding	A	
	Compute unit rates associated with ratios of fractional • lengths. • areas. • quantities measured in like or different units.	Applying	A	
	(2a) Determine if a proportional relationship exists when given a table of equivalent ratios or a graph of the relationship in the coordinate plane.	Understanding	B	
	(2b) Identify the constant of proportionality and express the proportional relationship using a variety of representations including tables, graphs, equations, diagrams, and verbal	Understanding	B	

	descriptions.			
	(2c) Model a proportional relationship using coordinate graphing.	**Applying**	**C**	
	Explain the meaning of the point (1, *r*), where r is the unit rate or constant of proportionality.	**Understanding**	**A**	

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

<u>Week 1:</u>

- **I can develop an understanding of ratios as a comparison of two quantities and learn to express ratios in three ways.**
- **I can find the unit rate of a given rate *(with whole numbers)*.**
- **I can find equivalent ratios and use unit rate to solve multi-step problems.**

<u>Week 2:</u>

- **I can find unit rates with fractions.**
- **I can use unit rates to make comparisons and solve problems.**

<u>Week 3:</u>

- **I can determine whether quantities are proportional by testing for equivalent ratios in a table.**
- **I can determine whether a set of ordered pairs represent a proportional relationship.**
- **I can interpret points on a graph of a proportional relationship, including identifying the constant of proportionality.**

<u>Week 4:</u>

- **I can represent proportional relationships with equations.**
- **I can identify the constant of proportionality for proportional relationships in tables, graphs, equations, diagrams, and verbal descriptions.**

KEY VOCABULARY

- **Ratio**
- **Rate**
- **Per**
- **For every**
- **Unit rate**
- **Quantity**
- **Complex fractions**
- **Proportion**
- **Equivalent ratios**
- **Proportional relationships**
- **Ratio table**
- **Coordinate plane**
- **Ordered pair**
- **Equation**
- **Constant of proportionality**

ESSENTIAL QUESTION(S)

- **How can you recognize and represent proportional relationships and use them to solve problems?**

PRIOR KNOWLEDGE

- **7.1**
  - **Recall addition and subtraction of fractions as joining and separating parts referring to the same whole.**
  - **Identify two fractions as equivalent (equal) if they are the**

	same size or the same point on a number line. ○ 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. ○ Generate equivalent fractions. ○ Define quantity, fraction, and ratio. ○ Reinterpret a fraction as a ratio. Example: Read 2/3 as 2 out of 3. ○ Write a ratio as a fraction. ○ Create a ratio or proportion from a given word problem, diagram, table, or equation. ○ Calculate unit rate or rate by using ratios or proportions. • 7.2 ○ Recall basic addition, subtraction, multiplication, and division facts. ○ Define ordered pair of numbers. ○ Define *x*-axis, *y*-axis, and zero on a coordinate. ○ Specify locations on the coordinate system. ○ Define ordered pair of numbers, quadrant one, coordinate plane, and plot points. ○ Label the horizontal axis (*x*). ○ Label the vertical axis (*y*). ○ Identify the *x*- and *y*-values in ordered pairs. ○ Model writing ordered pairs. ○ Define quantity, fraction, and ratio. ○ Reinterpret a fraction as a ratio. Example: Read 2/3 as 2 out of 3. ○ Write a ratio as a fraction. ○ Create a ratio or proportion from a given word problem, diagram, table, or equation.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources	**Other Resources**	**ACAP Resources**

	Proficiency Scale 7.1 Proficiency Scale 7.2a-c	ACAP Summative Resources
RTI	EXTENSION OPPORTUNITIES	

UNIT 3: Analyze and Solve Percent Problems	DURATION: 2 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS • 7.3 Solve multi-step percent problems in context using proportional reasoning, including simple interest, tax, gratuities, commissions, fees, markups and markdowns, percent increase, and percent decrease.	SUPPORTING STANDARDS • 7.8 Solve multi-step real-world and mathematical problems involving rational numbers (integers, signed fractions and decimals), converting between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies. • 7.9 Use variables to represent quantities in real-world or mathematical problems and construct algebraic expressions, equations, and inequalities to solve problems by reasoning about

	the quantities

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
How to interpret a real-world problem to determine what is being asked.		Applying	B	
Techniques for calculating and using percents to solve problems in context.		Applying	B	
How to interpret the solution in the context of the problem.		Applying	B	
	Write and solve proportions to help them solve real-world problems involving percent.	Applying	B	
	Solve problems that require them to calculate: simple interest, tax, gratuities, commission, fees, mark ups, markdowns, percent increase and percent decrease.	Applying	B	

KEY COMPONENTS		
LEARNING TARGETS (incremental learning target by week) <u>Week 1:</u> ● I can find the percent of a number. ● I can find the sales tax and total given the percent. ● I can find the commission of sales. ● I can solve problems involving percent markups and markdowns. <u>Week 2:</u> ● I can represent percent problems using proportions. *This includes finding the part, whole, or percent.* ● I can solve problems involving percent change and percent error. ● I can apply percent reasoning to solve simple interest problems.	KEY VOCABULARY ● proportion ● percent ● simple interest ● tax	● gratuities ● commissions ● fees ● markups and markdowns ● percent increase and percent decrease

ESSENTIAL QUESTION(S)	PRIOR KNOWLEDGE
• How can percents show proportional relationships between quantities and be used to solve problems?	• Define percent. • Calculate a proportion for missing information. • Identify a proportion from given information. • Solve a proportion using part over whole equals percent over 100. • Define equation and variable. • Set up an equation to represent the given situation, using correct mathematical operations and variables. • Identify the unknown, in a given situation, as the variable. • Solve the equation represented by the real-world situation.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources	Other Resources Proficiency Scale 7.3	ACAP Resources ACAP Summative Resources
RTI	EXTENSION OPPORTUNITIES	

UNIT 4: Use Sampling to Draw Inferences About Populations	DURATION: 4 weeks

CONTENT STANDARDS

PRIORITY STANDARDS

- 7.10 Examine a sample of a population to generalize information about the population.
  - 7.10a Differentiate between a sample and a population.
  - 7.10b Compare sampling techniques to determine whether a sample is random and thus representative of a population, explaining that random sampling tends to produce representative samples and support valid inferences.
  - 7.10c Determine whether conclusions and generalizations can be made about a population based on a sample.
  - 7.10d Use data from a random sample to draw inferences about a population with an unknown characteristic of interest, generating multiple samples to gauge variation and making predictions or conclusions about the population.
  - 7.10e Informally explain situations in which statistical bias may exist.
- 7.11 Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.
- 7.12 Make informal comparative inferences about two populations using measures of center and variability and/or mean absolute deviation in context.

SUPPORTING STANDARDS

- 7.1 Calculate unit rates of length, area, and other quantities measured in like or different units that include ratios or fractions.
- 7.2 Represent a relationship between two quantities and determine whether the two quantities are related proportionally.
- 7.6 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
A random sample can be found by various methods, including simulations or a random number generator.		Applying	B	
Samples should be the same size in order to compare the variation in estimates or predictions.		Understanding	B	

Populations can be compared using measures of center and measures of variability.		Analyzing	C	
Measures of center are insufficient to compare populations. measures of variability are necessary to assess if data sets are significantly different or not.		Understanding	B	
Mean is the sum of the numerical values divided by the number of values.		Remembering	A	
Median is the number that is the midpoint of an ordered set of numerical data.		Remembering	A	
Mode is the data value or category occurring with the greatest frequency (there can be no mode, one mode, or several modes).		Remembering	A	
Mean absolute deviation of a data set is found by the following steps: 1) calculate the mean 2) determine the deviation of each variable from the mean 3) divide the sum of the absolute value of each deviation by the number of data points.		Remembering	A	
Range is a number found by subtracting the minimum value from the maximum value.		Remembering	A	
	Determine whether a sample is random or not and justify their reasoning.	Understanding	B	
	Use the center and variability of data collected from multiple same-size samples to estimate parameters of a population.	Applying	B	
	Make inferences about a population from random sampling of that population.	Analyzing	C	

	Informally assess the difference between two data sets by examining the overlap and separation between the graphical representations of two data sets.	Evaluating	C	
	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities.	Evaluating	C	
	Measure the difference between the centers by expressing it as a multiple of a measure of variability.	Analyzing	C	
	Find the measures of center of a data set.	Remembering	A	
	Find the interquartile range of a data set and use it to compare variability between data sets.	Applying	B	

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

Week 1:

- I can differentiate between a sample and a population.
- I can identify a valid sample versus an invalid sample.
- I can identify a biased sample versus an unbiased sample.
- I can determine if a sample is representative of a population.

Week 2:

- I can make inferences about a population from a sample set.
- I can find the measure of center *(mean, median, mode, range, and interquartile range)*.

Week 3:

- I can model data using box and whisker plots.
- I can draw comparative inferences about two populations using median and interquartile range (IQR).

Week 4:

- I can model data using a dot plot.
- I can compare populations using the mean, median, mode, range,

KEY VOCABULARY

- Population
- Sample
- Biased
- Unbiased
- Sampling techniques
- Random sampling
- Representative samples
- Inferences
- Visual overlap
- Measure of variability
- Data distribution
- Range
- Interquartile range
- Mean absolute deviation
- Mean
- Median
- Mode

interquartile range, and mean absolute deviation.		

ESSENTIAL QUESTION(S)	PRIOR KNOWLEDGE

• How can sampling be used to draw inferences about one or more populations?	• 7.10
	  ○ Define statistical question.
	  ○ Calculate the range, mean, median, and mode of a numerical data set.
	  ○ Recognize the difference between population and sample.
	  ○ Identify bias from real-world context.
	• 7.11
	  ○ Describe the center of a set of data in a given distribution.
	  ○ Compare and contrast the center and variation.
	  ○ Interpret graphing points in all four quadrants of the coordinate plane in real-world situations.
	• 7.12
	  ○ Describe the center of a set of data in a given distribution.
	  ○ Compare and contrast the center and variation.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources	Other Resources Proficiency Scale 7.10a-e Proficiency Scale 7.11 Proficiency Scale 7.12	ACAP Resources ACAP Summative Resources
RTI	EXTENSION OPPORTUNITIES	

UNIT 5: Probability	DURATION: 4 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● 7.13 Use a number from 0 to 1 to represent the probability of a chance event occurring, explaining that larger numbers indicate greater likelihood of the event occurring, while a number near zero indicates an unlikely event. ● 7.14 Define and develop a probability model, including models that may or may not be uniform, where uniform models assign equal probability to all outcomes and non-uniform models involve events that are not equally likely. ○ 7.14a Collect and use data to predict probabilities of events. ○ 7.14b Compare probabilities from a model to observed frequencies, explaining possible sources of discrepancy. ● 7.15 Approximate the probability of an event using data generated by a simulation (experimental probability) and compare it to the theoretical probability. ○ 7.15a Observe the relative frequency of an event over the long run, using simulation or technology, and use those results to predict approximate relative frequency. ● 7.16 Find probabilities of simple and compound events through experimentation or simulation and by analyzing the sample space, representing the probabilities as percents, decimals, or fractions. ○ 7.16a Represent sample spaces for compound events	SUPPORTING STANDARDS ● 7.2 Represent a relationship between two quantities and determine whether the two quantities are related proportionally. ● 7.3 Solve multi-step percent problems in context using proportional reasoning, including simple interest, tax, gratuities, commissions, fees, markups and markdowns, percent increase, and percent decrease. ● 7.6 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. ● 7.8 Solve multi-step real-world and mathematical problems involving rational numbers (integers, signed fractions and decimals), converting between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies.

using methods such as organized lists, tables, and tree diagrams, and determine the probability of an event by finding the fraction of outcomes in the sample space for which the compound event occurred. ○ 7.16b Design and use a simulation to generate frequencies for compound events. ○ 7.16c Represent events described in everyday language in terms of outcomes in the sample space which composed the event.	

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Probability is equal to the ratio of favorable number of outcomes to total possible number of outcomes.		Remembering	A	
As a number for probability increases, so does the likelihood of the event occurring.		Understanding	B	
A probability near 0 indicates an unlikely event.		Understanding	B	
A probability around ½ indicates an event that is neither unlikely or likely.		Understanding	B	
A probability near 1 indicates a likely event.		Understanding	B	
The probability of any single event can be expressed using terminology like impossible, unlikely, likely, or certain or as a number between 0 and 1, inclusive, with numbers closer to 1 indicating greater likelihood.		Understanding	B	
A probability model is a visual display of the sample space and each corresponding probability.		Remembering	A	

Probability models can be used to find the probability of events.		**Remembering**	**A**	
A uniform probability model has equally likely probabilities.		**Remembering**	**A**	
Sample space and related probabilities should be used to determine an appropriate probability model for a random circumstance.		**Understanding**	**B**	
Relative frequencies for experimental probabilities become closer to the theoretical probabilities over a large number of trials.		**Understanding**	**B**	
Theoretical probability is the likelihood of an event happening based on all possible outcomes.		**Remembering**	**A**	
Long-run relative frequencies allow one to approximate the probability of a chance event and vice versa.		**Understanding**	**B**	
How the sample space is used to find the probability of compound events.		**Understanding**	**B**	
A compound event consists of two or more simple events.		**Remembering**	**A**	
A sample space is a list of all possible outcomes of an experiment.		**Remembering**	**A**	
How to make an organized list.		**Creating**	**D**	
How to create a tree diagram.		**Creating**	**D**	
	Approximate the probability of a chance event.	**Remembering**	**A**	
	Use words like impossible, very unlikely, unlikely, equally likely/unlikely, likely,	**Understanding**	**B**	

	very likely, and certain to describe the probabilities of events.			
	Make predictions before conducting probability experiments, run trials of the experiment, and refine their conjectures as they run additional trials.	Analyzing	C	
	Collect data on the chance process that produces an event.	Understanding	B	
	Use a developed probability model to find probabilities of events.	Applying	B	
	Compare probabilities from a model to observed frequencies.	Analyzing	C	
	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.	Creating	D	
	Observe an event's long-run relative frequency.	Analyzing	C	
	Find probabilities of compound events using organized lists, tables, tree diagrams and simulations.	Applying	B	
	Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams.	Applying	B	
	For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.	Understanding	B	
	Design a simulation to generate frequencies for compound events.	Creating	D	
	Use a designed simulation to generate frequencies for compound events.	Applying	B	

KEY COMPONENTS		
LEARNING TARGETS (incremental learning target by week) **<u>Week 1:</u>** ● I can describe the likelihood that an event will occur, using a range from impossible to certain. ● I can calculate the probability that an event will occur. ● I can determine the theoretical probability of an event and use it to predict an outcome. **<u>Week 2:</u>** ● I can determine the experimental probability of an event. ● I can compare and contrast theoretical and experimental probability. ● I can make predictions with experimental probability. **<u>Week 3:</u>** ● I can list favorable outcomes. ● I can list the number of favorable outcomes. ● I can use probability models to find probabilities of events. ● I can use a probability model to find or estimate the probability of an event. **<u>Week 4:</u>** ● I can find all possible outcomes of a compound event. ● I can use tree diagrams, tables, and organized lists to represent sample spaces. ● I can find the probability of a compound event. ● I can simulate a compound event to approximate its probability.	**KEY VOCABULARY** ● Probability ● Outcome ● Event ● Chance ● Likely ● Unlikely ● Very unlikely ● Very likely ● Equally likely ● Impossible ● Certain ● Probability model	● Uniform model ● Non-uniform model ● Observed frequencies ● Experimental probability ● Simulation ● Theoretical probability ● Relative frequency ● Tree diagram ● Compound probability ● Simulation ● Sample space ● Compound event
ESSENTIAL QUESTION(S) ● How can you investigate chance processes and develop, use, and evaluate probability models?	**PRIOR KNOWLEDGE** ● 7.13, 7.14, 7.15, 7.16 ○ Recall addition and subtraction of fractions as joining and separating parts referring to the same whole. ○ Identify two fractions as equivalent (equal) if they are the same size or the same point on a number line. ○ 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. ○ Generate equivalent fractions. ○ Recall how to read a graph or table.	

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources	**Other Resources** Proficiency Scale 7.13 Proficiency Scales 7.14 & 7.15 Proficiency Scale 7.16a-c	**ACAP Resources** ACAP Summative Resources
RTI	EXTENSION OPPORTUNITIES	

UNIT 6: Generate Equivalent Expressions	DURATION: 3 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS • 7.6 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. • 7.7 Generate expressions in equivalent forms based on context and explain how the quantities are related. • 7.8 Solve multi-step real-world and mathematical problems	SUPPORTING STANDARDS • 7.4 Apply and extend knowledge of operations of whole numbers, fractions, and decimals to add, subtract, multiply, and divide rational numbers including integers, signed fractions, and decimals.

involving rational numbers (integers, signed fractions and decimals), converting between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies.	

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
How to add, subtract, multiply, and divide rational numbers.		Understanding	B	
How to define and apply the Distributive Property: $a(b + c) = ab + ac$		Remembering	A	
How to find the greatest common factor of two or more terms.		Remembering	A	
Properties of operations can be used to identify or create equivalent linear expressions.		Understanding	B	
Equivalent expressions can reveal real-world and mathematical relationships, and some forms of equivalent expressions can provide more insight than others.		Understanding	B	
Techniques for converting between fractions, decimals, and percents.		Applying	B	
Techniques for estimation, mental computations, and how to assess the reasonableness of their answers.		Applying	B	
	Apply properties of operations as strategies to add and subtract linear expressions with rational coefficients.	Applying	B	
	Apply properties of operations as strategies to factor linear expressions with rational coefficients.	Applying	B	

	Apply properties of operations as strategies to expand linear expressions with rational coefficients.	**Applying**	**B**	
	Determine whether two expressions are equivalent.	**Understanding**	**B**	
	Rewrite expressions into equivalent forms by combining like terms, using the distributive property, and factoring.	**Applying**	**B**	
	Convert between different forms of a rational number.	**Applying**	**B**	
	Add, subtract, multiply and divide rational numbers. -translate verbal forms of problems into algebraic symbols, expressions, and equations.	**Analyzing**	**C**	
	Use estimation and mental computation techniques to assess the reasonableness of their answers.	**Applying**	**B**	

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

<u>Week 1:</u>

- **I can identify the parts of an expression *(terms, constant, variable, coefficient)*.**
- **I can write and evaluate algebraic expressions.**
- **I can identify and use properties of operations *(Commutative Property, Associative Property, and additive inverse)*.**
- **I can identify like terms.**
- **I can combine like terms to write equivalent expressions.**
- **I can identify equivalent expressions.**

<u>Week 2:</u>

- **I can expand expressions using the Distributive Property.**
- **I can use area models to represent the Distributive Property.**
- **I can use the common factors and the Distributive Property to factor expressions.**

<u>Week 3</u>:

KEY VOCABULARY

- **Algebraic expressions**
- **Expression**
- **Terms**
- **Like terms**
- **Simplify**
- **Constant**
- **Factor**
- **Coefficient**
- **Variable**
- **Expand**
- **Equivalent expressions**
- **Associative property**
- **Commutative property**
- **Distributive property**
- **Integers**
- **Estimation**
- **Rational numbers**

• I can add and subtract expressions. • I can apply my knowledge of adding expressions to solve real-world problems. • I can use an equivalent expression to find new information.		

ESSENTIAL QUESTION(S)

- How can properties of operations help to generate equivalent expressions that can be used in solving problems?

PRIOR KNOWLEDGE

- 7.6
  - Apply properties of operations for addition and subtraction.
  - Define equivalent, simplify, term, distributive property, associative property of addition and multiplication, and the commutative property of addition and multiplication.
  - Simplify expressions with parentheses (Ex. $5(4 + x) = 20 + 5x$).
  - Combine terms that are alike of a given expression.
  - Recognize the property demonstrated in a given expression.
  - Simplify an expression by dividing by the greatest common factor.
    Example: $18x + 6y = 6(3x + y)$.
  - Determine the greatest common factor.
- 7.7
  - Define equivalent expressions.
  - Recognize equivalent expressions.
  - Recognize that a variable without a written coefficient is understood to be one.
  - Convert mathematical terms to mathematical symbols and numbers (Ex. sum: +, difference: -; product: ·, quotient: ÷).
- 7.8
  - Represent addition and subtraction with objects, mental images, drawings, expressions, or equations.
  - Define integers, positive and negative numbers.
  - Define rational numbers.
  - Define equivalent, simplify, term, distributive property, associative property of addition and multiplication, and the commutative property of addition and multiplication.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources	**Other Resources** Proficiency Scale 7.6 & 7.7 Proficiency Scale 7.8	**ACAP Resources** ACAP Summative Resources
RTI	**EXTENSION OPPORTUNITIES**	

UNIT 7: Solve Problems Using Equations and Inequalities	DURATION: 4 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● 7.9 Use variables to represent quantities in real-world or mathematical problems and construct algebraic expressions, equations, and inequalities to solve problems by reasoning about the quantities. ○ 7.9a 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. ○ 7.9b 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.	SUPPORTING STANDARDS ● 7.2 Represent a relationship between two quantities and determine whether the two quantities are related proportionally.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
How to apply the Distributive Property, $p(x + q) = px + pq$, where p and q are specific rational numbers.		Applying	B	
When multiplying or dividing both sides of an inequality by a negative number, every term must change signs and the inequality symbol is reversed.		Applying	B	
In the graph of an inequality, the endpoint will be a closed circle indicating the number is included in the solution set (≤ or ≥) or an open circle indicating the number is not included in the solution set (< or >).		Understanding	B	
	Use variables to represent quantities in a real-world or mathematical problem.	Applying	B	

	Construct equations ($px + q = r$ and $p(x + q) = r$) to solve problems by reasoning about the quantities.	Creating	D	
	Construct simple inequalities ($px + q > r$ or $px + q < r$) to solve problems by reasoning about the quantities.	Creating	D	
	Graph the solution set of an inequality.	Applying	B	

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

Week 1:

- I can define a variable and solution.
- I can solve one-step equations.
- I can write two-step equations for real-world situations.
- I can solve two-step equations.

Week 2:

- I can use the Distributive Property to solve equations with integers and rational numbers.
- I can write equations to represent real-world situations that will require the use of the Distributive Property to solve.

Week 3:

- I can write and graph simple inequalities.
- I can solve inequalities one-step inequalities and graph the solutions on a number line.
- I can write and solve two-step inequalities.

Week 4:

- I can write and solve two-step inequalities.
- I can solve multi-step inequalities.

KEY VOCABULARY

- Algebraic expressions
- Variable
- Equations
- Properties of equality
- Inequalities
- Greater than
- Greater than or equal to
- Less than
- Less than or equal to
- Solution

ESSENTIAL QUESTION(S)

- How can you solve real-world and mathematical problems with numerical and algebraic equations and inequalities?

PRIOR KNOWLEDGE

- 7.9, 7.9a, 7.9b
  - Define inequality.
  - Define equivalent, simplify, term, distributive property, associative property of addition and multiplication, and the commutative property of addition and multiplication.
  - Define equation, solution of an equation, solution of an

	inequality, and inequality. ○ Compare and contrast equations and inequalities. ○ Determine if an inequality is by replacing the variable with a given number. ○ Determine if an equation is true by replacing the variable with a given number. ○ Simplify a numerical sentence to determine equivalence. ○ Recognize the symbols for =, >, <, ?, and ?. ○ Define equation and variable. ○ Set up an equation to represent the given situation, using correct mathematical operations and variables. ○ Identify the unknown, in a given situation, as the variable.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources	Other Resources Proficiency Scale 7.9a Proficiency Scale 7.9b	ACAP Resources ACAP Summative Resources
RTI	EXTENSION OPPORTUNITIES	

UNIT 8: Solve Problems Involving Geometry	DURATION: 5 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● 7.17 Solve problems involving scale drawings of geometric figures, including computation of actual lengths and areas from a scale drawing and reproduction of a scale drawing at a different scale. ● 7.18 Construct geometric shapes (freehand, using a ruler and a protractor, and using technology), given a written description or measurement constraints with an emphasis 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. ● 7.19 Describe the two-dimensional figures created by slicing three-dimensional figures into plane sections. ● 7.20 Explain the relationships among circumference, diameter, area, and radius of a circle to demonstrate understanding of formulas for the area and circumference of a circle. ○ 7.20a Informally derive the formula for area of a circle. ○ 7.20b Solve area and circumference problems in real-world and mathematical situations involving circles. ● 7.21 Use facts about supplementary, complementary, vertical, and adjacent angles in multi-step problems to write and solve simple equations for an unknown angle in a figure. ● 7.22 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 rectangular prism	**SUPPORTING STANDARDS** ● 7.1 Calculate unit rates of length, area, and other quantities measured in like or different units that include ratios or fractions. ● 7.2 Represent a relationship between two quantities and determine whether the two quantities are related proportionally. ● 7.3 Solve multi-step percent problems in context using proportional reasoning, including simple interest, tax, gratuities, commissions, fees, markups and markdowns, percent increase, and percent decrease. ● 7.4 Apply and extend knowledge of operations of whole numbers, fractions, and decimals to add, subtract, multiply, and divide rational numbers including integers, signed fractions, and decimals. ● 7.6 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. ● 7.9 Use variables to represent quantities in real-world or mathematical problems and construct algebraic expressions, equations, and inequalities to solve problems by reasoning about the quantities. ○ 7.9a 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. ○ 7.9b 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.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
How to calculate actual measures such as area and perimeter from a scale drawing.		Remembering	A	
Scale factor impacts the length of line segments, but it does not change the angle measurements.		Understanding	B	
There is a proportional relationship between the corresponding sides of similar figures.		Understanding	B	
A proportion can be set up using the appropriate corresponding side lengths of two similar figures.		Understanding	B	
If a side length is unknown, a proportion can be solved to determine the measure of it.		Understanding	B	
If three side lengths will create a unique triangle or no triangle.		Remembering	A	
The difference between two-dimensional and three-dimensional figures.		Understanding	B	
The names and properties of two-dimensional shapes.		Remembering	A	
The names and properties of three-dimensional solids.		Remembering	A	
Supplementary angles are angles whose measures add to 180 degrees.		Remembering	A	
Complementary angles are angles whose measures add to 90 degrees.		Remembering	A	

Vertical angles are opposite angles formed when two lines intersect.		Remembering	A	
Adjacent angles are non-overlapping angles which share a common vertex and side.		Remembering	A	
That volume of any right prism is the product of the height and area of the base.		Remembering	A	
The volume relationship between pyramids and prisms with the same base and height.		Understanding	B	
The surface area of prisms and pyramids can be found using the areas of triangular and rectangular faces.		Understanding	B	
	Find missing lengths on a scale drawing.	Applying	B	
	Use scale factors to compute actual lengths, perimeters, and areas in scale drawings.	Applying	B	
	Use a scale factor to reproduce a scale drawing at a different scale.	Applying	B	
	Freehand, draw geometric shapes with given conditions.	Creating	D	
	Using a ruler and protractor, draw geometric shapes with given conditions.	Creating	D	
	Using technology, draw geometric shapes with given conditions.	Creating	D	
	Construct triangles from three measures of angles or sides.	Creating	D	
	Identify the conditions that determine a unique triangle, more than one triangle, or no triangle.	Understanding	B	

	Discover two-dimensional shapes from slicing three-dimensional figures. For example, students might slice a clay rectangular prism from different perspectives to see what two-dimensional shapes occur from each slice.	Analyzing	C	
	Write a simple equation to find an unknown angle.	Applying	B	
	Identify and determine values of angles in complementary and supplementary relationships.	Understanding	B	
	Identify pairs of vertical angles in angle diagrams.	Understanding	B	
	Identify pairs of complementary and supplementary angles in angle diagrams.	Understanding	B	
	Use vertical, complementary, and supplementary angle relationships to find missing angles.	Applying	B	
	Find the area and perimeter of two-dimensional objects composed of triangles, quadrilaterals, and polygons.	Applying	B	
	Use a net of a three-dimensional figure to determine the surface area.	Applying	B	
	Find the volume and surface area of pyramids, prisms, or three-dimensional objects composed of cubes, pyramids, and right prisms.	Applying	B	

KEY COMPONENTS		
LEARNING TARGETS (incremental learning target by week) <u>Week 1:</u> ● I can compute actual lengths from a scale drawing. ● I can calculate actual areas from a scale drawing.	KEY VOCABULARY ● Proportion ● Scale drawing ● Reproduction	● Diameter ● Radius ● Circle

• I can reproduce a scale drawing to a different scale. **Week 2:** • I can construct geometric shapes using technology given a written description or measurement constraints. • I can construct geometric shapes by hand, using a ruler and protractor, given a written description or measurement constraints. • I can determine if a set of measurements creates a unique triangle, more than one triangle, or no triangle. • I can construct triangles from: three measures of angles and three side lengths. **Week 3:** • I can recognize the relationship of angles formed by intersecting lines or rays. • I can identify complementary and supplementary angles. • I can identify vertical and adjacent angles. • I can solve simple equations for an unknown angle in a figure using facts about supplementary and complementary angles. • I can solve simple equations for an unknown angle in a figure using facts about vertical, and adjacent angles. • I can write simple equations for an unknown angle in a figure using facts about supplementary and complementary angles. • I can write simple equations for an unknown angle in a figure using facts about vertical and adjacent angles. **Week 4:** • I can identify the radius and diameter of a circle. • I can find the area and circumference of a circle. • I can find the circumference of a circle when given the area. • I can find the area of a circle when given the circumference. • I can informally derive the formula for the area of a circle. • I can explain the relationships among circumference, diameter, area, and radius of a circle. • I can solve real-world problems involving the area and/ or circumference of a circle. **Week 5:** • I can determine what the cross section looks like when a 3D figure is sliced. • I can find the area of two-dimensional objects composed of triangles, quadrilaterals, and polygons.	• Scale factor • Construct • Protractor • Angle measures • Constraints • Acute triangle • Right triangle • Obtuse triangle • Isosceles triangle • Scalene triangle • Equilateral triangle • Two-dimensional figures • Three-dimensional solids • Rectangular prisms • Plane sections	• Area • Circumference • π *(pi)* • Supplementary angles • Complementary angles • Vertical angles • Adjacent angles • Area • Volume • Surface area • Triangles • Quadrilaterals • Polygons • Cubes

• I can find the surface area of three-dimensional objects whose nets are composed of triangles, quadrilaterals, and polygons. • I can solve real-world and mathematical problems involving surface area of three-dimensional objects whose nets are composed of triangles, quadrilaterals, and polygons. • I can solve real-world and mathematical problems involving volume of three-dimensional objects composed of cubes and right rectangular prisms.		

ESSENTIAL QUESTION(S)
• How can geometry be used to solve problems?
	PRIOR KNOWLEDGE
	• 7.17
	  ○ Construct repeating and growing patterns with a variety of representations.
	  ○ Continue an existing pattern.
	  ○ Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
	  ○ Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories.
	  ○ Define unit rate, proportion, and rate.
	  ○ Create a ratio or proportion from a given word problem.
	• 7.18 & 7.21
	  ○ Model using a protractor to draw angles.
	  ○ Measure the length of an object by selecting and using appropriate tools such as a ruler.
	  ○ Recognize attributes of shapes.
	  ○ Define vertex/vertices and angle.
	• 7.19
	  ○ Identify that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals).
	  ○ Recognize and draw shapes having specified attributes such as a given number of angles or a given number of equal faces.
	  ○ Identify triangles, quadrilaterals, pentagons, hexagons, heptagons, and octagons based on the number of sides, angles, and vertices.
	  ○ Define three-dimensional figures, surface area, and nets.
	  ○ Select and create a three-dimensional figure using manipulatives.
	  ○ Identify three-dimensional figures.
	• 7.20	

	○ Define center, radius, and diameter of a circle. ○ Identify real-world examples of radius and diameter. Examples: bicycle wheel, pizza, pie. ● 7.21 ○ Draw points, lines, line segments, and parallel and perpendicular lines, angles, and rays. ● 7.22 ○ Recognize the formula for volume. ○ Define volume, rectangular prism, edge, and formula. ○ Evaluate the volumes of rectangular prisms in the context of solving real-world and mathematical problems. ○ Set up V=lwh and V=Bh to find volumes in the context of solving real-world and mathematical problems. ○ Discover the volume of a rectangular prism using manipulatives. ○ Define three-dimensional figures, surface area, and nets. ○ Evaluate how to apply using surface area of a three-dimensional figure to solving real-world and mathematical problems. ○ Draw nets to find the surface area of a given three-dimensional figure.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES		
Envision Resources	Other Resources Proficiency Scale 7.17 Proficiency Scale 7.18 Proficiency Scale 7.19 Proficiency Scale 7.20 Proficiency Scale 7.21 Proficiency Scale 7.22	ACAP Resources ACAP Summative Resources
RTI	EXTENSION OPPORTUNITIES	

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