

Winston County Schools Curriculum Guide

7th Math (A+ Updated 2023)

1st 9 Weeks

Unit 1 ***Operations*** ***with Rational*** ***Numbers***

(22 days)

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.
- Identify and explain situations where the sum of opposite quantities is 0 and opposite quantities are defined as additive inverses.
 - Interpret the sum of two or more rational numbers, by using a number line and in real-world contexts.
 - Explain subtraction of rational numbers as addition of additive inverses.
 - 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.
 - Extend strategies of multiplication to rational numbers to develop rules for multiplying signed numbers, showing that the properties of the operations are preserved.
 - Divide integers and explain that division by zero is undefined. Interpret the quotient of integers (with a non-zero divisor) as a rational number.
 - Convert a rational number to a decimal using long division, explaining that the decimal form of a rational number terminates or eventually repeats.
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.
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.

I can...

Knowledge:

Students will know:

- the meaning of additive inverse
- the sum of additive inverses is zero
- subtracting a negative is the same as adding a positive
- the strategies of addition, subtraction, multiplication, and division of positive and negative numbers

Skills:

Students will be able to:

- add and subtract positive and negative rational numbers
- multiply and divide positive and negative rational numbers
- divide complex fractions
- perform the steps to converting a rational number to a terminating or repeating decimal.

	• rational numbers will become either terminating or repeating decimals • the appropriate operation in order to find the solution.	
Resources / Technology	A+ , IXL, SAVVAS enVision Mathematics, Eureka Math	
Assessments	A+ Common Assessments	
<i>Unit 2</i> <i>Operations on Expressions</i> <i>(12 days)</i>	6. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. 7. Generate expressions in equivalent forms based on context and explain how the quantities are related. 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.	
I can...	Knowledge: Students will know: • expressions show how quantities are related. • how to apply the distributive property. • know the difference between a constant and a coefficient. • only like terms can be combined to simplify expressions. • factoring is the opposite of the distributive property.	Skills: Students will be able to: • rewrite expressions in different forms • translate a verbal expression into an algebraic expression. • translate an algebraic expression into a verbal expression.
Resources / Technology	A+, IXL, SAVVAS enVision Mathematics, Eureka Math	
Assessments	A+ Common Assessments	
<i>Unit 3</i> <i>Equations and Inequalities</i> <i>(8 days)</i>	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. - Solve word problems leading to equations of the form $px+q = r$, where p, q and r are specific rational numbers. Solve equations of these form fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. - 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.	
I can...	Knowledge: Students will know: - the vocabulary of expressions (coefficient, like terms, distributive property) - inverse operations - the difference between an open and closed circle on the graph of an inequality	Skills: Students will be able to: - write and solve one, two, and multistep equations and inequalities - graph the solution to a single variable inequality on a number line
Resources / Technology	A+, IXL, SAVVAS enVision Mathematics, Eureka Math	
Assessments	A+ Common Assessments	

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2nd 9 Weeks

<i>Unit 3</i> <i>Equations and Inequalities</i> <i>Continued ...</i> <i>(13 days)</i>	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. a. Solve word problems leading to equations of the form $px+q=r$, where p, q and r are specific rational numbers. Solve equations of these form fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. b. Solve word problems leading to inequalities of the form $px+q>r$ or $px+q<r$ where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.		
I can...	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> Knowledge: Students will know: - the vocabulary of expressions (coefficient, like terms, distributive property) - inverse operations - the difference between an open and closed circle on the graph of an inequality </td><td style="width: 50%; padding: 5px;"> Skills: Students will be able to: - write and solve one, two, and multistep equations and inequalities - graph the solution to a single variable inequality on a number line </td></tr> </table>	Knowledge: Students will know: - the vocabulary of expressions (coefficient, like terms, distributive property) - inverse operations - the difference between an open and closed circle on the graph of an inequality	Skills: Students will be able to: - write and solve one, two, and multistep equations and inequalities - graph the solution to a single variable inequality on a number line
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Resources / Technology	A+, IXL , SAVVAS enVision Mathematics, Eureka Math		
Assessments	A+ Common Assessments		
<i>Unit 4</i> <i>Ratios and Proportions</i> <i>(19 days)</i>	1. Calculate unit rates of length, area, and other quantities measured in like or different units that include ratios or fractions. 2. Represent a relationship between two quantities and determine whether the two quantities are related proportionally. a. 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. b. Identify the constant of proportionality (unit rate) and express the proportional relationship using multiple representations including tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. 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.		

I can...	Knowledge: Students will know: - the uses of unit rates in real-world context. - the meaning of points in proportional relationships and how they relate to the given situation. - the constant of proportionality is also considered to be the unit rate. - when to apply unit rates in real-world scenarios.	Skills: Students will be able to: - recognize and represent proportional relationships between quantities. - distinguish proportional relationships from non-proportional. - identify the constant of proportionality given a table, graph, equation or verbal description. - write equations based on given information from graphs, tables, or verbal descriptions. - find unit rates based on given information from graphs, tables, equations, or verbal descriptions. - calculate unit rate.
Resources / Technology	A+, IXL, SAVVAS enVision Mathematics, Eureka Math	
Assessments	A+ Common Assessments	
<i>Unit 5</i> <i>Percent</i> <i>Applications</i> <i>(11 days)</i>	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. 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.	
I can...	Knowledge: Students will know: - The vocabulary of percent applications, including tax, tip/gratuity, discount/markdown, markup, simple interest, commission, percent increase and decrease, and percent error. - Tax and tip/gratuity are added to the subtotal to find the total cost. - Discount/markdown takes money away from the subtotal.	Skills: Students will be able to: - Convert between fractions, decimals, and percents. - Use proportions to solve problems when given two terms out of three from the part, whole, and percent. - Use equations to find the missing term from the part, whole, and percent. - Determine the amount of tax on an item and its total cost. - Determine the amount of tip left on a bill and the total cost.

	• Retail stores markup items in order to make a profit. • Some jobs, especially sales jobs, are based on commission, where the employee makes a percent of the product's selling price. • Markup is an application of percent increase. • Markdown is an application of percent decrease. • Borrowing money in the form of a loan will cause one to pay back more than the initial loan amount.	• Determine the cost of a discounted item. • Determine the amount of commission made from a real-life scenario. • Solve percent increase and decrease problems that simulate real-world situations. • Determine the amount of markup or markdown that simulate real-world situations. • Find the percent error based on a real-life situation. • Apply percent knowledge to real-life situations relating to credit cards and loans. • Calculate interest and explain its effect over a period of time.
Resources / Technology	A+, IXL, SAVVAS enVision Mathematics, Eureka Math	
Assessments	A+ Common Assessments	

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3rd 9 Weeks

Unit 6 Statistics

(15 days)

10. Examine a sample of a population to generalize information about the population.
- Differentiate between a sample and a population.
 - 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.
 - Determine whether conclusions and generalizations can be made about a population based on a sample.
 - 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 make predictions or conclusions about the population.
 - Informally explain situations in which statistical bias may exist.
- 11. Informally assess the degree of visual overlap of two numerical data distributions with roughly equal variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.**
- 12. Make informal comparative inferences about two populations using measures of center and variability and/or mean absolute deviation (MAD) in context.**

I can...

Knowledge:

Students will know:

- when a sample is representative of the population and when it is only representative of a smaller group of the population
- the relationships that exist in developed patterns
- the formula for MAD
- the purpose of various data displays, such as box-and-whisker plots, stem-and-leaf plots, and dotplots

Skills:

Students will be able to:

- calculate measures of center and spread
- calculate and interpret MAD
- compare various data displays to gauge measures of center and variability for two data sets
- gather data from a sample and use that to make inferences about the population
- differentiate between a sample and population
- determine whether a sample is random

Resources /
Technology

A+, IXL, SAVVAS enVision Mathematics, Eureka Math

Assessments

A+ Common Assessments

<i>Unit 7</i> <i>Probability</i> <i>(15 days)</i>	13. Use a number between 0 and 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. 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. a. Collect and use data to predict probabilities of events. b. Compare probabilities from a model to observe frequencies, explaining possible sources of discrepancy. 15. Approximate the probability of an event by using data generated by a simulation (experimental probability) and compare it to theoretical probability. 16. Find probabilities of simple and compound events through experimentation or simulation and by analyzing the sample space, representing the probabilities as percents, decimals, and fractions. a. Represent sample spaces for compound events 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. b. Design and use a simulation to generate frequencies for compound events. c. Represent events described in everyday language in terms of outcomes in the sample space which composed the event.		
I can...	<table> <tr> <td data-bbox="475 1293 898 1883"> Knowledge: Students will know: - the definitions of theoretical & experimental probability - the purpose of a tree diagram in determining sample space and, in turn, compound probability - the Fundamental Counting Principle </td><td data-bbox="898 1293 1411 1883"> Skills: Students will be able to: - design and implement an effective data simulation to generate probability data - calculate simple and compound probability - express probability as a fraction, a decimal, or a percent - determine the likelihood of an event - find and compare theoretical and experimental probabilities - represent sample spaces in lists, tables, or tree diagrams </td></tr> </table>	Knowledge: Students will know: - the definitions of theoretical & experimental probability - the purpose of a tree diagram in determining sample space and, in turn, compound probability - the Fundamental Counting Principle	Skills: Students will be able to: - design and implement an effective data simulation to generate probability data - calculate simple and compound probability - express probability as a fraction, a decimal, or a percent - determine the likelihood of an event - find and compare theoretical and experimental probabilities - represent sample spaces in lists, tables, or tree diagrams
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Assessments	A+ Common Assessments	
<i>Unit 8</i> <i>2D Figures</i> <i>Introduction</i> <i>(13 days)</i>	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. 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. a. Informally derive the formula for the area of a circle. b. Solve area and circumference problems in real-world and mathematical situations involving circles. 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 prisms.	
I can...	Knowledge: Students will know: - the definitions of complementary, supplementary, and corresponding angles - the formulas for circumference and area of a circle and area of a rectangle	Skills: Students will be able to: - use a scale factor to find the area of a scaled figure - provide an informal proof for the formula for the area of a circle - apply the formulas of circumference and area of a circle in real-world contexts
Resources / Technology	A+, IXL, SAVVAS enVision Mathematics, Eureka Math	
Assessments	A+ Common Assessments	

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4th 9 Weeks

Unit 8 *2D Figures* *Continued...*

(6 days)

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.

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.

c. Informally derive the formula for the area of a circle.

d. Solve area and circumference problems in real-world and mathematical situations involving circles.

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 prisms.

I can...

Knowledge:

Students will know:

- the definitions of complementary, supplementary, and corresponding angles
- the formulas for circumference and area of a circle and area of a rectangle

Skills:

Students will be able to:

- use a scale factor to find the area of a scaled figure
- provide an informal proof for the formula for the area of a circle
- apply the formulas of circumference and area of a circle in real-world contexts

Resources /
Technology

A+, IXL, SAVVAS enVision Mathematics, Eureka Math

Assessments

A+ Common Assessments

Unit 9 *Angle and* *Triangle* *Relationships*

(15 days)

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.

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.

I can...

Knowledge:

Students will know:

Skills:

Students will be able to:

	• The Triangle Inequality Theorem states that for a triangle to exist, the sum of any two sides of a triangle must be greater than the third side. • A unique triangle is formed when given 3 sides, 2 sides with included angle, or 2 angles with included side. • No triangle is formed if the sum of the angles exceeds 180°. • More than one triangle is formed given three angle measures adding to 180°. • Complementary angles are two angles whose sum is 90°. • Supplementary angles are two angles whose sum is 180°. • Vertical angles are opposite angles formed by two intersecting lines. • Adjacent angles have a common vertex and ray.	• Determine if three given side lengths form a triangle. • Determine if three given measures form a unique triangle, more than one triangle, or no triangle. • Find the missing measurements of a triangle, given specific angles or sides. • Identify, apply, and solve for unknown angle measures related to supplementary, complementary, adjacent, and vertical angles. • Identify angles that add to 360° and use them to solve for unknown angle measures.
Resources / Technology	A+, IXL, SAVVAS enVision Mathematics, Eureka Math	
Assessments	A+ Common Assessments	
<i>Unit 10</i> <i>3D Applications</i> <i>(14 days)</i>	19. Describe the two-dimensional figures created by slicing three-dimensional figures into plane sections. 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 prisms.	
I can...	Knowledge: Students will know: • the figures that can be produced by slicing a 3D solid parallel or perpendicular to its base • the difference between surface area and volume • the formulas that can be used to calculate the surface area of prisms • the formulas that can be used to calculate the volume of prisms	Skills: Students will be able to: • calculate the surface area of a cube or rectangular prism • calculate the volume of a cube or rectangular prism • relate the formulas for surface area to their respective nets

Resources / Technology	A+, IXL, SAVVAS enVision Mathematics, Eureka Math	
Assessments	A+ Common Assessments	