

Summit Public Schools
Summit, New Jersey
Grade Level 6/ Content Area: Math 6
Length of Course: One School Year

Curriculum

Course Description: In Grade 6, instructional time should focus on four critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking.

1. Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates.
2. Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense.
3. Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems.
4. Students begin to develop their ability to think statistically.

Students in Grade 6 also build on their prior knowledge by reasoning about relationships among shapes to determine area (triangles and quadrilaterals), surface area (prisms & pyramids), and volume (prisms & pyramids). They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

Unit 1: Integers, Decimals & Order of Operations (6 weeks)

Unit 2: Number Theory and Fractions (5 weeks)

Unit 3: Data & Graphs (4 weeks)

Unit 4: Expressions & Equations (6 weeks)

Unit 5: Ratios, Rates & Proportions (6 weeks)

Unit 6: Geometry (5 weeks)

Unit 7: Inequalities & Functions (5 weeks)

Unit 1: Integers, Decimals & Order of Operations

Standard 6.NS & 6.EE.2 (Number System & Order of Operations)

Compute fluently with multi-digit numbers and apply and extend previous understandings of numbers to the system of rational numbers.

Big Ideas: Prentice Hall (Chapters 1.1, 1.2, 1.5 – 1.9 and 11.1 – 11.6)

- Understand the concepts of opposite numbers, negative numbers, and absolute value.
- Compare and order integers and rational numbers.

| | |
|--|---|
| <ul style="list-style-type: none"> Perform multiple step problems by using order of operations. | |
| Essential Questions <i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i> | Enduring Understandings <i>What will students understand about the big ideas?</i> |
| <ul style="list-style-type: none"> How are opposite and negative numbers used in real-world contexts? What is the difference between an integer and a rational number? How do I apply the order of operations in complex, multi step problems? | <ul style="list-style-type: none"> More than integers are necessary to solve real-world applications. Example: negative, opposite, and rational numbers. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order |
| Areas of Focus: Proficiencies (Cumulative Progress Indicators) | Examples, Outcomes, Assessments |
| <p>Students will:</p> <p>6.NS.2. Fluently divide multi-digit numbers using the standard algorithm.</p> <p>6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.</p> <p>6.NS.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.</p> <p>6.NS.7. Understand ordering and absolute value of rational numbers.</p> <p>6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers.</p> | <p>Instructional Focus:</p> <ul style="list-style-type: none"> Whole Numbers Estimating Whole Numbers Understanding Decimals Comparing and Ordering Decimals Adding & Subtracting Decimals Multiplying Decimals Dividing Decimals Exploring Integers Comparing and Ordering Integers Adding Integers Subtracting Integers Multiplying Integers Dividing Integers Order of Operations - Including Exponents Properties of Numbers <p>Sample Assessments:</p> <ul style="list-style-type: none"> Test, Quizzes, Activity List, Senteo Questions Sets <ol style="list-style-type: none"> Express $36 \div 8$ as $4(9 \div 2)$ Calculate $-(-3) = 3$ Write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C. For an account balance of -30 dollars, write $-30 = 30$ to describe the size of the debt in dollars. <p>Instructional Strategies:</p> <ul style="list-style-type: none"> Upside down division for GCF Use of pneumatic devices to memorize order of operations “Box Method” for Factoring |

| | |
|--|---|
| | <p>Interdisciplinary Connections</p> <ul style="list-style-type: none"> • Discuss the connection between Integers and Science. Science: negative numbers when working with temperature and sea levels. Also discuss the connection to money when spending and saving. <p>Technology Integration</p> <ul style="list-style-type: none"> • Internet Games/Activities – utilize various sites to practice skills. • Video Tutors: supporting videos to reinforce lessons <p>Global Perspectives</p> <ul style="list-style-type: none"> • Reflect with students how the metric system with the use of decimals is used as a global form of measurement. |
| <p>The following skills and themes listed to the right should be reflected in the design of units and lessons for this course or content area.</p> | <p>21st Century Skills:</p> <p>Creativity and Innovation</p> <p>Critical Thinking and Problem Solving</p> <p>Communication and Collaboration</p> <p>Information Literacy</p> <p>Media Literacy</p> <p>Life and Career Skills</p> <p>21st Century Themes (as applies to content area):</p> <p>Financial, Economic, Business, and Entrepreneurial Literacy</p> <p>Civic Literacy</p> <p>Health Literacy</p> |

Unit 2: Number Theory and Fractions

| |
|---|
| <p>Standard 6.NS (Fractions (multiplication and division), GCF & LCM) Apply and extend previous understandings of operations with fractions to multiply and divide rational numbers. Solve real-life and mathematical problems using factors and multiples.</p> |
| <p>Big Ideas: Prentice Hall 4.1, 4.3, 4.4 – 4.7, 4.9, 5.1 – 5.5 and 6.1 – 6.4</p> <ul style="list-style-type: none"> • Multiply & divide fractions by fractions (fractions and mixed numbers) |

| | |
|---|--|
| <ul style="list-style-type: none"> Understand the meaning behind least common multiples and greatest common factors. | |
| Essential Questions <i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i> | Enduring Understandings <i>What will students understand about the big ideas?</i> |
| <ul style="list-style-type: none"> How do we solve real world application fraction problems? | <ul style="list-style-type: none"> Apply and extend previous understandings of multiplication and division to divide fractions by fractions. Compute fluently with multi-digit numbers and find common factors and multiples. |
| Areas of Focus: Proficiencies (Cumulative Progress Indicators) | Examples, Outcomes, Assessments |
| <p>Students will:</p> <p>6.NS.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $3/4$-cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi? Compute fluently with multi-digit numbers and find common factors and multiples.</p> <p>6.NS.4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. <i>For example, express $36 + 8$ as $4(9 + 2)$. Apply and extend previous understandings of numbers to the system of rational numbers.</i></p> | <p>Instructional Focus:</p> <ul style="list-style-type: none"> Greatest Common Factor Equivalent, Mixed Numbers and Improper Fractions Least Common Multiple Fractions and Decimals Multiplying and Dividing Fractions and Mixed Numbers <p>Sample Assessments:</p> <ul style="list-style-type: none"> PBL: Party Time – students will work throughout the unit to apply multiplication and division of fractions by manipulating recipes. The use of decimals will be revisited when applying the costs of the ingredients. Quizzes, Activity List, Senteo Question Sets, Tests <p>Sample Questions:</p> <ol style="list-style-type: none"> <i>How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally?</i> <i>How many $3/4$-cup servings are in $2/3$ of a cup of yogurt?</i> <i>How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi?</i> <p>Instructional Strategies:</p> <p>Interdisciplinary Connections</p> <ul style="list-style-type: none"> Cooking – fractions represented in recipes and ingredients. <p>Technology Integration</p> <ul style="list-style-type: none"> Prentice Hall Video Tutor – students can practice required skills as well as review addition and subtraction of fractions. |

| | |
|---|---|
| | <p>Global Perspectives</p> <ul style="list-style-type: none"> Fractions in real-world settings such as distance referenced on street signs, stock prices and ingredients. |
| The following skills and themes listed to the right should be reflected in the design of units and lessons for this course or content area. | <p>21st Century Skills:</p> <p>Creativity and Innovation</p> <p>Critical Thinking and Problem Solving</p> <p>Communication and Collaboration</p> <p>Information Literacy</p> <p>Media Literacy</p> <p>Life and Career Skills</p> <p>21st Century Themes (as applies to content area):</p> <p>Financial, Economic, Business, and Entrepreneurial Literacy</p> <p>Health Literacy</p> |

Unit 3: Data & Graphs

| Standard 6.SP (Statistics) | |
|---|--|
| Develop understanding of statistical variability. Summarize and describe distributions. | |
| Big Ideas: Prentice Hall 2.1-2.7 | |
| <ul style="list-style-type: none"> Understand and interpret data, graphs and tables representing a variety of real-world situations. | |
| Essential Questions | Enduring Understandings |
| <i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i> | <i>What will students understand about the big ideas?</i> |
| <ul style="list-style-type: none"> What kind of information can we get from different types of graphs? How can the mean, median, mode, and range be used to describe the shape of the data? | <ul style="list-style-type: none"> Data extremes can skew sets of data and graphs. Specific graphs can display data more accurately. |
| Areas of Focus: Proficiencies (Cumulative Progress Indicators) | Examples, Outcomes, Assessments |
| Students will: 6.SP.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, “How old am I?” is not a statistical question, but “How old are | Instructional Focus: <ul style="list-style-type: none"> Mean Median & Mode Frequency Tables & Line Plots, Box Plots Bar Graphs & Line Graphs |

| | |
|---|--|
| <p>the students in my school?” is a statistical question because one anticipates variability in students’ ages.</p> <p>6.SP.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.</p> <p>6.SP.3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.</p> <p>6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.</p> <p>6.SP.5. Summarize numerical data sets in relation to their context, such as by: Reporting the number of observations. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.</p> | <ul style="list-style-type: none"> • Organizing Data • Stem-Leaf Plots • Misleading Graphs <p>Sample Assessments:</p> <ul style="list-style-type: none"> • Student conducted survey with supporting data tables, data summaries and various use of graphs. • Quizzes, Tests & Senteo Question Sets <p>Instructional Strategies:</p> <p>Interdisciplinary Connections</p> <ul style="list-style-type: none"> • Social Studies- Review tables and graphs associated with current events and/or economies and construct meaning from information given. • Science-Many experiments display their information in graphs such as showing change over time, etc. • 6th Grade Water Project <p>Technology Integration</p> <ul style="list-style-type: none"> • Use Excel to input data about water usage and then use different graphs to display the data. Compare how the data can be used to influence readers based on type of graph chosen. • M&M Web Quest – research and compare nutritional values of various types flavors of M&M’s. <p>http://academics.uww.edu/cni/webquest/HallOfFame/Snacks/Index.htm</p> <ul style="list-style-type: none"> • Create-a-graph http://nces.ed.gov/NCESKIDS/Graphing/ and make each type of graph with that one set of data and discuss which worked the best and why. <p>Global Perspectives</p> <ul style="list-style-type: none"> • Graph water usage from various parts of the world at a |
|---|--|

| | |
|---|---|
| | given time. Make inferences and interpret data from water usage graphs around the world. |
| The following skills and themes listed to the right should be reflected in the design of units and lessons for this course or content area. | <p>21st Century Skills:</p> <ul style="list-style-type: none"> Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy Life and Career Skills <p>21st Century Themes (as applies to content area):</p> <ul style="list-style-type: none"> Financial, Economic, Business, and Entrepreneurial Literacy Civic Literacy Health Literacy |

Unit 4: Expressions & Equations

| | |
|---|---|
| <p>Standard 6.EE (Expressions & Equations – Including All Rational Numbers) Apply and extend previous understandings of arithmetic to algebraic expressions. Reason about and solve one-variable equations and inequalities. Represent and analyze quantitative relationships between dependent and independent variables.</p> | |
| <p>Big Ideas: Prentice Hall - 3.2, 3.3, 3.5, 11.7, 3.6, 3.7 and 3.8</p> <ul style="list-style-type: none"> • This unit will introduce students to the concepts of powers and order of operations. Students will explore algebraic expressions, equations and tables, as well as use the distributive property to combine like terms. | |
| <p>Essential Questions <i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i></p> | <p>Enduring Understandings <i>What will students understand about the big ideas?</i></p> |
| <ul style="list-style-type: none"> • How do powers affect numbers? • How can order of operations, the distributive property, and combining like terms help solve an algebraic equation? • How can an algebraic expression help me solve a real-world application problem? | <p>Students will understand that...</p> <ul style="list-style-type: none"> • Powers can simplify computation. • Algebraic expressions and equations can help solve real-world application problems. |

| Areas of Focus: Proficiencies (Cumulative Progress Indicators) | Examples, Outcomes, Assessments |
|--|--|
| <p>Students will:</p> <p>7 6.EE.1. Write and evaluate numerical expressions involving whole-number exponents.</p> <p>6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers. Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = \frac{1}{2}$.</p> <p>6.EE.3. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.</p> <p>6.EE.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.</p> <p>6.EE.5. Understand solving an equation or inequality as a process of answering a</p> | <p>Instructional Focus:</p> <ul style="list-style-type: none"> • Variables & Expressions • Writing Algebraic Expressions • Solving Addition Equations • Solving Subtraction Equations • Solving Multiplication & Division • Distributive Property <p>Sample Assessments:</p> <ul style="list-style-type: none"> • Activity List, Quizzes and a Unit test <p>Sample Questions:</p> <ol style="list-style-type: none"> 1. <i>An appliance repairman charges \$50 for coming to a home and \$40 per hour for service. Write an expression to represent her earning for h hours.</i> 2. <i>Karen delivered 7 newspapers and John delivered x number of newspapers. Write an expression to represent how many John delivered if Karen delivered 7 more than John.</i> <p>Instructional Strategies:</p> <p>Interdisciplinary Connections</p> <ul style="list-style-type: none"> • Science: Experiments – constant and variables. • Social Studies-distance formula to calculate distances on a map using a given scale. <p>Technology Integration</p> <ul style="list-style-type: none"> • Algebra Balance Scale – <p>One Step- http://www.mathplayground.com/AlgebraEquations.html</p> <p>Two Step - http://nlvm.usu.edu/en/nav/category_g_3_t_2.html</p> <p>Global Perspectives</p> <ul style="list-style-type: none"> • Transform the distance formula to solve for distance, rate or time between locations on a map with a given scale. |

| | |
|--|--|
| <p>question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p>6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.</p> <p>6.EE.7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.</p> <p>6.EE.9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.</p> <p>6.EE.9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.</p> | |
| <p>The following skills and themes listed to the right should be reflected in the design of units and lessons for this course or content area.</p> | <p>21st Century Skills:</p> <ul style="list-style-type: none"> Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration |

| | |
|--|---|
| | <p>Information Literacy</p> <p>Media Literacy</p> <p>Life and Career Skills</p> <p>21st Century Themes (as applies to content area):</p> <p>Financial, Economic, Business, and Entrepreneurial Literacy</p> <p>Civic Literacy</p> <p>Health Literacy</p> |
|--|---|

Unit 5: Ratios, Rates & Proportions

| Standard 6.RP Ratios & Proportional Relationships | |
|--|---|
| Understand ratio concepts and use ratio reasoning to solve problems. | |
| Big Ideas: Prentice Hall 7.1 – 7.4 | |
| Essential Questions <i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i> | Enduring Understandings <i>What will students understand about the big ideas?</i> |
| <ul style="list-style-type: none"> How do you recognize and represent proportional relationships between quantities? How do you apply proportions? | <ul style="list-style-type: none"> Utilize proportional relationships to solve real-world problems. |
| Areas of Focus: Proficiencies (Cumulative Progress Indicators) | Examples, Outcomes, Assessments |
| <p>6.RP.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”</p> <p>6.RP.2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.”¹</p> <p>6.RP.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g.,</p> | <p>Instructional Focus:</p> <ul style="list-style-type: none"> Ratios Unit Rate Proportions Solving Proportions Percent of a Number <p>Sample Assessments:</p> <ul style="list-style-type: none"> Test, Quizzes, Activity List, Senteo Question Sets <p>Sample Questions:</p> <ol style="list-style-type: none"> His recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar. We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger. Make tables of equivalent ratios relating quantities with whole-number measurements, |

| | |
|---|---|
| <p>by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.</p> <p>a) Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.</p> <p>b) Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?</p> <p>c) Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.</p> <p>d) Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.</p> | <p><i>find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.</i></p> <ol style="list-style-type: none"> 4. <i>If it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?</i> 5. <i>Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.</i> 6. <i>Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.</i> <p>Instructional Strategies:</p> <p>Interdisciplinary Connections</p> <ul style="list-style-type: none"> • Social Studies – map reading – we need to set up ratios to accurately convert the scale to the actual distance. • Science-density formula as a ratio of mass and volume. <p>Technology Integration</p> <ul style="list-style-type: none"> • Input ratios into Excel spreadsheets to create line graphs to display data and show linear relationships <p>Global Perspectives</p> <ul style="list-style-type: none"> • Describe how the metric system is used around the world. We rely on converting standard measurement to metric. |
| <p>The following skills and themes listed to the right should be reflected in the design of units and lessons for this course or content area.</p> | <p>21st Century Skills:</p> <p>Creativity and Innovation</p> <p>Critical Thinking and Problem Solving</p> <p>Communication and Collaboration</p> <p>Information Literacy</p> <p>Media Literacy</p> <p>Life and Career Skills</p> <p>21st Century Themes (as applies to content</p> |

| | |
|--|---|
| | <p>area):</p> <p>Financial, Economic, Business, and Entrepreneurial Literacy</p> <p>Civic Literacy</p> <p>Health Literacy</p> |
|--|---|

Unit 6: Geometry

| Standard 6.G (Geometry) | |
|--|---|
| <p>Solve real-world and mathematical problems involving area, surface area, and volume.</p> | |
| <p>Big Ideas: Prentice Hall 9.3 – 9.10</p> <ul style="list-style-type: none"> Estimate and calculate area and perimeter of polygons. Identify, draw and name parts of three dimensional figures and their nets. Find the surface area and volume of three dimensional figures. | |
| Essential Questions | Enduring Understandings |
| <p><i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i></p> | <p><i>What will students understand about the big ideas?</i></p> |
| <ul style="list-style-type: none"> Is it possible to find the perimeter and/or area of an irregular figure? How do I utilize given formulas to calculate surface area and volume? | <p>Students will understand that...</p> <ul style="list-style-type: none"> How to solve practical problems using perimeter, area, surface area and volume formulas. |
| Areas of Focus: Proficiencies (Cumulative Progress Indicators) | Examples, Outcomes, Assessments |
| <p>Students will:</p> <p>6.G.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.</p> <p>6.G.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l w h$ and $V = b h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.</p> <p>6.G.3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate</p> | <p>Instructional Focus:</p> <ul style="list-style-type: none"> Perimeters & Area Rectangles Area Parallelograms & Triangles Circles & Circumference Area of Circle 3D Figures Surface Area Prisms Volume Rectangular Prism Surface Area & Volume Of Cylinders <p>Sample Assessments:</p> <ul style="list-style-type: none"> Quizzes and Unit test & Senteo Question Sets Activity List-Nets and Volume of Prisms. <p>Instructional Strategies:</p> <p>Interdisciplinary Connections</p> <ul style="list-style-type: none"> Science- Using the volume formula of Prisms and Cylinders to find capacity. Introduction to Technology – when creating various projects, |

| | |
|---|---|
| <p>or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.</p> <p>6.G.4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.</p> | <p>measurement must be accurate for construction.</p> <p>Technology Integration</p> <ul style="list-style-type: none"> Interactive Tutorial/Activity <p>Area Parallelogram & Triangle: http://studyjams.scholastic.com/studyjams/jams/math/measurement.htm</p> <p>Nets of Prisms & Cylinders www.learner.org/interatives/geometry/3d_prisms.html</p> <p>Global Perspectives</p> <ul style="list-style-type: none"> How geometry is used to develop and build everyday items. |
| <p>The following skills and themes listed to the right should be reflected in the design of units and lessons for this course or content area.</p> | <p>21st Century Skills:</p> <ul style="list-style-type: none"> Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration Information Literacy Media Literacy Life and Career Skills <p>21st Century Themes (as applies to content area):</p> <ul style="list-style-type: none"> Financial, Economic, Business, and Entrepreneurial Literacy Civic Literacy Health Literacy |

Unit 6: Inequalities & Functions

| | |
|---|--|
| <p>Standard 6.EE (Expressions & Equations – Including All Rational Numbers) Apply and extend previous understandings of arithmetic to algebraic expressions. Reason about and solve one-variable equations and inequalities. Represent and analyze quantitative relationships between dependent and independent variables</p> | |
| <p>Big Ideas: Prentice Hall 11.8, 11.9, 11.10, 12.2 & 12.3</p> <ul style="list-style-type: none"> Students will apply knowledge of equations to inequalities. Solve functions and apply data to the coordinate plane. | |
| <p style="text-align: center;">Essential Questions</p> <p><i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i></p> | <p style="text-align: center;">Enduring Understandings</p> <p><i>What will students understand about the big ideas?</i></p> |

| <ul style="list-style-type: none"> • What is the Cartesian plane and what does an ordered pair represent? • How can an equation or inequality can be used to represent a given situation? • How is solving an inequality similar to solving an equation? | <p>Students will understand that...</p> <ul style="list-style-type: none"> • An inequality is a statement that two quantities are not equal. The quantities are compared by using symbols $<$, $>$, \leq, \geq • The Cartesian plane and ordered pairs can be utilized to represent real world application problems. |
|---|---|
| Areas of Focus: Proficiencies (Cumulative Progress Indicators) | Examples, Outcomes, Assessments |
| <p>Students will:</p> <p>6.EE.5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.</p> <p>6.EE.8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.</p> <p>6.EE.9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.</p> <p>6.NS.6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.</p> | <p>Instructional Focus:</p> <ul style="list-style-type: none"> • Graphing Coordinate Plane • Applications of Integers • Graphing Functions • Inequalities • Solving One Step Inequalities <p>Sample Assessments:</p> <ul style="list-style-type: none"> • Tests, Quizzes, Senteo Question Sets <p>Instructional Strategies:</p> <p>Interdisciplinary Connections</p> <ul style="list-style-type: none"> • Science-Application and use of integers when working with temperatures • Social Studies-Majority of economic budgets are inequalities not equations. <p>Technology Integration</p> <ul style="list-style-type: none"> • Smart Board Interactive Gallery – “Algebraic Function” <p>Global Perspectives</p> <ul style="list-style-type: none"> • Graphing equations help tell a story and in decision making. Attached: real life personal finance question. <p>http://www.mathchamber.com/PDFs/algebra/Unit%207%20Ticket%20In%20Graphing%20Systems.pdf</p> |
| <p>The following skills and themes listed to the right should be reflected in the design of units and lessons for this course or content area.</p> | <p>21st Century Skills:</p> <p>Creativity and Innovation</p> <p>Critical Thinking and Problem Solving</p> |

| | |
|--|--|
| | Communication and Collaboration Information Literacy Media Literacy Life and Career Skills 21 st Century Themes (as applies to content area): Financial, Economic, Business, and Entrepreneurial Literacy Civic Literacy Health Literacy |
|--|--|

Texts and Resources:

Prentice Hall Mathematics, Course 1 (2008 New Jersey Edition) – (PH)
Connected Mathematics
Prentice Hall Mathematics, Online Resources

Summit Public Schools

Summit, New Jersey

Curricular Addendum

Career-Ready Practices

CRP1: Act as a responsible and contributing citizen and employee.

CRP2: Apply appropriate academic and technical skills.

CRP3: Attend to personal health and financial well-being.

CRP4: Communicate clearly and effectively and with reason.

CRP5: Consider the environmental, social and economic impacts of decisions.

CRP6: Demonstrate creativity and innovation.

CRP7: Employ valid and reliable research strategies.

CRP8: Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9: Model integrity, ethical leadership and effective management.

CRP10: Plan education and career paths aligned to personal goals.

CRP11: Use technology to enhance productivity.

CRP12: Work productively in teams while using cultural global competence.

Interdisciplinary Connections

- Close Reading of works of art, music lyrics, videos, and advertisements
- Use [Standards for Mathematical Practice](#) and [Cross-Cutting Concepts](#) in science to support debate/inquiry across thinking processes

Technology Integration

Ongoing:

- Listen to books on CDs, Playaways, videos, or podcasts if available.
- Use document camera or overhead projector for shared reading of texts.

Other:

- Use Microsoft Word, Inspiration, or SmartBoard Notebook software to write the words from their word sorts.
- Use available technology to create concept maps of unit learning.

**Instructional Strategies:
Supports for English Language Learners:**

| Sensory Supports | Graphic Supports | Interactive Supports |
|-------------------------------------|--------------------|---|
| Real-life objects (realia) | Charts | In pairs or partners |
| Manipulatives | Graphic organizers | In triads or small groups |
| Pictures & photographs | Tables | In a whole group |
| Illustrations, diagrams, & drawings | Graphs | Using cooperative group structures |
| Magazines & newspapers | Timelines | With the Internet (websites) or software programs |
| Physical activities | Number lines | In the home language |
| Videos & films | | With mentors |
| Broadcasts | | |
| Models & figures | | |

from <https://wida.wisc.edu>

Media Literacy Integration

- Use multiple forms of print media (including books, illustrations/photographs/artwork, video clips, commercials, podcasts, audiobooks, Playaways, newspapers, magazines) to practice reading and comprehension skills.

Global Perspectives

- [The Global Learning Resource Library](#)

Differentiation Strategies:

| Accommodations | Interventions | Modifications |
|--|---|---|
| Allow for verbal responses | Multi-sensory techniques | Modified tasks/ expectations |
| Repeat/confirm directions | Increase task structure (e.g., directions, checks for understanding, feedback) | Differentiated materials |
| Permit response provided via computer or electronic device | Increase opportunities to engage in active academic responding (e.g., writing, reading aloud, answering questions in class) | Individualized assessment tools based on student need |
| Audio Books | Utilize prereading strategies and activities: previews, anticipatory guides, and semantic mapping | Modified assessment grading |