| TOMS RIVER REGIONAL SCHOOLS<br>MATHEMATICS CURRICULUM | |
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| **Content Area: Mathematics** | |
| **Course Title: Grade 8 Mathematics** | **Grade Level: 8** |

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| **The Number System** | **4 weeks** |
| **Expressions and Equations** | **14 weeks** |
| **Functions** | **4 weeks** |
| **Geometry** | **8 weeks** |
| **Statistics and Probability** | **5 weeks** |

**Date Created:** **February 06, 2014**

**Board Approved on:**

**TOMS RIVER REGIONAL SCHOOLS**
**MATHEMATICS Unit Overview**

**Content Area: Mathematics**

**Domain:** The Number System

**Cluster:**

- Know that there are numbers that are not rational, and approximate them by rational numbers.

**Cluster Summary:** Students develop an understanding of rational and irrational numbers. They express fractions as terminating or repeating decimals and terminating decimals as fractions. To use rational approximations of irrational numbers to compare and order numbers. As with integers, students learn how to manipulate positive and negative fractions and mixed numbers using addition, subtraction, multiplication, and division to solve problems in everyday contexts. Students understand that it is often useful to convert numbers to other representations in order to solve problems.

**Primary interdisciplinary connections:** Infused within the unit are connections to the NJCCS for Mathematics, Language Arts Literacy and Technology.

**21st century themes:** Through instruction in life and career skills, all students acquire the knowledge and skills needed to prepare for life as citizens and workers in the 21st century. For further clarification see NJ World Class Standards at www.NJ.gov/education/aps/cccs/career/

**Learning Targets**

**Content Statements**

| Number | Common Core Standard for Mastery |
|---|---|
| **MA.8.8.NS.1** | Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. |
| **MA.8.8.NS.2** | Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions. |
| **Unit Essential Questions**<br>• How are decimals, fractions, and percents related?<br>• How do you compare and order rational and irrational numbers? | **Unit Enduring Understandings**<br>*Students will understand that…*<br>• Every number belongs to a set(s) and how the number compares to other numbers.<br>• There are differences between each set of real numbers, particularly between rational and irrational. |

| **Unit Objectives**<br>*Students will understand...* | **Unit Objectives**<br>*Students will be able to…* |
| --- | --- |
| • That every rational number is either a terminating or a repeating decimal.<br>• The real number system and how the subsets relate to one another. | • Convert terminating decimals into reduced fractions, and vice versa.<br>• Compare real numbers and order them on a number line.<br>• Read, write, classify, and compare rational numbers.<br>• Differentiate between rational and irrational numbers.<br>• Use rational approximations or irrational numbers to compare numbers. |

## TOMS RIVER REGIONAL SCHOOLS MATHEMATICS CURRICULUM
### Evidence of Learning

**Formative Assessments**

- Observation
- Homework
- Class participation
- Whiteboards/communicators
- Do-Now
- Notebook
- Writing prompts
- Exit passes

**Summative Assessments**

- Chapter/Unit Test
- Quizzes
- Presentations
- Unit Projects
- Quarterly Exams

**Modifications (ELLs, Special Education, Gifted and Talented)**

- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Follow all IEP modifications/504 plans

**Curriculum development Resources/Instructional Materials/Equipment Needed /Teacher Resources:**

For further clarification refer to State Standards Initiative at **www.corestandards.org.**

- **Microsoft Excel/PowerPoint**
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**Teacher Notes:**

## OCEAN COUNTY MATHEMATICS
## Unit Overview

**Content Area: Mathematics**

**Domain:** Expressions and Equations

**Cluster:**

- Work with radicals and integer exponents
- Understand the connections between proportional relationships, lines, and linear equations.
- Analyze and solve linear equations and pairs of simultaneous linear equations.

**Cluster Summary:** Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students strategically choose and efficiently implement procedures to solve linear equations in one variable, understanding that when they use the properties of equality and the concept of logical equivalence, they maintain the solutions of the original education.

**Primary interdisciplinary connections:** Infused within the unit are connections to the NJCCS for Mathematics, Language Arts Literacy and Technology.

**21st century themes:** Through instruction in life and career skills, all students acquire the knowledge and skills needed to prepare for life as citizens and workers in the 21st century. For further clarification see NJ World Class Standards at www.NJ.gov/education/aps/cccs/career/

### Learning Targets

**Content Statements**

| Number | Common Core Standard for Mastery |
|---|---|
| **MA.8.8.EE.1** | Know and apply the properties of integer exponents to generate equivalent numerical expressions. |
| **MA.8.8.EE.2** | Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that the square root of 2 is irrational. |
| **MA.8.8.EE.3** | Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. |
| **MA.8.8.EE.4** | Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. |

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| **MA.8.8.EE.5** | Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. |
| **MA.8.8.EE.6** | Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b. |
| **MA.8.8.EE.7** | Solve linear equations in one variable. |
| **MA.8.8.EE.7.b** | Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. |
| **MA.8.8.EE.8** | Analyze and solve pairs of simultaneous linear equations. |
| **MA.8.8.EE.8.a** | Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. |
| **MA.8.8.EE.8.b** | Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. |
| **MA.8.8.F.3** | Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. |
| **MA.8.8.F.4** | Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. |
| **MA.8.8.G.7** | Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. |

| Number | Common Core Standard for Introduction |
|---|---|
| **MA.9-12.HSA-SSE.B** | Write expressions in equivalent forms to solve problems |
| **MA.9-12.HSA-SSE.1.a** | Interpret parts of an expression, such as terms, factors, and coefficients. |
| **MA.9-12.HSA-CED.1** | Create equations and inequalities in one variable and use them to solve problems. |
| **MA.9-12.HSA-REI.1** | Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. |
| **MA.9-12.HSA-CED.4** | Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. |
| **Unit Essential Questions**<br>• How do you add, subtract, multiply, and divide very large and small numbers?<br>• How can linear equations be used to represent real-life situations?<br>• What are the connections between proportional relationships, lines, and linear equations? | **Unit Enduring Understandings**<br>***Students will understand that…***<br>• Equation solving is working backwards and undoing operations.<br>• An ordered pair is a solution to an equation, then it must be on the graph of the equation.<br>• A solution to an equation (or a system of equations) is the values of the variables that makes the equation (or both equations) true.<br>• Like terms must be combined.<br>• The distributive property can be used to simplify expressions and solve equations. |
| **Unit Objectives**<br>*Students will understand...*<br>• Expressions are simplified by various means.<br>• Equations can be solved using the properties of equality.<br>• Slope is a constant change.<br>• Slope is the ratio comparing the vertical change to the horizontal change on a coordinate grid.<br>• A y-intercept is the point on a graph where a line of an equation crosses the y-axis.<br>• A coordinate point on a line is a solution to the equation of the line.<br>• A system of equations can have one, no, or an infinite number of solutions.<br>• When a system of equations has one solution, it is represented as the coordinate point where the lines intersect. | **Unit Objectives**<br>*Students will be able to…*<br>• Simplify real number expressions by multiplying and dividing monomials.<br>• Use the law of exponents to find powers of monomials.<br>• Write and evaluate expressions using negative exponents.<br>• Use scientific notation to write small and large numbers.<br>• Compute with numbers written in scientific notation.<br>• Find square roots and cube roots.<br>• Approximate the decimal value of non-perfect squares and cubes.<br>• Differentiate between proportional and non-proportional linear relationships.<br>• Find the slope of a line. |

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| | • Write a direct variation equation.<br>• Graph linear equations written in slope-intercept form by using the slope and y- intercept.<br>• Graph a function written in standard form the using x- and y-intercepts.<br>• Find one solution for a system of two equations.<br>• Solve systems of equations by graphing.<br>• Solve systems of equations by substitution or elimination.<br>• Graph and analyze slope triangles.<br>• Solve one and two-step equations using inverse operations.<br>• Solve equations with variables on both sides.<br>• Solve multi-step equations. |

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**Teacher Notes:**

## TOMS RIVER REGIONAL SCHOOLS MATHEMATICS
## Unit Overview

**Content Area: Mathematics**

**Domain:** Functions

**Cluster:**

- Define, evaluate, and compare functions.
- Use functions to model relationships between quantities.

**Cluster Summary:** Students grasp the concept of a function as a rule that assigns to each input exactly one output. They understand that functions describe situations where one quantity determines another. They can translate among representations and partial representations of functions (noting that tabular and graphical representations may be partial representations), and they describe how aspects of the function are reflected in the different representations.

**Primary interdisciplinary connections:** Infused within the unit are connections to the NJCCS for Mathematics, Language Arts Literacy and Technology.

**21st century themes:** Through instruction in life and career skills, all students acquire the knowledge and skills needed to prepare for life as citizens and workers in the 21st century. For further clarification see NJ World Class Standards at www.NJ.gov/education/aps/cccs/career/

### Learning Targets

**Content Statements**

| Number | Common Core Standard for Mastery |
|---|---|
| **MA.8.8.F.1** | Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. |
| **MA.8.8.F.3** | Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. |
| **MA.8.8.F.4** | Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. |

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| **MA.8.8.EE.5** | Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. |
| **MA.8.8.EE.6** | Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b. |
| **Number** | **Common Core Standard for Introduction** |
| **MA.9-12.HSA-REI.3** | Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. |
| **MA.9-12.HSA-REI.5** | Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. |
| **MA.9-12.HSA-REI.6** | Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. |
| **MA.9-12.HSA-REI.10** | Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). |
| **MA.9-12.HSA-REI.11** | Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. |
| **Unit Essential Questions**<br>• Which representation of a pattern more clearly shows whether or not the pattern is linear: a table of values or a graph of the pattern?<br>• Are all functions linear? Are all lines functions?<br>• What do you expect to see in this graph given its equations? | **Unit Enduring Understandings**<br>***Students will understand that…***<br>• Students will model real-life data with equations and graphs and will be able to interpret what is shown.<br>• Students will compare graphs and analyze the corresponding tables to understand why the graphs are as they are.<br>• Students will be able to make predictions about graphs based on the equations/tables that correspond to them. |

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| **Unit Objectives**<br>*Students will understand...*<br>• The rules of functions.<br>• The slope-intercept form of an equation and its components.<br>• The graphic representation of a unit rate is the slope.<br>• y = mx + b is a linear function. | **Unit Objectives**<br>*Students will be able to…*<br>• Determine if relations are functions.<br>• Complete function tables.<br>• Represent linear functions using tables and graphs.<br>• Compare functions in their different forms (tables, graphs, and equations).<br>• Describe functional relationships (linear vs. nonlinear).<br>• Translate verbal expressions to create function equations.<br>• Graph equations in two variables by making a table of values and plotting points.<br>• Write an equation from the given graph using the slope and y-intercept. |

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**Teacher Notes:**

| TOMS RIVER REGIONAL SCHOOLS MATHEMATICS<br>Unit Overview | |
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| **Content Area: Mathematics** | |
| **Domain:** Geometry | |
| **Cluster:**<br>• Understand congruence and similarity using physical models, transparencies, or geometry software.<br>• Understand and apply the Pythagorean Theorem.<br>• Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. | |
| **Cluster Summary:** Students use ideas about distance and angles, how they behave under translations, rotations, reflections, and dilations, and ideas about congruence and similarity to describe and analyze two-dimensional figures and to solve problems. Students understand the Pythagorean Theorem and apply it to find distances between points on the coordinate plane, to find lengths, and to analyze polygons. Students complete their work on volume by solving problems involving cones, cylinders, and spheres.<br><br>**Primary interdisciplinary connections:** Infused within the unit are connections to the NJCCS for Mathematics, Language Arts Literacy and Technology.<br><br>**21st century themes:** Through instruction in life and career skills, all students acquire the knowledge and skills needed to prepare for life as citizens and workers in the 21st century. For further clarification see NJ World Class Standards at www.NJ.gov/education/aps/cccs/career/ | |
| **Learning Targets** | |
| **Content Statements** | |
| **Number** | **Common Core Standard for Mastery** |
| **MA.8.8.EE.2** | Use square root and cube root symbols to represent solutions to equations of the form x = p and x = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that the square root of 2 is irrational. |
| **MA.8.8.G.1** | Verify experimentally the properties of rotations, reflections, and translations |
| **MA.8.8.G.1.a** | Lines are taken to lines, and line segments to line segments of the same length. |
| **MA.8.8.G.1.b** | Angles are taken to angles of the same measure. |
| **MA.8.8.G.1.c** | Parallel lines are taken to parallel lines. |
| **MA.8.8.G.2** | Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the |

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| | congruence between them. |
| **MA.8.8.G.3** | Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. |
| **MA.8.8.G.4** | Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. |
| **MA.8.8.G.5** | Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. |
| **MA.8.8.G.6** | Explain a proof of the Pythagorean Theorem and its converse. |
| **MA.8.8.G.7** | Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. |
| **MA.8.8.G.8** | Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. |
| **MA.8.8.G.9** | Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. |
| **Number** | **Common Core Standard for Introduction** |
| **MA.9-12.HSG-CO.9** | Prove theorems about lines and angles. |
| **MA.9-12.HSG-CO.10** | Prove theorems about triangles. |
| **MA.9-12.HSG-CO.11** | Prove theorems about parallelograms. |
| **MA.9-12.HSG-CO.12** | Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). |
| **Unit Essential Questions**<br>• Will a transversal always create a pair of congruent obtuse angles and a pair of congruent acute angles?<br>• Why must you find the area of a figures base and multiply that by its height in order to find its volume?<br>• How do you know if two shapes are similar? What's the difference between similar shapes and congruent shapes?<br>• When is the Pythagorean Theorem applicable? | **Unit Enduring Understandings**<br>***Students will understand that…***<br>• Students will be able to find the missing angles in shapes and sets of lines using their vocabulary knowledge.<br>• Students will be able to explain how to obtain an image from its pre-image and vice versa.<br>• Students will be able to solve real world problems using the Pythagorean Theorem<br>• Students will know that volume is the same as area but in three-dimensions instead of two-dimensions. Knowing this, they will understand that in order to determine a shapes volume, they must multiply the area of the shapes' base by the height of the shape. |

| **Unit Objectives**<br>*Students will understand...*<br>• The relationship among the angles in polygons.<br>• That a regular polygon is both equilateral and equiangular.<br>• That reflections, rotations, and translations result in congruent figures.<br>• That dilations result in similar figures. | **Unit Objectives**<br>*Students will be able to…*<br>• Identify parallel and perpendicular lines.<br>• Identify types of angles.<br>• Identify angles formed by a transversal.<br>• Find missing angles in polygons.<br>• Calculate the sum of the angles in any polygon.<br>• Calculate the measurement of one angle in a regular polygon.<br>• Rotate an image about the origin.<br>• Reflect an image across the x- or y-axis.<br>• Translate an image according to specified directions.<br>• Dilate an image according to a scale factor.<br>• Identify similar polygons and find missing measures of similar polygons.<br>• Determine if a triangle is a right triangle using the Pythagorean Theorem.<br>• Use the Pythagorean Theorem to find unknown side lengths of right triangles.<br>• Apply the Pythagorean Theorem to find the distance between two points on a coordinate grid.<br>• Use the Pythagorean Theorem to find unknown dimensions of three-dimensional figures.<br>• Find the volume of prisms, pyramids, cylinders, cones, and spheres. |
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**Teacher Notes:**

| TOMS RIVER REGIONAL SCHOOLS MATHEMATICS<br>Unit Overview | |
|---|---|
| **Content Area: Mathematics** | |
| **Domain:** Statistics and Probability | |
| **Cluster:**<br>• Investigate patterns of association in bivariate data. | |
| **Cluster Summary:** Students use a linear equation to describe the association between two quantities in bivariate data (such as arm span vs. height for students in a classroom). At this grade, fitting the model, and assessing its fit to the data are done informally. Interpreting the model in the context of the data requires students to express a relationship between the two quantities in question and to interpret components of the relationship in terms of the situation.<br><br>**Primary interdisciplinary connections:** Infused within the unit are connections to the NJCCS for Mathematics, Language Arts Literacy and Technology.<br><br>**21st century themes:** Through instruction in life and career skills, all students acquire the knowledge and skills needed to prepare for life as citizens and workers in the 21st century. For further clarification see NJ World Class Standards at www.NJ.gov/education/aps/cccs/career/ | |
| **Learning Targets** | |
| **Content Statements** | |
| **Number** | **Common Core Standard for Mastery** |
| **MA.8.8.SP.** | Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. |
| **MA.8.8.SP.2** | Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. |
| **MA.8.8.SP.3** | Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. |
| **MA.8.8.SP.4** | Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. |

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| **Unit Essential Questions**<br>• What do you expect to see in the scatter plot based on the predicted correlation from the data?<br>• Using the best-fit-line equation, find the x-value(s) for the given y-value and vice versa.<br>• Is the y-intercept of the best-fit-line equation reasonable for the given situation?<br>• Why do you think the data does/doesn't have a linear trend? | **Unit Enduring Understandings**<br>***Students will understand that…***<br>• Scatter plots can be created by both hand and technology.<br>• Scatter plots can be used to analyze real-world data to make predictions about future data. |
| **Unit Objectives**<br>*Students will understand...*<br>• A line of best fit can be used to make predictions if a linear association exists between two variables. | **Unit Objectives**<br>*Students will be able to…*<br>• Create and interpret scatter plots.<br>• Make predictions of correlations based on the data topics.<br>• Identify correlations of scatter plots.<br>• Determine the best-fit lines for the data.<br>• Find the equation of the best-fit lines.<br>• Use the best-fit line to predict values of data.<br>• Solve problems in the context of bivariate measurement data interpreting the slope and intercept.<br>• Construct and interpret a two-way table.<br>• Calculate relative frequencies and use them to describe a possible association between the variables. |

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- **Teacher-made tests, worksheets, warm-ups, and quizzes**
- **Computer software to support unit**
  - www.Kutasoftware.com
  - www.Khanacademy.com
  - www.mathworksheetsite.com
  - www.studyisland.com
  - www.brightstorm.com
  - http://www.ixl.com/

**Teacher Notes:**

| THE NUMBER SYSTEM | | |
|---|---|---|
| **PRE-REQUISITE SKILLS AND KNOWLEDGE** | **EXPECTED MASTERY** | **SKILLS AND KNOWLEDGE TO BE INTRODUCED, BUT NOT MASTERED** |
| – Convert rational numbers to decimals using long division.<br>– Perform operations with rational numbers (including fractions and decimals). | • **Know that real numbers that are not rational are called irrational.**<br>• **Approximate the value of irrational numbers using rational numbers.**<br>– Know that all rational numbers either terminate or repeat.<br>– Find square and cube roots. | |

| EXPRESSIONS & EQUATIONS: RADICALS & INTEGER EXPONENTS | | |
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| **PRE-REQUISITE SKILLS AND KNOWLEDGE** | **EXPECTED MASTERY** | **SKILLS AND KNOWLEDGE TO BE INTRODUCED, BUT NOT MASTERED** |
| – Write and evaluate numerical expressions involving whole-number exponents.<br>– Perform operations with rational numbers (including fractions and decimals). | • **Know and apply the properties of integer exponents (including negative exponents).**<br>– Use scientific notation to estimate very large and very small quantities.<br>– Perform operations with numbers written in scientific notation. | – Interpret scientific notation that has been generated by technology. |

| EXPRESSIONS & EQUATIONS: LINEAR RELATIONSHIPS | | |
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| **PRE-REQUISITE SKILLS AND KNOWLEDGE** | **EXPECTED MASTERY** | **SKILLS AND KNOWLEDGE TO BE INTRODUCED, BUT NOT MASTERED** |
| – Write, graph, and solve one-step equations, including negative numbers.<br>– Solve two-step equations.<br>– Solve real-life and mathematical problems using numerical and algebraic expression and equations.<br>– Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions. | • **Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.**<br>• **Show that a linear equation in one variable has one solution, infinitely many solutions, or no solution by transforming the equation into simpler forms.**<br>• **Compare linear relationships presented in different ways.**<br>• **Interpret the unit rate as the slope.**<br>• **Derive equations in y = mx** | – Rewriting equations in different forms. |

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| | **and y = mx + b.**<br>• **Understand that the solution of a system of two linear equations in two variables corresponds to the point of intersection of their graphs.**<br>• **Solve systems of two linear equations in two variables graphically and algebraically.** | |

| **FUNCTIONS** | | |
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| **PRE-REQUISITE SKILLS AND KNOWLEDGE** | **EXPECTED MASTERY** | **SKILLS AND KNOWLEDGE TO BE INTRODUCED, BUT NOT MASTERED** |
| – Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions.<br>– Represent proportional relationships with equations. | • **Understand the definition of a function.**<br>• **Compare and write functions in different ways.**<br>• **Understand that y = mx + b is a linear function.** | – Recognize nonlinear functions. |

| **GEOMETRY** | | |
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| **PRE-REQUISITE SKILLS AND KNOWLEDGE** | **EXPECTED MASTERY** | **SKILLS AND KNOWLEDGE TO BE INTRODUCED, BUT NOT MASTERED** |
| – Use proportionality to solve ratio problems.<br>– Reproduce a scale drawing at a different scale.<br>– Measure and describe relationships among vertical, adjacent, supplementary, and complementary angles.<br>– Find areas and circumferences of circles.<br>– Solve problems involving area, volume, and surface area of objects composed of triangles, quadrilaterals, cubes, and right prisms. | • **Understand that reflections, rotations, and translations produce congruent figures.**<br>• **Understand that dilations produce similar figures.**<br>• **Explain a proof of the Pythagorean Theorem and its converse.**<br>• **Use the Pythagorean Theorem to find missing measures of right triangles and distances between points in the coordinate plane.**<br>• **Know and apply the formulas for the volumes of cones, cylinders, and spheres.**<br><br>– Describe translations, reflections, rotations, and dilations using coordinates.<br>– Describe a sequence of transformations between two congruent or similar figures.<br>– Classify and determine the measures of angles created when parallel lines are cut by a transversal.<br>– Demonstrate that the sum of | – Recognize Pythagorean triplets.<br>– Apply properties of special right triangles.<br>– Similarity of solids |

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| | the interior angle measures of a triangle is 180° and apply this fact to find the unknown measures of angles and the sum of the angles of polygons. | |

| STATISTICS & PROBABILITY | | |
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| **PRE-REQUISITE SKILLS AND KNOWLEDGE** | **EXPECTED MASTERY** | **SKILLS AND KNOWLEDGE TO BE INTRODUCED, BUT NOT MASTERED** |
| | • **Construct and interpret scatter plots.**<br>• **Find and assess lines of fit for scatter plots.**<br>• **Use equations of lines to solve problems and interpret the slope and the y-intercept.**<br>• **Create and analyze two-way tables.** | |