

Expressions and Equations

Grade 8 Math Grade 8 Math

Start Date: September 09, 2013

End Date : November 08, 2013

Unit Overview	Content Elaborations	Unit Resources
<p>Students will be able to:</p> <p>Apply properties of integer exponents.</p> <p>Use square and cube roots to represent solutions of equations.</p> <p>Create, use, and manipulate scientific notation to represent very large and very small numbers.</p> <p>Use a constant rate to compare two proportional relationships.</p> <p>Use slope to compare two similar real-world objects using points on a non-vertical line and the slope-intercept equation.</p> <p>Solve linear equations in one variable using inverse operations, distributive property, and combining like terms to find solutions which can be a rational number, infinitely many solutions, or no solutions.</p> <p>Solve real world and algebraic linear systems of equations by graphing, algebraically, and guess and check.</p>	<p>Working with irrational numbers, integer exponents, and scientific notation. Know and apply the properties of integer exponents to generate equivalent numerical expressions.</p> <p>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 $\sqrt{2}$ is irrational</p> <p>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.</p> <p>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.</p> <p>Formulating and reasoning about expressions and equations, including modeling an association in bivariate data</p>	<p>Holt Pre-Algebra: Cube Root Lesson(made up) 2-9 -----McDougal Littel Algebra 1 8.5 Scientific Notation Lab(planetary distance and/or bacteria-virus size) 1-1 1-3 1-4 1-6 1-5 --assessment-- 10-1 10-2 10-3 10-4 10-4 10-6 --assessment-- 7-1 7-2 7-4 --assessment-- McDougal Littel Algebra 1 4.1 McDougal Littel Algebra 1 4.2 McDougal Littel Algebra 1 4.5 McDougal Littel Algebra 1 4.7</p>

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with a linear equation, and solving linear equations and systems of linear equations and, analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

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

Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations.

Barbie Bungie Jump
System of Equations Lab
11-5*
--assessment--
Smart Board lessons
Common Core Model Curriculum
Study Island

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Solve linear equations in one variable. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). Solve linear equations with rational number coefficients, including equations whose solutions

Analyze and solve pairs of simultaneous linear equations. 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. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.* Solve real-world and mathematical problems leading to two linear equations in two variables

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Unit Vocabulary	Enduring Understandings (Big Ideas)	Connections
<p>Scientific notation cube roots power exponential form base exponents square roots slope unit rate proportions similar figures slope-intercept form coordinate plane axis (x and y) intercepts(x and y) rise run line plane ratio equivalent ratios rate unit price analyze units conversion factors cross-product linear systems algebraic expressions</p>	<p>Write with radical and integer exponents. Understand the connections between proportional relationships, lines and linear equations. Analyze and solve linear equations and pairs of simultaneous linear equations.</p>	<p>This cluster goes beyond the Grade 8 Critical Areas of Focus to address Working with irrational numbers, integer exponents, and Scientific notation.</p> <p>This cluster is connected to the Grade 8 Critical Area of Focus #1, Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations and Critical Area of Focus #3, Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.</p> <p>This cluster is connected to the Grade 8 Critical Area of Focus #1, Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations.</p>

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algebraic inequalities coefficients constants equation evaluate inverse operation isolate the variable like terms origin ordered pairs solution substitute coordinate(x and y) distributive property systems of equations direct variation Quadrant		
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Standards

CC Common Core State Standards - Mathematics (2010) - Grade 8

Domain 8.EE Expressions and Equations

Cluster Statement Work with radicals and integer exponents.

Standard 8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.

Standard 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.

Standard 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.

Standard 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.

Cluster Statement Understand the connections between proportional relationships, lines, and linear equations.

Standard 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.

Standard 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 .

Cluster Statement Analyze and solve linear equations and pairs of simultaneous linear equations.

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Standard 8.EE.7 Solve linear equations in one variable.

8.EE.7.a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).

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.

Standard 8.EE.8 Analyze and solve pairs of simultaneous linear equations.

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.

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.

8.EE.8.c Solve real-world and mathematical problems leading to two linear equations in two variables.

Student Assessment	Unit Reflection
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Expressions and Equations

Content	Skills	Assessment
<ul style="list-style-type: none"> A. Cube Roots B. Scientific Notation C. Algebraic Expression/Equations/Inequalities D. Solving Multi-Step Equations/Inequalities E. Systems of Equations F. Proportional Reasoning G. Graphing Linear Equations 	<ul style="list-style-type: none"> A. Cube Roots <ul style="list-style-type: none"> 1. Evaluating cubes 2. Evaluating cube roots B. Scientific Notation <ul style="list-style-type: none"> 1. Expressing large and small numbers 2. Operations C. Algebraic Expression/Equations/Inequalities <ul style="list-style-type: none"> 1. Evaluate 2. Write 3. Solve 1-step equations/inequalities 4. Combine like terms D. Solving Multi-Step Equations/Inequalities <ul style="list-style-type: none"> 1. Two-step equations 2. Multi-step equations 3. Variables on both sides 4. Multi-step inequalities E. Systems of Equations <ul style="list-style-type: none"> 1. Linear combinations 2. Substitution F. Proportional Reasoning <ul style="list-style-type: none"> 1. Ratios and proportions 2. Rates and unit rates 3. Solving proportions G. Graphing Linear Equations 	<ul style="list-style-type: none"> Assessments- Daily Work/Independent Practice- District Short Cycle- Student Labs- Student Observations-

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| | <ol style="list-style-type: none">1. Ordered Pairs2. Coordinate Plane3. x/y tables4. Function form5. Slope6. slope-intercept form7. graphing | |
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