ONSLOW COUNTY SCHOOLS

Course: MATH 1 (8th Grade)
Compacted-Accelerated Curriculum

Standards Division Document
School Year 2016-17

Snapshot of Standards

- 1st Nine Weeks: Essential Questions & Academic Vocabulary
- 2nd Nine Weeks: Essential Questions & Academic Vocabulary
- 3rd Nine Weeks: Essential Questions & Academic Vocabulary
- 4th Nine Weeks: Essential Questions & Academic Vocabulary

Unpacking Document: Math 1 with RESOURCES** ***Draft

(Once opened, click on *UPDATED July, 2016* Google Folder: Math Resources for Instruction in top right-hand corner to download document)

Unpacking Document: 8th Grade with RESOURCES

Released EOG/EOC

EOC Weighted Distribution

8 Mathematical Practices

1:1 Activities Video Links Vetted Resources

Assessment Options Flip Books STEM / Project Based Learning Links

First Nine Weeks **SNAPSHOT**	Second Nine Weeks **SNAPSHOT**	Third Nine Weeks **SNAPSHOT**	Fourth Nine Weeks **SNAPSHOT**
Major Concepts: Number systems, Scientific Notation, Solving one variable, Functions notation, Linear equations & functions	**Major Concept:** Solving one variable inequalities, Systems of Equations & Inequalities, Exponential Functions, Geometric sequences.	**Major Concept:** Operations with polynomials, exponent rules, quadratic functions.	**Major Concept:** Wrap up Quadratics, One variable statistics, Coordinate geometry, Prep for and administer EOG & EOC.
Standards 8.EE.1 8.EE.3 8.EE.4 NC.M1.A-APR.1 NC.M1.A-CED.1 , 4 NC.M1.A-REI.1 , 3 8.F.1 8.F.2 8.F.3 8.F.4 8.F.5 NC.M1.F-IF.1 , 2, 3, 4, 5, 6 NC.M1.A-SSE.1a & b NC.M1.A-CED. 1, 2 NC.M1.A-REI.10 NC.M1.F-IF. 2, 3, 4, 5, 6, 7, 9 NC.M1.F-LE.1, 5 NC.M1.F-BF.1a & b , 2 NC.M1.G-GPE.5 8.SP.1 8.SP.2 8.SP.3 NC.M1.S-ID.6a & b, 7, 8, 9	**Standards** 8.EE.8 NC.M1.A-CED. 3 NC.M1.A-REI.5, 6, 10, 11, 12 NC.M1.A-SSE.1a & b NC.M1.A-CED.1, 2 NC.M1.A-REI.10, 11 NC.M1.F-IF.2, 3, 4, 5, 6, 7, 8b, 9 NC.M1.F-BF.1a & b, 2 NC.M1.F-LE.1, 3, 5 NC.M1.S-ID.6c NC.M1.N-RN.2 NC.M1.A-APR.1 NC.M1.F-BF.1b, 2	**Standards** NC.M1.A-SSE.1a, 1b, 3 NC.M1.A-APR.3 NC.M1.A-CED.1, 2 NC.M1.A-REI.1, 4, 11 8.F.1 8.F.2 8.F.3 8.F.4 8.F.5 NC.M1.F-IF.2, 4, 5, 6, 7, 8a, 9 NC.M1.F-BF.1b NC.M1.F-LE.3	**Standards** 8.SP.4 NC.M1.S-ID.1, 2, 3 NC.M1.G-GPE.4, 5, 6 **Return to Main Menu**

PLEASE NOTE: RESOURCES ARE STILL BEING POPULATED TO THE NC DPI SITE. THEREFORE, GO TO THE *Unpacking Document: Math 1 with RESOURCES *Draft* LINK ON THE MAIN MENU PAGE, AND CHECK PERIODICALLY TO VIEW RECENT UPDATES.

IN THE NEAR FUTURE ADDITIONAL INFORMATION AND RESOURCES WILL BE UPLOADED TO ONENOTE AND DESSIMINATED TO THE SCHOOLS.

Public Schools of North Carolina
State Board of Education | Department of Public Instruction

8th Grade Mathematics ● Unpacked Content

For the new Common Core standards that will be effective in all North Carolina schools in the 2012-13 School Year.

This document is designed to help North Carolina educators teach the Common Core (Standard Course of Study). NCDPI staff are continually updating and improving these tools to better serve teachers.

What is the purpose of this document?
To increase student achievement by ensuring educators understand specifically what the new standards mean a student must know, understand and be able to do.

What is in the document?
Descriptions of what each standard means a student will know, understand and be able to do. The "unpacking" of the standards done in this document is an effort to answer a simple question "What does this standard mean that a student must know and be able to do?" and to ensure the description is helpful, specific and comprehensive for educators.

How do I send Feedback?
We intend the explanations and examples in this document to be helpful and specific. That said, we believe that as this document is used, teachers and educators will find ways in which the unpacking can be improved and made ever more useful. Please send feedback to us at feedback@dpi.state.nc.us and we will use your input to refine our unpacking of the standards. Thank You!

Just want the standards alone?
You can find the standards alone at www.corestandards.org .

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At A Glance

This page was added to give a snapshot of the mathematical concepts that are new or have been removed from this grade level as well as instructional considerations for the first year of implementation.

New to 8th Grade:

- Integer exponents with numerical bases (8.EE.1)
- Scientific notation, including multiplication and division (8.EE.3 and 8.EE.4)
- Unit rate as slope (8.EE.5)
- Qualitative graphing (8.F.5)
- Transformations (8.G.1 and 8.G.3)
- Congruent and similar figures (characterized through transformations) (8.G.2 and 8.G.4)
- Angles (exterior angles, parallel cut by transversal, angle-angle criterion) (8.G.5)
- Finding diagonal distances on a coordinate plane using the Pythagorean Theorem (8.G.8)
- Volume of cones, cylinders and spheres (8.G.9)
- Two-way tables (8.SP.4)

Moved from 8th Grade:

- Indirect measurement (embedded throughout)
- Linear inequalities (moved to high school)
- Effect of dimension changes (moved to high school)
- Misuses of data (embedded throughout)
- Function notation (moved to high school)
- Point-slope form (moved to high school) and standard form of a linear equation (not in CCSS)

Notes:

- Topics may appear to be similar between the CCSS and the 2003 NCSCOS; however, the CCSS may be presented at a higher cognitive demand.
- **For more detailed information, see the crosswalks (http://www.ncpublicschools.org/acre/standards/common-core-tools)**

Instructional considerations for CCSS implementation in 2012 – 2013:

- Solving proportions with tables, graphs, equations (7.RP.2a, 7.RP.2b, 7.RP.2c, 7.RP.2d) – prerequisite to 8.EE.5
- Identifying the conditions for lengths to make a triangle (7.G.2)
- Supplementary, complementary, vertical and adjacent angles (7.G.5) – prerequisite to 8.G.5
- Finding vertical and horizontal distances on the coordinate plane (6.NS.3) – foundational to 8.G.8
- Mean Absolute Deviation (6.SP.5c) – foundational to standard deviation in Math One standards so could be addressed at that time.

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Standards for Mathematical Practice

The Common Core State Standards for Mathematical Practice are expected to be integrated into every mathematics lesson for all students Grades K-12. Below are a few examples of how these Practices may be integrated into tasks that students complete.

Standards for Mathematical Practice	Explanations and Examples
1. Make sense of problems and persevere in solving them.	In grade 8, students solve real world problems through the application of algebraic and geometric concepts. Students seek the meaning of a problem and look for efficient ways to represent and solve it. They may check their thinking by asking themselves, "What is the most efficient way to solve the problem?", "Does this make sense?", and "Can I solve the problem in a different way?"
2. Reason abstractly and quantitatively.	In grade 8, students represent a wide variety of real world contexts through the use of real numbers and variables in mathematical expressions, equations, and inequalities. They examine patterns in data and assess the degree of linearity of functions. Students contextualize to understand the meaning of the number or variable as related to the problem and decontextualize to manipulate symbolic representations by applying properties of operations.
3. Construct viable arguments and critique the reasoning of others.	In grade 8, students construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.). They further refine their mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students. They pose questions like "How did you get that?", "Why is that true?" "Does that always work?" They explain their thinking to others and respond to others' thinking.
4. Model with mathematics.	In grade 8, students model problem situations symbolically, graphically, tabularly, and contextually. Students form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations. Students solve systems of linear equations and compare properties of functions provided in different forms. Students use scatterplots to represent data and describe associations between variables. Students need many opportunities to connect and explain the connections between the different representations. They should be able to use all of these representations as appropriate to a problem context.
5. Use appropriate tools strategically.	Students consider available tools (including estimation and technology) when solving a mathematical problem and decide when certain tools might be helpful. For instance, students in grade 8 may translate a set of data given in tabular form to a graphical representation to compare it to another data set. Students might draw pictures, use applets, or write equations to show the relationships between the angles created by a transversal.
6. Attend to precision.	In grade 8, students continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning. Students use appropriate terminology when referring to the number system, functions, geometric figures, and data displays.
7. Look for and make use of structure.	Students routinely seek patterns or structures to model and solve problems. In grade 8, students apply properties to generate equivalent expressions and solve equations. Students examine patterns in tables and graphs to generate equations and describe relationships. Additionally, students experimentally verify the effects of transformations and describe them in terms of congruence and similarity. **Return to Main Menu**

Standards for Mathematical Practice	Explanations and Examples
8. Look for and express regularity in repeated reasoning.	In grade 8, students use repeated reasoning to understand algorithms and make generalizations about patterns. Students use iterative processes to determine more precise rational approximations for irrational numbers. They analyze patterns of repeating decimals to identify the corresponding fraction. During multiple opportunities to solve and model problems, they notice that the slope of a line and rate of change are the same value. Students flexibly make connections between covariance, rates, and representations showing the relationships between quantities.

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Grade 8 Critical Areas (from CCSS pg. 52)

The Critical Areas are designed to bring focus to the standards at each grade by describing the big ideas that educators can use to build their curriculum and to guide instruction. The Critical Areas for eighth grade can be found on page 52 in the *Common Core State Standards for Mathematics.*

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**
   Students use linear equations and systems of linear equations to represent, analyze, and solve a variety of problems. Students recognize equations for proportions ($y/x = m$ or $y = mx$) as special linear equations ($y = mx + b$), understanding that the constant of proportionality (m) is the slope, and the graphs are lines through the origin. They understand that the slope (m) of a line is a constant rate of change, so that if the input or x-coordinate changes by an amount A, the output or y-coordinate changes by the amount $m \cdot A$. Students also 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 (such as slope and y-intercept) in terms of the situation.

   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 equation. Students solve systems of two linear equations in two variables and relate the systems to pairs of lines in the plane; these intersect, are parallel, or are the same line. Students use linear equations, systems of linear equations, linear functions, and their understanding of slope of a line to analyze situations and solve problems.

2. **Grasping the concept of a function and using functions to describe quantitative relationships**
   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.

3. **Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem**
   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 show that the sum of the angles in a triangle is the angle formed by a straight line, and that various configurations of lines give rise to similar triangles because of the angles created when a transversal cuts parallel lines. Students understand the statement of the Pythagorean Theorem and its converse, and can explain why the Pythagorean Theorem holds, for example, by decomposing a square in two different ways. They apply the Pythagorean Theorem 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.

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Expressions and Equations 8.EE

Common Core Cluster

Work with radicals and integer exponents.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: **laws of exponents, power, perfect squares, perfect cubes, root, square root, cube root, scientific notation, standard form of a number.** Students should also be able to read and use the symbol: ±

Common Core Standard	Unpacking What does this standard mean that a student will know and be able to do?
RESOURCES Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,* $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	**8.EE.1** In 6th grade, students wrote and evaluated simple numerical expressions with whole number exponents (ie. $5^3 = 5 \cdot 5 \cdot 5 = 125$). Integer (positive and negative) exponents are further developed to generate equivalent numerical expressions when multiplying, dividing or raising a power to a power. Using numerical bases and the laws of exponents, students generate equivalent expressions. Students understand: • Bases must be the same before exponents can be added, subtracted or multiplied. (Example 1) • Exponents are subtracted when like bases are being divided (Example 2) • A number raised to the zero (0) power is equal to one. (Example 3) • Negative exponents occur when there are more factors in the denominator. These exponents can be expressed as a positive if left in the denominator. (Example 4) • Exponents are added when like bases are being multiplied (Example 5) • Exponents are multiplied when an exponents is raised to an exponent (Example 6) • Several properties may be used to simplify an expression (Example 7) Example 1: $\frac{2^3}{5^2} = \frac{8}{25}$ Example 2: $\frac{2^2}{2^6} = 2^{2-6} = 2^{-4} = \frac{1}{2^4} = \frac{1}{16}$ Example 3: $6^0 = 1$ Students understand this relationship from examples such as $\frac{6^2}{6^2}$. This expression could be simplified as $\frac{36}{36} = 1$. Using the laws of exponents this expression could also be written as $6^{2-2} = 6^0$. Combining these gives $6^0 = 1$. Example 4: $\frac{3^{-2}}{2^4} = 3^{-2} \text{ x } \frac{1}{2^4} = \frac{1}{3^2} \text{ x } \frac{1}{2^4} = \frac{1}{9} \text{ x } \frac{1}{16} = \frac{1}{144}$

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	Example 5: $(3^2)(3^4) = (3^{2+4}) = 3^6 = 729$ Example 6: $(4^3)^2 = 4^{3x2} = 4^6 = 4{,}096$ Example 7: $\frac{(3^2)^4}{(3^2)(3^3)} = \frac{3^{2x4}}{3^{2+3}} = \frac{3^8}{3^5} = 3^{8-5} = 3^3 = 27$
RESOURCES 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. *For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger.*	**8.EE.3** Students use scientific notation to express very large or very small numbers. Students compare and interpret scientific notation quantities in the context of the situation, recognizing that if the exponent increases by one, the value increases 10 times. Likewise, if the exponent decreases by one, the value decreases 10 times. Students solve problems using addition, subtraction or multiplication, expressing the answer in scientific notation. Example 1: Write 75,000,000,000 in scientific notation. *Solution:* 7.5×10^{10} Example 2: Write 0.0000429 in scientific notation. *Solution:* 4.29×10^{-5} Example 3: Express 2.45×10^5 in standard form. *Solution:* 245,000 Example 4: How much larger is 6×10^5 compared to 2×10^3 *Solution:* 300 times larger since 6 is 3 times larger than 2 and 10^5 is 100 times larger than 10^3. Example 5: Which is the larger value: 2×10^6 or 9×10^5? *Solution:* 2×10^6 because the exponent is larger **Return to Main Menu**

RESOURCES 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.	**8.EE.4** Students understand scientific notation as generated on various calculators or other technology. Students enter scientific notation using E or EE (scientific notation), * (multiplication), and ^ (exponent) symbols. Example 1: 2.45E+23 is 2.45×10^{23} and 3.5E-4 is 3.5×10^{-4} (NOTE: There are other notations for scientific notation depending on the calculator being used.) Students add and subtract with scientific notation. Example 2: In July 2010 there were approximately 500 million Facebook users. In July 2011 there were approximately 750 million Facebook users. How many more users were there in 2011? Write your answer in scientific notation. *Solution:* Subtract the two numbers: 750,000,000 - 500,000,000 = 250,000,000 → 2.5×10^{8} Students use laws of exponents to multiply or divide numbers written in scientific notation, writing the product or quotient in proper scientific notation. Example 3: $(6.45 \times 10^{11})(3.2 \times 10^{4}) = (6.45 \times 3.2)(10^{11} \times 10^{4})$ *Rearrange factors* $= 20.64 \times 10^{15}$ *Add exponents when multiplying powers of 10* $= 2.064 \times 10^{16}$ *Write in scientific notation* Example 4: $\frac{3.45 \times 10^{5}}{6.7 \times 10^{-2}} \quad \frac{6.3}{1.6} \quad 10^{5-(-2)}$ *Subtract exponents when dividing powers of 10* $= 0.515 \times 10^{7}$ *Write in scientific notation* $= 5.15 \times 10^{6}$ Example 5: $(0.0025)(5.2 \times 10^{4}) = (2.5 \times 10^{-3})(5.2 \times 10^{5})$ *Write factors in scientific notation* $= (2.5 \times 5.2)(10^{-3} \times 10^{5})$ *Rearrange factors* $= 13 \times 10^{2}$ *Add exponents when multiplying powers of 10* $= 1.3 \times 10^{3}$ *Write in scientific notation* Example 6: The speed of light is 3×10^{8} meters/second. If the sun is 1.5×10^{11} meters from earth, how many seconds does it take light to reach the earth? Express your answer in scientific notation. *Solution*: 5×10^{2} (light)(x) = sun, where x is the time in seconds $(3 \times 10^{8})x = 1.5 \times 10^{11}$ $\frac{1.5 \times 10^{11}}{3 \times 10^{8}}$ Students understand the magnitude of the number being expressed in scientific notation and choose an appropriate corresponding unit. Example 7: 3×10^{8} is equivalent to 300 million, which represents a large quantity. Therefore, this value will affect the unit chosen. **Return to Main Menu**

Expressions and Equations 8.EE

Common Core Cluster

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

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: **intersecting, parallel lines, coefficient, distributive property, like terms, substitution, system of linear equations**

Common Core Standard	Unpacking What does this standard mean that a student will know and be able to do?
RESOURCES Analyze and solve pairs of simultaneous linear equations. 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** Systems of linear equations can also have one solution, infinitely many solutions or no solutions. Students will discover these cases as they graph systems of linear equations and solve them algebraically. Students graph a system of two linear equations, recognizing that the ordered pair for the point of intersection is the *x*-value that will generate the given *y*-value for both equations. Students recognize that graphed lines with one point of intersection (different slopes) will have one solution, parallel lines (same slope, different *y*-intercepts) have no solutions, and lines that are the same (same slope, same *y*-intercept) will have infinitely many solutions. By making connections between algebraic and graphical solutions and the context of the system of linear equations, students are able to make sense of their solutions. Students need opportunities to work with equations and context that include whole number and/or decimals/fractions. Students define variables and create a system of linear equations in two variables <u>Example 1:</u> 1. Plant A and Plant B are on different watering schedules. This affects their rate of growth. Compare the growth of the two plants to determine when their heights will be the same. *Solution:* Let *W* = number of weeks Let *H* = height of the plant after *W* weeks

Plant A		
W	H	
0	4	(0, 4)
1	6	(1, 6)
2	8	(2, 8)
3	10	(3, 10)

Plant B		
W	H	
0	2	(0, 2)
1	6	(1, 6)
2	10	(2, 10)
3	14	(3, 14)

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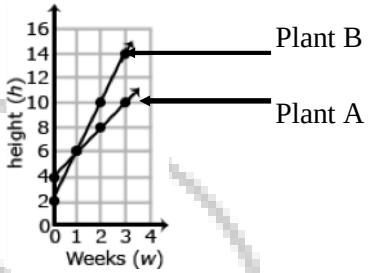
2. Based on the coordinates from the table, graph lines to represent each plant.

Solution:



3. Write an equation that represents the growth rate of Plant A and Plant B.

Solution: Plant A $H = 2W + 4$

Plant B $H = 4W + 2$

4. At which week will the plants have the same height?

Solution:

$2W + 4 = 4W + 2$ *Set height of Plant A equal to height of Plant B*

$2W - 2W + 4 = 4W - 2W + 2$ *Solve for W*

$4 = 2W + 2$

$4 - 2 = 2W + 2 - 2$

$\frac{2}{2} = \frac{2W}{2}$

$1 = W$

After one week, the height of Plant A and Plant B are both 6 inches.

Check: $2(1) + 4 = 4(1) + 2$

$2 + 4 = 4 + 2$

$6 = 6$

Given two equations in slope-intercept form (Example 1) or one equation in standard form and one equation in slope-intercept form, students use substitution to solve the system.

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Example 2:

Solve: Victor is half as old as Maria. The sum of their ages is 54. How old is Victor?

Solution: Let v = Victor's age
Let m = Maria's age

$$\begin{cases} v + m = 54 \\ v = \frac{1}{2} m \end{cases}$$

$\frac{1}{2} m + m = 54$ *Substitute ½m for v in the first equation*

$1\frac{1}{2} m = 54$

$m = 36$

If Maria is 36, then substitute 36 into $v + m = 54$ to find Victor's age of 18.

Note: Students are not expected to change linear equations written in standard form to slope-intercept form or solve systems using elimination.

For many real world contexts, equations may be written in standard form. Students are not expected to change the standard form to slope-intercept form. However, students may generate ordered pairs recognizing that the values of the ordered pairs would be solutions for the equation. For example, in the equation above, students could make a list of the possible ages of Victor and Maria that would add to 54. The graph of these ordered pairs would be a line with all the possible ages for Victor and Maria.

Victor	Maria
20	34
10	44
50	4
29	25

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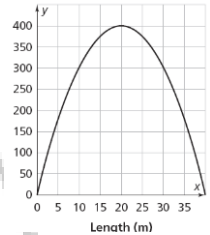
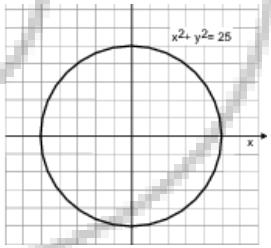
Functions 8.F

Common Core Cluster

Define, evaluate, and compare functions.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: **functions, *y*-value, *x*-value, vertical line test, input, output, rate of change, linear function, non-linear function**

Common Core Standard	Unpacking What does this standard mean that a student will know and be able to do?
RESOURCES 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.[1] [1]Function notation is not required in Grade 8.	**8.F.1** Students understand rules that take *x* as input and gives *y* as output is a function. Functions occur when there is exactly one *y*-value is associated with any *x*-value. Using *y* to represent the output we can represent this function with the equations $y = x^2 + 5x + 4$. Students are **not** expected to use the function notation *f(x)* at this level. Students identify functions from equations, graphs, and tables/ordered pairs. **Graphs** Students recognize graphs such as the one below is a function using the vertical line test, showing that each *x*-value has only one *y*-value;  whereas, graphs such as the following are not functions since there are 2 *y*-values for multiple *x*-value.  **Return to Main Menu**

Tables or Ordered Pairs

Students read tables or look at a set of ordered pairs to determine functions and identify equations where there is only one output (*y*-value) for each input (*x*-value).

Functions

x	y
0	3
1	9
2	27

Not A Function

x	y
16	4
16	-4
25	5
25	-5

{(0, 2), (1, 3), (2, 5), (3, 6)}

Equations

Students recognize equations such as $y = x$ or $y = x^2 + 3x + 4$ as functions; whereas, equations such as $x^2 + y^2 = 25$ are not functions.

RESOURCES Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

8.F.2 Students compare two functions from different representations.

Example 1:

Compare the following functions to determine which has the greater rate of change.

Function 1: y = 2x + 4

Function 2:

x	y
-1	-6
0	-3
2	3

Solution: The rate of change for function 1 is 2; the rate of change for function 2 is 3. Function 2 has the greater rate of change.

Example 2:

Compare the two linear functions listed below and determine which has a negative slope.

Function 1: Gift Card

Samantha starts with $20 on a gift card for the bookstore. She spends $3.50 per week to buy a magazine. Let y be the amount remaining as a function of the number of weeks, *x*.

x	y
0	20
1	16.50
2	13.00
3	9.50

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Function 2: Calculator rental

The school bookstore rents graphing calculators for $5 per month. It also collects a non-refundable fee of $10.00 for the school year. Write the rule for the total cost (c) of renting a calculator as a function of the number of months (*m*).

$c = 10 + 5m$

Solution: Function 1 is an example of a function whose graph has a negative slope. Both functions have a positive starting amount; however, in function 1, the amount decreases 3.50 each week, while in function 2, the amount increases 5.00 each month.

NOTE: Functions could be expressed in standard form. However, the intent is not to change from standard form to slope-intercept form but to use the standard form to generate ordered pairs. Substituting a zero (0) for *x* and *y* will generate two ordered pairs. From these ordered pairs, the slope could be determined.

<u>Example 3:</u>

$2x + 3y = 6$

Let $x = 0$:

$$2(0) + 3y = 6$$
$$3y = 6$$
$$\frac{3y}{3} = \frac{6}{3}$$
$$y = 2$$

Ordered pair: (0, 2)

Let $y = 0$:

$$2x + 3(0) = 6$$
$$2x = 6$$
$$\frac{2x}{2} = \frac{6}{2}$$
$$x = 3$$

Ordered pair: (3, 0)

Using (0, 2) and (3, 0) students could find the slope and make comparisons with another function.

RESOURCES 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. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*

8.F.3 Students understand that linear functions have a constant rate of change between any two points. Students use equations, graphs and tables to categorize functions as linear or non-linear.

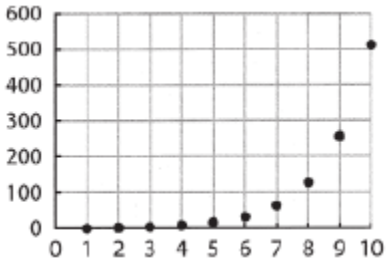
<u>Example 1:</u>

Determine if the functions listed below are linear or non-linear. Explain your reasoning.

1. $y = -2x^2 + 3$
2. $y = 0.25 + 0.5(x - 2)$
3. $A = \pi r^2$
4.

X	Y
1	12
2	7
3	4
4	3
5	4
6	7

5.



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	Solution: 1. Non-linear 2. Linear 3. Non-linear 4. Non-linear; there is not a constant rate of change 5. Non-linear; the graph curves indicating the rate of change is not constant. **Return to Main Menu**

Functions 8.F

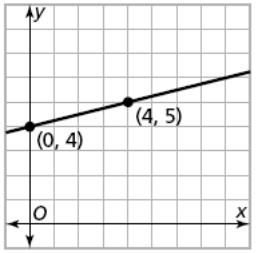
Common Core Cluster

Use functions to model relationships between quantities.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: **linear relationship, rate of change, slope, initial value, y-intercept**

Common Core Standard	Unpacking What does this standard mean that a student will know and be able to do?
RESOURCES 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.	**8.F.4** Students identify the rate of change (slope) and initial value (y-intercept) from tables, graphs, equations or verbal descriptions to write a function (linear equation). Students understand that the equation represents the relationship between the x-value and the y-value; what math operations are performed with the x-value to give the y-value. Slopes could be undefined slopes or zero slopes. **Tables:** Students recognize that in a table the y-intercept is the y-value when x is equal to 0. The slope can be determined by finding the ratio $\frac{y}{x}$ between the change in two y-values and the change between the two corresponding x-values. <u>Example 1:</u> Write an equation that models the linear relationship in the table below. **x** / **y** -2 / 8 0 / 2 1 / -1 *Solution:* The y-intercept in the table below would be (0, 2). The distance between 8 and -1 is 9 in a negative direction → -9; the distance between -2 and 1 is 3 in a positive direction. The slope is the ratio of rise to run or $\frac{y}{x}$ or $\frac{-9}{3}$ = -3. The equation would be $y = -3x + 2$ **Graphs:** Using graphs, students identify the y-intercept as the point where the line crosses the y-axis and the slope as the <u>rise.</u> run **Return to Main Menu**

Example 2:
Write an equation that models the linear relationship in the graph below.



Solution: The y-intercept is 4. The slope is ¼ , found by moving up 1 and right 4 going from (0, 4) to (4, 5). The linear equation would be $y = \frac{1}{4}x + 4$.

Equations:
In a linear equation the coefficient of x is the slope and the constant is the y-intercept. Students need to be given the equations in formats other than $y = mx + b$, such as $y = ax + b$ (format from graphing calculator), $y = b + mx$ (often the format from contextual situations), etc.

Point and Slope:
Students write equations to model lines that pass through a given point with the given slope.
Example 2:
A line has a zero slope and passes through the point (-5, 4). What is the equation of the line?
Solution: $y = 4$

Example 3:
Write an equation for the line that has a slope of ½ and passes though the point (-2, 5)
Solution: $y = \frac{1}{2}x + 6$
Students could multiply the slope ½ by the x-coordinate -2 to get -1. Six (6) would need to be added to get to 5, which gives the linear equation.

Students also write equations given two ordered pairs. **Note that point-slope form is not an expectation at this level.** Students use the slope and y-intercepts to write a linear function in the form $y = mx + b$.

Contextual Situations:
In contextual situations, the y-intercept is generally the starting value or the value in the situation when the independent variable is 0. The slope is the rate of change that occurs in the problem. Rates of change can often occur over years. In these situations it is helpful for the years to be "converted" to 0, 1, 2, etc. For example, the years of 1960, 1970, and 1980 could be represented as 0 (for 1960), 10 (for 1970) and 20 (for 1980).

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Example 4:
The company charges $45 a day for the car as well as charging a one-time $25 fee for the car's navigation system (GPS). Write an expression for the cost in dollars, *c*, as a function of the number of days, *d*, the car was rented.

Solution: $C = 45d + 25$

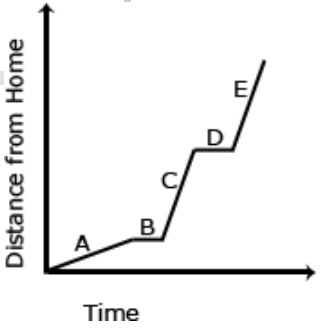
Students interpret the rate of change and the *y*-intercept in the context of the problem. In Example 4, the rate of change is 45 (the cost of renting the car) and that initial cost (the first day charge) also includes paying for the navigation system. Classroom discussion about one-time fees vs. recurrent fees will help students model contextual situations.

RESOURCES Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

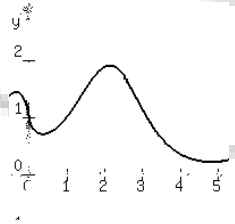
8.F.5 Given a verbal description of a situation, students sketch a graph to model that situation. Given a graph of a situation, students provide a verbal description of the situation.

Example 1:
The graph below shows a John's trip to school. He walks to his Sam's house and, together, they ride a bus to school. The bus stops once before arriving at school.

Describe how each part A – E of the graph relates to the story.
Solution:
A John is walking to Sam's house at a constant rate.
B John gets to Sam's house and is waiting for the bus.
C John and Sam are riding the bus to school. The bus is moving at a constant rate, faster than John's walking rate.
D The bus stops.
E The bus resumes at the same rate as in part C.



Example 2:
Describe the graph of the function between $x = 2$ and $x = 5$?



Solution:
The graph is non-linear and decreasing.

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Statistics and Probability 8.SP

Common Core Cluster

Investigate patterns of association in bivariate data.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: **bivariate data, scatter plot, linear model, clustering, linear association, non-linear association, outliers, positive association, negative association, categorical data, two-way table, relative frequency**

Common Core Standard	Unpacking What does this standard mean that a student will know and be able to do?
RESOURCES 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.	**8.SP.1** Bivariate data refers to two-variable data, one to be graphed on the *x*-axis and the other on the *y*-axis. Students represent numerical data on a scatter plot, to examine relationships between variables. They analyze scatter plots to determine if the relationship is linear (positive, negative association or no association) or non-linear. Students can use tools such as those at the National Center for Educational Statistics to create a graph or generate data sets. (http://nces.ed.gov/nceskids/createagraph/default.aspx) Data can be expressed in years. In these situations it is helpful for the years to be "converted" to 0, 1, 2, etc. For example, the years of 1960, 1970, and 1980 could be represented as 0 (for 1960), 10 (for 1970) and 20 (for 1980). Example 1: Data for 10 students' Math and Science scores are provided in the chart. Describe the association between the Math and Science scores.

Student	1	2	3	4	5	6	7	8	9	10
Math	64	50	85	34	56	24	72	63	42	93
Science	68	70	83	33	60	27	74	63	40	96

Solution: This data has a positive association.

Example 2:
Data for 10 students' Math scores and the distance they live from school are provided in the table below. Describe the association between the Math scores and the distance they live from school.

Student	1	2	3	4	5	6	7	8	9	10
Math	64	50	85	34	56	24	72	63	42	93
Distance from School (miles)	0.5	1.8	1	2.3	3.4	0.2	2.5	1.6	0.8	2.5

Solution: There is no association between the math score and the distance a student lives from school.

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Example 3:
Data from a local fast food restaurant is provided showing the number of staff members and the average time for filling an order are provided in the table below. Describe the association between the number of staff and the average time for filling an order.

Number of Staff	3	4	5	6	7	8
Average time to fill order (seconds)	56	24	72	63	42	93

Solution: There is a positive association.

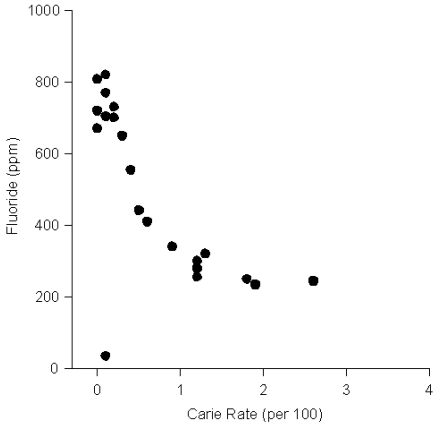
Example 4:
The chart below lists the life expectancy in years for people in the United States every five years from 1970 to 2005. What would you expect the life expectancy of a person in the United States to be in 2010, 2015, and 2020 based upon this data? Explain how you determined your values.

Date	1970	1975	1980	1985	1990	1995	2000	2005
Life Expectancy (in years)	70.8	72.6	73.7	74.7	75.4	75.8	76.8	77.4

Solution: There is a positive association.

Students recognize that points may be away from the other points (outliers) and have an effect on the linear model.
NOTE: Use of the formula to identify outliers is **not** expected at this level.

Students recognize that not all data will have a linear association. Some associations will be non-linear as in the example below:



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RESOURCES 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

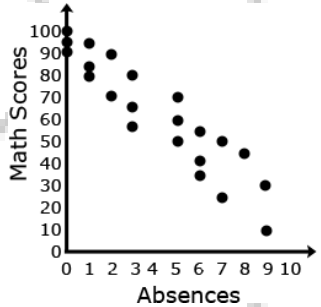
8.SP.2 Students understand that a straight line can represent a scatter plot with linear association. The most appropriate linear model is the line that comes closest to most data points. The use of linear regression is not expected. If there is a linear relationship, students draw a linear model. Given a linear model, students write an equation.

REOURCES Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*

8.SP.3 Linear models can be represented with a linear equation. Students interpret the slope and *y*-intercept of the line in the context of the problem.

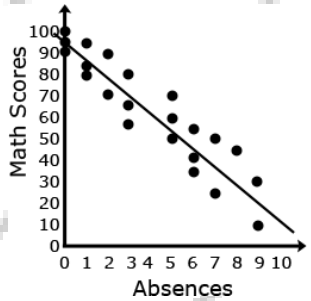
Example 1:

1. Given data from students' math scores and absences, make a scatterplot.



Absences	Math Scores
3	65
5	50
1	95
1	85
3	80
6	34
5	70
3	56
0	100
7	24
8	45
2	71
9	30
0	95
6	55
6	42
2	90
0	92
5	60
7	50
9	10
1	80

2. Draw a linear model paying attention to the closeness of the data points on either side of the line.



3. From the linear model, determine an approximate linear equation that models the given data (about $y = -\frac{25}{3}x + 95$)

4. Students should recognize that 95 represents the *y*-intercept and $-\frac{25}{3}$ represents the slope of the line. In the context of the problem, the *y*-intercept represents the math score a student with 0 absences could expect. The slope indicates that the math scores decreased 25 points for every 3 absences.

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<table>
<tr>
<td></td>
<td>5. Students can use this linear model to solve problems. For example, through substitution, they can use the equation to determine that a student with 4 absences should expect to receive a math score of about 62. They can then compare this value to their line.</td>
</tr>
<tr>
<td>RESOURCES 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. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?</td>
<td>8.SP.4 Students understand that a two-way table provides a way to organize data between two categorical variables. Data for both categories needs to be collected from each subject. Students calculate the relative frequencies to describe associations.

<u>Example 1:</u>
Twenty-five students were surveyed and asked if they received an allowance and if they did chores. The table below summarizes their responses.

<table>
<tr><td></td><td>Receive Allowance</td><td>No Allowance</td></tr>
<tr><td>Do Chores</td><td>15</td><td>5</td></tr>
<tr><td>Do Not Do Chores</td><td>3</td><td>2</td></tr>
</table>

Of the students who do chores, what percent do not receive an allowance?
Solution: 5 of the 20 students who do chores do not receive an allowance, which is 25%</td>
</tr>
</table>

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We would like to acknowledge the Arizona Department of Education for allowing us to use some of their examples and graphics.

EOC Weighted Distribution

The following table shows the number of operational items for each standard. Note that future coverage of standards could vary within the constraints of the content category weights in *Tables 1-3*. Some standards not designated with tested items (i.e., "–") may be a prerequisite standard, may be tested within the context of another standard or may be included as an embedded field test item. The standards may be reviewed by visiting the North Carolina DPI K-12 Mathematics wiki site at http://maccss.ncdpi.wikispaces.net.

Math I		Number of Items Per Standard*
The Real Number System	N-RN.1	–
	N-RN.2	2
Quantities	N-Q.1	1
	N-Q.2	–
	N-Q.3	–
Seeing Structure in Expressions	A-SEE.1	–
	A-SEE.2	1
	A-SEE.3	0-1
Arithmetic with Polynomials & Rational Expressions	A-APR.1	1
Creating Equations	A-CED.1	4
	A-CED.2	2
	A-CED.3	2
	A-CED.4	1-2
Reasoning with Equations & Inequalities	A-REI.1	–
	A-REI.3	–
	A-REI.5	–
	A-REI.6	1
	A-REI.10	–
	A-REI.11	1
	A-REI.12	1

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EOC Weighted Distribution (continued)

Interpreting Functions	F-IF.1	–
	F-IF.2	1-2
	F-IF.3	–
	F-IF.4	1-2
	F-IF.5	0-1
	F-IF.6	1-2
	F-IF.7	1
	F-IF.8	2-3
	F-IF.9	1
Building Functions	F-BF.1	2-3
	F-BF.2	0-1
	F-BF.3	1
Linear, Quadratic, & Exponential Models	F-LE.1	1-2
	F-LE.2	1
	F-LE.3	1
	F-LE.5	1
Congruence	G-CO.1	–
Expressing Geometric Properties with Equations	G-GPE.4	1
	G-GPE.5	1
	G-GPE.6	1
	G-GPE.7	1
Geometric Measurement & Dimension	G-GMD.1	–
	G-GMD.3	1
Interpreting Categorical & Quantitative Data	S-ID.1	–
	S-ID.2	1
	S-ID.3	1-2
	S-ID.5	2
	S-ID.6	1
	S-ID.7	1
	S-ID.8	1-2
	S-ID.9	–

*Some standards not designated with tested items (i.e., "–") may be a prerequisite standard, may be tested within the context of another standard or may be included as an embedded field test item.

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1st Nine Weeks

Linear Equations / Inequalities /*Expressions and Equations / *Functions & graphing

ESSENTIAL QUESTIONS

- How do you graph inequalities?
- How do you solve inequalities?
- How do you use the words "AND/OR" to write and solve compound inequalities?
- How do you solve absolute value equations and inequalities?
- Why do we use variables?
- Why are "the order of operations" and other properties of mathematics important?
- Why is advantageous to use and solve equations algebraically for real-world problems?
- When would we want to use the absolute value of numbers?
- How does the slope affect direct variation?
- What does the slope-intercept form of an equation tell us?
- What's the best way to solve a system of equations?
- How can words be turned into math equations?

ACADEMIC VOCABULARY

Factors, coefficients, laws of exponents, power, perfect squares, perfect cubes, root, square root, cube root, scientific notation, standard form of a number, inverse operations, linear and quadratic functions, simple rational, exponential functions, inequalities, function notation, domain, range, Fibonacci sequence, intercepts, intervals, relative maximums, minimums; symmetries, end behavior, periodicity, rate of change, quadratic functions, exponential and logarithmic functions, trigonometric functions, midline, amplitude, coordinate plane, slope, f (x) and/or g (x).

2nd Nine Weeks

***Expressions and Equations*Writing equations of lines, parallel / perpendicular, and linear modeling*Systems*Statistics**

ESSENTIAL QUESTIONS

- How can real-life data be displayed and used?
- How can you solve a system of equations or inequalities?
- Can systems of equations model real-world situations?
- Can equations that appear to be different be equivalent?
- How can you solve equations?
- How can you represent quantities, patterns, and relationships?
- How are properties related to algebra?

ACADEMIC VOCABULARY

Intersecting, parallel lines, coefficient, distributive property, like terms, substitution, system of linear equations, residuals, correlation and causation, parallel or perpendicular, midpoint, endpoint, elimination, half-planes, inequalities, dot plots, histograms, box plots, median, mean, spread, interquartile range, standard deviation, outliers, joint, marginal, and conditional relative frequencies.

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3rd Nine Weeks

***Polynomials and Quadratics *Functions *Exponentials**

ESSENTIAL QUESTIONS

- What does a Quadratic Equations look like when graphed?
- What are QE and how can they be rewritten?
- How are exponential word problems solved?
- What's the difference between linear data and exponential data?
- How are radicals related to exponents?
- What are other ways exponential equations can be expressed?
- How are radicals related to exponents?
- What's the best way to solve a system of equations?

ACADEMIC VOCABULARY

Linear or exponential function, constant rate of change, constant percent rate of change, growth or decay, Decompose, even and odd functions, linear relationship, rate of change, slope, initial value, y-intercept, polynomials, combining like terms, radicals and rational exponents, properties of exponents, power rule, radical, cube root.

4th Nine Weeks

***Series and Sequences *Statistics and Probability *Geometry**

ESSENTIAL QUESTIONS

- How is Geometry used to find answers and solve problems?
- What can data clustering reveal on a scatter plot?
- What does the line of best fit represent?
- What is the quadrant count ratio and how is it used?
- What kind of data is displayed in a two-way table?
- When estimating a line of best fit, how should the line be positioned?
- How can the line of best fit be used to make predictions about the problem situation?
- How can a two-way table be used to examine the relationship between two categorical variables?
- How closely does the model fit the data i.e. how close are the actual data points to the line of best fit?
- What does the slope and *y*-intercept of the line of best fit mean in the context of the situation?

ACADEMIC VOCABULARY

Bivariate data, scatter plot, linear model, clustering, linear association, non-linear association, outliers, positive association, negative association, categorical data, two-way table, relative frequency, recursive, arithmetic sequence, common ratio, geometric sequence, perpendicular line, parallel line, line segment, circular arc, Pythagorean Theorem, distance formula, dissection arguments, Cavalieri's principle.

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1:1 Activities

- **iM**
  https://www.illustrativemathematics.org/content-standards/8
  https://www.illustrativemathematics.org/content-standards/HSA
- **IXL**
  https://www.ixl.com/math/grade-8
  https://www.ixl.com/math/algebra-1
- **Inter *Active*** http://www.shodor.org/interactivate/
- **Dare to Compare** http://nces.ed.gov/nceskids/eyk/
- **Granny Prix** http://www.adaptedmind.com/gradelist.php?grade=8
- **Math Apps for the iPad** https://www.pinterest.com/mikefisher821/math-apps-for-the-ipad/
- **Interactive Site** http://interactivesites.weebly.com/math.html
- **Virtual Manipulatives** http://nlvm.usu.edu/en/nav/grade_g_3.html
- **Worksheets** http://www.commoncoresheets.com/Shapes.php
- **Dan Meyers** https://docs.google.com/spreadsheets/d/1jXSt_CoDzyDFeJimZxnhgwOVsWkTQEsfqouLWNNC6Z4/pub?output=html
- **LearnFree.org** http://www.gcflearnfree.org/math

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Video Links

- **Learn Zillion**

https://learnzillion.com/resources/57276-8th-grade-geometry
https://learnzillion.com/resources/57275-8th-grade-functions
https://learnzillion.com/resources/57279-8th-grade-statistics-and-probability
https://learnzillion.com/resources/57274-8th-grade-expressions-and-equations
https://learnzillion.com/resources/57273-8th-grade-the-number-system

- **Khan Academy** https://www.khanacademy.org/

Vetted Resources

Learn Zillion
Inside Mathematics
Math Assessment Project
Illuminations
NCDPI
Engage NY
Yummy Math
Better Lessons
NCTM
Illustrative Mathematics
Learning Trajectories
Howard County Schools
Quantile Framework for Mathematics
Common Core State Standards (National Document)
http://ccssmath.org/
Warwick

REV Videos (All 2 to 3 minutes in length – Easily Downloadable)

Negative Exponents
https://onslow.rev.vbrick.com/#/videos/5ff6550c-b276-45a0-a795-b48471d13576
Cube Roots
https://onslow.rev.vbrick.com/#/videos/d86be7bd-7d8a-428e-8f88-4f26890050ce
Graphing Calculator: Cubes & Cube Roots
https://onslow.rev.vbrick.com/#/videos/6f7f154f-b4ae-437a-99ca-4b251b00cb8c
Scientific Notation
https://onslow.rev.vbrick.com/#/videos/2626124c-954d-4ff8-8478-9b80a2a6b5ff
Pythagorean Theorem
https://onslow.rev.vbrick.com/#/videos/5c3dd3aa-05a5-4698-89eb-365e269409c4
Multi-step Equations
https://onslow.rev.vbrick.com/#/videos/3d622c8d-81ef-4289-9d28-799be2738bef
Equations with variables on both sides
https://onslow.rev.vbrick.com/#/videos/46f14ffb-b14a-4d4a-969a-04983d4a676a
Equations: Two variables (word problems)
https://onslow.rev.vbrick.com/#/videos/cf500c1c-b5bd-4e01-a8a8-ba4e8a83c4d6
Slope Intercept Form
https://onslow.rev.vbrick.com/#/videos/2f650ad3-38d8-4305-9ae7-e9beca8fc372
Volume
https://onslow.rev.vbrick.com/#/videos/3df72380-1501-4c6e-8b4a-cf7c4ce68800

Growth and Decay
https://onslow.rev.vbrick.com/#/videos/3b9c13b9-9452-4b83-900f-c07dbc4c79be
Quadratics
https://onslow.rev.vbrick.com/#/videos/d2b026b5-eca6-4aa2-bd5f-3c848546c9e0
System of Equations
https://onslow.rev.vbrick.com/#/videos/38fd6a52-470c-4764-b4b5-9cd6e185b173
Factoring (Box Method)
https://onslow.rev.vbrick.com/#/videos/ff91dfe5-8426-46de-8c88-8d01585d1946
Point Slope Form
https://onslow.rev.vbrick.com/#/videos/63a20788-0983-4a45-9a65-9ed803d52c69
Rational Expressions I
https://onslow.rev.vbrick.com/#/videos/d3ca13f3-ba65-487b-8d7a-155a1547e388
Rational Expressions II
https://onslow.rev.vbrick.com/#/videos/bb9b6ff3-a0aa-484a-b95a-0faba6b24297
Determining Slope from graph *Slope Rida*
https://onslow.rev.vbrick.com/#/videos/989339b7-458a-4ed7-b063-647527c5577b
Transversals
https://onslow.rev.vbrick.com/#/videos/6d3f9a74-371f-4fae-8b52-14df911c6a91

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Flip Books	EOG/EOC Released Test
➢ http://www.cesa2.org/STEM/Flip%20book_CCSS_8th%20grade.pdf	➢ http://www.dpi.state.nc.us/docs/accountability/testing/releasedforms/g8mathpp.pdf ➢ http://www.ncpublicschools.org/docs/accountability/testing/releasedforms/releasedmath1.pdf
Assessment Options	**STEM – Project Based Learning**
➢ **EDMENTUM** https://ple.platoweb.com/Account/SignIn ➢ https://goformative.com/ ➢ https://kahoot.it/#/ ➢ https://www.tenmarks.com/login ➢ https://www.assistments.org/ ➢ **http://8thgradeschoolnetassessments.weebly.com/** ➢ **http://math1schoolnetassessments.weebly.com/**	●http://projectbasedmath.weebly.com/ ●http://www.livebinders.com/play/play?id=767726 ●http://bie.org/ ●http://www.edutopia.org/project-based-learning ●http://www.mathalicious.com/ FREE Online PDF to Word Converter https://www.pdftoword.com/ No Password – Quick & Easy! **Return to Main Menu**

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