# Bridging the [NYS Mathematics Common Core Learning Standards](https://www.engageny.org/resource/new-york-state-p-12-common-core-learning-standards-for-mathematics) ~ Transition from Grade 8 to High School The intention of this tool is to provide a template for discussion and planning as students transition from the 2019-2020 school year to the 2020-2021 school year. In this instance, the 8th grade mathematics teacher will comment on the 2019-2020 mathematics common core curriculum relating to that year’s instruction; the high school mathematics teacher will use this information to plan/teach all standards within their mathematics course and meet the needs of all learners for the 2020-2021 school year.

**Key:** Each standard includes an image of an instructor () and an image of a laptop () to indicate whether the standard was taught in the classroom or remotely. Circling or deleting the appropriate image will best indicate the method of instruction for that standard during the 2019-2020 school year. Deleting both images would mean the standard was not addressed during the 2019-2020 school year.

The major content emphases.

The supporting content emphases.

The additional content emphases.

## Domain: Number System

### Cluster: Know that there are numbers that are not rational and approximate them by rational numbers.

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|  | Grade 8 Learning Standard | Instruction Provided | Grade 8  Comments & Considerations | Connects with Standards in Algebra I  & Geometry | High School  Reflection & Planning  2020 – 2021 |
| **8.NS.1 Post** | 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. | Classroom Internet |  | N.RN.3 |  |
| **8.NS.2 Post** | 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 (e.g., π2 ). For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. | Classroom Internet |  | N.RN.3 |  |

## Domain: Expressions and Equations

### Cluster: Work with radicals and integer exponents.

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|  | Grade 8 Learning Standard | Instruction Provided | Grade 8  Comments & Considerations | Connects with Standards in Algebra I  & Geometry | High School  Reflection & Planning  2020 – 2021 |
| **8.EE.1** | Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example,*  *32 × 3–5 = 3–3 = 1/33 = 1/27.* | Classroom Internet |  | A.SSE.2  A.SSE.3  A.APR.1 |  |
| **8.EE.2 Post** | 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 √2 is irrational. | Classroom Internet |  | A.REI.4a  A.REI.4b A.CED.1 |  |
| **8.EE.3** | Use numbers expressed in the form of a single digit times a whole-number 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 3 108 and the population of the world as 7 109, and determine that the world population is more than 20 times larger.* | Classroom Internet |  |  |  |
| **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. | Classroom Internet |  | N.Q.1  N.Q.3 |  |

## Domain: Expressions and Equations

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

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|  | Grade 8 Learning Standard | Instruction Provided | Grade 8  Comments & Considerations | Connects with Standards in Algebra I  & Geometry | High School  Reflection & Planning  2020 – 2021 |
| **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. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.* | Classroom Internet |  | A.REI.10 |  |
| **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*. | Classroom Internet |  | A.REI.10  G.GPE.5 |  |

## Domain: Expressions and Equations

### Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations.

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|  | Grade 8 Learning Standard | Instruction Provided | Grade 8  Comments & Considerations | Connects with Standards in Algebra I  & Geometry | High School  Reflection & Planning  2020 – 2021 |
| **8.EE.7** | Solve linear equations in one variable.   1. 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). 2. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. | Classroom Internet |  | A.CED.4  A.REI.1  A.REI.3 |  |
| **8.EE.8** | Analyze and solve pairs of simultaneous linear equations.   1. 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. 2. 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.* 3. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.* | Classroom Internet |  | A.CED.2 A.CED.3  A.REI.5  A.REI.6  A.REI.7  A.REI.10 A.REI.12 G.GPE.5 |  |

## Domain: Functions

### Cluster: Define, evaluate, and compare functions.

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|  | Grade 8 Learning Standard | Instruction Provided | Grade 8  Comments & Considerations | Connects with Standards in Algebra I  & Geometry | High School  Reflection & Planning  2020 – 2021 |
| **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.  **Note: Function notation is not required in Grade 8.** | Classroom Internet |  | F.IF.1  G.CO.2 |  |
| **8.F.2** | 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.* | Classroom Internet |  | F.IF.9 |  |
| **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. *For example, the function A = s2 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.* | Classroom Internet |  | F.LE.1 |  |

## Domain: Functions

### Cluster: Use functions to model relationships between quantities.

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| **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. | Classroom Internet |  | A.CED.1  A.CED.2  F.BF.1  F.IF.6  F.LE.1  F.LE.2  F.LE.5  S.ID.7 |  |
| **8.F.5** | 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. | Classroom Internet |  | F.IF.4  F.LE.1  F.LE.3 |  |

## Domain: Geometry

### Cluster: Understand congruence and similarity.

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|  | Grade 8 Learning Standard | Instruction Provided | Grade 8  Comments & Considerations | Connects with Standards in Algebra I  & Geometry | High School  Reflection & Planning  2020 – 2021 |
| **8.G.1** | Verify experimentally the properties of rotations, reflections, and translations.   1. Lines are taken to lines, and line segments to line segments of the same length. 2. Angles are taken to angles of the same measure. 3. Parallel lines are taken to parallel lines. | Classroom Internet |  | G.CO.2  G.CO.4 |  |
| **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 congruence between them. | Classroom Internet |  | G.CO.5  G.CO.6  G.CO.7 |  |
| **8.G.3** | Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. | Classroom Internet |  | G.CO.5  G.SRT.1 |  |
| **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. | Classroom Internet |  | G.CO.3  G.SRT.2 |  |
| **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. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.* | Classroom Internet |  | G.CO.9  G.CO.10  G.SRT.3 |  |

## Domain: Geometry

### Cluster: Understand and apply the Pythagorean Theorem.

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|  | Grade 8 Learning Standard | Instruction Provided | Grade 8  Comments & Considerations | Connects with Standards in Algebra I  & Geometry | High School  Reflection & Planning  2020 – 2021 |
| **8.G.6 Post** | Explain a proof of the Pythagorean Theorem and its converse. | Classroom Internet |  | G.SRT.4 |  |
| **8.G.7 Post** | Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. | Classroom Internet |  | G.SRT.8 |  |
| **8.G.8 Post** | Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. | Classroom Internet |  | G.GPE.1 G.GPE.4 G.GPE.7 |  |

## Domain: Geometry

### Cluster: Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.

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|  | Grade 8 Learning Standard | Instruction Provided | Grade 8  Comments & Considerations | Connects with Standards in Algebra I  & Geometry | High School  Reflection & Planning  2020 – 2021 |
| **8.G.9** | Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. | Classroom Internet |  | G.GMD.1  G.GMD.3  G.MG.1  G.MG.2 |  |

## Domain: Stats and Probability

### Cluster: Investigate patterns of association in bivariate data.

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|  | Grade 8 Learning Standard | Instruction Provided | Grade 8  Comments & Considerations | Connects with Standards in Algebra I  & Geometry | High School  Reflection & Planning  2020 – 2021 |
| **8.SP.1** | 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. | Classroom Internet |  | S.ID.6c  S.ID.9 |  |
| **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. | Classroom Internet |  | S.ID.6  S.ID.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. *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.* | Classroom Internet |  | S.ID.6  S.ID.7 |  |
| **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. *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?* | Classroom Internet |  | S.ID.5  S.ID.9 |  |