## JC Schools 8th Grade Yearly Math Standards

| Units | Priority Standards | Supporting Standards |
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| Unit 1 <br> Comparing Real Numbers <br> 16 Days <br> Unit End Date: Sept. 20 <br> Unit Assessment <br> Window: Sept. 13-27 | 8.NS.A. 2 <br> Estimate the value and compare the size of irrational numbers and approximate their locations on a number line. <br> a. Know the differences between rational and irrational numbers. | 8.NS.A.1.a-d <br> Explore the real number system. <br> b. Understand that all rational numbers have a decimal expansion that terminates or repeats. <br> c. Convert decimals which repeat into fractions and fractions into repeating decimals. <br> d. Generate equivalent representations of rational numbers. <br> 8.EEI.A.2.a-c <br> Investigate concepts of square and cube roots. <br> a. Solve equations of the form $x 2=p$ and $x 3=p$, where $p$ is a positive rational number. <br> b. Evaluate square roots of perfect squares less than or equal to 625 and cube roots of perfect cubes less than or equal to 1000. <br> c. Recognize that square roots of non-perfect squares are irrational. |
| Unit 2 | 8.GM.B. 7 <br> Use the Pythagorean Theorem to determine unknown side lengths in right triangles in problems in two- and three-dimensional contexts. | 8.EEI.A.2.a-c <br> Investigate concepts of square and cube roots. <br> a. Solve equations of the form $x 2=p$ and $x 3=p$, where $p$ is a positive rational number. |


| Applying the Pythagorean Theorem <br> 14 Days <br> Unit End Date: Oct. 8 Unit Assessment Window: Oct. 1-18 | 8.GM.B. 6 <br> Use models to demonstrate a proof of the Pythagorean Theorem and its converse. | b. Evaluate square roots of perfect squares less than or equal to 625 and cube roots of perfect cubes less than or equal to 1000. <br> c. Recognize that square roots of non-perfect squares are irrational. <br> 8.GM.B. 8 <br> Use the Pythagorean Theorem to find the distance between points in a Cartesian coordinate system. |
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| Unit 3 <br> Solving Equations in One Variable <br> 21 Days <br> Unit End Date: Nov. 10 <br> Unit Assessment Window: Nov. 5-19 | 8.EEI.C.7.a,b <br> Solve linear equations and inequalities in one variable. <br> a. Create and identify linear equations with one solution, infinitely many solutions or no solutions. <br> b. Solve linear equations and inequalities with rational number coefficients, including equations and inequalities whose solutions require expanding expressions using the distributive property and combining like terms. <br> 8.EEI.C.8.c,d <br> Analyze and solve systems of linear equations. <br> c. Explain why systems of linear equations can have one solution, no solution or infinitely many solutions. <br> d. Solve systems of two linear equations. <br> *Algebraically only <br> 8.GM.A.5.C <br> Explore angle relationships and establish informal arguments. <br> c. Construct and explore the angles created when parallel lines are cut by a transversal. | 8.EEI.A.2.a-c <br> Investigate concepts of square and cube roots. <br> a. Solve equations of the form $x 2=p$ and $x 3=p$, where <br> $p$ is a positive rational number. <br> b. Evaluate square roots of perfect squares less than or equal to 625 and cube roots of perfect cubes less than or equal to 1000. <br> c. Recognize that square roots of non-perfect squares are irrational. |
| Unit 4 | 8.EEI.A. 1 <br> Know and apply the properties of integer exponents to generate equivalent expressions. | 8.EEI.A. 3 |


| Exponents and Scientific Notation <br> 21 Days <br> Unit End Date: Dec. 16 Unit Assessment Window: Dec. 9-Jan. 6 | 8.EEI.A.4.a <br> Use scientific notation to solve problems. <br> a. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. | Express very large and very small quantities in scientific notation and approximate how many times larger one is than the other. <br> 8.EEI.A.4.b <br> Use scientific notation to solve problems. <br> b. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. |
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| Unit 5 Comparing Functions <br> 8 Days <br> Unit End Date: Jan. 11 Unit Assessment Window: Jan. 4-19 | 8.F.A.1.a-c <br> Explore the concept of functions. (The use of function notation is not required.) <br> a. Understand that a function assigns to each input exactly one output. <br> b. Determine if a relation is a function. <br> 8.F.B. 5 <br> Describe the functional relationship between two quantities from a graph or a verbal description. | 8.F.A.3.a-c <br> Investigate the differences between linear and nonlinear functions. <br> a. Interpret the equation $\mathrm{y}=m \mathrm{x}+b$ as defining a linear function, whose parameters are the slope $(m)$ and the $y$-intercept (b). <br> b. Recognize that the graph of a linear function has a constant rate of change <br> c. Give examples of nonlinear functions. |
| Unit 6 Proportional Relationships <br> 20 Days <br> Unit End Date: Feb. 9 <br> Unit Assessment <br> Window: Feb. 2-16 | 8.EEI.B.6.a,b <br> Apply concepts of slope and y-intercept to graphs, equations and proportional relationships. <br> a. Explain why the slope $(\mathrm{m})$ is the same between any two distinct points on a non-vertical line in the Cartesian coordinate plane. <br> b. Derive the equation $y=m x$ for a line through the origin and the equation $y=m x+b$ for a line intercepting the vertical axis at $b$. <br> 8.F.B.4.a-c <br> Use functions to model linear relationships between quantities. <br> a. Explain the parameters of a linear function based on the context of a problem. | 8.EEI.B.5.a,b <br> Graph proportional relationships. <br> a. Interpret the unit rate as the slope of the graph. <br> b. Compare two different proportional relationships. |


|  | *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 <br> b. Determine the parameters of a linear function *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) of a linear function. <br> c. Determine the $x$-intercept of a linear function |  |
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| Unit 7 <br> Nonproportional Relationships <br> 19 Days <br> Unit End Date: March 9 <br> Unit Assessment <br> Window: March 2-16 | 8.EEI.B.6.a,b <br> Apply concepts of slope and $y$-intercept to graphs, equations and proportional relationships. <br> a. Explain why the slope ( $m$ ) is the same between any two distinct points on a non-vertical line in the Cartesian coordinate plane. <br> b. Derive the equation $y=m x$ for a line through the origin and the equation $y=m x+b$ for a line intercepting the vertical axis at $b$. <br> 8.EEI.C.8.a,b <br> Analyze and solve systems of linear equations. <br> a. Graph systems of linear equations and recognize the intersection as the solution to the system. <br> b. Explain why solution(s) to a system of two linear equations in two variables correspond to point(s) of intersection of the graphs. <br> 8.F.A. 2 <br> Compare characteristics of two functions each represented in a different way. <br> 8.F.B.4.a-c <br> Use functions to model linear relationships between quantities. <br> a. Explain the parameters of a linear function based on the context of a problem. <br> *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.A.3.a-c <br> Investigate the differences between linear and nonlinear functions. <br> a. Interpret the equation $y=m x+b$ as defining a linear function, whose parameters are the slope ( $m$ ) and the y-intercept (b). <br> b. Recognize that the graph of a linear function has a constant rate of change <br> c. Give examples of nonlinear functions. |


|  | b. Determine the parameters of a linear function *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) of a linear function. <br> c. Determine the x-intercept of a linear function. |  |
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| Unit 8 <br> Bivariate Data and Scatter Plots <br> 7 Days <br> Unit End Date: March 18 Unit Assessment Window: March 11-25 | 8.DSP.A. 1 <br> Construct and interpret scatter plots of bivariate measurement data to investigate patterns of association between two quantities. <br> 8.DSP.A. 3 <br> Interpret the parameters of a linear model of bivariate measurement data to solve problems. <br> 8.DSP.A.4.a <br> Understand the patterns of association in bivariate categorical data displayed in a two-way table. <br> a. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. | 8.DSP.A. 2 <br> Generate and use a trend line for bivariate data, and informally assess the fit of the line. <br> 8.DSP.A.4.b <br> Understand the patterns of association in bivariate categorical data displayed in a two-way table. <br> b. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. |
| Unit 9 <br> Volume and Surface Area <br> 12 Days <br> Unit End Date: April 12 <br> Unit Assessment <br> Window: April 5-19 | 8.GM.C.9.a,b <br> Solve problems involving surface area and volume. <br> a. Understand the concept of surface area and find surface area of pyramids. <br> b. Understand the concepts of volume and find the volume of pyramids, cones and spheres. |  |
| Unit 10 Transformations <br> 11 Days | 8.GM.A. 3 <br> Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. | 8.GM.A.1.a,b <br> Verify experimentally the congruence properties of rigid transformations. <br> a. Verify that angle measure, betweeness, collinearity and distance are preserved under rigid transformations. |


| Unit End Date: April 27 <br> Unit Assessment <br> Window: April 20-May 4 |  | b. Investigate if orientation is preserved under rigid transformations. <br> 8.GM.A.2.a <br> Understand that two-dimensional figures are congruent if a series of rigid transformations can be performed to map the pre-image to the image. <br> a. Describe a possible sequence of rigid transformations between two congruent figures. <br> 8.GM.A.4.a <br> Understand that two-dimensional figures are similar if a series of transformations (rotations, reflections, translations and dilations) can be performed to map the pre-image to the image. <br> a. Describe a possible sequence of transformations between two similar figures. |
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| Unit 11 <br> Angle Relationships <br> 8 Days <br> Unit End Date: May 9 <br> Unit Assessment <br> Window: May 2-16 |  | 8.GM.A.5.a,b,d <br> Explore angle relationships and establish informal arguments. <br> a. Derive the sum of the interior angles of a triangle. <br> b. Explore the relationship between the interior and exterior angles of a triangle. <br> d. Use the properties of similar figures to solve problems. |

