Content Area: Math

Grade Level: 8th

Curriculum Map/Scope & Sequence (2021)

Unit Name/Time Period	BIG Ideas/Skills	IL Priority Learning Standards	I CAN Statements Red = review Blue = new	Assessments
Unit 1 - approximately 6 weeks (August/Sep)	**Envision Math 2.0 Book** **Chapter 1 - Real Numbers** - Rational numbers as decimals - Irrational numbers - Compare/Order real numbers - Equations with square roots and cube roots - Properties of exponents - Scientific Notation - Operations with Scientific Notation	**8.NS.1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. **8.NS.2** Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations. **8.EE.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	I CAN write repeating decimals as fractions. I CAN identify a number that is irrational. I CAN compare and order rational and irrational numbers. I CAN find square roots and cube roots of rational numbers. I CAN solve equations involving squares or cubes. I CAN use the properties of exponents to write equivalent expressions. I CAN write a number with a negative or zero exponent in different ways. I CAN estimate using large and small quantities using powers of 10. I CAN use scientific notation to write very large and very small quantities. I CAN perform operations with numbers in scientific notation.	• Math XL • Additional Practice Worksheets • Paper/pencil HW • Classroom Observation • Lesson Quizzes • STAR • Freckle • Unit Test

		8.EE.2 Use square root symbols to represent solutions to equations of the form of 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 $\sqrt{2}$is irrational. **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 as one is than the other. For example, estimate the population of the United States as 3 x 108 and the population of the world as 7 x 109, and determine that the world population is more than 20 times larger. **8.EE.4a** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. **8.EE.4b** 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.		
Unit 2 - approximately 4 weeks	**Envision Math 2.0 Book Chapter 7 - Pythagorean Theorem**	**8.G.6** Explain a proof of the Pythagorean Theorem and its converse.	I can use the Pythagorean Theorem to find unknown sides of right triangles.	• Math XL • Additional Practice

(October)	- Use the Pythagorean Theorem - Converse of the pythagorean Theorem - Apply the Pythagorean Theorem to real-world problems - Find distances in the coordinate plane	**8.G.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. **8.G.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	I CAN use the converse of the Pythagorean Theorem to identify right triangles. I CAN use the Pythagorean Theorem to solve problems. I CAN use the Pythagorean Theorem to find the distance between two points in the coordinate plane.	Worksheets • Paper/pencil HW • Classroom Observation • Lesson Quizzes • STAR • Freckle • Unit Test • Google Slideshow
<u>Unit 3</u> - approximately 6 weeks (Nov/Dec)	**<u>Envision Math 2.0 Book</u> Chapter 2 (2-1 to 2-4) - Solve Linear Equations** - Solve equations by combining like terms - Solve equations with variables on both sides of the equal sign. - Solve equations by using the distributive property - Solve multi-step equations - Solve equations with zero, one, or infinite solutions. - Solve multi-step inequalities.	**8.EE.7** Solve linear equations in one variable. **8.EE.7a** 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.7b** Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	I CAN solve 1 and 2 step equations. I CAN solve equations that have like terms on one side of the equal sign. I CAN solve equations with variables on both sides of the equation. I CAN use the distributive property to multiply quantities. I CAN use the distributive property to solve equations. I CAN solve multi-step equations and pairs of equations using more than one approach. I CAN determine the number of solutions an equation has. I can solve simple one and two step inequalities. I can solve multi-step inequalities.	• Math XL • Additional Practice Worksheets • Lesson Quizzes • Chapter Checkpoints • Additional Vocabulary Support WS • Freckle • Chapter Tests
<u>Unit 4</u> - approximately 4 weeks (January)	**<u>Envision Math 2.0 Book</u> Chapter 2 (2-5 to 2-9) - Analyze Linear Equations** - Compare proportional relationships - Connect proportional relationships and slope - Analyze linear equations using y=mx - Understand y-intercept	**8.EE.5a** Graph proportional relationships, interpreting the unit rate as the slope of the graph. **8.EE.5b** Compare two different proportional relationships represented in different ways. For example, compare a distance-time	I CAN compare proportional relationships. I CAN compare proportional relationships represented in different ways. I CAN understand the definition of slope and how it relates to a line. I CAN write equations to describe linear relationships.	• Math XL • Additional Practice Worksheets • Lesson Quizzes • Chapter Checkpoints • Additional Vocabulary

	of lines and equations - Analyze linear equations using y=mx+b	graph to a distance-time equation to determine which of two moving objects has greater speed. **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.	I CAN find the *y*-intercept of a graph and explain what it means I CAN derive the slope-intercept form equation from standard form. I CAN apply the slope-intercept form equation to different linear relationships.	Support WS ● Freckle ● Chapter Tests
<u>Unit 5</u> - approximately 5-6 weeks (Feb/March)	**<u>Envision Math 2.0 Book</u> Chapter 3 - Use Functions to Model Relationships and beginning of Chapter 5 (Solve Systems of Equations)** - Understand relations and functions - Connect representations of functions - Compare linear and nonlinear functions - Construct functions to model linear relationships - Intervals of increase/decrease in a function - Sketch functions from verbal descriptions - Determine number of solutions of a system of equations - Solve systems of equations by graphing	**8.FF.1a** Understand that a function is a rule that assigns to each input exactly one output. **8.FF.1b** The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. **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. **8.F.3a** Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line. **8.F.3b** Give examples of functions that are not linear	I CAN tell whether a relation is a function using inputs and outputs. I CAN identify functions by their equations, tables, and graphs. I CAN compare linear and nonlinear functions. I CAN write an equation in the form of y = mx + b to describe a linear function. I CAN describe the behavior of a function and write a description to go with its graph. I CAN sketch the graph of a function that has been described verbally. I CAN find the number of solutions of a system of equations by inspecting the equations. I CAN find the solution to a system of equations by graphing. I CAN find the solution to a system of equations algebraically using elimination or substitution.	● Math XL ● Additional Practice Worksheets ● Lesson Quizzes ● Chapter Checkpoints ● Additional Vocabulary Support WS ● Freckle ● Chapter Tests

		and prove that they are not linear. **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. **8.F.5a** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). **8.F.5b** Sketch a graph that exhibits the qualitative features of a function that has been described verbally. **8.EE.8** Analyze and solve pairs of simultaneous linear equations. **8.EE.8a** Understand that solutions to a system of two linear equations in two variables correspond to points of intersections of their graphs, because points of intersection satisfy both equations simultaneously. **8.EE.8b.1** Solve systems of two linear equations in two variables algebraically. **8.EE.8b.2** Estimate solutions [to systems of two linear equations in two variables] by graphing the equations.		

		8.EE.8b.3 Solve simple cases [of systems of two linear equations in two variables] by inspection. For example, 3x+2y=5 and 3x+2y=6 have no solution because 3x+2y cannot simultaneously be 5 and 6. **8.EE.8c** 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.		
Unit 6 - approximately 4 weeks (March/April)	**Envision Math 2.0 Book** **Chapter 6 - Congruence and Similarity** - Analyze Translations - Analyze Reflections - Analyze Rotations - Compose Transformations - Understand congruent figures - Describe Dilations - Understand similar figures - Angles, Lines, and Transversals - Interior/Exterior Angles of Triangles	**G.8.1a** Verify experimentally the properties of rotations, reflections, and translations: Lines are taken to lines, and line segments to line segments of the same length. **G.8.1b** Verify experimentally the properties of rotations, reflections, and translations: Angles are taken to angles of the same measure **G.8.1a** Verify experimentally the properties of rotations, reflections, and translations: Parallel lines are taken to parallel lines **G.8.2** 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.	I CAN translate two-dimensional figures. I CAN reflect two-dimensional figures. I CAN rotate two-dimensional figures. I CAN describe and perform a sequence of transformations. I CAN use a sequence of translations, reflections, and rotations to show that figures are congruent. I CAN dilate two-dimensional figures. I CAN use a sequence of transformations, including dilations, to show that figures are similar. I CAN identify and find the measures of angles formed by parallel lines and a transversal. I CAN find the interior and exterior angle measures of a triangle. I CAN use angle measures to determine whether two triangles are similar.	• Math XL • Additional Practice Worksheets • Lesson Quizzes • Chapter Checkpoints • Additional Vocabulary Support WS • Freckle • Transformation Graphing Project • Chapter Tests

		8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. **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.		
Unit 7 - approximately 2 weeks (April)	**Envision Math 2.0 Book** **Chapter 8 - Surface Area and Volume** - Surface area of 3D shapes - Volume of Cylinders - Volume of Cones - Volume of Spheres	**8.G.9** Know the formulas for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	I CAN find the surface area of prisms. I CAN find the surface area of cylinders. I CAN find the surface area of cones. I CAN find the surface area of spheres. I CAN find the volume of prisms. I CAN use what I know about the volume of prisms to find the volume of cylinders. I CAN find the volume of cones. I CAN find the volume of spheres and use it to solve problems.	• Math XL • Additional Practice Worksheets • Lesson Quizzes • Chapter Checkpoints • Additional Vocabulary Support WS • Rice Labs • Freckle • Chapter Tests
Unit 8 - approximately 2 weeks (May) ****Sometimes we do not get to this****	**Envision Math 2.0 Book** **Chapter 4 - Investigate Bivariate Data** - Construct and interpret scatterplots - Analyze linear associations - Use linear models to make predictions - Interpret two-way frequency tables	**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.	I CAN construct a scatter plot and use it to understand the relationship between paired data. I CAN use a line to represent the relationship between paired data. I CAN make a prediction by using the equation of a line that closely fits a set of data. I CAN display and interpret relationships between paired categorical data.	• Math XL • Additional Practice Worksheets • Lesson Quizzes • Chapter Checkpoints • Additional Vocabulary Support WS

	- Interpret two-way relative frequency tables	**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. **8.SP.3** 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.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. 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?	I CAN find the relative frequencies of two-way tables and interpret what they mean.	• Freckle • Chapter Tests