

# 2020 - 2021 Math 8E Curriculum Map

M. Howell

## Unit 1 - Equations

Lessons	Topics	Standards	Objectives	Essential Questions	Vocabulary
4 lessons 2 Quizzes 1 Review 1 Test  (Sept 10 - Sept 29)	Solving Simple Equations  Solving Multi-step Equations  Solving Equations with Variables on Both Sides  Rewriting Equations and Formulas	8.EE.7 8.EE.7a 8.EE.7b	To solve simple equations using addition, subtraction, multiplication and division.  To use inverse operations to solve multi-step equations.  To use the distributive property to solve multi-step equations.  To solve equations with variables on both sides.  To determine whether equations have no solution or infinitely many solutions.  To rewrite equations to solve for one variable in terms of the other variable(s).	How can you use inductive reasoning to discover rules in mathematics? How can you test a rule?  How can you solve a multi-step equation? How can you check the reasonableness of your solution?  How can you solve an equation that has variables on both sides?  How can you use a formula for one measurement to write a formula for a different measurement?	Literal Equation

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## Chapter 2 - Transformations

Lesson	Topics	Standards	Objectives	Essential Questions	Vocabulary
7 Lessons 2 Quizzes 1 Review 1 Test  (Sept 30 - Oct 28th)	Congruent Figures	8.G.1 8.G.2 8.G.3	To name corresponding angles and corresponding sides of congruent figures.	How can you identify congruent triangles?	Congruent Figures
	Translations	8.G.4	To identify congruent figures.	How can you arrange tiles to make a tessellation?	Corresponding Angles
	Reflections		To identify translations.	How can you use reflections to classify a frieze pattern?	Corresponding Sides
	Rotations		To translate figures in the coordinate plane.	What are the three basic ways to move an object in a plane?	Transformations
	Similar Figures		To identify reflections.	How can you use proportions to help make decisions in art, design and magazine layouts?	Image
	Perimeters and Areas of Similar Figures		To reflect figures in the x-axis or the y-axis of the coordinate plane.	How do changes in dimensions of similar geometric figures affect the perimeters and the areas of the figures?	Translation
	Dilations		To identify rotations.	How can you enlarge or reduce a figure in the coordinate plane?	Reflection
			To rotate figures in the coordinate plane.		Line of Reflection
			To use more than one transformation to find images of figures.		Rotation
			To name corresponding angles and corresponding sides of similar figures.		Center of Rotation
		To identify similar figures.		Angle of Rotation	
		To find unknown measures of similar figures.		Similar Figures	

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			<p>To understand the relationship between perimeters of similar figures.</p> <p>To understand the relationship between areas of similar figures.</p> <p>To find ratios of perimeters and areas for similar figures.</p> <p>To identify dilations.</p> <p>To dilate figures in the coordinate plane.</p> <p>To use more than one transformation to find images of figures.</p>		<p>Dilation</p> <p>Center of Dilation</p> <p>Scale Factor</p>
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## Unit 3 - Angles and Triangles

Lessons	Topics	Standards	Objectives	Essential Questions	Vocabulary
4 lessons 2 Quizzes 1 Review 1 Test  (Oct 29 - Nov 18)	Parallel Lines and Transversals  Angles of Triangles  Angles of Polygons  Using Similar Triangles	8.G.5	To identify the angles formed when parallel lines are cut by a transversal.  To find measures of angles formed when parallel lines are cut by a transversal.  To understand that the sum of a triangle is $180^\circ$ .  To find the measure of interior and exterior angles of triangles.  To find the sum of the interior angle measures of polygons.  To understand that the sum of the exterior angle measures of a polygon is $360^\circ$ .  To find the measures of interior and exterior angles of polygons.  To understand the concept of similar triangles.  To identify similar triangles.  To use indirect measurement to find missing measures.	How can you describe angles formed by parallel lines and transversals?  How can you describe the relationships among the angles of a triangle?  How can you find the sum of interior angle measures and the sum of the exterior angle measures of a polygon?  How can you use angles to tell whether triangles are similar?	Transversal  Interior Angles  Exterior Angles  Interior Angles of a polygon  Exterior Angles of a Polygon  Convex Polygon  Concave Polygon  Regular Polygon  Indirect Measurement

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## Chapter 4 - Volume and Similar Solids

Lesson	Topics	Standards	Objectives	Essential Questions	Vocabulary
4 Lessons 2 Quizzes 1 Review 1 Test  (Nov 30 - Dec 17)	Volumes of Cylinders  Volumes of Cones  Volumes of Spheres  Surface Area and Volumes of Similar Solids	8.G.9	To find the volume of cylinders.  To find the heights of cylinders given the volume.  To solve real-life problems.  To find the volumes of cones.  To find the height of cones given the volume.  To find the volumes of spheres.  To find the radii of spheres given the volumes.  Identify similar solids.  To use properties of similar solids to find missing measures.  To understand the relationship between surface areas and similar solids.  To understand the relationship between volumes of similar solids.	How can you find the volume of a cylinder?  How can you find the volume of a cone?  How can you find the volume of a sphere?  When the dimensions of a solid increases by a factor of $k$ , how does the surface area change? How does the volume change?	Sphere  Hemisphere  Similar Solids

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## Unit 5 - Graphing and Writing Linear Equations

Lessons	Topics	Standards	Objectives	Essential Questions	Vocabulary
8 lessons 2 Quizzes 1 Review 1 Test  (Jan 4 - Feb 1)	Graphing Linear Equations  Slope of a Line  Slopes of Parallel and Perpendicular Lines  Graphing Proportional Relationships  Graphing Linear Equations in Slope-Intercept Form  Graphing Linear Equations in Standard Form  Writing Equations in Slope-Intercept Form	8.EE.5  8.EE.6  8.F.4	To understand that lines represent solutions of linear equations.  To graph linear equations.  To find slopes of lines by using two points.  To find slopes of lines from tables.  To identify parallel and perpendicular lines.  To write and graph proportional relationships.  To find slopes and y-intercepts of graphs of linear equations.  To graph linear equations written in slope-intercept form.  To graph linear equations written in standard form.  Write equations of lines in slope-intercept form.  To write equations of lines using a slope and a point.	How can you recognize a linear equation? How can you draw its graph?  How can you use the slope of a line to describe the line?  How can you use an equation to identify parallel and perpendicular lines?  How can you describe the graph of the equation $y=mx+b$ ?  How can you describe the graph of the equation $ax + by = c$ ?  How can you write an equation of a line when you are given the slope and the y-intercept of the line?  How can you write an equation of a line when you are given the slope and a point on the line?	Linear Equation  Solution of a Linear Equation  Slope  Rise  Run  X-intercept  Y-intercept  Slope-intercept form  Standard Form  Point-slope form

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	Writing Equations in Point-slope Form		To write equations of lines using two points.		
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## Chapter 6 - Data Analysis and Display

<b>Lesson</b>	<b>Topics</b>	<b>Standards</b>	<b>Objectives</b>	<b>Essential Questions</b>	<b>Vocabulary</b>
4 Lessons 1 Test  (Feb 2 - Feb 22)	Scatter Plots  Lines of Fit  Two-Way Tables  Choosing a Data Display	8.SP.1 8.SP.2 8.SP.3	To construct and interpret scatter plots.  To describe patterns in scatter plots.  To find lines of fit.  To use lines of fit to solve problems.  To read two-way tables.  To make and interpret two-way tables.  To choose appropriate data display.  To identify and analyze misleading data displays.	How can you construct and interpret a scatter plot?  How can you use data to predict an event?  How can you read and make a two-way table?  How can you display data in a way that helps you make decisions?	Scatter Plot  Line of Fit  Line of Best Fit  Two-way table  Joint Frequency  Marginal Frequency

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## Unit 7 - Exponents and Scientific Notation

Lessons	Topics	Standards	Objectives	Essential Questions	Vocabulary
7 lessons 2 Quizzes 1 Review 1 Test  (Feb 23 - March 24)	Exponents  Product of Powers Property  Quotient of Powers Property  Zero and Negative Exponents  Reading Scientific Notation  Writing Scientific Notation  Operations in Scientific Notation	8.EE.1 8.EE.3 8.EE.4	To write expressions using integer exponents.  To evaluate expressions involving integer exponents.  To multiply powers with the same base.  To find a power of a power.  To find a power of a product.  To divide powers with the same base.  To simplify expressions involving the quotient of powers.  To evaluate expressions involving numbers with zero as an exponent.  To evaluate expressions involving negative integer exponents.  To identify numbers written in scientific notation.	How can you use exponents to write numbers?  How can you use inductive reasoning to observe patterns and write general rules involving properties of exponents?  How can you divide two powers that have the same base?  How can you evaluate a nonzero number with an exponent of zero? How can you evaluate a nonzero number with a negative integer exponent?  How can you read numbers that are written in scientific notation?  How can you write a number in scientific notation?  How can you perform operations with numbers written in scientific notation?	Power  Base  Exponent  Scientific Notation

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			<p>Write numbers in standard form.</p> <p>To compare numbers in scientific notation.</p> <p>To write large and small numbers in scientific notation.</p> <p>To perform operations with numbers written in scientific notation.</p> <p>To add, subtract, multiply and divide numbers written in scientific notation.</p>		
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## Chapter 8 - Systems of Linear Equations

Lesson	Topics	Standards	Objectives	Essential Questions	Vocabulary
4 Lessons 2 Quizzes 1 Review 1 Test  (April 6 - April 27)	Solving Systems of Linear Equations by Graphing  Solving Systems of Linear Equations by Substitution  Solving Systems of Linear Equations by Elimination  Solving Special Linear Equations by Graphing	8.EE.8a 8.EE.8b 8.EE.8c	To write and solve systems of linear equations by graphing.  To solve real-life problems.  To write and solve systems of linear equations by substitution.  To write and solve systems of linear equations by elimination.  To solve systems of linear equations with no solution or infinitely many solutions.	How can you solve a system of linear equations?  How can you use substitution to solve a system of equations?  How can you use elimination to solve a system of linear equations?  Can a system of linear equations have no solution? Can a system of a linear equation have many solutions?	System of Linear Equations  Solution of a System of Linear Equations

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## Unit 9 - Functions

Lessons	Topics	Standards	Objectives	Essential Questions	Vocabulary
5 lessons 2 Quizzes 1 Review 1 Test  (April 28 - May 19)	Relations and Functions  Representations of Functions  Linear Functions  Comparing Linear and Nonlinear Functions  Analyzing and Sketching Graphs	8.F.1 8.F.2 8.F.3 8.F.4 8.F.5	To define relations and functions.  To determine whether relations are functions.  To describe patterns in mapping diagram.  To write function rules.  To use input-output tables to represent functions.  To use graphs to represent functions.  To understand that the equation $y=mx+b$ defines a linear function.  To write linear functions using graphs or tables.  To compare linear functions.  To identify linear and nonlinear functions from tables or graphs.  To compare linear and nonlinear functions.	How can you use a mapping diagram to show the relationship between two data sets?  How can you represent a function in different ways?  How can you use a function to describe a linear pattern?  How can you recognize when a pattern in real life is linear or nonlinear?  How can you use a graph to represent relationships between quantities without using numbers?	Input  Output  Relation  Mapping Diagram  Function  Function Rule  Linear Function  Nonlinear Function

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			<p>To analyze the relationship between two quantities using graphs.</p> <p>To sketch graphs to represent the relationship between two quantities.</p>		
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## Chapter 10 - Real Numbers and the Pythagorean Theorem

Lesson	Topics	Standards	Objectives	Essential Questions	Vocabulary	
6 Lessons 2 Quizzes 1 Review 1 Test  (May 20 - June 11)	Finding Square Roots	8.EE.2	To find square roots of perfect squares.	How can you find the dimensions of a square or a circle when you are given its area?	Square Root	
		8.G.6			Perfect Square	
	Finding Cube Roots	8.G.7	To evaluate expressions involving square roots.	How is the cube root of a number different from the square root of a number?	Radical Sign	
		8.G.8			Radicand	
		8.NS.1	To use square roots to solve equations.		Cube Root	
	The Pythagorean Theorem	8.NS.2	To find cube roots of perfect cubes.	How are the lengths of the sides of a right triangle related?	Perfect Cube	
	Approximating Square Roots		To evaluate expressions involving cube roots.	How can you find decimal approximations of square roots that are not rational?	Theorem	
	Repeating Decimals		To evaluate expressions involving cube roots.		Legs	
	Using the Pythagorean Theorem		To use cube roots to solve equations.		In what other ways can you use the Pythagorean Theorem?	Hypotenuse
			To provide geometric proof of the Pythagorean Theorem.			Pythagorean Theorem
		To use the Pythagorean Theorem to find missing side lengths of right triangles.	Irrational Number			
		To solve real-life problems.		Real Numbers		
			To define irrational numbers.			

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			<p>To approximate square roots.</p> <p>To approximate values of expressions involving irrational numbers.</p> <p>To use the converse of the Pythagorean Theorem to identify right triangles.</p> <p>To use the Pythagorean Theorem to find distances in a coordinate plane.</p>		<p>Distance Formula</p>
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