8th Grade Foundations Math Curriculum Map

Map Sequence Disclaimer - The units in this curriculum map should be followed in a linear progression. ELOs and learning targets within each unit may be taught in the order that the teacher believes is best for their classroom.

Additional aligned resources covering a multitude of the standards below that can be used in whole class instruction as well as small group activities can be found at:

- Engaging Math lessons from PBS
- Assessment with learning goals and scales

▌Major Content is where students should spend the large majority (between 65-85%) of class time on the major work of the grade.
▫ Supporting Content and ◯ Additional Content can engage students in the major work of the grade.

Useful Vocabulary:

DOK: Webb's Depth of Knowledge, which indicates the level of rigor
ELO: Essential Learning Outcome = content standard + mathematical practice
Learning Target: "I can" statement to determine student mastery
Suggested Assessment Bank: items that *could* be used formatively and/or summatively to assess student progress
Suggested Resources: multiple standards-aligned activities/lessons that are intentionally included because no one resource is sufficient

Feedback: Please go here to provide the CLT with any useful feedback on a curriculum map.

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1 - Rigid Transformations & Congruence (Suggested days = 15)

Compelling Question #1: How can a student use geometry and coordinate graphing to verify and explain which transformations have been performed to create congruent figures?

Essential Learning Outcomes	8th Grade Learning Targets	Foundational Skills	Foundational Assessments & Resources
▮ Students will persevere in identifying, describing, finding coordinates, and graphing reflections, rotations and translations. (8.G.1, 8.G.3) (MP.1) Vocabulary: Reflection Rotation Translation A′, B′, etc. (“A prime,” “B prime,” etc.) Coordinates Ordered Pair Vertex/Vertices Quadrant x-axis y-axis Horizontal Vertical Sequence	DOK 1 I can identify and describe a reflection. I can identify and describe a rotation. I can identify and describe a translation. I can graph a translation. I can graph a reflection. DOK 2 I can graph a rotation. I can find the coordinates of a translation. I can find the coordinates of a rotation. I can find the coordinates of a reflection. I can draw an image of a figure under a sequence of rigid transformations.	4.MD.7 Recognize angle measure as additive. 4.G.1 Draw points, lines, line segments, rays, angles, and perpendicular and parallel lines 5.G.1 Graph points on the coordinate plane 5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant 6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices 6.NS.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane 7.G.2 Draw geometric shapes with given conditions 7.G.5 Supplementary, complementary, vertical, and adjacent angles	4.MD.7 Finding an Unknown Angle Measuring Angles Angle Estimation Competition Detectives Determining Angles Identifying Angles (online activity) 4.MD.7 Assessment Bank 4.G.1 Virtual Geoboard (virtual manipulative) Copy My Angle Geoboard Angles Geoboard ABCs Line Segments on Geoboards Boomerang Angles (online activity) The Geometry of Letters What's the Point? Measuring Angles 5.G.1 Battle Ship Using Grid Paper 5.G.1 Assessment Bank 5.G.2 Meerkat Coordinate Plane Task 5.G.2 Assessment Bank 6.G.3 Polygons in the Coordinate Plane Resources for 6.G.3 6.G.3 Assessment Bank 6.NS.8 Distances Between Points

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			Resources for 6.NS.8 6.NS.8 Assessment Bank 7.G.2 Any Way You Slice It 7.G.2 Assessment Bank 7.G.5 Angles in Field Hockey 7.G.5 Assessment Bank
▮ Students will construct arguments and critique the reasoning of others when identifying corresponding sides and angles of congruent shapes. (8.G.2, 8.G.4, 8.G.5) (MP.3) Vocabulary: Congruent Corresponding	DOK 1 I can identify corresponding sides and angles in congruent shapes. I can verify congruence by comparing measurements.	6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices 7.G.2 Draw geometric shapes with given conditions 7.G.5 Supplementary, complementary, vertical, and adjacent angles 8.G.1 Verify experimentally the properties of rotations, reflections, and translations 8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates	6.G.3 Polygons in the Coordinate Plane Resources for 6.G.3 6.G.3 Assessment Bank 7.G.2 Any Way You Slice It 7.G.2 Assessment Bank 7.G.5 Angles in Field Hockey 7.G.5 Assessment Bank 8.G.1 Origami Silver Rectangle 8.G.2-5 Congruent Rectangles Point Reflection Illinois Teach and Talk: 8.G.2 Illinois Teach and Talk: 8.G.4 Illinois Teach and Talk: 8.G.5 Aaron's Designs
▮ Students will identify different angle relationships and determine the measures of missing angles. (8.G.5) (MP.2) Vocabulary:	DOK 1 I can identify complementary angles. I can identify supplementary angles. I can identify adjacent angles.	8.G.1 Verify experimentally the properties of rotations, reflections, and translations 8.G.2	8.G.1 Origami Silver Rectangle 8.G.2 Congruent Rectangles

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Parallel Complementary Supplementary Adjacent Vertical Interior Exterior Transversal Alternate Interior Alternate Exterior	I can identify vertical angles. <u>DOK 2</u> I can find the measures of complementary angles. I can find the measures of supplementary angles. I can find the measures of adjacent angles. I can find the measures of vertical angles. I can find the missing angle inside a triangle. I can find the exterior angle of a triangle based on the exterior angle theorem.	Understand congruence 8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates	8.G.3 Point Reflection

2 - Dilations & Similarity (Suggested days = 15)

<u>Compelling Question #2:</u> How can a student use geometry and coordinate graphing to verify and explain how a dilation can be performed to create similar figures?

Essential Learning Outcomes	8th Grade Learning Targets	Foundational Skills	Foundational Assessments & Resources
▮ Students will persevere in identifying, finding coordinates, and graphing dilations. (8.G.1, 8.G.3) (MP.1) <u>Vocabulary:</u> Dilation A', B', etc. ("A prime," "B prime," etc.) Coordinates Ordered Pair Vertex/Vertices Quadrant x-axis y-axis Horizontal Vertical Sequence	<u>DOK 2</u> I can identify a dilation. I can find the coordinates of a dilation. I can graph a dilation.	4.MD.7 Recognize angle measure as additive 4.G.1 Draw points, lines, line segments, rays, angles, and perpendicular and parallel lines 5.G.1 Graph points on the coordinate plane 5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant 6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices 6.NS.8	4.MD.7 Finding an Unknown Angle Measuring Angles Angle Estimation Competition Detectives Determining Angles Identifying Angles (online activity) 4.MD.7 Assessment Bank 4.G.1 Virtual Geoboard (virtual manipulative) Copy My Angle Geoboard Angles Geoboard ABCs Line Segments on Geoboards Boomerang Angles (online activity) The Geometry of Letters What's the Point? Measuring Angles 4.G.1 Assessment Bank 5.G.1 Battle Ship Using Grid Paper

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		Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane 7.G.2 Draw geometric shapes with given conditions 7.G.5 Supplementary, complementary, vertical, and adjacent angles	5.G.1 Assessment Bank 5.G.2 Meerkat Coordinate Plane Task 5.G.2 Assessment Bank 6.G.3 Polygons in the Coordinate Plane Resources for 6.G.3 6.G.3 Assessment Bank 6.NS.8 Distances Between Points Resources for 6.NS.8 6.NS.8 Assessment Bank 7.G.2 Any Way You Slice It 7.G.2 Assessment Bank 7.G.5 Angles in Field Hockey 7.G.5 Assessment Bank
▮ Students will construct arguments and critique the reasoning of others when identifying corresponding sides and angles of similar shapes. (8.G.2, 8.G.4, 8.G.5) (MP.3) Vocabulary: Similar Corresponding	DOK 1 I can identify corresponding sides and angles in similar shapes. I can understand that all corresponding angles of two similar polygons have equal measure. I can identify similar shapes.	6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices 7.G.2 Draw geometric shapes with given conditions 7.G.5 Supplementary, complementary, vertical, and adjacent angles 8.G.1 Verify experimentally the properties of rotations, reflections, and translations 8.G.3	Identifying Similar Triangles 6.G.3 Polygons in the Coordinate Plane Resources for 6.G.3 6.G.3 Assessment Bank 7.G.2 Any Way You Slice It 7.G.2 Assessment Bank 7.G.5 Angles in Field Hockey 7.G.5 Assessment Bank 8.G.1 Origami Silver Rectangle

		Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates	8.G.3 Point Reflection

3 - Linear Relationships (Suggested days = 15)

Compelling Question #3: How can a student demonstrate conceptual understanding of components of linear relationships represented in different ways?

Essential Learning Outcomes	8th Grade Learning Targets	Foundational Skills	Foundational Assessments & Resources
▮ Students will compare the quotients of a pair of side lengths in similar triangles to introduce the concept of slope. (8.EE.6) (MP.2) Vocabulary: Similar Intercept Rise Run	DOK 1 I can find the slope of a line in a coordinate plane using knowledge of similar triangles.	6.G.1 Understanding ratio relationships 6.RP.2 Using ratios, unit rates, making tables, converting measurements 6.RP.3 Solving problems involving scale drawings of geometric figures 7.G.1 Computing unit rates 7.RP.1 Recognizing and representing proportional relationships between quantities 7.RP.2 Understand congruence 8.G.2 Understand that a two-dimensional figure is similar to another 8.G.4	6.G.1 Wallpaper Decomposition Resources for 6.G.1-2 & 4 6.G.1 Assessment Bank 6.RP.2-3 Price per pound and pounds per dollar Painting a Barn Resources for 6.RP.2-3 6.RP.2 Assessment Bank 6.RP.3 Assessment Bank 7.G.1 Floor Plan Map Distance Scaling Angles and Polygons Circumference of a Circle Approximating the Area of a Circle 7.G.1 Assessment Bank 7.RP.1 Track Practice Ratio problem w/ rational numbers Cooking with Whole Cup Molly's Run Cider Versus Juice - Variation 1 Cider Versus Juice - Variation 2

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		Understand that a two-dimensional figure is similar to another 8.G.5 Angles sums and exterior angles of triangles, angles of similar triangles, and angles created by parallel lines cut by transversal	Sale! Thunder and Lightning 7.RP.1 Assessment Bank 7.RP.2 Music Companies, Variation 1 Art Class, Variation 1 Art Class, Variation 2 Buying Coffee 7.RP.2 Assessment Bank 8.G.2 Congruent Rectangles 8.G.4 Are They Similar? 8.G.5 Find the Missing Angle
▮ Students will reason abstractly and quantitatively when interpreting slopes, unit rates, or equations of proportional relationships in the form of $y = mx + b$. (8.EE.6) (MP.2) Vocabulary: Rise Run Slope Unit rate $y = mx + b$ Slope-Intercept Form	DOK 1 I can recognize that the unit rate is the coefficient of x in a linear equation and the slope of the line on a graph. I can explain that an equation in the form of $y = mx$ will represent the graph of a proportional relationship with a slope of m and y- intercept of 0. I can understand what happens to the equations of translated lines. I can explain why a positive or negative slope in a particular context makes sense. I can write equations for all sorts of lines.	6.G.1 Understanding ratio relationships. 6.RP.2 Using ratios, unit rates, making tables, converting measurements 6.RP.3 Solving problems involving scale drawings of geometric figures 7.G.1 Solving problems involving scale drawings of geometric figures 7.RP.1 Computing unit rates 7.RP.2	6.G.1 Wallpaper Decomposition Resources for 6.G.1-2 & 4 6.G.1 Assessment Bank 6.RP.2-3 Price per pound and pounds per dollar Painting a Barn Resources for 6.RP.2-3 6.RP.2 Assessment Bank 6.RP.3 Assessment Bank 7.G.1 Floor Plan Map Distance Scaling Angles and Polygons Circumference of a Circle Approximating the Area of a Circle 7.G.1 Assessment Bank

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		Recognizing and representing proportional relationships between quantities 8.G.2 Understand congruence 8.G.4 Understand that a two-dimensional figure is similar to another 8.G.5 Angles sums and exterior angles of triangles, angles of similar triangles, and angles created by parallel lines cut by transversal	7.RP.1 Track Practice Cooking with Whole Cup Molly's Run Cider Versus Juice - Variation 1 Cider Versus Juice - Variation 2 Sale! Thunder and Lightning Ratio problem w/ rational numbers 7.RP.1 Assessment Bank 7.RP.2 Music Companies, Variation 1 Art Class, Variation 1 Art Class, Variation 2 Buying Coffee 7.RP.2 Assessment Bank 8.G.2 Congruent Rectangles 8.G.4 Are They Similar? 8.G.5 Find the Missing Angle
▮ Students will precisely graph proportional relationships and linear equations. (8.EE.5) (MP.6) Vocabulary: Proportional Relationship Interpret Slope Rate of change Represent	DOK 2 I can draw a graph of a proportional relationship when given a table or an equation.	6.RP.2 Understanding ratio relationships 6.RP.3 Using ratios, unit rates, making tables, converting measurements 7.EE.4 Using variables to represent quantities, construct simple equations and inequalities, solving equations 7.RP.1	6.RP.2-3 Price per pound and pounds per dollar Painting a Barn Resources for 6.RP.2-3 6.RP.2 Assessment Bank 6.RP.3 Assessment Bank 7.EE.4 Solving 1 step Equations Solving 2 step Equations Creating Inequalities 7.EE.4 Assessment Bank

		Computing unit rates 7.RP.2 Recognizing and representing proportional relationships between quantities	7.RP.1 Track Practice Ratio problem w/ rational numbers Cooking with Whole Cup Molly's Run Cider Versus Juice - Variation 1 Cider Versus Juice - Variation 2 Sale! Thunder and Lightning 7.RP.1 Assessment Bank 7.RP.2 Music Companies, Variation 1 Art Class, Variation 1 Art Class, Variation 2 Buying Coffee 7.RP.2 Assessment Bank

4 - Linear Equations & Linear Systems (Suggested days = 20)

Compelling Question #4: How can a student use appropriate algebraic and graphing methods to evaluate meaning in different circumstances?			
Essential Learning Outcomes	**8th Grade Learning Targets**	**Foundational Skills**	**Foundational Assessments & Resources**
▮ Students will persevere in solving linear equations in one variable algebraically. (8.EE.7) (MP.1) Vocabulary: Linear Inverse/Opposite Operation	DOK 1 I can check the solution to an equation. DOK 2 I can simplify a linear equation by using the distributive property, combining like terms, and inverse operations. I can solve multi-step linear equations with rational coefficients.	6.EE.3 Apply the properties of operations to generate equivalent expressions. 6.EE.4 Identify when two expressions are equivalent 6.EE.6 Understand that a variable can represent an unknown number 6.EE.7	6.EE.3-4 Rectangle Perimeter 1 Rectangle Perimeter 2 Resources for 6.EE.A.3-4 6.EE.3 Assessment Bank 6.EE.4 Assessment Bank 6.EE.6-7 Firefighter Allocation Morning Walk Resources for 6.EE.6-7 6.EE.6 Assessment Bank 6.EE.7 Assessment Bank

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		Solve problems by writing and solving equations of the form $x + p = q$ and $px = q$, where p, q, and x are nonnegative rational numbers 6.EE.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. 7.RP.2 Recognizing and representing proportional relationships between quantities 7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. 7.EE.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. 7.EE.4 Using variables to represent quantities, construct simple equations and inequalities, solving equations 7.NS.3 Solve problems involving the four operations with rational numbers 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.	6.EE.8 Height Requirements Resources for 6.EE.8 6.EE.8 Assessment Bank 7.RP.2 Music Companies, Variation 1 Art Class, Variation 1 Art Class, Variation 2 Art Class, Assessment Variation Buying Coffee 7.RP.2 Assessment Bank 7.EE.1 Writing Expressions What does 2,000 Calories Look Like? 7.EE.1 Assessment Bank 7.EE.2 Ticket to Ride Howard County Task - Shop Smart 7.EE.2 Assessment Bank 7.EE.4 Solving 1 step Equations Solving 2 step Equations Creating Inequalities 7.EE.4 Assessment Bank 7.NS.3 Sharing Prize Money Howard County Task: Triple Triumph 7.NS.3 Assessment Bank 8.SP.3 US Airports, Assessment Variation

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▮ Students will find precise solutions to systems of two linear equations algebraically and graphically. (8.EE.8) (MP.6) Vocabulary: System of Equations Solution No Solution Infinitely Many Solutions	DOK 1 I can understand that the solution to a system of equations is the point on a graph where their lines intersect. I can use structure to find the number of solutions to a system of equations. I can explain the difference between one solution, no solution, and infinitely many solutions to a system of equations. I can determine if (x, y) is the solution to a system of equations. I can classify a system of equations. DOK 2 I can estimate a solution to a system of equations by graphing. I can solve a system of equations by substitution. I can solve a system of equations by elimination. I can solve a system of equations with one solution. I can solve a system of equations with no solution. I can solve a system of equations with infinitely many solutions. DOK 3 I can justify a choice to use a particular method of solving a system of equations based on characteristics of the system. I can translate a word problem into a system of equations, and then solve that system algebraically.	6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers 6.EE.5 Understand solving an equation or inequality as answering a question of which numbers from a set make the equation or inequality true; use substitution to verify a solution. 6.EE.6 Understand that a variable can represent an unknown number 6.EE.7 Solve problems by writing and solving equations of the form $x + p = q$ and $px = q$, where p, q, and x are nonnegative rational numbers 6.EE.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. 7.EE.4 Using variables to represent quantities, construct simple equations and inequalities, solving equations 7.G.1 Solving problems involving scale drawings of geometric figures 7.NS.3 Solve problems involving the four operations with rational numbers 7.RP.2	6.EE.2 Rectangle Perimeter 1 6.EE.2 Assessment Bank 6.EE.5-8 Height Requirements Firefighter Allocation Morning Walk Resources for 6.EE.A.5-7 Resources for 6.EE.B.5 & 8 6.EE.5 Assessment Bank 6.EE.6 Assessment Bank 6.EE.7 Assessment Bank 6.EE.8 Assessment Bank 7.EE.4 Solving 1 step Equations Solving 2 step Equations Creating Inequalities 7.EE.4 Assessment Bank 7.G.1 Floor Plan Map Distance Scaling Angles and Polygons Circumference of a Circle Approximating the Area of a Circle 7.G.1 Assessment Bank 7.NS.3 Howard County Task: Triple Triumph Sharing Prize Money 7.NS.3 Assessment Bank 7.RP.2 Music Companies, Variation 1 Art Class, Variation 1 Art Class, Variation 2 Buying Coffee 7.RP.2 Assessment Bank

		Recognizing and representing proportional relationships between quantities 8.EE.5 Graph proportional relationships and linear equations 8.EE.6 Interpreting slopes, unit rates, or equations of proportional slope-intercept relationships 8.G.5 Angles sums and exterior angles of triangles, angles of similar triangles, and angles created by parallel lines cut by transversal	8.EE.5 Peaches and Plums 8.EE.6 Slopes Between Points on a Line 8.G.5 Find the Missing Angle

5 - Introducing Functions (Suggested days = 20)

Compelling Question #5: How can a student apply the properties of functions represented in different ways to form conclusions?

Essential Learning Outcomes	8th Grade Learning Targets	Foundational Skills	Foundational Assessments & Resources
▮ Students will make sense of the properties and construct viable arguments about the correspondences between input and output values in equations, tables, and graphs. (8.F.1, 8.F.2) (MP.1, MP.2) Vocabulary: Function Input Output Corresponding Rate of change Algebraically Verbal Description Numerically	DOK 1 I can define a function as a rule that assigns to each input exactly one output. I can show the relationship between the inputs and outputs of a function by graphing them as ordered pairs on a coordinate grid. DOK 2 I can determine the properties of a function written in algebraic form (rate of change, meaning of y-intercept, linear, non-linear). I can determine the properties of a function given the inputs and outputs in a table. I can compare the properties of two functions that are	6.RP.2 Understanding ratio relationships 6.RP.3 Using ratios, unit rates, making tables, converting measurements 7.EE.4 Using variables to represent quantities, construct simple equations and inequalities, solving equations 7.G.1 Solving problems involving scale drawings of geometric figures	6.RP.2-3 Price per pound and pounds per dollar Painting a Barn Resources for 6.RP.2-3 6.RP.2 Assessment Bank 6.RP.3 Assessment Bank 7.EE.4 Solving 1 step Equations Solving 2 step Equations Creating Inequalities 7.EE.4 Assessment Bank 7.G.1 Floor Plan

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y-intercept Initial Value	represented in different ways (e.g. an equation, a table, a graph, or verbal representation).	7.RP.1 Computing unit rates 7.RP.2 Recognizing and representing proportional relationships between quantities 8.EE.5 Graph proportional relationships and linear equations 8.EE.6 Interpreting slopes, unit rates, or equations of proportional slope-intercept relationships 8.G.5 Angles sums and exterior angles of triangles, angles of similar triangles, and angles created by parallel lines cut by transversal	Map Distance Scaling Angles and Polygons Circumference of a Circle Approximating the Area of a Circle 7.G.1 Assessment Bank 7.RP.1 Track Practice Cooking with Whole Cup Molly's Run Cider Versus Juice - Variation 1 Cider Versus Juice - Variation 2 Sale! Thunder and Lightning 7.RP.1 Assessment Bank Ratio problem w/ rational numbers 7.RP.2 Music Companies, Variation 1 Art Class, Variation 1 Art Class, Variation 2 Buying Coffee 7.RP.2 Assessment Bank 8.EE.5-6 Slopes Between Points on a Line Peaches and Plums 8.G.5 Find the Missing Angle
▮ Students will be able to explain the differences between linear and nonlinear functions. (8.F.3, 8.F.5) (MP.3) Vocabulary: $y = mx + b$ Slope-Intercept Form Linear	DOK 2 I can explain why the equation $y = mx + b$ represents a linear function and interpret the slope and y-intercept in relation to the function. I can give examples of relationships that are nonlinear functions. I can create a table of values that can be defined as a nonlinear function.	7.G.1 Solving problems involving scale drawings of geometric figures 7.RP.2 Recognizing and representing proportional relationships between quantities 8.EE.5	7.G.1 Floor Plan Map Distance Scaling Angles and Polygons Circumference of a Circle Approximating the Area of a Circle 7.G.1 Assessment Bank 7.RP.2 Music Companies, Variation 1

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		Graph proportional relationships and linear equations 8.EE.6 Interpreting slopes, unit rates, or equations of proportional slope-intercept relationships 8.F.1 Input and output of a function 8.F.2 Comparing properties of 2 functions	Art Class, Variation 1 Art Class, Variation 2 Buying Coffee 7.RP.2 Assessment Bank 8.EE.5 Peaches and Plums 8.EE.6 Slopes Between Points on a Line 8.F.1 US Garbage, Version 1 8.F.2 Battery Charging
▮ Students will determine and interpret the rate of change and initial value of a linear function from tables, graphs, or as modeled by a description. (8.F.4) (MP.2) Vocabulary: Rate of change Initial Value	DOK 2 I can determine the rate of change and initial value of the function from a description of a relationship, two (x, y) values, reading from a table, or reading from a graph. DOK 3 I can 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. I can explain why the equation $y = mx + b$ represents a linear function and interpret the slope and y-intercept in relation to the function.	6.RP.2 Understanding ratio relationships 6.RP.3 Using ratios, unit rates, making tables, converting measurements 7.EE.4 Using variables to represent quantities, construct simple equations and inequalities, solving equations 7.RP.1 Computing unit rates 7.RP.2 Recognizing and representing proportional relationships between quantities 8.EE.6 Interpreting slopes, unit rates, or equations of proportional slope-intercept relationships 8.F.1	6.RP.2-3 Price per pound and pounds per dollar Painting a Barn Resources for 6.RP.2-3 6.RP.2 Assessment Bank 6.RP.3 Assessment Bank 7.EE.4 Solving 1 step Equations Solving 2 step Equations Creating Inequalities 7.EE.4 Assessment Bank 7.RP.1 Ratio problem w/ rational numbers Track Practice Cooking with Whole Cup Molly's Run Cider Versus Juice - Variation 1 Cider Versus Juice - Variation 2 Sale! Thunder and Lightning 7.RP.1 Assessment Bank

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		Input and output of a function 8.F.2 Comparing properties of 2 functions 8.F.3 Interpreting a slope-intercept equation as a function whose graph is a straight line	7.RP.2 Music Companies, Variation 1 Art Class, Variation 1 Art Class, Variation 2 Buying Coffee 7.RP.2 Assessment Bank 8.EE.6 Slopes Between Points on a Line 8.F.1 US Garbage, Version 1 8.F.2 Battery Charging 8.F.3 Introduction to Linear Functions
▮ Students will construct a function to model a linear relationship between two quantities. (8.F.4, 8.F.5) (MP.1, MP.4, MP.5) <u>Vocabulary:</u> Rate of change Initial Value Qualitative Increasing Decreasing Exhibit	<u>DOK 2</u> I can match and sketch precise graphs from function equations or tables. I can write an equation to represent a relationship displayed in a graph or table. I can sketch a graph that exhibits the qualitative features of a function that has been described verbally. I can write a story that describes the functional relationship between two variables depicted on a graph.	6.RP.2 Understanding ratio relationships 6.RP.3 Using ratios, unit rates, making tables, converting measurements 7.EE.4 Using variables to represent quantities, construct simple equations and inequalities, solving equations 7.RP.1 Computing unit rates 7.RP.2 Recognizing and representing proportional relationships between quantities 8.EE.5 Graph proportional relationships and linear equations	6.RP.2-3 Price per pound and pounds per dollar Painting a Barn Resources for 6.RP.2-3 6.RP.2 Assessment Bank 6.RP.3 Assessment Bank 7.EE.4 Solving 1 step Equations Solving 2 step Equations Creating Inequalities Ratio problem w/ rational numbers 7.EE.4 Assessment Bank 7.RP.1 Track Practice Cooking with Whole Cup Molly's Run Cider Versus Juice - Variation 1 Cider Versus Juice - Variation 2 Sale! Thunder and Lightning

		8.EE.6 Interpreting slopes, unit rates, or equations of proportional slope-intercept relationships 8.F.1 Input and output of a function 8.F.2 Comparing properties of 2 functions 8.F.3 Interpreting a slope-intercept equation as a function whose graph is a straight line	7.RP.1 Assessment Bank 7.RP.2 Music Companies, Variation 1 Art Class, Variation 1 Art Class, Variation 2 Buying Coffee 7.RP.2 Assessment Bank 8.EE.6 Slopes Between Points on a Line 8.F.1 US Garbage, Version 1 8.F.2 Battery Charging 8.F.3 Introduction to Linear Functions

6 - Bivariate Data (Suggested days = 15)

Compelling Question #6: How can a student analyze and use visual representations of data to make predictions and reason abstractly?

Essential Learning Outcomes	8th Grade Learning Targets	Foundational Skills	Foundational Assessments & Resources
⊡ Students will make sense of and construct scatterplots. (8.SP.1) (MP.2, MP.4) Vocabulary: Bivariate Scatterplot Trend Positive Association Negative Association No Association	DOK 1 I can construct a scatterplot. I can interpret points on a scatterplot. I can recognize outliers in a scatterplot. I can recognize clusters in a scatterplot. I can recognize a pattern as having a positive or negative association. I can recognize a pattern as having a linear or nonlinear association.	5.G.2 Graph points in the first quadrant and interpret coordinate values from context. 6.G.3 Draw polygons given coordinates of vertices, and find side lengths. 6.NS.6	5.G.2 Battle Ship Using Grid Paper Meerkat Coordinate Plane Task 5.G.2 Assessment Bank 6.G.3 Polygons in the Coordinate Plane Resources for 6.G.3 6.G.3 Assessment Bank

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Linear Association Nonlinear Association Outlier Cluster	I can compare patterns of association between two quantities.	Locate rational and negative numbers on number lines and coordinate axes 6.NS.8 Graph points in all four quadrants; find distance between points with same first coordinate or same second coordinate	6.G.6 Resources for 6.NS.6 6.NS.6 Assessment Bank 6.NS.8 Distances Between Points Resources for 6.NS.8 6.NS.8 Assessment Bank
⊡ Students will reason quantitatively to model bivariate data with a straight line. (8.SP.2, 8.SP.3) (MP.2, MP.4, MP.7) Vocabulary: Line of Best Fit Informal Slope y-intercept Model	DOK 1 I can informally construct a line of best fit. DOK 2 I can assess the data by comparing the data points to the line of best fit. I can construct an argument comparing two or more lines of best fit. I can create an equation for a linear model. DOK 3 I can use the equation of a linear model to solve bivariate measurement data problems. I can use the equation of a linear model to interpret the slope. I can use the equation of a linear model to interpret the intercepts.	6.NS.8 Graph points in all four quadrants; find distance between points with same first coordinate or same second coordinate. 8.F.4 Determine and interpret rate of change and initial value of a function from two (x, y) values or a description 8.SP.1 Construct and interpret scatter plots	6.NS.8 Distances Between Points Resources for 6.NS.8 6.NS.8 Assessment Bank 8.SP.1 - Animal Brains
⊡ Students will collect and analyze data, model the data by constructing a table, and reason abstractly and quantitatively when interpreting the data. (8.SP.4) (MP.2, MP.3, MP.4, MP.7) Vocabulary: Categorical Frequency Relative Frequency Two-Way Table Frequency Table Row Column	DOK 1 I can construct a two-way table. DOK 2 I can interpret a two-way table. I can calculate relative frequencies in a two-way table. DOK 3 I can use relative frequencies to describe association between two variables.	None	

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7 - Integer Exponents & Scientific Notation (Suggested days = 20)

Compelling Question #7: How can a student utilize properties of exponents to simplify complex calculations and expressions?

Essential Learning Outcomes	8th Grade Learning Targets	Foundational Skills	Foundational Assessments & Resources
▮ Students will make use of structure when applying properties of integer exponents to simplify expressions. (8.EE.1) (MP.7) Vocabulary: Integer Exponent Expression Equivalent Negative exponent	DOK 1 I can explain why a zero exponent produces a value of one. I can explain how a number raised to an exponent of -1 is the reciprocal of that number. DOK 2 I can use and explain the properties of integer exponents to generate equivalent numerical expressions.	4.OA.4 Determine factors, multiples, and whether a number is prime or composite for 1-100 5.NBT.2 Explain patterns in products when multiplying or dividing by powers of 10 6.EE.1 Write and evaluate numerical expressions with whole-number exponents	4.OA.4 The Locker Game Squirreling It Away Howard County 4.OA.4 Resources Howard County 4.OA.4 Centers Howard County Grade 4 Resource Bank 4.OA.4 Assessment Bank 5.NBT.2 Building Powers of 10 Exponents as Powers of 10 Multiplying a Whole Number by Powers of 10 Patterns R Us Egyptian Powers of 10 game 5.NBT.2 Assessment Bank 6.EE.1 Seven to the What?!? Resources for 6.EE.1 6.EE.1 Assessment Bank
▮ Students will express and compare numbers in scientific notation, and precisely calculate operations of numbers expressed in scientific notation. (8.EE.3, 8.EE.4) (MP.1, MP.2) Vocabulary: Estimate Power of 10 Integer Single digit	DOK 1 I can use scientific notation to express very large quantities. I can use scientific notation to express very small quantities. I can express numbers as a single digit multiplied by an integer power of 10. I can perform operations using numbers expressed in scientific notation.	3.OA.3 Use multiplication and division in word problems to solve for unknowns 4.OA.2 Multiply or divide in word problems involving multiplicative comparison 5.NBT.1	3.OA.3 Gifts from Grandma, Variation 1 Two Interpretations of Division Analyzing Word Problems Involving Multiplication Illinois Teach & Talk 3.OA.3 Howard County 3.OA.3 Resources EngageNY 3.OA.3 Resources RPS Resource Book Lessons 3.OA.3 Assessment Bank

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	DOK 2 I can interpret scientific notation that has been generated by technology. I can use scientific notation to estimate very small and large numbers. I can compare quantities to express how much larger one is compared to the other. DOK 3 I can choose appropriate units of measure when using scientific notation.	Recognize that a digit in one place represents ten times as much as the digit to its right and one-tenth of the digit to its left 5.NBT.2 Explain patterns in products when multiplying or dividing by powers of 10 5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm 6.EE.1 Write and evaluate numerical expressions with whole-number exponents 7.EE.3 Solve multi-step problems with rational numbers of any form 7.NS.3 Solve problems involving the four operations with rational numbers 8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions	4.OA.2 Bikes and Trikes Howard County 4.OA.2 Resources Howard County 4.OA.2 Centers Howard County Grade 4 Resource Bank Comparing Money raised 4.OA.2 Assessment Bank 5.NBT.1 Comparing Digits Dice Roll Number Challenge Millions and Billions of People Ten Times Tenths and Hundredths 5.NBT.1 Assessment Bank 5.NBT.2 Building Powers of 10 Exponents as Powers of 10 Multiplying a Whole Number by Powers of 10 Patterns R Us Marta's Multiplication Error 5.NBT.2 Assessment Bank 5.NBT.5 Elmer's Multiplication Error Closest to 1,000 Start of the Year Celebration Make the Largest Product Make the Smallest Product 5.NBT.5 Assessment Bank 6.EE.1 Seven to the What?!? Resources for 6.EE.1-2 6.EE.1 Assessment Bank 7.EE.3 101 Challenges Stained Glass

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			7.EE.3 Assessment Bank (empty folder) 7.NS.3 Howard County Task: Triple Triumph Sharing Prize Money 7.NS.3 Assessment Bank 8.EE.1 Raising to the zero and negative powers
▮ Students will use square and cube roots with precision to solve equations involving integers. (8.EE.2) (MP.2) <u>Vocabulary:</u> Square root Cube root Rational Irrational Solution Equation	<u>DOK 1</u> I can evaluate square roots of small perfect squares. I can evaluate cube roots of small perfect cubes. I can understand that the square root of 2 is irrational. <u>DOK 2</u> I can use square root to represent solutions to equations. I can use cube root to represent solutions to equations.	4.OA.3 Solve multi-step word problems with whole numbers, including problems where remainders must be interpreted 6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation 6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers 6.EE.5 Understand solving an equation or inequality as answering a question of which numbers from a set make the equation or inequality true; use substitution to verify a solution 6.EE.7 Solve problems by writing and solving equations of the form $x + p = q$ and $px = q$, where p, q, and x are nonnegative rational numbers 7.NS.1 Add and subtract rational numbers; represent addition and subtraction on number line diagrams 7.NS.2	4.OA.3 Carnival Tickets Karl's Garden Digging Dinosaurs Double Down Friends You Can Count On 4.OA.3 Assessment Bank 6.NS.3 Resources for 6.NS.B.2-3 6.NS.3 Assessment Bank 6.EE.2 Rectangle Perimeter 1 Resources for 6.EE.A.1-2 6.EE.2 Assessment Bank 6.EE.5,7 Morning Walk Resources for 6.EE.A.5-7 6.EE.5 Assessment Bank 6.EE.7 Assessment Bank 7.NS.1-3 Golf Anyone? Bookstore Account Why is Negative X Negative Always Positive? Sharing Prize Money 7.NS.1 Assessment Bank 7.NS.2 Assessment Bank 7.NS.3 Assessment Bank

		Multiply and divide rational numbers 7.NS.3 Solve problems involving the four operations with rational numbers 8.G.6 Explain a proof of the Pythagorean Theorem and its converse	8.G.6 Converse of the Pythagorean Theorem

8 - Pythagorean Theorem & Irrational Numbers (Suggested days = 20)

Compelling Question #8: How can a student make conjectures or form conclusions using the relationship between sides of a right triangle?

Essential Learning Outcomes	8th Grade Learning Targets	Foundational Skills	Foundational Assessments & Resources
⊡ Students will identify and compare rational and irrational numbers. (8.NS.1, 8.NS.2) (MP.1, MP.2) Vocabulary: Rational Irrational Decimal expansion Repeating decimal Convert	DOK 1 I can identify rational numbers as numbers that can be written in the form of a fraction. I can write non-terminating, repeating decimals with a repeating symbol that highlights the repeated pattern. I can identify irrational numbers as any non-repeating, non-terminating decimal. I can recognize that any number that is not irrational is rational. DOK 2 I can convert terminating and repeating decimals into fractions. I can convert fractions into terminating or repeating decimals. I can compare the value of a number by stating which is bigger or smaller.	5.NF.3 Interpret a fraction as division 5.NF.4 Multiply a fraction or whole number by a fraction 6.NS.1 Compute quotients of fractions 7.NS.1 Add and subtract rational numbers; represent addition and subtraction on number line diagrams 7.NS.2 Multiply and divide rational numbers 8.EE.2 Use square root and cube root symbols to represent solutions to equations	5.NF.3 What is 23/5? How Much Pie? 5.NF.3 Assessment Bank 5.NF.4 Connor and Makayla Sharing Lunches Connecting the Area Model to Context 5.NF.4 Assessment Bank 6.NS.1 Traffic Jam Resources for 6.NS.1 6.NS.1 Assessment Bank 7.NS.1-2 Golf Anyone? Bookstore Account Why is Negative X Negative Always Positive? 7.NS.1 Assessment Bank 7.NS.2 Assessment Bank

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⊡ Students will reason quantitatively to show that decimal expansion for rational numbers eventually repeats. (8.NS.1, 8.NS.2) (MP.1, MP.2, MP.5, MP.6) Vocabulary: Rational Irrational Decimal expansion Repeating decimal Convert Approximation Number line Estimate Truncate	DOK 1 I can write any rational number as a decimal expansion that repeats.	5.NF.3 Interpret a fraction as division 5.NF.4 Multiply a fraction or whole number by a fraction 6.NS.1 Compute quotients of fractions 7.NS.1 Add and subtract rational numbers; represent addition and subtraction on number line diagrams 7.NS.2 Multiply and divide rational numbers 8.EE.2 Use square root and cube root symbols to represent solutions to equations	5.NF.3 What is 23/5? How Much Pie? 5.NF.3 Assessment Bank 5.NF.4 Connor and Makayla Sharing Lunches Connecting the Area Model to Context 5.NF.4 Assessment Bank 6.NS.1 Traffic Jam Resources for 6.NS.1 6.NS.1 Assessment Bank 7.NS.1-2 Golf Anyone? Why is Negative X Negative Always Positive? Bookstore Account 7.NS.1 Assessment Bank 7.NS.2 Assessment Bank
⊡ Students will approximate and locate irrational numbers on a number line. (8.NS.2) (MP.4) Vocabulary: Rational Irrational Decimal expansion Repeating decimal Convert Approximation Number line Estimate Truncate	DOK 1 I can round decimals to the nearest whole number. I can round decimals when given a place value. I can correctly place rational numbers on a number line. DOK 2 I can approximate any decimal between two whole numbers. I can approximate any decimal between tenths of a number. I can use rational numbers to approximate irrational numbers. I can place irrational numbers on a number line to the closest approximation.	7.NS.2 Multiply and divide rational numbers 8.EE.2 Use square root and cube root symbols to represent solutions to equations 8.NS.1 Understand rational numbers	7.NS.2 Golf Anyone? Why is Negative X Negative Always Positive? 7.NS.2 Assessment Bank 8.NS.1 Novice Task: Number Sense Identifying Rational Numbers Translating Between…
▮ Students will be able to state, rearrange, and prove the Pythagorean Theorem. (8.G.6) (MP.8)	DOK 1 I can state the Pythagorean Theorem. I can rearrange the Pythagorean Theorem as needed.	6.G.1 Understanding ratio relationships	6.G.1-2,4 Wallpaper Decomposition Computing Volume Progression 1

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Vocabulary: Right Triangle Leg Hypotenuse Squared Pythagorean Theorem	DOK 2 I can explain a proof of the Pythagorean Theorem and its converse.	6.G.2 Find the volume of a right rectangular prism with fractional edge lengths 6.G.4 Nets of three dimensional figures 7.G.6 Area, volume and surface area of two- and three-dimensional 8.EE.2 Use square root and cube root symbols to represent solutions to equations	Nets for Pyramids and Prisms Resources for 6.G.1-2,4 6.G.1 Assessment Bank 6.G.2 Assessment Bank 6.G.4 Assessment Bank 7.G.6 Rectangular Prism Volume and Surface Area Area and Circumference Circle Radius Which Circle is Bigger? Sand Under the Swing Set 7.G.6 Assessment Bank
▮ Students will apply the Pythagorean Theorem and its converse as a mathematical model to a variety of real-world and mathematical problems. (8.G.7, 8.G.8) (MP.4) Vocabulary: Right Triangle Leg Hypotenuse Squared Pythagorean Theorem Distance Distance Formula	DOK 1 I can determine if a triangle is a right triangle using the length of the sides. DOK 2 I can determine whether a missing side of a right triangle is a hypotenuse or leg, and then find its length. I can use the Pythagorean Theorem to determine the distance between two points on a coordinate grid. I can solve word problems with the Pythagorean Theorem.	5.G.2 Graph points in the first quadrant and interpret coordinate values from context 6.G.3 Draw polygons given coordinates of vertices, and find side lengths 6.NS.8 Graph points in all four quadrants; find distance between points with same first coordinate or same second coordinate 8.G.6 Explain a proof of the Pythagorean Theorem and its converse	5.G.2 Battle Ship Using Grid Paper Meerkat Coordinate Plane Task 5.G.2 Assessment Bank 6.G.3 Polygons in the Coordinate Plane Resources for 6.G.3 6.NS.8 Distances Between Points Resources for 6.NS.8 6.NS.8 Assessment Bank 8.G.6 Converse of the Pythagorean Theorem

9 - Cylinders, Cones, Spheres (Suggested days = 10)

Compelling Question #9: How can a student use knowledge of geometry to determine the volume of cylinders, cones, and spheres in real-world and mathematical problems?			
Essential Learning Outcomes	**8th Grade Learning Targets**	**Foundational Skills**	**Foundational Assessments & Resources**

8th Grade Foundations Math Curriculum Map

◯ Students will use formulas to precisely calculate the volume of cylinders, cones, and spheres. (8.G.9) (MP.2, MP.6) Vocabulary: Volume Formula Radius Diameter Height Cylinder Cone Sphere	DOK 1 I can state the formula for the volume of a cone. I can state the formula for the volume of a cylinder. I can state the formula for the volume of a sphere. DOK 2 I can calculate the volume of cones. I can calculate the volume of cylinders. I can calculate the volume of spheres.	6.EE.5 Understand solving an equation or inequality as answering a question of which numbers from a set make the equation or inequality true; use substitution to verify a solution 7.NS.3 Solve problems involving the four operations with rational numbers 8.NS.1 Understand rational numbers 8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers 8.G.6 Explain a proof of the Pythagorean Theorem and its converse 8.EE.2 Use square root and cube root	6.EE.5 Resources for 6.EE.5-7 6.EE.5 Assessment Bank 7.NS.3 Howard County Task: Triple Triumph Sharing Prize Money 7.NS.3 Assessment Bank 8.NS.1 Identifying Rational Numbers 8.NS.2 Irrational Numbers on the Number Line 8.G.6 Converse of the Pythagorean Theorem
◯ Students will apply the mathematics behind the volume of cylinders, cones, and spheres to problems arising in everyday life. (8.G.9) (MP.2, MP.4) Vocabulary: Volume Formula Radius Diameter Height Cylinder Cone Sphere	DOK 2 I can calculate the volume of cylinders, cones, and spheres in real-world problems. I can reason about the volume of differents shapes. I can see how changing one dimension changes the volume of a shape.	6.EE.5 Understand solving an equation or inequality as answering a question of which numbers from a set make the equation or inequality true; use substitution to verify a solution 7.NS.3 Solve problems involving the four operations with rational numbers 8.NS.1 Understand rational numbers 8.NS.2	6.EE.5 Resources for 6.EE.5-7 6.EE.5 Assessment Bank 7.NS.3 Howard County Task: Triple Triumph Sharing Prize Money 7.NS.3 Assessment Bank 8.NS.1 Identifying Rational Numbers 8.NS.2 Irrational Numbers on the Number Line 8.G.6

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		Use rational approximations of irrational numbers to compare the size of irrational numbers 8.G.6 Explain a proof of the Pythagorean Theorem and its converse 8.EE.2 Use square root and cube root	Converse of the Pythagorean Theorem