

## Unit Outline 8<sup>th</sup> Grade

Timeline	Essential Question/Big Ideas	Content	Standards	Assessments
≈4.5 Days	<ul style="list-style-type: none"> <li>• How would you describe the relationship between bridge strength and bridge thickness revealed by your experiment?</li> <li>• How would you describe the pattern relating bridge strength to bridge length shown in your experimental data?</li> <li>• How can you predict if a pattern between variables will be linear or nonlinear?</li> </ul>	<b>CMP2/3: Thinking with Mathematical Models</b> <b>Investigation 1-Exploring Data Patterns</b> <ul style="list-style-type: none"> <li>• Unit Readiness Assessment</li> <li>• 1.1 Bridge Thickness and Strength</li> <li>• 1.2 Bridge Length and Strength</li> <li>• 1.3 Custom Construction Parts</li> <li>• Math Reflections</li> <li>• Check-Up 1</li> </ul>	8.F.B.5, 8.SP.1	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> <li>• Unit Readiness Assessment</li> <li>• Check-up 1</li> </ul>
≈7 Days	<ul style="list-style-type: none"> <li>• How can you find a linear function that is a good model for a set of data and then measure the accuracy of that model with residuals?</li> <li>• How do you write an equation for a linear function if you are given a graph, a table, or two points?</li> <li>• What strategies do you use in writing equations for linear functions?</li> <li>• What strategies do you find useful to find solutions for linear equations?</li> <li>• When the graph of two linear functions intersect, what do the coordinates of that intersection point tell you?</li> </ul>	<b>Investigation 2-Linear Models and Equations</b> <ul style="list-style-type: none"> <li>• 2.1 Modeling Linear Data Patterns</li> <li>• 2.2 Up and Down the Staircase</li> <li>• 2.3 Tree Top Fun</li> <li>• 2.4 Boat Rental Business</li> <li>• 2.5 Amusement Park or Movies</li> <li>• Math Reflections</li> <li>• Partner Quiz</li> </ul>	8.EE.B.5, 8.EE.C.7, 8.EE.C.7b, 8.EE.C.8, 8.EE.C.8a, 8.EE.C.8c, 8.F.A.1, 8.F.A.2, 8.F.A.3, 8.F.B.4, 8.SP.A.2, 8.SP.A.3	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> <li>• Partner Quiz</li> </ul>
≈5 Days	<ul style="list-style-type: none"> <li>• When the product of two variables is some fixed number, what is the pattern of change and how is that pattern of change reflected in tables and graphs of the relationship?</li> <li>• What examples using distance, rate and time show one variable inversely related to another?</li> <li>• How does the cost per person change if a fixed total cost is split among an increasing number of individual payers?</li> <li>• What pattern in a table or graph of data suggests an inverse variation model for that kind of function?</li> </ul>	<b>Investigation 3-Inverse Variation</b> <ul style="list-style-type: none"> <li>• 3.1 Rectangles With Fixed Area</li> <li>• 3.2 Distance, Speed, and Time</li> <li>• 3.3 Planning a Field Trip</li> <li>• 3.4 Modeling Data Patterns</li> <li>• Math Reflections</li> </ul>	8.EE.B.5, 8.F.A.1, 8.F.A.3, 8.F.B.5, 8.SP.A.1	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> </ul>

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≈5.5 Days	<ul style="list-style-type: none"> <li>• If you have data relating two variables, how can you check to see whether a linear model is a good fit?</li> <li>• From the scatter plot, how do you know if a linear model fits the data? How do you know if there are outliers? How do you know if the relationship is positive or negative?</li> <li>• What does a correlation coefficient of 1, 0, or -1 suggest to you about the relationship between two variables?</li> <li>• How do you calculate the standard deviation for a data distribution and what does that statistic tell about the distribution?</li> </ul>	<b>Investigation 4-Variability and Association in Numeric Data</b> <ul style="list-style-type: none"> <li>• 4.1 Virtuvian Man</li> <li>• 4.2 Older and Faster</li> <li>• 4.3 Correlation Coefficients and Outliers</li> <li>• 4.4 Measuring Variability</li> <li>• Math Reflections</li> <li>• Check-Up 2</li> </ul>	8.F.A.1, 8.F.A.3, 8.F.B.4, 8.F.B.5, 8.SP.A.1, 8.SP.A.2, 8.SP.A.3	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> <li>• Check-up 2</li> </ul>
≈4.5 Days	<ul style="list-style-type: none"> <li>• What does a two-way table show you about preferences among groups?</li> <li>• Suppose you have recorded the counts of different preferences by a group in a two-way table. How can you use those counts, or percents from the counts, to decide if two groups have the same preferences or not?</li> <li>• Suppose you have data about the same trait in two groups. How can you organize the data to compare and decide if the groups are the same or not relative to the trait?</li> </ul>	<b>Investigation 5-Variability and Association in Categorical Data</b> <ul style="list-style-type: none"> <li>• 5.1 Wood or Steel? That's the Question</li> <li>• 5.2 Politics of Girls and Boys: Analyzing Data in Two-Way Tables</li> <li>• 5.3 After-School Jobs and Homework</li> <li>• Math Reflections</li> <li>• Unit Test</li> <li>• Unit Project</li> </ul>	8.SP.A.4	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> <li>• Unit Test</li> <li>• Unit Project</li> </ul>
≈ 4 Days	<ul style="list-style-type: none"> <li>• How do driving distance and flying distance between two coordinates relate to each other?</li> <li>• How do the coordinates of endpoints of a segment help draw other lines, which are parallel or perpendicular to the segment?</li> <li>• How does knowing how to calculate areas of rectangles and triangles help in the calculation of irregular areas?</li> </ul>	<b>CMP2/3: Looking for Pythagoras</b> <b>Investigation 1-Coordinate Grids</b> <ul style="list-style-type: none"> <li>• Unit Readiness Assessment</li> <li>• 1.1 Driving Around Euclid</li> <li>• 1.2 Planning Parks</li> <li>• 1.3 Finding Areas</li> <li>• Math Reflections</li> </ul>	8.G.B.8	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> <li>• Unit Readiness Assessment</li> </ul>

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≈ 6.5 Days	<ul style="list-style-type: none"> <li>• How many different square areas are possible to draw using the dots on a dot grid as vertices? Why are some square areas not possible?</li> <li>• What does <math>\sqrt{x}</math> mean? How does it relate to <math>x^2</math>?</li> <li>• How can you find the distance between any two points on a grid?</li> <li>• What does it mean to take the cube root of a number?</li> </ul>	<b>Investigation 2-Squaring Off</b> <ul style="list-style-type: none"> <li>• 2.1 Looking for Squares</li> <li>• 2.2 Square Roots</li> <li>• 2.3 Using Squares to Find Lengths</li> <li>• 2.4 Cube Roots</li> <li>• Math Reflections</li> <li>• Check-Up 1</li> </ul>	8.EE.A.2, 8.NS.A.2	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> <li>• Check-Up 1</li> </ul>
≈ 7 Days	<ul style="list-style-type: none"> <li>• You know the sum of the two shortest side lengths of a triangle must be greater than the third side length. Is there a similar relationship among the squares on the sides of a triangle? Is the relationship the same for all triangles?</li> <li>• How can you prove that the relationship observed in Problem 3.1 will work for all triangles?</li> <li>• How can you find the distance between any two points on a plane?</li> <li>• If a triangle with side lengths a, b, and c satisfies the relationship <math>a^2 + b^2 = c^2</math>, is the triangle a right triangle?</li> </ul>	<b>Investigation 3-The Pythagorean Theorem</b> <ul style="list-style-type: none"> <li>• 3.1 Discovering the Pythagorean Theorem</li> <li>• 3.2 A Proof of the Pythagorean Theorem</li> <li>• 3.3 Finding Distances</li> <li>• 3.4 Measuring the Egyptian Way</li> <li>• Math Reflections</li> <li>• Partner Quiz</li> </ul>	8.G.B.6, 8.G.B.7, 8.G.B.8	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> <li>• Partner Quiz</li> </ul>
≈ 5 Days	<ul style="list-style-type: none"> <li>• Can you find distances that are exact square roots of all whole numbers? Can you order square roots on a number line?</li> <li>• Why can you represent every fraction as a repeating or terminating decimal? How can you predict which representations will repeat and which will terminate?</li> <li>• Can you represent every repeating or terminating decimal as a fraction?</li> <li>• Can you identify every number as either rational or irrational?</li> </ul>	<b>Investigation 4-Using the Pythagorean Theorem: Understanding Real Numbers</b> <ul style="list-style-type: none"> <li>• 4.1 Analyzing the Wheel of Theodorus</li> <li>• 4.2 Representing Fractions as Decimals</li> <li>• 4.3 Representing Decimals as Fractions</li> <li>• 4.4 Getting Real</li> <li>• Math Reflections</li> </ul>	8.EE.A.2, 8.G.B.7, 8.NS.A.1, 8.NS.A.2	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> </ul>

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<p>≈ 7.5 Days</p>	<ul style="list-style-type: none"> <li>• How can you use the Pythagorean Theorem to find distances in a geometric shape?</li> <li>• How do the lengths of the sides of a 30-60-90 triangle relate to each other?</li> <li>• What is the relationship between the coordinates of a point (x, y) on a circle with a center at the origin?</li> </ul>	<p><b>Investigation 4-Using the Pythagorean Theorem: Analyzing Triangles and Circles</b></p> <ul style="list-style-type: none"> <li>• 5.1 Stopping Sneaky Sally</li> <li>• 5.2 Analyzing Triangles</li> <li>• 5.3 Analyzing Circles</li> <li>• Math Reflections</li> <li>• Looking Back</li> <li>• Unit Project</li> <li>• Unit Test</li> </ul>	<p>8.G.A.4, 8.G.B.7, 8.G.B.8</p>	<ul style="list-style-type: none"> <li>• Daily Check-ins/Problem of the Day</li> <li>• Unit Test</li> <li>• Unit Project</li> </ul>

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