## Math 8 Year at a Glance

Use these links to access more information about the course units of study: [Student Link](#), [Family Link](#), and [Teacher Link](#).

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| Unit 1: Rigid Transformations and Congruence | 12 days (4 pd) 24 days (7 pd) | 8.G.A.1.a, b 8.G.A.2 8.G.A.3 8.G.A.5 | • Exploration of transformations will verify the properties of rotations, reflections, and translations.  
• Two-dimensional figures can be rotated, translated, and reflected on a coordinate plane.  
• Congruent figures are formed by a series of rigid transformations.  
• Parallel lines, cut by a transversal, form angles with special relationships to one another.  
• Interior and exterior angles of triangles have special relationships. | • How does a rigid transformation affect the coordinates of a figure?  
• What does it mean for two figures to be congruent?  
• What sequence of transformations is needed to map one figure onto another?  
• How can I show the angle relationships formed by parallel lines but by a transversal?  
• How can I show the relationships between angles, both interior and exterior, of a triangle? | This unit has a mid and an end of unit assessment  
Human scored and computer scored items that assess content, reasoning, and problem solving. |

| Unit 2: Dilations, Similarity, and Introducing Slope | 9 days (4 pd) 18 days (7 pd) | 8.G.A.2 8.G.A.3 8.G.A.4 8.G.A.5 8.EE.B.6 | • Angle measures are preserved in a dilation, but lengths are multiplied by a scale factor.  
• Similar figures are formed by a series of transformations.  
• Slope, the vertical length divided by the horizontal length, can be identified from a graph, table, or equation. | • How does a dilation affect the attributes of a figure?  
• What does it mean for two figures to be similar?  
• What sequence of transformations will create a similar figure from a given figure?  
• What criterion can I use to identify two similar triangles?  
• What is a slope triangle for a line? How is it used? | Human scored and computer scored items that assess content, reasoning, and problem solving. |
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| **Unit 3:** Linear Relationships | 10 days (4 pd)    | 8.EE.B.5 8.EE.B.6 8.EE.C.8.a 8.G.A.1 | - Proportional relationships can be compared using graphs, tables, and equations.  
- Not all linear relationships are proportional.  
- Unit rate and rate of change can be interpreted as slope when the data is graphed on a coordinate plane.  
- Slope, $m$, is the same for any two distinct points on a non-vertical line.  
- The formula $y = mx+b$ is another way of expressing $y = kx$, both $m$ and $k$ represent constant values.  
- Graphs of linear equations that intersect the y-axis anywhere other than the origin do not represent proportional relationships.  
- The graph of a linear equation is the set of all solutions. | - What quantitative measure would I use to compare proportional relationships?  
- What characteristics identify a proportional linear relationship?  
- What linear relationship exists between two quantities?  
- What strategies can I use to write the equation of a line?  
- What information can be found by examining the graph of a linear equation?  
- What strategies can I use to check my solution to an equation?  
- What is an example of a solution to an equation that doesn’t make sense in context? | Human scored and computer scored items that assess content, reasoning, and problem solving. |
| **Unit 4:** Linear Equations and Linear Systems | 10 days (4 pd)    | 8.EE.C.7.a, b 8.EE.C.8.a, b, c | - Linear equations can have no, one, or infinitely many solutions.  
- The solution to a linear equation may require expanding expressions.  
- The solution to a system of equations contains the values that satisfy all equations in the system.  
- Systems of linear equations can be solved using more than one method. | - How do I choose the best strategy for solving an equation?  
- What does it mean to have infinitely many solutions?  
- How do I choose the best strategy for solving a system of equations?  
- How would I use a system of equations to model a real-world situation?  
- What does the solution mean in context? | Human scored and computer scored items that assess content, reasoning, and problem solving. |
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- Functions can be represented in tables, graphs, and equations.  
- Not all functional relationships are linear.  
- Relationships in mathematics can be represented, modeled, and analyzed using patterns and functions.  
- An approximation of Pi is integral to volumes of solid figures that are related to circles.  
- Relationships exist between dimensions and volumes of cylinders, cones, and spheres.                                                                                                                                 | - What are the characteristics of a function?  
- What is the relationship between x and y in a function?  
- What story does the graph of a function tell me?  
- How do you sketch the graph of a function from its context?  
- Why is it necessary to use Pi to find the volume of cylinders, cones, and spheres?  
- What is the relationship between the volume of a cone and the volume of a cylinder?  
- How would I use the volume of a figure to find other dimensions such as height or radius?                                                                                                                                 | This unit has a mid and an end of unit assessment.  
Human scored and computer scored items that assess content, reasoning, and problem solving.                                                                                                                          |
|                               | (4 pd)   |                     |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                  |
|                               | 30 days  |                     |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                  |
|                               | (7 pd)   |                     |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                  |
| **Unit 6: Associations in Data** | 8 days   | 8.SP.A.1 8.SP.A.2 8.SP.A.3 8.SP.A.4 | - Bivariate data displayed in scatterplots can be described using patterns such as clustering, outliers, positive or negative correlation, and linear or nonlinear association.  
- A straight line, or fit line, can be drawn on a scatterplot to model the bivariate data.  
- The equation of the linear model can be used to solve problems and make predictions.  
- Patterns of associations can be seen in bivariate data by displaying frequencies and relative frequencies in a two-way table.                                                                 | - How would I use a pattern to describe the data?  
- When is it appropriate to draw a fit line?  
- How do we use the linear model to make predictions?  
- What associations describe the data?  
- What inferences can be made from the data?                                                                                                                                                                     | Human scored and computer scored items that assess content, reasoning, and problem solving.                                                                                                                          |
|                               | (4 pd)   |                     |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                  |
|                               | 16 days  |                     |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                  |
|                               | (7 pd)   |                     |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                      |                                                                                                                                                                                                                  |
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| **Unit 7: Exponents and Scientific Notation**  |          |                     | - Properties of integer exponents can be used to generate equivalent numerical expressions.  
- Numbers with very small or very large values can be expressed concisely using scientific notation. | - Using the patterns, what rule would allow me to multiply or divide two powers with the same base?  
- Using the patterns, what rule would allow me to multiply different bases with the same exponent?  
- How can I express repeated multiplication of powers using a single exponent?  
- What does it mean when a value is raised to a negative power?  
- How does using powers of 10 make it easier to communicate about very large or very small numbers?  
- When might scientific notation be useful? | Human scored and computer scored items that assess content, reasoning, and problem solving. |
| **Unit 8: Pythagorean Theorem and Irrational Numbers** |          |                     | - Root values of numbers can be determined or approximated.  
- The square roots of rational numbers are not always rational.  
- Right triangles have a special relationship among their side lengths which can be represented by a model and formula.  
- The Pythagorean Theorem and its converse are related to the formula used to find the distance between two points on a coordinate plane. | - How do I distinguish between rational and irrational numbers?  
- How would I determine the placement of an irrational number on a number line?  
- How can I find the missing side length of a right triangle?  
- How do I find the distance between two points on a coordinate plane? | Human scored and computer scored items that assess content, reasoning, and problem solving. |
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| Unit 9: Putting It All Together | 5 days (4 pd) | 8.G.A.5 8.F.A.1 8.F.B 8.SP.A | • Properties of shapes can be used to create and to make inferences about regular tessellations.  
• Mathematical models can be used to make predictions about weather. | • What is a tessellation?  
• How do you know if a regular polygon can tessellate on a coordinate plane?  
• What relationships or patterns of association exist between the latitude and temperature of a given location? |                  |