Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Grade 8 Mathematics	Mathematics	Grade 8	

Course Description:

Students begin grade 8 with transformational geometry. They study rigid transformations and congruence, then dilations and similarity (this provides background for understanding the slope of a line in the coordinate plane). Next, they build on their understanding of proportional relationships from grade 7 to study linear relationships. They express linear relationships using equations, tables, and graphs, and make connections across these representations. They expand their ability to work with linear equations in one and two variables. Building on their understanding of a solution to an equation in one or two variables, they understand what is meant by a solution to a system of equations in two variables. They learn that linear relationships are an example of a special kind of relationship called a function. They apply their understanding of linear relationships and functions to contexts involving data with variability. They extend the definition of exponents to include all integers, and in the process codify the properties of exponents. They learn about orders of magnitude and scientific notation in order to represent and compute with very large and very small quantities. They encounter irrational numbers for the first time and informally extend the rational number system to the real number system, motivated by their work with the Pythagorean Theorem.

Aligned Core Resources:	Connection to the *BPS Vision of the Graduate*
Kendall Hunt Illustrative Mathematics	CRITICAL THINKING AND PROBLEM SOLVING • Collect, assess and analyze relevant information • Reason effectively. Use systems thinking • Make sound judgments and decisions. • Identify, define and solve authentic problems and essential questions. • Reflect critically on learning experience, processes and solutions • Transfer knowledge to other situations CONTENT MASTERY • Develop and draw from a baseline understanding of knowledge in academic disciplines from our Bristol curriculum.

Additional Course Information: ***Knowledge/Skill Dependent courses/prerequisites***	Link to ***Completed Equity Audit***
	Grade 8-Mathematics Equity Audit

Standard Matrix

Standards	Aligned Lessons
8.EE.A	8.8.14
8.EE.A.1	8.7.2, 8.7.3, 8.7.4, 8.7.5, 8.7.6, 8.7.7, 8.7.8, 8.7.11, 8.7.14

8.EE.A.2	8.8.2, 8.8.3, 8.8.4, 8.8.5, 8.8.10, 8.8.12, 8.8.13
8.EE.A.3	8.7.9, 8.7.10, 8.7.11, 8.7.12, 8.7.14, 8.7.16
8.EE.A.4	8.7.10, 8.7.11, 8.7.12, 8.7.13, 8.7.14, 8.7.15, 8.7.16
8.EE.B	8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.3.5, 8.3.6, 8.3.7, 8.3.8, 8.3.9, 8.3.10, 8.3.11, 8.3.12
8.EE.B.5	8.3.2, 8.3.3, 8.3.4, 8.3.6
8.EE.B.6	8.2.10, 8.2.11, 8.2.12, 8.3.7, 8.3.10, 8.3.11, 8.3.14
8.EE.C	8.3.12, 8.3.13, 8.4.2, 8.4.3, 8.4.4, 8.4.5, 8.4.9, 8.4.10
8.EE.C.7	8.4.3, 8.4.4, 8.4.5, 8.4.6, 8.4.9
8.EE.C.7.a	8.4.7, 8.4.8
8.EE.C.7.b	8.4.6
8.EE.C.8	8.4.9, 8.4.10, 8.4.11, 8.4.12, 8.4.13, 8.4.14, 8.4.15
8.EE.C.8.a	8.3.13, 8.3.14, 8.4.12, 8.4.13
8.EE.C.8.b	8.4.12, 8.4.15
8.EE.C.8.c	8.4.15, 8.4.16
8.F.A	8.5.3, 8.5.22
8.F.A.1	8.5.1, 8.5.2, 8.5.3, 8.5.4, 8.5.5, 8.5.17, 8.9.4
8.F.A.2	8.5.7, 8.5.8
8.F.A.3	8.5.4, 8.5.7, 8.5.8, 8.5.18
8.F.B	8.5.10, 8.5.11, 8.5.17, 8.5.18, 8.8.2, 8.9.4, 8.9.6
8.F.B.4	8.5.8, 8.5.9, 8.5.10, 8.5.11
8.F.B.5	8.5.5, 8.5.6, 8.5.10
8.G.A	8.1.17, 8.2.1, 8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.2.8, 8.2.9, 8.2.11, 8.2.12, 8.9.1, 8.9.2, 8.9.3
8.G.A.1	8.1.2, 8.1.3, 8.1.4, 8.1.6, 8.1.11, 8.1.14, 8.3.8
8.G.A.1.a	8.1.7, 8.1.8, 8.1.9, 8.1.10, 8.1.13
8.G.A.1.b	8.1.7, 8.1.8, 8.1.9, 8.1.10
8.G.A.1.c	8.1.9
8.G.A.2	8.1.11, 8.1.12, 8.1.13, 8.1.15, 8.2.6, 8.2.7
8.G.A.3	8.1.5, 8.1.6, 8.2.4, 8.2.5, 8.2.12
8.G.A.4	8.2.6, 8.2.7, 8.2.9

8.G.A.5	8.1.14, 8.1.15, 8.1.16, 8.2.8, 8.2.13, 8.9.2
8.G.B	8.8.6, 8.8.7, 8.8.9
8.G.B.6	8.8.7, 8.8.9
8.G.B.7	8.8.6, 8.8.7, 8.8.8, 8.8.10, 8.8.16
8.G.B.8	8.8.11
8.G.C	8.5.12, 8.5.17, 8.5.19, 8.5.20
8.G.C.9	8.5.13, 8.5.14, 8.5.15, 8.5.16, 8.5.17, 8.5.18, 8.5.19, 8.5.20, 8.5.21, 8.5.22
8.NS.A	8.8.2, 8.8.3, 8.8.10, 8.8.14
8.NS.A.1	8.8.14, 8.8.15
8.NS.A.2	8.8.1, 8.8.4, 8.8.5, 8.8.12, 8.8.13
8.SP.A	8.6.11, 8.9.4, 8.9.5, 8.9.6
8.SP.A.1	8.6.1, 8.6.2, 8.6.3, 8.6.4, 8.6.5, 8.6.6, 8.6.7, 8.6.8
8.SP.A.2	8.6.4, 8.6.5, 8.6.6, 8.6.8
8.SP.A.3	8.6.3, 8.6.6, 8.6.8
8.SP.A.4	8.6.9, 8.6.10

Unit Links

Unit Title:
Unit 1: Rigid Transformations and Congruence
Relevant Standards: Bold indicates priority

Lesson	Standards
8.1.1	8.G.A.1
8.1.2	8.G.A.1
8.1.3	8.G.A.1
8.1.4	8.G.A.1
8.1.5	8.G.A.3
8.1.6	8.G.A.1, 8.G.A.3
8.1.7	8.G.A.1.a, 8.G.A.1.b
8.1.8	8.G.A.1.a, 8.G.A.1.b, 8.G.A.1.c
8.1.9	8.G.A.1.a, 8.G.A.1.b, 8.G.A.1.c
8.1.10	8.G.A.1.a, 8.G.A.1.b
8.1.11	8.G.A.1, 8.G.A.2
8.1.12	8.G.A.2
8.1.13	8.G.A.1.a, 8.G.A.2
8.1.14	8.G.A.1, 8.G.A.5
8.1.15	8.G.A.2, 8.G.A.5
8.1.16	8.G.A.5, 8.G.B.6
8.1.17	8.G.A

Unit Narrative
In this unit, students learn to understand and use the terms “reflection,” “rotation,” “translation,” recognizing what determines each type of transformation, e.g., two points determine a translation. They learn to understand and use the terms “transformation” and “rigid transformation.” They identify and describe translations, rotations, and reflections, and sequences of these, using the terms “corresponding sides” and “corresponding angles,” and recognizing that lengths and angle measures are preserved. They draw images of figures under rigid transformations on and off square grids and the coordinate plane. They use rigid transformations to generate shapes and to reason about measurements of figures. They learn to understand congruence of plane figures in terms of rigid transformations. They recognize when one plane figure is congruent or not congruent to another. Students use the definition of “congruent” and properties of congruent figures to justify claims of congruence or non-congruence.

CFA 1: Lesson 3 CFA 2: Lesson 9 CFA 3: Lesson 12 EoU: (Use MoU-A 1, 2, 3, 4, 5a, 6a, 6b, 7a, 7b with Q's EoU-A 2, 4) *(Keep Current assessment in Edulastic , combination of MoU and EoU)*	20 Days
Family Overview (link below)	**Integration of Technology:**
Family Resources-English Family resources-Spanish	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning.*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Alternate interior angles, clockwise, congruent, coordinate plane, corresponding, counterclockwise, image, reflections, right angles, rigid transformation, rotation, sequence of transformations, straight angle, tessellation, transformation, translation, transversal, vertex, vertical angles	• *DESMOS* • *Edulastic*
Connections to Prior Units:	**Connections to Future Units:**
None	Geometry Unit 1
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation: Clarify vocabulary and symbols; Promote understanding across languages	• Pre-teach vocabulary and symbols, especially in ways that promote connection to the learners' experience and prior knowledge • Provide graphic symbols with alternative text descriptions • Highlight how complex terms, expressions, or equations are composed of simpler words or symbols • Embed support for vocabulary and symbols within the text (e.g., hyperlinks or footnotes to definitions, explanations, illustrations, previous coverage, translations) • Embed support for unfamiliar references within the text (e.g., domain specific notation, lesser known properties and theorems, idioms, academic language, figurative language, mathematical language, jargon, archaic language, colloquialism, and dialect) • Embed visual, non-linguistic supports for vocabulary clarification (pictures, videos, etc)
Supporting Multilingual/English Learners	

Related CELP standards:	Learning Targets:
An EL can . . .construct grade appropriate oral and written claims and support them with reasoning and evidence.	I can describe movements of figures by center of rotations, line of reflections, distance and direction. • Level 1: With prompting, I can use terms (orally or written) like reflect, rotate and translate to describe the movement of a figure. • Level 2: With prompting, I can make a claim (oral or written) about congruence and justify my thinking by using terms like reflect, rotate and translate to describe the movement of a figure. • Level 3: With guidance, I can make a claim (oral or written) about congruence and justify my thinking by using terms like reflect, rotate, translate AND include direction and/or distance to describe the movement of a figure. • Level 4: I can make a claim (oral or written) about congruence and justify my thinking by using terms like reflect, rotate, translate AND include direction and/or distance to describe the movement of a figure. • Level 5: I can make a counterargument to describe why the figures are or are not congruent using rigid transformations.

Lesson Sequence	Learning Target(s)	Success Criteria/ Assessment
1 Rigid Transformations (Lessons 1-6)	• I can describe movements of figures by center of rotations, line of reflections, distance and direction. (Entire Unit) • I can generalize about categories for translation, rotation and reflection . (lesson 2-6) • I can identify the sequence of transformations that takes one figure to its image. (Lesson 4) • I can create a drawing on a coordinate grid of a transformed object using concise verbal descriptions. (Lesson 5 and 6)	Lesson 1 • I can describe how a figure moves and turns to get from one position to another. Lesson 2 • I can identify corresponding points before and after a transformation. • I know the difference between translations, rotations, and reflections. Lessons 3 • I can decide which type of transformations will work to move one figure to another. • I can use grids to carry out transformations of figures and accurately label the corresponding points. Lesson 4 • I can identify a sequence of translations, rotations, and reflections to precisely describe transformations. Lesson 5 • I can apply transformations to points on a grid if I know their coordinates Lesson 6 • I can apply transformations to a polygon on a grid if I know the coordinates of its vertices.
2 Properties of Rigid Transformations	• I can justify whether or not rigid transformations could produce an image. (Lesson 7)	Lesson 7 • I can describe the effects of a rigid transformation on the lengths and angles in a polygon.

(Lessons 7-10)	• I can generalize about rotating line segments 180° about various points and observe the relationship to parallel lines.(lesson 8-9) • I can generalize about the relationship between vertical angles by a rigid transformation. (Lesson 9) • I can describe transformations using corresponding points, line segments, and angles. (lesson 10)	Lesson 8 • I can describe how to move one part of a figure to another using a rigid transformation. Lesson 9 • I can describe the effects of a rigid transformation on a pair of parallel lines. • If I have a pair of vertical angles and know the angle measure of one of them, I can find the angle measure of the other. Lesson 10 • I can find missing corresponding side lengths or angle measures using properties of rigid transformations.
3 Congruence (Lessons 11-13)	• I can justify whether or not shapes, polygons and ovals are congruent. (Lesson 11-13) • I can describe the relationship between corresponding segments and length. (Lesson 13)	Lesson 11 • I can decide visually whether or not two figures are congruent by comparing corresponding side lengths, angles and areas of figures. Lesson 12 • I can decide whether or not two figures are congruent using rigid transformations. Lesson 13 • I can use distances between points to decide if two figures are congruent.
4 Angles in a Triangle (Lessons 14-16)	• I can show alternate interior angles are congruent by understanding angle relationships. (Lesson 14) • I can justify whether or not triangles can be created from given angle measurements and generalize about the sum of the angles in a triangle. (Lesson 15-16)	Lesson 14 • If I have two parallel lines cut by a transversal, I can identify alternate interior angles and use that to find missing angle measurements. Lesson 15 • If I know two of the angle measures in a triangle, I can find the third angle measure. Lesson 16 • I can explain using pictures why the sum of the angles in any triangle is 180 degrees.
5 Let Put it to Work (Lessons 17)	• I can describe transformations found in tessellations and in designs with rotational symmetry. (Lesson 17)	Lesson 17 • I can repeatedly use rigid transformations to make interesting repeating patterns of figures. • I can use properties of angle sums to reason about how figures will fit together.

Unit Title:
Unit 2: Dilations, Similarity, and Introducing Slope
Relevant Standards: Bold indicates priority

Lesson	Standards
8.2.1	8.G.A
8.2.2	8.G.A
8.2.3	8.G.A
8.2.4	8.G.A, 8.G.A.3
8.2.5	8.G.A, 8.G.A.3
8.2.6	8.G.A.2, 8.G.A.4
8.2.7	8.G.A.2, 8.G.A.4
8.2.8	8.G.A, 8.G.A.5
8.2.9	8.G.A, 8.G.A.4
8.2.10	8.EE.B.6
8.2.11	8.EE.B.6, 8.G.A
8.2.12	8.EE.B.6, 8.G.A, 8.G.A.3
8.2.13	8.G.A.4, 8.G.A.5

Unit Narrative:
In this unit, students learn to understand and use the term "dilation," and to recognize that a dilation is determined by a point called the "center" and a number called the "scale factor." They learn that under dilation, the image of a circle is a circle and the image of a line is a line parallel to the original. They draw images of figures under dilations on and off the coordinate plane. They use the terms "corresponding sides" and "corresponding angles" to describe correspondences between a figure and its dilated image, and recognize that angle measures are preserved, but lengths are multiplied by the scale factor. They learn to understand similarity of plane figures in terms of rigid transformations and dilations. They learn to recognize when one plane figure is similar or not similar to another. They use the definition of "similar" and properties of similar figures to justify claims of similarity or non-similarity. Students learn the terms "slope" and "slope triangle," and use the similarity of slope triangles on the same line to understand that any two distinct points on a line determine the same slope.

Demonstration of Learning:	Pacing for Unit
CFA 1: **Lesson 4** CFA 2: **Lesson 7** CFA 3: **Lesson 10** EoU: Assessment- Use EOU A , #1, #3, #4, #5 (changed numbers), reference current edulastic EOU #5 (this was	15 Days

an added question), EOU A #6a change to put on grid, dropped b, Include 6c, added explain how you found slope and values, reference current edulastic #7 (eliminate b, and d) and add grid - added 7 (c) dilate with scale factor of 2	
Family Overview (link below)	**Integration of Technology:**
Family Resources-English Family resources-Spanish	Edulastic DESMOS
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Alternate interior angles, center of a dilation, clockwise, congruent, coordinate plane, corresponding, counterclockwise, dilation, image, reflection, right angle, rigid transformation, rotation, scale factor, sequence of transformations, similar, slope, straight angle, tessellation, transformation, translation, transversal,vertex, vertical angles	• DESMOS • Edulastic
Connections to Prior Units:	**Connections to Future Units:**
Grade 7, Unit 1	Geometry, Unit 3
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation: Clarify vocabulary and symbols; Promote understanding across languages	Pre-teach vocabulary and symbols, especially in ways that promote connection to the learners' experience and prior knowledge • Provide graphic symbols with alternative text descriptions • Highlight how complex terms, expressions, or equations are composed of simpler words or symbols • Embed support for vocabulary and symbols within the text (e.g., hyperlinks or footnotes to definitions, explanations, illustrations, previous coverage, translations) • Embed support for unfamiliar references within the text (e.g., domain specific notation, lesser known properties and theorems, idioms, academic language, figurative language, mathematical language, jargon, archaic language, colloquialism, and dialect) • Embed visual, non-linguistic supports for vocabulary clarification (pictures, videos, etc)
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**

<table>
<tr><td colspan="2">An EL can . . .construct grade appropriate oral and written claims and support them with reasoning and evidence.</td><td>I can explain how to apply dilations and perform dilations to find specific images by using scale factors and given coordinates.
• Level 1: With prompting, I can use terms (orally or written) like reflect, rotate, translate and dilate to describe the movement of a figure.
• Level 2: With prompting, I can make a claim (oral or written) about congruence and similarity and justify my thinking by using terms like reflect, rotate, translate and dilate to describe the movement of a figure.
• Level 3: With guidance, I can make a claim (oral or written) about congruence and similarity and justify my thinking by using terms like reflect, rotate, translate, dilation AND include direction , distance and/or scale factor to describe the movement of a figure.
• Level 4: I can make a claim (oral or written) about similarity and justify my thinking by using terms like reflect, rotate, translate, dilate AND include direction, distance and/or scale factor to describe the movement of a figure.
• Level 5: I can make a counterargument to describe why the figures are or are not similar using transformations.</td></tr>
<tr><td>Lesson Sequence</td><td>Learning Target</td><td>Success Criteria/ Assessment</td></tr>
<tr><td>1
Dilations
(Lessons 1-5)</td><td>• I can describe and represent dilations of figures and points by observing centers of dilation. (Lessons 1-2)
• I can explain how to apply dilations and perform dilations to find specific images by using scale factors and given coordinates. (Lesson 3-5)</td><td>Lesson 1
• I can decide if one rectangle is a dilation of another rectangle.
• I know how to use a center and a scale factor to describe a dilation.
Lesson 2
• I can apply dilations to figures on a circular grid when the center of dilation is the center of the grid.
Lesson 3
• I can apply a dilation to a polygon using appropriate math tools.
Lesson 4
• I can apply dilations to figures on a rectangular grid.
• I can describe angle measures and side lengths of a polygon after applying a dilation with a given scale factor.
Lesson 5
• I can apply dilations to polygons on a rectangular grid if I know the coordinates of the vertices and of the center of dilation.</td></tr>
<tr><td>2
Similarity
(Lessons 6-9)</td><td>• I can describe sequences of transformations and represent figures using specific transformations. (Lesson 6)</td><td>Lesson 6
• I can apply a sequence of transformations to one figure to get a similar figure.</td></tr>
</table>

	• I can justify the similarity of two polygons given their angle measures and side lengths (Lesson 7) • I can explain how to determine whether triangles are congruent, similar, or neither (Lesson 8) • I can describe observations about side lengths in similar triangles (Lesson 9) • I can explain strategies for finding missing side lengths (Lesson 9)	• I can use a sequence of transformations to explain why two figures are similar. Lesson 7 • I can use angle measures and side lengths to conclude that two polygons are not similar. • I know the relationship between angle measures and side lengths in similar polygons. Lesson 8 • I know how to decide if two triangles are similar just by looking at their angle measures. Lesson 9 • I can decide if two triangles are similar by looking at quotients of lengths of corresponding sides. • I can find missing side lengths in a pair of similar triangles using quotients of side lengths.
3 Slope (Lessons 10-12)	• I can draw a line on a coordinate grid given its slope and describe (orally) observations about lines with the same slope. (Lesson 10) • I can create an equation relating the quotient of the vertical and horizontal side lengths of a slope triangle to the slope of a line. (Lesson 11) • I can explain how to apply dilations to find specific images of points (Lesson 12) • I can represent graphs of lines using equations (Lesson 12)	Lesson 10 • I can draw a line on a grid with a given slope. • I can find the slope of a line on a grid using a slope triangle. Lesson 11 • I can decide whether a point is on a line by finding quotients of horizontal and vertical distances. Lesson 12 • I can find an equation for a line and use that to decide which points are on that line.
4 Let's Put it to Work (Lessons 13)	• I can explain reasoning for a conjecture (Lesson 13)	Lesson 13 • I can model a real-world context with similar triangles to find the height of an unknown object.

Unit Title:
Unit 3: Linear Relationships
Relevant Standards: Bold indicates priority

Lesson	Standards
8.3.1	8.EE.B, 8.EE.B.5
8.3.2	8.EE.B, 8.EE.B.5
8.3.3	8.EE.B, 8.EE.B.5
8.3.4	8.EE.B, 8.EE.B.5
8.3.5	8.EE.B
8.3.6	8.EE.B, 8.EE.B.5
8.3.7	8.EE.B, 8.EE.B.6
8.3.8	8.EE.B, 8.G.A.1
8.3.9	8.EE.B
8.3.10	8.EE.B, 8.EE.B.6
8.3.11	8.EE.B, 8.EE.B.6
8.3.12	8.EE.B, 8.EE.C
8.3.13	8.EE.C, 8.EE.C.8.a
8.3.14	8.EE.B.6, 8.EE.C.8.a

Unit Narrative:
In this unit, students learn to understand and use the terms "rate of change," "linear relationship," and "vertical intercept." They deepen their understanding of slope, and they learn to recognize connections among rate of change, slope, and constant of proportionality, and between linear and proportional relationships. They learn to understand that lines with the same slope are translations of each other. They represent linear relationships with tables, equations, and graphs that include lines with negative slopes or vertical intercepts, and horizontal and vertical lines. They learn to use the term "solution of an equation" when working with one or two linear equations in two variables, and learn to understand the graph of a linear equation as the set of its solutions. Students use these terms and representations in reasoning about situations involving one or two constant rates.

Demonstration of Learning:	**Pacing for Unit**
CFA 1: **Lesson 3** CFA 2: Lesson 6 CFA 3: **Lesson 11** EoU: Assessment A- #1, #2, #3, #4 (format as a drag and drop), #5- add parts a, b, c to calculate	16 Days

each runner's rate, part d is which is faster., #6, #7a, b- change wording to "Write an equation that represents the total cost (y) for x months", c, d, eliminate e.	
Family Overview (link below)	**Integration of Technology:**
Family Resources- English Family Resources-Spanish	Edulastic DESMOS
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Alternate interior angles, center of a dilation, clockwise, congruent, constant of proportionality, coordinate plane, corresponding, counterclockwise, dilation, image, linear relationship, rate of change, reflection, right angle, rigid transformation, rotation, scale factor, sequence of transformations, similar, slope, solution to an equation with two variables, straight angle, tessellation, transformation, translation, transversal, vertex, vertical angles, vertical intercept	• DESMOS • Edulastic
Connections to Prior Units:	**Connections to Future Units:**
Grade 7, Unit 5	Grade 8, Unit 6
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation- Illustrate through multiple media	• Present key concepts in one form of symbolic representation (e.g., an expository text or a math equation) with an alternative form (e.g., an illustration, dance/movement, diagram, table, model, video, comic strip, storyboard, photograph, animation, physical or virtual manipulative)
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
An EL can . . . determine the meaning of words and phrases in oral presentations and literary and informational text.	I can represent linear relationships using graphs, tables, equations, and verbal descriptions. • Level 1: Relying on anchor charts, I can recognize the meaning of slope, vertical intercept and proportionality. • Level 2: Using anchor charts, I can identify the slope, vertical intercept and proportionality. • Level 3: Using anchor charts, I can identify positive/negative slope on a graph or a table, and determine the vertical intercept. • Level 4: Using tables, graphs and equations, I can identify positive/negative slope on a graph or a table, and determine the vertical intercept and proportionality.

		• Level 5: I can represent linear relationships using graphs, tables, equations, and verbal descriptions.
Lesson Sequence	**Learning Target**	**Success Criteria/Assessment**
1 Proportional Relationships (Lessons1-4)	• I can represent and graph situations involving proportional relationships (Lesson 1-2) • I can represent constants of proportionality in different ways (Lesson 3) • I can explain how to graph proportional relationships (Lesson 3) • I can interpret multiple representations of a proportional relationship in order to answer questions and explain the solution method (Lesson 4)	Lesson 1 • I can graph a proportional relationship from a story. • I can use the constant of proportionality to compare the pace of different animals. Lesson 2 • I can graph a proportional relationship from an equation. • I can tell when two graphs are of the same proportional relationship even if the scales are different. Lesson 3 • I can scale and label coordinate axes in order to graph a proportional relationship. Lesson 4 • I can compare proportional relationships represented in different ways.
2 Representing Linear Relationships (Lessons 5-8)	• I can explain how to use a graph to determine information about a linear situation (Lessons 5 and 6) • I can represent slope using expressions (lesson 7) • I can generalize about equations and linear relationships (Lesson 7) • I can represent linear relationships using graphs, tables, equations, and verbal descriptions (Lesson 8)	Lesson 5 • I can find the rate of change of a linear relationship by figuring out the slope of the line representing the relationship. Lesson 6 • I can interpret the vertical intercept of a graph of a real-world situation using a numerical and verbal description. • I can match graphs to the real-world situations they represent by identifying the slope and the vertical intercept. Lesson 7 • I can use patterns to write a linear equation to represent a situation. • I can write an equation for the relationship between two items in a real-world situation. Lesson 8 • I can explain where to find the slope and vertical intercept in both an equation and its graph. • I can write equations of lines using y=mx+b.
3 Finding Slopes (Lessons 9-11)	• I can represent situations using negative slopes and slopes of zero (Lesson 9) • I can generalize in order to make predictions about the slope of lines (Lesson 10) • I can explain how to graph linear relationships (Lesson 10) • I can explain how slope relates to changes in a situation (Lesson 11)	Lesson 9 • I can give an example of a situation that would have a negative slope when graphed. • I can look at a graph and tell if the slope is positive or negative and explain how I know. Lesson 10 • I can calculate positive and negative slopes given two points on the line. • I can describe a line precisely enough that another student can draw it. Lesson 11

		- I can write equations of lines that have a positive or a negative slope. - I can write equations of vertical and horizontal lines.
4 Linear Equations (Lessons 12-13)	- I can represent situations by graphing lines and writing equations (Lesson 12) - I can determine whether a point is a solution to an equation of a line using a graph of the line. (Lesson 13)	Lesson 12 - I know that the graph of an equation is a visual representation of all the solutions to the equation. - I understand what the solution to an equation in two variables is. Lesson 13 - I can find solutions (x, y) to linear equations given either the x - or the y -value to start from.
5 Let's Put it to Work (Lesson 14)	I can represent situations involving linear relationships (Lesson 14)	Lesson 14 I can write linear equations to reason about real-world situations.

Unit Title:

Unit 4: Linear Equations and Linear Systems

Relevant Standards: Bold indicates priority

Lesson	Standards
8.4.1	8.EE.C.7
8.4.2	8.EE.C
8.4.3	8.EE.C, 8.EE.C.7
8.4.4	8.EE.C, 8.EE.C.7
8.4.5	8.EE.C, 8.EE.C.7
8.4.6	8.EE.C.7, 8.EE.C.7.b
8.4.7	8.EE.C.7.a
8.4.8	8.EE.C.7.a
8.4.9	8.EE.C, 8.EE.C.7, 8.EE.C.8
8.4.10	8.EE.C, 8.EE.C.8
8.4.11	8.EE.C.8
8.4.12	8.EE.C.8, 8.EE.C.8.a, 8.EE.C.8.b
8.4.13	8.EE.C.8, 8.EE.C.8.a
8.4.14	8.EE.C.8
8.4.15	8.EE.C.8, 8.EE.C.8.b, 8.EE.C.8.c
8.4.16	8.EE.C.8.c

Unit Narrative:

In this unit, students write and solve linear equations in one variable. These include equations in which the variable occurs on both sides of the equal sign, and equations with no solutions, exactly one solution, and infinitely many solutions. They learn that any one such equation is false, true for one value of the variable, or true for all values of the variable. They interpret solutions in the contexts from which the equations arose. Students write and solve systems of linear equations in two variables and interpret the solutions in the contexts from which the equations arose. They learn what is meant by a solution for a system of equations, namely that a solution of the system is a solution for each equation in the system. Students use the understanding that each pair of values that make an equation true are coordinates of a point on the graph of the equation and conversely that the coordinates of each point on the graph of an equation make the equation true. Thus, a pair of values that satisfies a system of equations are coordinates of a point that lies on the graphs of all the equations in the system, and, conversely, a point that lies on the graphs of all the equations in the system has coordinates that satisfy all the equations in the system. Students learn to understand and use the terms “system of equations,” “solution for the system of

equations," "zero solutions," "no solution," "one solution," and "infinitely many solutions."	
Demonstration of Learning:	**Pacing for Unit**
CFA 1: Lesson 3 CFA 2: Lesson 8 CFA 3: Lesson 11 CFA 4: Lesson 14 EoU: Assessment A	18 Days
Family Overview (link below)	**Integration of Technology:**
Family Resources-English FAmily Resources-Spanish	Desmos Edulastic (Pear Assessment)
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Alternate interior angles, center of dilations, clockwise, coefficient, congruent, constant of proportionality, constant term, coordinate plane, corresponding, counterclockwise, dilation, image, linear relationship, rate of change, reflection, right angle, rigid transformation, rotation, scale factor, sequence of transformations, similar, slope, solution to an equation with two variables, straight angle, system of equations, term, tessellations, transformation, translation, transversal, vertex, vertical angles, vertical intercept	• DESMOS • Edulastic
Connections to Prior Units:	**Connections to Future Units:**
Grade 7, Unit 6	Algebra 1, Unit 2
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation: Highlight patterns, critical features, big ideas, and relationships	• Highlight or emphasize key elements in text, graphics, diagrams, formulas • Use outlines, graphic organizers, unit organizer routines, concept organizer routines, and concept mastery routines to emphasize key ideas and relationships • Use multiple examples and non-examples to emphasize critical features • Use cues and prompts to draw attention to critical features • Highlight previously learned skills that can be used to solve unfamiliar problems
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
An EL can . . .construct grade appropriate oral and written claims and support them with	I can generalize about the structures of equations and systems that have one, infinite, and no solutions.

reasoning and evidence.		• Level 1: With prompting and supports, I can verbally or nonverbally identify the number of solutions for an equation or system. • Level 2: With prompting and supports, I can identify and explain an error using academic vocabulary such as acceptable moves, equality, and number of solutions. • Level 3: With guidance and supports, I can make a claim about the number of solutions and identify evidence using academic vocabulary such as acceptable moves, equality, and the number of solutions to support my claim. • Level 4: I can make a claim about the number of solutions and identify evidence using academic vocabulary such as acceptable moves, equality, and the number of solutions to support my claim. • Level 5: I can make a counterargument as to generalize about the structures of equations and systems that have one, infinite, and no solutions.
Lesson Sequence	**Learning Target**	**Success Criteria/Assessment**
1 Puzzle Problems (Lesson 1)	• I can justify and critique strategies for solving puzzles (Lesson 1)	Lesson 1 • I can solve puzzle problems using diagrams, equations, or other representations.
2 Linear Equations in One Variable (Lesson 2-9)	• I can justify predictions and critique reasoning about maintaining balance in equations(Lesson 2/3) • I can critique solutions of linear equations (Lessons 4 and 5) • I can generalize about the structures of equations to justify predictions about whether an equation has one, infinite, and no solutions (Lessons 6, 7, 8)	Lesson 2 • I can add or remove blocks from a hanger and keep the hanger balanced. • I can represent balanced hangers with equations. Lesson 3 • I can add, subtract, multiply, or divide each side of an equation by the same expression to get a new equation with the same solution. Lesson 4 • I can make sense of multiple ways to solve an equation. Lesson 5 • I can solve an equation where the variable appears on both sides. Lesson 6 • I can solve linear equations in one variable. Lesson 7 • I can determine whether an equation has no solutions, one solution, or infinitely many solutions. Lesson 8 • I can solve equations with different numbers of solutions. Lesson 9 • I can use an expression to find when two things, like height, are the same in a real-world situation.
3 Systems of Equations (Lesson 10-15)	• I can identify the solution to a system of equations in a real world context (Lessons 9-12)	Lesson 10 • I can identify ordered pairs that are solutions to an equation. • I can interpret ordered pairs that are solutions to an equation. Lesson 11

	• I can solve systems of equations in multiple ways (Lessons 13-15) • I can generalize and critique reasoning about the structures of systems of equations (Lessons 14 and 15)	• I can use graphs to find an ordered pair that two real-world situations have in common. Lesson 12 • I can explain the solution to a system of equations in a real-world context. • I can explain what a system of equations is. • I can make graphs to find an ordered pair that two real-world situations have in common. Lesson 13 • I can graph a system of equations. • I can solve systems of equations using algebra. Lesson 14 • I can use the structure of equations to help me figure out how many solutions a system of equations has. Lesson 15 • I can write a system of equations from a real-world situation.
4 Let's Put it to Work (Lesson 16)	• I can critique explanations of solutions (Lesson 16)	Lesson 16 • I can use a system of equations to represent a real-world situation and answer questions about the situation.

Unit Title:

Unit 5: Functions and Volume

Relevant Standards: Bold indicates priority

Lesson	Standards
8.5.1	8.F.A.1
8.5.2	8.F.A.1
8.5.3	8.F.A, 8.F.A.1, 8.F.B.4
8.5.4	8.F.A.1, 8.F.A.3
8.5.5	8.F.A.1, 8.F.B, 8.F.B.5
8.5.6	8.F.B.5
8.5.7	8.F.A.2, 8.F.A.3
8.5.8	8.F.A.2, 8.F.A.3, 8.F.B.4
8.5.9	8.F.B.4
8.5.10	8.F.B, 8.F.B.4, 8.F.B.5
8.5.11	8.F.B, 8.F.B.4, 8.G.C
8.5.12	8.G.C
8.5.13	8.G.C.9
8.5.14	8.G.C.9
8.5.15	8.G.C.9
8.5.16	8.G.C.9
8.5.17	8.F.A.1, 8.F.B, 8.G.C, 8.G.C.9
8.5.18	8.F.A.3, 8.F.B, 8.G.C.9
8.5.19	8.G.C, 8.G.C.9
8.5.20	8.G.C, 8.G.C.9
8.5.21	8.G.C.9
8.5.22	8.F.A, 8.G.C.9

Unit Narrative:

In this unit, students are introduced to the concept of a function. They learn to understand and use the terms

“input,” “output,” and “function,” e.g., “temperature is a function of time.” They describe functions as increasing or decreasing between specific numerical inputs, and they consider the inputs of a function to be values of its independent variable and its outputs to be values of its dependent variable. (The terms “Independent variable” and “dependent variable” were introduced in grade 6.) They use tables, equations, and graphs to represent functions, and describe information presented in tables, equations, or graphs in terms of functions. In working with linear functions, students coordinate and synthesize their understanding of “constant of proportionality” (which was introduced in grade 7), “rate of change” and “slope” (which were introduced earlier in grade 8), and increasing and decreasing. Students perceive similarities in structure between pairs of known and new volume formulas: for a rectangular prism and a cylinder; and for a cylinder and a cone. Students rearrange these formulas to show functional relationships and use them to reason about how the volume of a figure changes as another measurement changes, e.g., the height of a cylinder is proportional to its volume; if the radius of a cylinder triples, its volume becomes nine times larger.

Demonstration of Learning:	**Pacing for Unit**
CFA 1: Lesson 5 CFA 2: Lesson 8 CFA 3: Lesson 13 MoU Assessment: A EoU: Assessment: A	25-Days
Family Overview (link below)	**Integration of Technology:**
Family Resources-English Family Resources-Spanish	DESMOS Edulastic
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Alternate interior angles, center of a dilation, clockwise, coefficient, cone, congruent, constant of proportionality, constant term, coordinate plane, corresponding, counterclockwise, cylinder, dependent variable, dilation, function, image, independent variable, linear relationship, radius, rate of change, reflection, right angles, rigid transformation, rotation, scale factor, sequence of transformations, similar, slope, solution to an equation with two variables, sphere, straight angle, system of equations, term tessellation, transformation, translation, transversal, vertex, vertical angles, vertical intercept, volume	• DESMOS • Edulastic
Connections to Prior Units:	**Connections to Future Units:**
Grade 7, Unit 7	Algebra 1, Unit 4
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation: Clarify vocabulary and symbols	• Pre-teach vocabulary and symbols, especially in ways that promote connection to the learners' experience and prior knowledge • Provide graphic symbols with alternative text descriptions • Highlight how complex terms, expressions, or

	equations are composed of simpler words or symbols • Embed support for vocabulary and symbols within the text (e.g., hyperlinks or footnotes to definitions, explanations, illustrations, previous coverage, translations) • Embed support for unfamiliar references within the text (e.g., domain specific notation, lesser known properties and theorems, idioms, academic language, figurative language, mathematical language, jargon, archaic language, colloquialism, and dialect)
Supporting Multilingual/English Learners	
Related CELP standards:	**Learning Targets:**
An EL can . . .determine the meaning of words and phrases in oral presentations and literary and informational text.	I can compare different representations of functions • Level 1: Using visual aids, I can recognize the meaning of input, output, and function. • Level 2: Using visual aids, I can determine input and output of a function. • Level 3: Using visual aids, I can determine the meaning of input, output, independent, and dependent variables of a function. • Level 4: I can determine the meaning of input, output, independent, and dependent variables of a function. • Level 5: I can represent functions in multiple ways (graphs, context, equations, tables, diagrams).

Lesson Sequence	Learning Target	Success Criteria/Assessment
1 Inputs and Outputs (Lesson 1-2)	• I can generalize about what happens to inputs for each rule (Lesson 1) • I can justify claims about what can be determined from given information (Lesson 2)	Lesson 1 • I can write rules when I know input-output pairs. • I know how an input-output diagram represents a rule. Lesson 2 • I know that a function is a rule with exactly one output for each allowable input. • I know that if a rule has exactly one output for each allowable input, then the output depends on the input.
2 Representing and Interpreting Functions (Lesson 3-7)	• I can compare different functions represented as a table, graph, equation, and situations using their features and structures (Lesson 3-7) • I can justify claims about volumes of cubes and spheres based on graphs (Lesson 7)	Lesson 3 • I can find the output of a function when I know the input. • I can name the independent and dependent variables for a given function and represent the function with an equation. Lesson 4 • I can identify graphs that do, and do not, represent functions.

		• I can use a graph of a function to find the output for a given input and to find the input(s) for a given output. Lesson 5 • I can explain the story told by the graph of a function. Lesson 6 • I can draw the graph of a function that represents a real-world situation. Lesson 7 • I can compare inputs and outputs of functions that are represented in different ways.
3 Linear Functions and Rates of Change (Lesson 8-10)	• I can justify claims about approximately linear relationships using key features such as rate of change (Lesson 8-10)	Lesson 8 • I can determine whether a function is increasing or decreasing based on whether its rate of change is positive or negative. • I can explain in my own words how the graph of a linear function relates to its rate of change and initial value. Lesson 9 • I can decide when a linear function is a good model for data and when it is not. • I can use data points to model a linear function. Lesson 10 • I can create graphs of nonlinear functions with pieces of linear functions.
4 Cylinders and Cones (Lesson 11-16)	• I can generalize about the relationship between the volumes of cylinders and cones and their dimensions (Lesson 11-16) • I can compare the volumes of cones with the volumes of cylinders (Lesson 13- 16)	Lesson 11 • I can collect data about a function and represent it as a graph. • I can describe the graph of a function in words. Lesson 12 • I know that volume is the amount of space contained inside a three-dimensional figure. • I recognize the 3D shapes cylinder, cone, rectangular prism, and sphere. Lesson 13 • I can find the volume of a cylinder in mathematical and real-world situations. • I know the formula for the volume of a cylinder. Lesson 14 • I can find missing information about a cylinder if I know its volume and some other information. Lesson 15 • I can find the volume of a cone in mathematical and real-world situations. • I know the formula for the volume of a cone. Lesson 16 • I can find missing information about a cone if I know its volume and some other information.
5 Dimensions and Spheres (Lesson 17-21)	• I can generalize about and compare volumes of spheres, cones, and cylinders as functions of their radii (Lesson 17-21)	Lesson 17 • I can create a graph of the relationship between volume and height for all cylinders (or cones) with a fixed radius.

		• I can explain in my own words why changing the height by a scale factor changes the volume by the same scale factor. Lesson 18 • I can create a graph representing the relationship between volume and radius for all cylinders (or cones) with a fixed height. • I can explain in my own words why changing the radius by a scale factor changes the volume by the scale factor squared. Lesson 19 • I can estimate the volume of a hemisphere by calculating the volume of shape I know is larger and the volume of a shape I know is smaller. Lesson 20 • I can find the volume of a sphere when I know the radius. Lesson 21 • I can find the radius of a sphere if I know its volume. • I can solve mathematical and real-world problems about the volume of cylinders, cones, and spheres.
6 Let's Put it to Work (Lesson 22)	• I can compare the volumes of cones, spheres, and cylinders using multiple representations of functions (Lesson 22)	Lesson 22 • I can compare functions about volume represented in different ways.

Unit Title:	
Unit 7: Exponents and Scientific Notation	

Relevant Standards: Bold indicates priority

Lesson	Standards
8.7.1	8.EE.A.1
8.7.2	8.EE.A.1, 8.EE.A.3, 8.EE.A.4
8.7.3	8.EE.A.1, 8.EE.A.4
8.7.4	8.EE.A.1
8.7.5	8.EE.A.1
8.7.6	8.EE.A.1
8.7.7	8.EE.A.1
8.7.8	8.EE.A.1
8.7.9	8.EE.A.3, 8.EE.A.4
8.7.10	8.EE.A.3, 8.EE.A.4
8.7.11	8.EE.A.1, 8.EE.A.3, 8.EE.A.4
8.7.12	8.EE.A.3, 8.EE.A.4
8.7.13	8.EE.A.3, 8.EE.A.4
8.7.14	8.EE.A.1, 8.EE.A.3, 8.EE.A.4
8.7.15	8.EE.A.4
8.7.16	8.EE.A.3, 8.EE.A.4

Unit Narrative:

In grade 6, students studied whole-number exponents. In this unit, they extend the definition of exponents to include all integers, and in the process codify the properties of exponents. They apply these concepts to the base-ten system, and learn about orders of magnitude and scientific notation in order to represent and compute with very large and very small quantities.

Demonstration of Learning:	Pacing for Unit
CFA 1: Lesson 7 CFA 2: Lesson 14 EoU: Assessment A	18 Days
Family Overview (link below)	**Integration of Technology:**

Family Resources-English Family Resources-Spanish	DESMOS Edulastic
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Alternate interior angles, base (of an exponent), center of dilation, clockwise, coefficient, cone, congruent, constant of proportionality, constant term, coordinate plane, corresponding, counterclockwise, cylinder, dependent variable, dilation, exponent, function, image, linear relationship, negative association, outlier, positive association, radius, rate of change, reciprocal, reflection, relative frequency, right angle, rotation, scale factor, scatter plot, scientific notation, segmented bar graph, sequence of transformations, similar, slope, solution to an equation with two variables, sphere, straight angle, systems of equations, term, tessellation, transformation, translation, transversal, two-way table, vertical angles, vertical intercept, volume	DESMOS Edulastic
Connections to Prior Units:	**Connections to Future Units:**
Grade 6, Unit 6	Algebra 1, Unit 5
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation: Highlight patterns, critical features, big ideas, and relationships	• Highlight or emphasize key elements in text, graphics, diagrams, formulas • Use outlines, graphic organizers, unit organizer routines, concept organizer routines, and concept mastery routines to emphasize key ideas and relationships • Use multiple examples and non-examples to emphasize critical features • Use cues and prompts to draw attention to critical features • Highlight previously learned skills that can be used to solve unfamiliar problems
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
An EL can . . . construct grade appropriate oral and written claims and support them with reasoning and evidence.	I can represent situations using exponents. • Level 1: With prompting and supports, I can identify the base and exponent of a power. • Level 2: With prompting and supports, I can construct an equivalent expression using a single power. • Level 3: With guidance and supports, I can construct an equivalent expression using a single power.

		• Level 4: I can construct equivalent expressions using exponents in a context. • Level 5: I can determine whether two expressions are equivalent using the structure of the expression in context.
Lesson Sequence	**Learning Target**	**Success Criteria/Assessment**
1 Exponent Review (Lesson 1)	• I can represent situations using exponents (Lesson 1).	Lesson 1 • I can use exponents to describe repeated multiplication. • I understand the meaning of a term with an exponent.
2 Exponent Rules (Lesson 2-8)	• I can recognize patterns between expressions using powers of 10 to generalize a rule (Lessons 2-5) • I can justify whether or not expressions are equivalent to exponential expressions (Lesson 6) • I can critique applications of exponent rules (Lesson 7)	Lesson 2 • I can explain and use a rule for multiplying powers of 10. Lesson 3 • I can explain and use a rule for raising a power of 10 to a power. Lesson 4 • I can evaluate 10^0 and explain why it makes sense. • I can explain and use a rule for dividing powers of 10. Lesson 5 • I can use the exponent rules with negative exponents. • I know what it means if 10 is raised to a negative power. Lesson 6 • I can use the exponent rules for bases other than 10. Lesson 7 • I can change an expression with a negative exponent into an equivalent expression with a positive exponent. • I can choose an appropriate exponent rule to rewrite an expression to have a single exponent. Lesson 8 • I can use and explain a rule for multiplying terms that have different bases but the same exponent.
3 Scientific Notation (Lesson 9-15)	• I can represent large and small numbers using number lines, exponents, and decimals (Lesson 9–11) • I can represent situations comparing quantities expressed in scientific notation (Lesson 12-14) • I can apply the rules of exponents to scientific notation in a context (Lesson 14-16)	Lesson 9 • Given a very large or small number, I can write an expression equal to it using a power of 10. Lesson 10 • I can plot a multiple of a power of 10 on such a number line. • I can subdivide and label a number line between 0 and a power of 10 with a positive exponent into 10 equal intervals. • I can write a large number as a multiple of a power of 10. Lesson 11 • I can plot a multiple of a power of 10 on such a number line.

		• I can subdivide and label a number line between 0 and a power of 10 with a negative exponent into 10 equal intervals. • I can write a small number as a multiple of a power of 10. Lesson 12 • I can apply what I learned about powers of 10 to answer questions about real-world situations. Lesson 13 • I can tell whether or not a number is written in scientific notation. Lesson 14 • I can multiply and divide numbers given in scientific notation. • I can use scientific notation and estimation to compare very large or very small numbers. Lesson 15 • I can add and subtract numbers given in scientific notation.
4 Let's Put it to Work (Lesson 16)	• I can apply the rules of exponents to scientific notation in a context (Lesson 14-16)	Lesson 16 • I can use scientific notation to compare different amounts and answer questions about real-world situations.

Unit Title:
Unit 8: Pythagorean Theorem

Relevant Standards: Bold indicates priority

Lesson	Standards
8.8.1	8.EE.A.2, 8.G.B, 8.G.B.6, 8.NS.A.2
8.8.2	8.EE.A.2, 8.F.B, 8.NS.A
8.8.3	8.EE.A.2, 8.NS.A, 8.NS.A.2
8.8.4	8.EE.A.2, 8.NS.A.2
8.8.5	8.EE.A.2, 8.NS.A.2
8.8.6	8.G.B, 8.G.B.6, 8.G.B.7
8.8.7	8.G.B, 8.G.B.6, 8.G.B.7
8.8.8	8.G.B, 8.G.B.7
8.8.9	8.G.B, 8.G.B.6
8.8.10	8.EE.A.2, 8.G.B.7, 8.NS.A
8.8.11	8.G.B.8
8.8.12	8.EE.A.2, 8.NS.A.2
8.8.13	8.EE.A.2, 8.NS.A.2
8.8.14	8.EE.A, 8.NS.A, 8.NS.A.1
8.8.15	8.NS.A.1
8.8.16	8.G.B.7

Unit Narrative:

In this unit, students work with geometric and symbolic representations of square and cube roots. They understand and use notation such as $\sqrt{2}$ and $\sqrt[3]{5}$ for square and cube roots. They understand the terms "rational number" and "irrational number," using long division to express fractions as decimals. They use their understanding of fractions to plot rational numbers on the number line and their understanding of approximation of irrationals by rationals to approximate the number-line location of a given irrational. Students learn (without proof) that $\sqrt{2}$ is irrational. They understand two proofs of the Pythagorean Theorem—an algebraic proof that involves manipulation of two expressions for the same area and a geometric proof that involves decomposing and rearranging two squares. They use the Pythagorean Theorem in two and three dimensions, e.g., to determine lengths of diagonals of rectangles and right rectangular prisms, and to estimate distances between points in the coordinate plane.

Demonstration of Learning:	Pacing for Unit
CFA 1: Lesson 5 CFA 2: Lesson 8	18 Days

CFA 3: Lesson 12 EoU: Assessment A (#7 is modified)	
Family Overview (link below)	**Integration of Technology:**
Family resources-English Family resource-Spanish	Edulastic DESMOS
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Alternate interior angles, base (of an exponent), center of a dilation, clockwise, coefficient, cone, congruent, constant of proportionality, constant term, coordinate plane, corresponding, counterclockwise, cube root, cylinder, dependent variable, dilation, exponent, function, hypotenuse, image, independent variable, irrational number, legs, linear relationship, negative association, outlier, positive association, Pythagorean Theorem, radius, rate of change, rational number, reciprocal, reflection, relative frequency, repeating decimal, right angle, rigid transformation, scale factor, scatter plot, scientific notation, segmented bar graph, sequence of transformations, similar, slope, solution to an equation with two variables, sphere, square root, straight angle, system of equations, term tessellation, transformation, translation, transversal, two-way table, vertex, vertical angles, vertical intercept, volume	Edulastic DESMOS
Connections to Prior Units:	**Connections to Future Units:**
Grade 6, Unit 1	Geometry, Unit 4
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation: Highlight patterns, critical features, big ideas, and relationships	• Highlight or emphasize key elements in text, graphics, diagrams, formulas • Use outlines, graphic organizers, unit organizer routines, concept organizer routines, and concept mastery routines to emphasize key ideas and relationships • Use multiple examples and non-examples to emphasize critical features • Use cues and prompts to draw attention to critical features • Highlight previously learned skills that can be used to solve unfamiliar problems
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**

An EL can . . . construct grade appropriate oral and written claims and support them with reasoning and evidence.		I can explain predictions about situations involving right triangles and strategies to verify. • Level 1: With prompting and supports, I can identify a right triangle and its hypotenuse. • Level 2: With prompting and supports, I can identify the hypotenuse using characteristics of right triangles. • Level 3: With guidance, I can determine whether three sides form a right triangle. • Level 4: I can find the missing hypotenuse of a triangle if given the lengths of its two legs. • Level 5: I can find the missing leg of a right triangle if given the length of its hypotenuse and other leg.
Lesson Sequence	**Learning Target**	**Success Criteria/Assessment**
1 Side Lengths and Areas of Squares (Lesson 1-5)	• I can explain strategies for finding area and how they connect to square roots (Lesson 1-2) • I can compare rational and irrational numbers (Lesson 3) • I can explain strategies for approximating, ordering, and finding square roots (Lesson 4-5)	Lesson 1 • I can find the area of a tilted square on a grid by using methods like “decompose and rearrange” and “surround and subtract.” • I can find the area of a triangle. Lesson 2 • I can explain what a square root is. • If I know the area of a square, I can express its side length using square root notation. • I understand the meaning of expressions like $\sqrt{25}$ and $\sqrt{3}$. Lesson 3 • I know what an irrational number is and can give an example. • I know what a rational number is and can give an example. Lesson 4 • I can find a decimal approximation for square roots. • I can plot square roots on the number line. Lesson 5 • When I have a square root, I can reason about which two whole numbers it is between.
2 The Pythagorean Theorem (Lesson 6-11)	• I can explain predictions about situations involving right triangles and strategies to verify (Lesson 6-10) • I can explain strategies for finding distances between points on a coordinate plane and diagonals in a context (Lesson 10-11)	Lesson 6 • I can explain what the Pythagorean Theorem says. Lesson 7 • I can explain why the Pythagorean Theorem is true. Lesson 8 • If I know the lengths of two sides, I can find the length of the third side in a right triangle. • When I have a right triangle, I can identify which side is the hypotenuse and which sides are the legs. Lesson 9 • I can explain why it is true that if the side lengths of a triangle satisfy the equation $a^2 + b^2 = c^2$ then it must be a right triangle. • If I know the side lengths of a triangle, I can determine if it is a right triangle or not. Lesson 10 • I can use the Pythagorean Theorem to solve problems. Lesson 11

		• I can find the distance between two points in the coordinate plane. • I can find the length of a diagonal line segment in the coordinate plane.
3 Side Lengths and Volumes of Cubes (Lesson 12-13)	• I can explain strategies for approximating the value of cube roots (Lesson 12-13)	Lesson 12 • I can approximate cube roots. • I know what a cube root is. • I understand the meaning of expressions like $\sqrt[3]{5}$. Lesson 13 • When I have a cube root, I can reason about which two whole numbers it is between.
4 Decimal Representation of Rational and Irrational Numbers (Lesson 14-15)	• I can compare strategies for approximating irrational numbers (Lesson 14- 15)	Lesson 14 • I can write a fraction as a repeating decimal. • I understand that every number has a decimal expansion. Lesson 15 • I can write a repeating decimal as a fraction. • I understand that every number has a decimal expansion.
5 Let's Put it to Work (Lesson 16)	• I can apply the Pythagorean Theorem to real-world contexts (Lesson 16).	Lesson 16 • I can apply what I have learned about the Pythagorean Theorem to solve a more complicated problem. • I can decide what information I need to know to be able to solve a real-world problem using the Pythagorean Theorem.

Unit Title:

Unit 6: Association in Data

Relevant Standards: Bold indicates priority

Lesson	Standards
8.6.1	8.SP.A, 8.SP.A.1
8.6.2	8.SP.A.1
8.6.3	8.SP.A.1, 8.SP.A.3
8.6.4	8.SP.A.1, 8.SP.A.2
8.6.5	8.SP.A.1, 8.SP.A.2
8.6.6	8.SP.A.1, 8.SP.A.2, 8.SP.A.3
8.6.7	8.SP.A.1
8.6.8	8.SP.A.1, 8.SP.A.2, 8.SP.A.3

8.6.9	8.SP.A.4
8.6.10	8.SP.A.4
8.6.11	8.SP.A

Unit Narrative:	
In this unit, students generate and work with bivariate data sets that has more variability than in previous units. They learn to understand and use the terms "scatter plot" and "association," and describe associations as "positive" or "negative" and "linear" or "non-linear." Students describe scatter plots, using a term previously used to describe univariate data "cluster," and the new term "outlier." They fit lines to scatter plots and informally assess their goodness of fit by judging the closeness of the data points to the lines, and compare predicted and actual values. Students learn to understand and use the terms "two-way table," "bar graph," and "segmented bar graph," using two-way tables to investigate categorical data.	
Demonstration of Learning:	**Pacing for Unit**
• CFA 1: Lesson 6 • CFA 2: Lesson 9 (Keep as is in Edulastic) • EoU: Version A	13 Days
Family Overview (link below)	**Integration of Technology:**
Family Resources-English Family resources-Spanish	DESMOS Edulastic
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Alternate interior angles, center of a dilation, clockwise, coefficient, cone, congruent, constant of proportionality, constant term, coordinate plane, corresponding, counterclockwise, cylinder, dependent variable, dilation, function, image, independent variable, linear relationship, negative association, outlier, positive association, radius, rate of change, reflection, relative frequency, right angles, rigid transformation, rotation, scale factor, scatter plot, segmented bar graph, sequence of transformations, similar, slope, solution to an equation with two variables, sphere, straight angle, system of equations, term tessellation, transformation, translation, transversal, two-way table, vertex, vertical angles, vertical intercept, volume	DESMOS Edulastic
Connections to Prior Units:	**Connections to Future Units:**
Grade 7, Unit 8	Algebra 1, Unit 3
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**

<table>
<tr><td colspan="2">Representation: Highlight patterns, critical features, big ideas, and relationships</td><td>Highlight or emphasize key elements in text, graphics, diagrams, formulas
Use outlines, graphic organizers, unit organizer routines, concept organizer routines, and concept mastery routines to emphasize key ideas and relationships
Use multiple examples and non-examples to emphasize critical features
Use cues and prompts to draw attention to critical features
Highlight previously learned skills that can be used to solve unfamiliar problems</td></tr>
<tr><td colspan="3">Supporting Multilingual/English Learners</td></tr>
<tr><td colspan="2">Related <u>CELP standards:</u></td><td>Learning Targets:</td></tr>
<tr><td colspan="2">An EL can . . . construct grade appropriate oral and written claims and support them with reasoning and evidence.</td><td>I can interpret tables, scatter plots, equations, and situations involving bivariate data.
Level 1: With prompting and supports, I can identify if a relationship has positive, negative, or no association.
Level 2: With prompting and supports, I can determine if a relationship has positive, negative, or no association.
Level 3: With guidance, I can describe what the association means in terms of the situation.
Level 4: I can describe what the association means in terms of the situation.
Level 5: I can use a linear model to make predictions.</td></tr>
<tr><td>Lesson Sequence</td><td>Learning Target</td><td>Success Criteria/Assessment</td></tr>
<tr><td>1
Does this predict that?
(Lesson 1-2)</td><td>I can interpret situations and graphs involving bivariate data (Lesson 1- 2)</td><td>Lesson 1
I can organize data to see patterns more clearly.
Lesson 2
I can draw a scatter plot to show data that has two paired variables.</td></tr>
<tr><td>2
Associations in Numerical data
(Lesson 3-8)</td><td>I can interpret tables, scatter plots, equations, and situations involving bivariate data and use that to make predictions (Lesson 3-5)
I can explain the meaning of slope for a situation (Lesson 6)
I can explain how to use lines to show associations, identify outliers and clusters, and answer questions (Lesson 7-8)</td><td>Lesson 3
I can describe the meaning of a point in a scatter plot in context.
Lesson 4
I can pick out outliers on a scatter plot.
I can use a model to predict values for data.
Lesson 5
I can draw a line to fit data in a scatter plot.
I can say whether data in a scatter plot has a positive or negative association (or neither).
Lesson 6
I can use the slope of a line fit to data in a scatter plot to say how the variables are connected in real-world situations.
Lesson 7
I can pick out clusters in data from a scatter plot.</td></tr>
</table>

		• I can use a scatter plot to decide if two variables have a linear association. Lesson 8 • I can analyze a set of data to determine associations between two variables.
3 Associations in Categorical Data (Lesson 9-10)	• I can represent data using two-way tables, bar graphs, and segmented bar graphs (Lessons 9 and 10)	Lesson 9 • I can identify the same data represented in a bar graph, a segmented bar graph, and a two-way table. • I can use a two-way frequency table or relative frequency table to find associations among variables. Lesson 10 • I can create relative frequency tables, bar graphs, and segmented bar graphs from frequency tables to find associations among variables.
4 Let's Put it to Work (Lesson 11)	• I can represent data using scatter plots (Lesson 11)	Lesson 11 • I can collect data and analyze it for associations using scatter plots, two-way tables, and segmented bar graphs.

Course Assessment Map

Edulastic Links to be Added at a later time

Unit	Assessment 1	Assessment 2	Assessment 3	Assessment 4	Assessment 5	Assessment 6
Unit 1-Rigid Transformations and Congruence	CFA 1 (Lesson 3)	CFA 2 (Lesson 9)	CFA 3 (Lesson 12)	Combine-MoU/EOU ()		
Unit 2-Dilations, Similarity, and Introducing Slope	CFA 1 (Lesson 4)	CFA 2 (Lesson 7)	CFA 3 (Lesson 10)	EOU ()		
Unit 3-Linear Relationships	CFA 1 (Lesson 3)	CFA 2 (Lesson 6)	EOU (Lesson 11)			
Unit 4-Linear Equations and Linear Systems	CFA 1 (Lesson 3)	CFA 2 (Lesson 8)	CFA 3 (Lesson 11)	CFA 4 (Lesson 14)	EOU (A)	
Unit 5-Functions	CFA 1 (Lesson 5)	CFA 2 (Lesson 8)	CFA 3 (Lesson 13)	MOU (A)	EOU (A)	
Unit 6-Association in Data	CFA 1 (L6)	CFA 2 (L9)	EOU (A)			
Unit 7-Exponents and Scientific	CFA 1 (L7)	CFA 2 (L14)	EOU (A)			
Unit 8-Pythagorean Theorem and Irrational Numbers	CFA 1 (Lesson 5)	CFA 2 (Lesson 8)	CFA 3 (lesson 12)	EOU (A, #7 modified)		