West Windsor-Plainsboro Regional School District
Geometry
July 2023

Math Equity Statement
ALL learners should have access to rigorous, high-level mathematical content in an environment where risk-taking, deep conceptual understanding, and growth mindset are the norm.

Core Beliefs:
Our district's strategic goals prioritize teaching and learning from a productive standpoint. Building upon the principles of *Catalyzing Change in High School Mathematics*, we aim to cultivate equitable mathematics practices and shift from deficit-based to productive beliefs. According to the National Council of Teachers of Mathematics (NCTM, 2020), "Mathematics education must be equitable, ensuring that each and every student has access to high-quality mathematics teaching and learning opportunities." Our objective is for every student to perceive themselves as capable, knowledgeable, and meaning-makers in mathematics.

Drawing from *Catalyzing Change* and *Mathematical Mindsets* by Jo Boaler (2016), we embrace the following beliefs:

- All students are capable of learning mathematics at high levels.
- All students will progress on their mathematical journey.
- Developing a growth mindset is essential for learning.
- Visual and deep thinking enhance mathematical understanding.
- Mathematics learning is fostered through discourse and collaboration.
- Mistakes are integral to the learning process.

Math Workshop:
Catalyzing Change states that teaching should provide opportunities for each and every student to develop a positive mathematical identity, recognizing their own mathematical abilities and potential. The Math Workshop instructional model enables meaningful mathematics engagement, reflection, and the realization of students' potential as mathematicians. By incorporating student choice, problem-solving, targeted small group instruction, and deliberate practice of critical grade-level concepts (Lempp, 2017), Math Workshop creates an environment where students feel comfortable taking intellectual risks. Sienna (2009) outlines four values to support students in taking risks and fostering discourse, which include:

- Valuing the thinking process alongside correct answers.
- Valuing problems that allow for multiple solutions.
- Valuing inquisitive responses.
- Valuing tolerance for mistakes (Sienna, 2009, p. 68).

Math Workshop embraces these values and fosters a supportive, collaborative learning environment for all students. It is the instructional model employed by our dedicated teachers.

Unit 1: Foundations of Geometry	
Content Area: Mathematics	
Course & Grade Level: Geometry CP, Grades 10,11	
Summary and Rationale	
Geometric figures help us to describe and understand the world around us. By exploring geometric relationships, students can model real world situations and improve our inductive and deductive reasoning skills. Students will be introduced to conditional statements, converse, inverse and contrapositive which lead us into the laws of reasoning. Students then study the midpoint and distance formulas as it relates to geometric figures and then apply this to segment addition and bisectors. Students then explore relationships between angles which helps them draw and interpret angles in diagrams, figures, and different types of lines cut by a transversal. Geometric patterns are used to make modern art pieces. The study of these patterns and their relationships gives a mathematical perspective to art. Students will construct figures using line designs, transformations, symmetry, golden ratios and concentric circles to create and describe patterns.	
Recommended Pacing	
26 days	
New Jersey Student Learning Standards for	
Standards for Mathematical Practice	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
5	Use appropriate tools strategically.
6	Attend to precision.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.
Standard: G-CO.A Experiment with transformations in the plane	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
Standard: G-CO.C Prove geometric theorems	
CPI #	**Cumulative Progress Indicator (CPI)**
9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints
Standard: G-CO.D Make geometric constructions	
CPI #	**Cumulative Progress Indicator (CPI)**
12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.
Standard: G-GPE.B Use coordinates to prove simple geometric theorems algebraically	
CPI #	**Cumulative Progress Indicator (CPI)**

6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.
7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.
Standard: G-MG.A Apply geometric concepts in modeling situations	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
Standard: Science Craft and Structure	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 10-11 texts and topics.
New Jersey Student Learning Standards for Career Readiness, Life Literacies and Key Skills	
CPI #	**Cumulative Progress Indicator (CPI)**
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.
9.4.12.TL.3	Analyze the effectiveness of the process and quality of collaborative environments.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
New Jersey Student Learning Standards for Computer Science and Design Thinking	
CPI #	**Cumulative Progress Indicator (CPI)**
8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.

Instructional Focus

Unit Enduring Understandings

- Understand the foundation for the development of Euclidean geometry as a formal, rigorous study of mathematical relationships.
- Empirical verification (inductive reasoning) is an important part of the process of proving, but it can never, by itself, constitute a formal proof.
- Geometry uses a wide variety of kinds of proofs both formal and informal.
- We can communicate mathematical ideas effectively in a variety of modalities.
- A diagram is a sophisticated mathematical device for thinking and communicating. A diagram is a built geometric artifact, with both a history- a narrative of successive expression- and a purpose. A diagram is not a picture. It needs to be interpreted: learning how to read a diagram can be like learning a new language.

Unit Essential Questions

- How does one create a series of logical arguments that lead to a conclusion?
- Why is it important to prove your position in an argument (mathematically or in general)?
- What are the characteristics of a valid argument?

- How can we use properties of plane figures to make logical arguments about geometric relationships?
- What's the difference between a postulate, property, and theorem?
- How do geometric relationships help to solve problems and/or make sense of phenomena?
- How can we best represent geometric relationships?

Content Understandings

- Geometric properties can be used to distinguish and analyze geometric figures.
- Algebraic skills can be used to prove facts about geometric figures in a plane.
- Inductive and deductive are two types of reasoning.
- Coordinate geometry can be used to represent and verify geometric/algebraic relationships.
- Angles in a diagram or figure contain helpful properties.

Content Questions

- What is a conditional statement and how does it help us draw conclusions?
- How can you find the midpoint and length of a line segment?
- How can placing a figure on the coordinate plane help us to describe properties of geometric figures?
- How can we measure and describe angles?
- What is special about angles formed by parallel lines cut by a transversal?

Objectives

We are learning to/that:

- Use conditional statements to draw conclusions about geometric relationships.
- Use inductive and deductive reasoning to explore the basics of Geometry including conditional statements, various types of proof, and angle/line relationships.
- Apply the midpoint and distance formulas to solve problems.
- Make a logical argument based on coordinate geometry.
- Angles can have properties that help us make discoveries about other angles in a geometric figure.
- Use theorems about parallel lines to make discoveries about angles.

Evidence of Learning

- ☑ Formative Assessment
- ☑ Summative Assessment
- ☑ Alternative Assessment
- ☑ Benchmark

Assessment plan includes teacher-designed formative and summative assessments, a district common assessment, self-assessments, and performance tasks. During each common, formative, and summative assessment, teachers will provide alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative assessments are individualized for the needs of all students. Accommodations

Resources

Core Text: Big Ideas Math, Geometry; Larson and Boswell

Unit 2: Transformations	
Content Area: Mathematics	
Course & Grade Level: Geometry CP, Grades 10,11	
Summary and Rationale	
Students will experiment with transformations in the plane. Comparisons of transformations will provide the foundation for understanding congruence. Students will establish the foundation for figure congruence which relies on the definition of transformations. Students will build an understanding of rigid motions, including translations, reflections and rotations, in order to develop notions about what it means for two objects to be congruent. Rigid motions are at the foundation of the definition of congruence, and students should recognize that they preserve distance and angle. Students will be encouraged to use a variety of tools, such as protractors, compasses, graph paper, and geometry software in order to transform given figures. Students will apply their understanding of congruence to copy segments and angles using a variety of physical and online tools. Dilations will be introduced here and then applied in unit 4 on similarity. Geometric patterns are used to make modern art pieces. The study of these patterns and their relationships gives a mathematical perspective to art. Students will construct figures using line designs, transformations, symmetry, golden ratios and concentric circles to create and describe patterns.	
Recommended Pacing	
14 days	
New Jersey Student Learning Standards for	
Standards for Mathematical Practice	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
5	Use appropriate tools strategically.
6	Attend to precision.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.
Standard: G-CO.A Experiment with transformations in the plane	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).
3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

Standard: G-CO.B Understand congruence in terms of rigid motions	
CPI #	**Cumulative Progress Indicator (CPI)**
6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
Standard: G-CO.D Make geometric constructions	
CPI #	**Cumulative Progress Indicator (CPI)**
12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.
Standard: G-SRT.A Understand similarity in terms of similarity transformations	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
Standard: G-MG.A Apply geometric concepts in modeling situations	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
New Jersey Student Learning Standards for English Language Arts **Companion Standards**	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
Standard: Science Craft and Structure	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 10-11 texts and topics.
New Jersey Student Learning Standards for Career Readiness, Life Literacies and Key Skills	
CPI #	**Cumulative Progress Indicator (CPI)**
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.
9.4.12.TL.3	Analyze the effectiveness of the process and quality of collaborative environments.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
New Jersey Student Learning Standards for Computer Science and Design Thinking	
CPI #	**Cumulative Progress Indicator (CPI)**
8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.
Instructional Focus	

Unit Enduring Understandings
• Understand the foundation for the development of Euclidean geometry as a formal, rigorous study of mathematical relationships. • Empirical verification (inductive reasoning) is an important part of the process of proving, but it can never, by itself, constitute a formal proof. • Geometry uses a wide variety of kinds of proofs both formal and informal. • Congruence can be verified using rigid transformations.
Unit Essential Questions
• How can we use properties of plane figures to make logical arguments about geometric relationships? • How can transformations be used to explain similarity? • Where are transformations found in our world?
Content Understandings • Congruence is a special case of similarity. • Algebraic skills can be used to prove facts about geometric figures in a plane. • We prove figures similar so that we can measure geometric objects indirectly.
Content Questions • How does the concept of rigid motion connect to the concept of congruence? • How can we use rigid transformations to show congruence? • How are the preimage and image related? • How is symmetry applied to figures to help discover properties of the figure? • What is a dilation and how is it related to scale factor? • What is the relationship between transformations that produce congruent figures and transformations that produce similar figures? • Can transformations be applied in any sequence in order to carry a shape onto itself?
Objectives
We are learning to/that: • Identify the three basic rigid transformations. • Identify and use rigid transformations (reflections, rotations, translations) in the plane. • Show that performing a series of rigid transformations does not change the size or shape of a figure. • Define and apply line and rotational symmetry. • Use transformations to draw conclusions about similarity and congruence. • Find the center of dilation and use dilations as they relate to scale factor.
Evidence of Learning
☑ Formative Assessment
☑ Summative Assessment
☑ Alternative Assessment
☑ Benchmark
Assessment plan includes teacher-designed formative and summative assessments, a district common assessment, self-assessments, and performance tasks. During each common, formative, and summative assessment, teachers will provide alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative assessments are individualized for the needs of all students. Accommodations
Resources
Core Text: Big Ideas Math, Geometry; Larson and Boswell

Unit 3: Congruence and Triangles	
Content Area: Mathematics	
Course & Grade Level: Geometry CP, Grades 10,11	
Summary and Rationale	
Students will use their knowledge of congruence to build an understanding of congruent triangles and polygons. They will use rigid motions to establish the SSS, SAS, HL, AAS and ASA Triangle Congruence Postulates/Theorems. Students will explore properties and relationships of sides and angles of triangles and polygons. They will use multiple formats to prove various theorems about triangles throughout the unit, including those pertaining to congruence, mid-segments, perpendicular bisectors, angle bisectors, medians and altitudes. Geometric patterns are used to make modern art pieces. The study of these patterns and their relationships gives a mathematical perspective to art. Students will construct figures using line designs, transformations, symmetry, golden ratios and concentric circles to create and describe patterns.	
Recommended Pacing	
30 days	
New Jersey Student Learning Standards for	
Standards for Mathematical Practice	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
5	Use appropriate tools strategically.
6	Attend to precision.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.
Standard: G-CO.A Experiment with transformations in the plane	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
Standard: G-CO.B Understand congruence in terms of rigid motions.	
CPI #	**Cumulative Progress Indicator (CPI)**
7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.
Standard: G-CO.C Prove geometric theorems	
CPI #	**Cumulative Progress Indicator (CPI)**

9	Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.
10	Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
11	Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.
Standard: G-CO.D Make geometric constructions	
CPI #	**Cumulative Progress Indicator (CPI)**
12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.
Standard: G-SRT.B Prove theorems involving similarity	
CPI #	**Cumulative Progress Indicator (CPI)**
5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
Standard: G-GPE.B Use coordinates to prove simple geometric theorems algebraically	
CPI #	**Cumulative Progress Indicator (CPI)**
4	Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point (0, 2).
5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
Standard: G-MG.A Apply geometric concepts in modeling situations	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
Standard: Science Craft and Structure	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 10-11 texts and topics.
New Jersey Student Learning Standards for Career Readiness, Life Literacies and Key Skills	

CPI #	Cumulative Progress Indicator (CPI)
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.
9.4.12.TL.3	Analyze the effectiveness of the process and quality of collaborative environments.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
New Jersey Student Learning Standards for Computer Science and Design Thinking	
CPI #	**Cumulative Progress Indicator (CPI)**
8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.

Instructional Focus

Unit Enduring Understandings

- Understand the foundation for the development of Euclidean geometry as a formal, rigorous study of mathematical relationships.
- Empirical verification (inductive reasoning) is an important part of the process of proving, but it can never, by itself, constitute a formal proof.
- A diagram is a sophisticated mathematical device for thinking and communicating. A diagram is a built geometric artifact, with both a history- a narrative of successive expression- and a purpose. A diagram is not a picture. It needs to be interpreted: learning how to read a diagram can be like learning a new language.
- The processes of proving include developing conjectures, considering the general case, exploring with examples, looking for structural similarities across cases, and searching for counterexamples.
- There are special relationships between the sides and angles of right triangles. These relationships can be used to solve problems involving missing side lengths or angle measures.

Unit Essential Questions

- Why is it important to prove your position in an argument (mathematically or in general)?
- How can we use properties of plane figures to make logical arguments about geometric relationships?
- How can we use geometric reasoning to prove statements about triangles?
- How can we use lines and angles to study relationships within triangles?

Content Understandings

- Extend algebraic skills to problem solving with geometric concepts.
- The process of proving includes a variety of activities; such as developing conjectures, considering the general case, exploring with examples, looking for structural similarities across cases, and searching for counterexamples.
- A proof can have many different valid representational forms.

Content Questions

- How can right triangles be solved?
- How can we use geometric reasoning to prove statements about triangles?
- What is the criteria for triangles to be congruent/similar? How does this relate to transformations?
- What are the relationships between sides and angles of a triangle?

Objectives

We are learning to/that:

- Identify congruent triangles and their corresponding parts.
- Identify the corresponding parts of congruent figures
- Apply deductive reasoning through SAS, SSS, ASA, AAS, and HL to prove triangles are congruent.
- Apply CPCTC to congruent triangles to determine properties of angles, segments, or other geometric concepts related to congruent triangles.

● Apply properties of isosceles, equilateral and right triangles. ● Identify and apply properties of medians, altitudes, perpendicular bisectors, angle bisectors; solve problems related to these. ● Identify and apply triangle inequalities. ● Make a logical argument based on triangle relationships.
Evidence of Learning
☑ Formative Assessment
☑ Summative Assessment
☑ Alternative Assessment
☑ Benchmark
Assessment plan includes teacher-designed formative and summative assessments, a district common assessment, self-assessments, and performance tasks. During each common, formative, and summative assessment, teachers will provide alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative assessments are individualized for the needs of all students. Accommodations
Resources
Core Text: Big Ideas Math, Geometry; Larson and Boswell

Unit 4: Similarity	
Content Area: Mathematics	
Course & Grade Level: Geometry CP, Grades 10,11	
Summary and Rationale	
Students will make connections between similarity and congruence, establishing that that congruence is a special case of similarity, where the ratio of side lengths is 1:1. Students will use prior knowledge of dilations and scale factor to identify similar figures. Students will use reasoning to apply similarity theorems and choose appropriate similarity theorems when comparing triangles. Students will then apply this knowledge to proportionality theorems. Geometric patterns are used to make modern art pieces. The study of these patterns and their relationships gives a mathematical perspective to art. Students will construct figures using line designs, transformations, symmetry, golden ratios and concentric circles to create and describe patterns.	
Recommended Pacing	
8 days	
New Jersey Student Learning Standards for	
Standards for Mathematical Practice	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
5	Use appropriate tools strategically.
6	Attend to precision.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.
Standard: G-SRT.A Understand similarity in terms of similarity transformations	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.
2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.
3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.
Standard: G-SRT.B Prove theorems involving similarity.	
CPI #	**Cumulative Progress Indicator (CPI)**

4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.
5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
Standard: G-MG.A Apply geometric concepts in modeling situations	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
Standard: Science Craft and Structure	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.
New Jersey Student Learning Standards for Career Readiness, Life Literacies and Key Skills	
CPI #	**Cumulative Progress Indicator (CPI)**
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.
9.4.12.TL.3	Analyze the effectiveness of the process and quality of collaborative environments.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
New Jersey Student Learning Standards for Computer Science and Design Thinking	
CPI #	**Cumulative Progress Indicator (CPI)**
8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.

Instructional Focus

Unit Enduring Understandings

- Understand the foundation for the development of Euclidean geometry as a formal, rigorous study of mathematical relationships.
- Empirical verification (inductive reasoning) is an important part of the process of proving, but it can never, by itself, constitute a formal proof.
- Geometry uses a wide variety of kinds of proofs both formal and informal.
- We can communicate mathematical ideas effectively in a variety of modalities.

Unit Essential Questions

- Why is it important to prove your position in an argument (mathematically or in general)?
- How can we use properties of plane figures to make logical arguments about geometric relationships?
- How can transformations be used to explain similarity?

- How can we best represent geometric relationships?

Content Understandings

- Geometry uses a wide variety of kinds of proofs both formal and informal.
- Congruence is a special case of similarity.
- Polygons are established as proportional through the ratio of corresponding side lengths.

Content Questions

- How do geometric relationships help to solve problems and/or make sense of phenomena?
- What is the relationship between transformations that produce congruent figures and transformations that produce similar figures?
- How can we use ratios, proportions, and similarity to solve problems?
- How does showing polygons are similar help us make discoveries about perimeter and area?

Objectives

We are learning to/that:

- Use transformations to draw conclusions about similarity and congruence.
- Apply and use properties of ratios and proportions.
- Make discoveries about perimeter and area.
- Identify similar polygons and explain why triangles are similar.
- Use proportionality theorems to calculate segment lengths.

Evidence of Learning

- ☑ Formative Assessment
- ☑ Summative Assessment
- ☑ Alternative Assessment
- ☑ Benchmark

Assessment plan includes teacher-designed formative and summative assessments, a district common assessment, self-assessments, and performance tasks. During each common, formative, and summative assessment, teachers will provide alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative assessments are individualized for the needs of all students. Accommodations

Resources

Core Text: Big Ideas Math, Geometry; Larson and Boswell

Unit 5: Right Triangles and Trigonometry	
Content Area: Mathematics	
Course & Grade Level: Geometry CP, Grades 10,11	
Summary and Rationale	
Students will discover relationships in special right triangles. Students will use their knowledge of similarity of right triangles to establish an understanding of the trigonometric ratios of angles in these triangles. They will explore the interrelationships between the trigonometric functions and use these ratios, along with the Pythagorean Theorem to solve right triangles, given different initial information. Students will model problems involving unknown angles and distances. Geometric patterns are used to make modern art pieces. The study of these patterns and their relationships gives a mathematical perspective to art. Students will construct figures using line designs, transformations, symmetry, golden ratios and concentric circles to create and describe patterns.	
Recommended Pacing	
13 days	
New Jersey Student Learning Standards for	
Standards for Mathematical Practice	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
5	Use appropriate tools strategically.
6	Attend to precision.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.
Standard: G-SRT.B Prove theorems involving similarity	
CPI #	**Cumulative Progress Indicator (CPI)**
4	Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.
5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
Standard: G-SRT.C Define trigonometric ratios and solve problems involving right triangles.	
CPI #	**Cumulative Progress Indicator (CPI)**
6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.
7	Explain and use the relationship between the sine and cosine of complementary angles.
8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
Standard: G-MG.A Apply geometric concepts in modeling situations	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	

CPI #	Cumulative Progress Indicator (CPI)
RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
Standard: Science Craft and Structure	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.
New Jersey Student Learning Standards for Career Readiness, Life Literacies and Key Skills	
CPI #	**Cumulative Progress Indicator (CPI)**
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.
9.4.12.TL.3	Analyze the effectiveness of the process and quality of collaborative environments.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
New Jersey Student Learning Standards for Computer Science and Design Thinking	
CPI #	**Cumulative Progress Indicator (CPI)**
8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.

Instructional Focus

Unit Enduring Understandings

- Understand the foundation for the development of Euclidean geometry as a formal, rigorous study of mathematical relationships.
- Empirical verification is an important part of the process of proving, but it can never, by itself, constitute a formal proof.
- Geometry uses a wide variety of kinds of proofs both formal and informal.
- A diagram is a sophisticated mathematical device for thinking and communicating. A diagram is a built geometric artifact, with both a history- a narrative of successive expression- and a purpose. A diagram is not a picture. It needs to be interpreted: learning how to read a diagram can be like learning a new language.
- Trigonometry is the study of triangles – more specifically, the study of the angles and dimensions of triangles. Although this might sound simple, trigonometry is a vital part of modern engineering, design, architecture and other fields.

Unit Essential Questions

- Why is it important to prove your position in an argument (mathematically or in general)?
- How can we use geometric reasoning to prove statements about triangles?
- How can trigonometry be applied to model real world situations?
- How can abstract ratios be used to make sense of the world around us?

Content Understandings

- There are special relationships between the sides and angles of right triangles. These relationships can be used to solve and model problems involving missing side lengths or angle measures.
- Extend algebraic skills to problem solving with geometric concepts.
- The processes of proving include a variety of activities, such as developing conjectures, considering the general case, exploring with examples, looking for structural similarities across cases, and searching for counterexamples.
- A proof can have many different valid representational forms.

Content Questions

- How does the Pythagorean Theorem and its converse help us to discover properties of right triangles?
- How are the sine, cosine and tangent related?
- How can right triangles be solved?
- How can we use geometric reasoning to prove statements about triangles?
- What is the criteria for triangles to be congruent/similar? How does this relate to transformations?
- What are the relationships between sides and angles of a triangle?
- What relationships exist between the trigonometric functions and the Pythagorean theorem?

Objectives

We are learning to/that:

- State the Pythagorean Theorem and apply it to model problems.
- State and apply the converse of the Pythagorean Theorem and related theorems about obtuse and acute triangles.
- Make a logical argument based on triangle relationships.
- Identify and use properties of special right triangles.
- Use trigonometry to solve for unknown side length and/or angle measurement in any triangle.
- Find the value of trigonometric functions of acute angles in a right triangle
- Solve and apply problems using right triangle trigonometry
- Determine the lengths of two sides of a 45˚ - 45˚ - 90˚ or a 30˚ - 60˚ - 90˚ triangle when the length of the third side is known

Evidence of Learning

- ☑ Formative Assessment
- ☑ Summative Assessment
- ☑ Alternative Assessment
- ☑ Benchmark

Assessment plan includes teacher-designed formative and summative assessments, a district common assessment, self-assessments, and performance tasks. During each common, formative, and summative assessment, teachers will provide alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative assessments are individualized for the needs of all students. Accommodations

Resources

Core Text: Big Ideas Math, Geometry; Larson and Boswell

Unit 6: Circles	
Content Area: Mathematics	
Course & Grade Level: Geometry CP, Grades 10,11	
Summary and Rationale	
Students will build on their understanding of similarity to investigate relationships between circles. In addition, students will explore relationships between parts of circles, including radii, tangents, secants and chords. Students should understand how these parts relate to segment lengths and angle measures, and how this relates back to similarity. Students will justify the formulas for circumference and area, and use them to explore arc length, and use the formula for the area of a sector and apply this knowledge to find the area of a sector of a circle. Using their understanding of the Cartesian coordinate system, students will use the distance formula to write equations of circles given a radius and center. Students should be able to justify whether or not a given point lies on a given circle using their understanding of coordinate geometry. Geometric patterns are used to make modern art pieces. The study of these patterns and their relationships gives a mathematical perspective to art. Students will construct figures using line designs, transformations, symmetry, golden ratios and concentric circles to create and describe patterns.	
Recommended Pacing	
15 days	
New Jersey Student Learning Standards for	
Standards for Mathematical Practice	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
5	Use appropriate tools strategically.
6	Attend to precision.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.
Standard: G-CO.A Experiment with transformations in the plane	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
Standard: G-C.A Understand and apply theorems about circles.	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Prove that all circles are similar.
2	Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.
3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.
Standard: G-C.B Find arc lengths and areas of sectors of circles.	
CPI #	**Cumulative Progress Indicator (CPI)**

5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
Standard: G-GPE.A Translate between the geometric description and the equation for a conic section	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
Standard: G-MG.A Apply geometric concepts in modeling situations	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
Standard: Science Craft and Structure	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.9-10.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 10-11 texts and topics.
New Jersey Student Learning Standards for Career Readiness, Life Literacies and Key Skills	
CPI #	**Cumulative Progress Indicator (CPI)**
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving.
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.
9.4.12.TL.3	Analyze the effectiveness of the process and quality of collaborative environments.
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
New Jersey Student Learning Standards for Computer Science and Design Thinking	
CPI #	**Cumulative Progress Indicator (CPI)**
8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.
Instructional Focus	
Unit Enduring Understandings	

- Understand the foundation for the development of Euclidean geometry as a formal, rigorous study of mathematical relationships.
- Empirical verification is an important part of the process of proving, but it can never, by itself, constitute a formal proof.
- Coordinate geometry can be used to represent and verify geometric/algebraic relationships.
- Because of its unique properties, a circle is considered by some to be a perfect figure.
- All circles are similar and there are relationships between circles, chords and radii that can be used to find measures of segments and angles.

Unit Essential Questions

- Why is it important to prove your position in an argument (mathematically or in general)?
- How can we use properties of plane figures to make logical arguments about geometric relationships?
- Can we ever know the area or circumference of a circle exactly?
- What makes a circle perfect?
- How can we apply circles and their properties to model various applications?

Content Understandings

- Pi is a ratio used to determine area and circumference.
- We use similarity and congruence to investigate and justify the relationships between circles.
- Changing the diameter or radius will affect the area and circumference of a circle differently.

Content Questions

- How are segments within circles, such as radii, diameters, and chords, related to each other? What is the relationship of their measurements?
- How do inscribed, circumscribed, and central angles relate to each other?
- What relationships exist between segments and angles formed by tangents, secants and chords?
- How are circular arcs and area of sectors/segments calculated?

Objectives

We are learning to/that:

- Define a circle, a sphere and terms related to them
- Use the interrelated properties of arcs, lines, and angles within circles to determine arc and segment lengths, angle measures, and sector areas.
- Find, graph, and apply the equation of a circle in problem solving and modeling real-life application problems.
- Use algebraic methods, as well as previously introduced geometric concepts, to solve problems involving length and angle measurement.
- Show that all circles are similar
- Identify and describe relationships among inscribed angles, radii, and chords
- Recognize inscribed (circumscribed) polygons and circumscribed (inscribed) circles
- Apply theorems about chords of a circle
- Solve problems involving inscribed angles and angles formed by chords, secants and tangents of a circle
- Solve problems involving lengths of chords, secant segments and tangent segment

Evidence of Learning

- ☑ Formative Assessment
- ☑ Summative Assessment
- ☑ Alternative Assessment
- ☑ Benchmark

Assessment plan includes teacher-designed formative and summative assessments, a district common assessment, self-assessments, and performance tasks. During each common, formative, and summative assessment, teachers will provide alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative assessments are individualized for the needs of all students. Accommodations

Resources

Core Text: Big Ideas Math, Geometry; Larson and Boswell

Unit 7: Geometric Measurements and Dimension	
Content Area: Mathematics	
Course & Grade Level: Geometry CP, Grades 10,11	
Summary and Rationale	
Students' experience with two-dimensional and three-dimensional objects is extended to include informal explanations of circumference, area, surface area and volume formulas. Students will make connections between algebra and geometry by manipulating formulas to find efficient versions of formulas for the purpose of solving problems. Students will model problems with two-dimensional nets and three-dimensional figures. Geometric patterns are used to make modern art pieces. The study of these patterns and their relationships gives a mathematical perspective to art. Students will construct figures using line designs, transformations, symmetry, golden ratios and concentric circles to create and describe patterns.	
Recommended Pacing	
16 days	
New Jersey Student Learning Standards for	
Standards for Mathematical Practice	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
5	Use appropriate tools strategically.
6	Attend to precision.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.
Standard: G-CO.D Make geometric constructions	
CPI #	**Cumulative Progress Indicator (CPI)**
13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.
Standard: G-GMD.A Explain volume formulas and use them to solve problems.	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.
3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
Standard: G-GMD.B Visualize relationships between two-dimensional and three-dimensional objects	
CPI #	**Cumulative Progress Indicator (CPI)**
4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
Standard: G-MG.A Apply geometric concepts in modeling situations.	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).

<table>
<tr><td>3</td><td>Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).</td></tr>
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<tr><td>CPI #</td><td>Cumulative Progress Indicator (CPI)</td></tr>
<tr><td>8.2.12.NT.1</td><td>Explain how different groups can contribute to the overall design of a product.</td></tr>
<tr><th colspan="2">New Jersey Student Learning Standards for Science</th></tr>
<tr><td>HS-LS2-2</td><td>Ecosystems: Interactions, Energy, and Dynamics
N-Q.1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and origin in graphs and data displays. N-Q.2. Define appropriate quantities for the purpose of descriptive modeling. N-Q.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. Science examples: (1) Recognize the difference between intensive and extensive quantities (e.g., a quantity with units of tons/acre is insensitive to the overall size of the area in question, unlike a quantity with units of tons). (2) Carefully format data displays and graphs, attending to origin, scale, units, and other essential items. *NGSS Appendix L pg. 31</td></tr>
<tr><th colspan="2">Instructional Focus</th></tr>
<tr><td colspan="2">Unit Enduring Understandings</td></tr>
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A diagram is a sophisticated mathematical device for thinking and communicating. A diagram is a built geometric artifact, with both a history- a narrative of successive expression- and a purpose. A diagram is not a picture. It needs to be interpreted: learning how to read a diagram can be like learning a new language.
Many applications of geometry involve three dimensional solids.</td></tr>
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<tr><td colspan="2">How can we use properties of solid figures to make logical arguments about geometric relationships?
How do you describe the size of a three-dimensional figure?</td></tr>
</table>

- How can we apply geometric dimension and measurement?
- How can a real-world object be modeled by a three-dimensional figure? How can this be helpful in solving real-world problems related to the object?

Content Understandings

- The process of calculating surface area and volume of 3-dimensional solids includes a variety of dimensions, such as height, slant height, radius, base edge length, and more.
- There are many applications of 3-dimensional solids that can be used to solve problems and explain the world around us.

Content Questions

- How can the formulas for volume, area and circumference be explained using various tools and visual or tactile representations?
- How can surface area and volume be used to model and solve real world applications of 3D solids?
- How can the formulas for surface area and volume of 3D figures help calculate the area and volume of composite solids?
- What will be the three-dimensional result of rotating a two-dimensional figure about a line?

Objectives

We are learning to/that:

- Find the areas of regular polygons.
- Identify the parts of prisms, pyramids, cones, cylinders, and spheres
- State and apply the properties of polyhedra.
- Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects
- Find the surface area of three-dimensional figures.
- Find the volume of three-dimensional figures.
- Model the world around us by using three dimensional figures
- Apply properties of surface area and volume to problem-solving.

Evidence of Learning

☑ Formative Assessment

☑ Summative Assessment

☑ Alternative Assessment

☑ Benchmark

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Resources

Core Text: Big Ideas Math, Geometry; Larson and Boswell