Grade/Subject	Grade 7/ Mathematics Grade 7/Accelerated Mathematics (Implement this unit plus 8th grade Unit 7)
Unit Title	Unit 5: Two and Three Dimensional Geometry
Overview of Unit	In this unit students will draw, construct, and describe geometrical figures and describe the relationships between them. Students will also solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Surface area and volume may be new concepts for some students.
Pacing	Grade 7 Mathematics - 53 days Grade 7Accelerated Mathematics - 45 days + 8th grade topics. This course also includes Unit 7: Volume from Grade 8.

Background Information For The Teacher

It is expected that students will have prior knowledge/experience related to the concepts and skills identified below. It may be necessary to pre-assess in order to determine if time needs to be spent on conceptual activities that help students develop a deeper understanding of these ideas.

- number sense
- computation with whole numbers and decimals, including application of order of operations
- addition and subtraction of common fractions with like denominators
- measuring length and finding perimeter and area of rectangles and squares
- characteristics of 2-D and 3-D shapes
- angle measurement

In sixth grade, students will be introduced to volume and surface area but not to area and circumference of circles.

In this unit students will:

- draw geometric figures using rulers and protractor with emphasis on triangles

- write and solve equations involving angle relationships
- explore two-dimensional cross-sections of cylinders, cones, pyramids, and prisms
- know and use the formula for the circumference and area of a circle
- solve engaging problems that require determining the area, volume, and surface area of fundamental solid figures.

Essential Questions (and Corresponding Big Ideas)	
How are the area and circumference of a circle related? • By sectioning a circle and laying out the pie pieces to form a parallelogram, students will write an expression for the area of the parallelogram related to the radius; length πr (half the circumference) and width r. They then explain why the area of the circle is πr x r = πr2 using the rearranged figure. How can we apply surface area and volume of solids to solve real-world problems? • Surface area is used for finding how much paint is needed to cover a room or how much material you need to reline a pool. How are cross-sections of three-dimensional objects formed? • They are formed in a variety of ways depending on the angle of the cut with the base of the object. How are algebra and geometry related? • We can write and solve equations to find unknown angles of figures.	
Core Content Standards	**Explanations and Examples**
7.G.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one	7.G.2 Conditions may involve points, line segments, angles, parallelism, congruence, angles, and perpendicularity. Examples: • Is it possible to draw a triangle with a 90° angle and one leg that is 4 inches long and one leg that is 3 inches long? If so, draw one. Is there more than one such triangle? • Draw a triangle with angles that are 60 degrees. Is this a unique triangle? Why or why not?

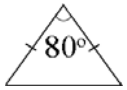
triangle, or no triangle.

Students practice drawing geometric shapes using technology, rulers and protractors, and free hand. While giving practice with multiple shapes, focus on triangles and constructing them from three given angles or sides. Students should determine, by looking at the given measures, whether one, more than one, or no triangles can be created. Angles need to add up to 180 degrees to make a triangle. The sum of two side lengths of a triangle is always greater than the third side. If this is true for all three combinations of added side lengths, then you will have a triangle.

What the Teacher does:

- Provide students with multiple opportunities to draw geometric shapes free hand. Provide both regular graph paper and isometric graph paper.
- Model how to use rulers and protractors and allow students to use the tools to create geometric shapes with measures.
- Introduce students to a variety of geometric software. Some products are free online and others will require school purchases. Provide ample time for students to explore how the software works and develop a degree of proficiency using the software to draw geometric shapes.
- Allow students to select the appropriate tool to solve problems where the teacher gives measures of three angles or sides and students craw the triangle(s).
- Provide different sized lengths of spaghetti for students to discover how the lengths of sides relate to one another to make a triangle. Any stick-like hands-on manipulative will work.
- Provide many examples where the triangles students form are unique, many examples where it is impossible to construct a triangle, and some scenarios where more than one triangle can be drawn. Provide students time to figure out how they can tell from the givens, such as, "If the three angles add up to more than 180 degrees, can you make a triangle? How can you tell if thee lines of given length will form a triangle?"

- Draw an isosceles triangle with only one 80 degree angle. Is this the only possibility or can you draw another triangle that will also meet these conditions?



- Can you draw a triangle with sides that are 13 cm, 5 cm and 6cm?
- Draw a quadrilateral with one set of parallel sides and no right angles.

What the Students do:

- Draw multiple geometric shapes using a variety of tools.
- Select the appropriate tools for drawing triangles in a given situation.
- Discover, through examples, whether the given information about triangles can create one, more than one, or no triangles.

Misconceptions and Common Errors:

Some students may need graph or isometric paper to draw shapes.

7.G.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

Students relate the two-dimensional shape that results from slicing a three-dimensional figure. Three-dimensional shapes will include right rectangle prisms and right rectangle pyramids.

What the Teacher does:

- Provide students with models of right rectangular prisms, cubes, and right rectangular pyramids that can be sliced such as those made of Styrofoam or florist forms.
- Ask student to create a table as below:

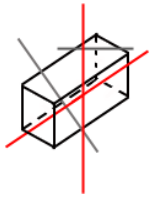
Name of 3D shape	2D shape	2D shape	2D shape	2D shape

As they consider the shapes, have students either imagine or slice through their shapes and determine the different planes that can be created with the slices.

- Challenge students with questions such as the following: How many different two-dimensional figures can be found by slicing a cube?

7.G.3 Example:

- Using a clay model of a rectangular prism, describe the shapes that are created when planar cuts are made diagonally, perpendicularly, and parallel to the base.



What the Students do:

- Discover the two-dimensional shapes that result from slicing a three dimensional figure.
- Develop the three dimensional visualization skills as they see the resulting two-dimensional shapes.

Misconceptions and Common Errors:

Some students who have difficulty developing thee-dimensional visualization skills may need to use hands on materials. In addition to Styrofoam, students can use clay shapes and slice through the shapes with a spatula.

Students sometimes confuse the entire remaining three-dimensional shape as the resulting two-dimensional shape created after the slicing. If you position a piece of paper over the slice and trace the outline of the slice, students can better see the resulting two-dimensional shape.

7.G.4 Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

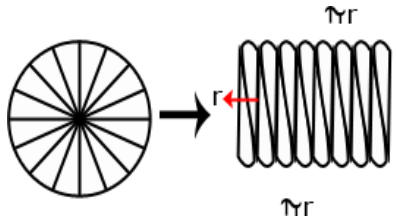
Students learn formulas for area ($A=\pi r^2$) and circumference ($C=2\pi r$) of circles and then solve problems (mathematical and real world) using these formulas. Students participate in discovering the relationship between to two formulas.

What the Teacher does:

- Provide students an opportunity to discover the relationship between circumference and diameter. Have students work in groups to measure the circumference and diameter of several round objects in the classroom such as the clock face. Students combine their data and look for a relationship between the circumference and diameter.
- Facilitate a discussion about circumference to lead students to the formula for circumference of a circle. Do the same for area.
- Pose problems to solve that apply area and circumference formulas such as the following: "The seventh grade is building a ring toss game to raise money for a field trip. The bottles where we toss the rings will be placed on a green circle. If the circle is 10 feet in diameter, how many square feet of carpet will they need to buy to cover the circle? How might you communicate this information to the salesperson to make sure you receive a piece of carpet that is the correct size?"
- Guide a derivation of the relationship between the circumference and area of a circle. Use a circle as a model. Cut the circle into as many equal-sized pie pieces as possible. Lay the pie pieces to form a shape similar to a parallelogram. Have students write an expression for the area of parallelogram related to the radius (note: the length of the base of the parallelogram is half the circumference, or πr, and the height is r, resulting in an area of πr^2, which is the area of the circle).

7.G.4 Examples:

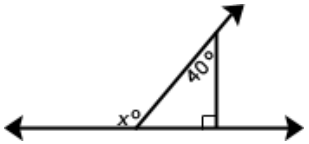
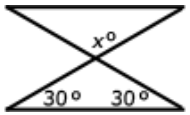
- The seventh grade class is building a mini golf game for the school carnival. The end of the putting green will be a circle. If the circle is 10 feet in diameter, how many square feet of grass carpet will they need to buy to cover the circle? How might you communicate this information to the salesperson to make sure you receive a piece of carpet that is the correct size?
- Students measure the circumference and diameter of several circular objects in the room (clock, trash can, door knob, wheel, etc.). Students organize their information and discover the relationship between circumference and diameter by noticing the pattern in the ratio of the measures. Students write an expression that could be used to find the circumference of a circle with any diameter and check their expression on other circles.
- Students will use a circle as a model to make several equal parts as you would in a pie model. The greater number the cuts, the better. The pie pieces are laid out to form a shape similar to a parallelogram. Students will then write an expression for the area of the parallelogram related to the radius (note: the length of the base of the parallelogram is half the circumference, or πr, and the height is r, resulting in an area of πr2. Extension: If students are given the circumference of a circle, could they write a formula to determine the circle's area or given the area of a circle, could they write the formula for the circumference?



What the Students do:

- Explain the relationship between circumference and diameter of a circle using correct mathematical vocabulary.
- Solve mathematical and real-world problems by applying the area of a circle and circumference formulas.
- Discover through hands-on experiences, and explain the relationship between the circumference and area of a circle.

Misconceptions and Common Errors:

	The formulas for the area of a circle and the circumference of a circle are often confused by students. Teaching students to memorize these formulas without any understanding of how they relate to a circle increases the chance for confusion. Build the understanding before presenting the formulas.
7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. Explore supplementary, complementary, vertical, and adjacent angles and their relationships to one another. These facts are used in multi-step problems. **What the Teacher does:** • Provide students the opportunities to explore supplementary, complementary, vertical, and adjacent angles first through measuring and then by finding the patterns. Apply these findings to look at the same angles in intersecting lines and many types of polygons. • Assign multi-step problems where students apply what they know about supplementary complementary, vertical, and adjacent angles to find solutions. • Have students create dictionaries of new vocabulary words as there are many new ones in this standard such as supplementary, complementary, vertical, and adjacent.	7.G.5 Angle relationships that can be explored include but are not limited to: • Same-side (consecutive) interior and same-side (consecutive) exterior angles are supplementary. Examples: • Write and solve an equation to find the measure of angle x.  • Write and solve an equation to find the measure of angle x.  **What the Students do:** • Discover the definitions of supplementary, complementary, vertical, and adjacent angles. • Solve multi-step problems by applying what they know about the types of angles. • Clarify their understandings of the terms supplementary, complementary, vertical, and adjacent angles by writing in their own words. **Misconceptions and Common Errors:** Students tend to confuse these vocabulary words. Making a foldable where they can look to distinguish between supplementary and complementary and then vertical and adjacent can be very helpful.

7.G.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

This standard pulls together much of what the students know and can do in geometry through problem solving of both mathematical and real-world problems. Students will work with two and three-dimensional objects and apply what they know about area, volume and surface area.

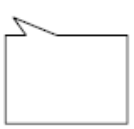
What the Teacher does:

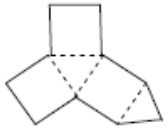
- Provide students with a variety of problems to solve from single to multi-step, from real world to mathematical. Present opportunities to solve the problems as individuals, pairs, and small groups. Allow students to present their findings and justifications in writing such as journal entries and orally as in class presentations facilitated by the teacher.
- Model and highlight appropriate use of vocabulary whenever possible.

7.G.6 Students understanding of volume can be supported by focusing on the area of base times the height to calculate volume. Students understanding of surface area can be supported by focusing on the sum of the area of the faces. Nets can be used to evaluate surface area calculations.

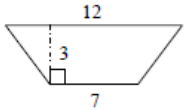
Examples:

- Choose one of the figures shown below and write a step by step procedure for determining the area. Find another person that chose the same figure as you did. How are your procedures the same and different? Do they yield the same result?





- A cereal box is a rectangular prism. What is the volume of the cereal box? What is the surface area of the cereal box? (Hint: Create a net of the cereal box and use the net to calculate the surface area.) Make a poster explaining your work to share with the class.
- Find the area of a triangle with a base length of three units and a height of four units.
- Find the area of the trapezoid shown below using the formulas for rectangles and triangles.



What the Students do:

- Solve a variety of real world and mathematical problems involving geometry concepts such as area, volume and surface area for two and three-dimensional objects.
- Communicate orally and in writing solutions, including justifications for those solutions.

Misconceptions and Common Errors:

A common error students make is to confuse when to use area, volume, or surface area. These students need to explore the concepts with concrete materials. They need to physically measure lengths and widths to find area, fill objects with cubes to develop their concept of volume, and use nets to determine surface area. Memorizing formulas makes it difficult for students to

	know when to use which concept.

Standards for Mathematical Practice	Explanations and Examples
Draw, construct, and describe geometrical figures and describe the relationships between them. **7.G.2, 7.G.3** Students work with their hands drawing, constructing geometric shapes, and concentrating on triangles and building them given the three angle measures or the measure of side lengths. Students find relationships between figures such as the plane figures that result from slicing a three-dimensional figure. Using scale drawings, and students solve problems including finding the actual lengths from scale drawings or redrawing a scale drawing to another scale. **MP1. Make sense of problems and persevere in solving them.** **MP4. Model with mathematics.** **MP5. Use appropriate tools strategically.** **Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.** **7.G.4, 7.G.5, 7.G.6** **MP1. Make sense of problems and persevere in solving them.** **MP4. Model with mathematics.**	Students solve problems using scale drawings. Students use drawings and hands-on materials to model geometric shapes and relationships. Students draw free hand or use technology or other tools to draw geometric shapes. Students solve problems involving geometric principles. Students use geometric models to solve problems.

K-U-D	
KNOW *Facts, formulas, information, vocabulary*	**DO** *Skills of the discipline, social skills, production skills, processes (usually verbs/verb phrases)*
• Formulas ○ area of two dimensional figures (circles, rectangles,	• SOLVE problems using formulas

triangles) ○ circumference of a circle ○ volume of three-dimensional figures ○ surface area of right rectangular prisms • Surface area is the sum of the area of the faces • Nets can be used to evaluate surface area calculations • Properties of special shapes ○ right triangles ○ isosceles triangles ○ squares ○ equilateral shapes • Slicing a three-dimensional figure results in various two-dimensional figures (created by the faces of the slice) • Angles (supplementary, complementary, vertical, adjacent)	• DERIVE informally the relationship between circumference and area of a circle • DRAW/CONSTRUCT geometric shapes with given conditions ○ USE rulers, protractors, technology • IDENTIFY unique triangles • DECOMPOSE three-dimensional shapes into two dimensional shapes (i.e. nets) • DESCRIBE two-dimensional figures that result from plane sections of three-dimensional figures • WRITE and SOLVE problems using equations to find an unknown angle in a figure
UNDERSTAND *Big ideas, generalizations, principles, concepts, ideas that transfer across situations*	
• Parallelograms and rectangles can be used to derive the formula for the area of a circle. • Coordinate geometry can be a useful tool for understanding geometric shapes and transformations. • Cross-sections of three-dimensional objects can be formed in a variety of ways, depending on the angle of the cut with the base of the object. • The area of irregular and regular polygons can be found by decomposing the polygon into triangles, squares, and rectangles. • Approximate volumes and surface area of simple geometric solids may be found using estimation. • How to use surface area and volume to solve real-world problems. • Manipulatives and the construction of nets may be used in computing the surface area of right rectangular prisms. • "Pi" (π) is the relationship between a circle's circumference and diameter. • Algebraic equations can be used to find unknown angles of geometric figures.	
Common Student Misconceptions for this Unit	
• Doubling side measures doubles the perimeter • Students have trouble identifying the base of the prism. • Students think that the way a shape is oriented is part of what defines it.	

- When identifying the base and height of a triangle, they use the 'bottom' line as the base and the height 'upwards' from the base.
- Students perceive a regular shape as one that is commonly used – however, a regular shape is one where all sides and angles are equal.
- Language is developmental and therefore is vastly different at different levels of geometric thinking.
    - corner, point → angle, vertex
    - like a square → rectangular
    - equal → congruent
    - diamond → rhombus, kite
    - a square has four sides → has four congruent sides and right angles
- Using a protractor – students think that when measuring angles they must always start from the right/left, or that a protractor must always be placed in the horizontal position, regardless of the orientation of the angle being measured.
- Students have a difficult time visualizing cross sections of 3-Dimensional shapes.

Unit Assessment/Performance Task	DOK
Unit 5 Test Unit 5 Performance Task Geometry	

Vocabulary
• Adjacent Angle, Vertical Angles, Corresponding Angles, Alternate Interior Angles • Circumference, Diameter, Radius • Complementary Angle, Supplementary angle • Congruent Figures • Cross-section • Irregular Polygon, Regular Polygon

- Names of Geometric Figures – rectangular prism, pyramid, cone, sphere, cylinder, triangular prism, trapezoid, square, parallelogram, circle, etc.
- Net
- Parallel Lines, Perpendicular Lines
- Pi
- Plane
- Scale Drawing
- Similar Figures
- Surface Area, Volume

Key Learning Activities/Possible Lesson Focuses (order may vary)

Pre-assessment (Recall prior knowledge) and Pre-requisite skills review (if needed)

Lesson 1: Examining Triangles

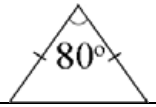
Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. (7.G.2)

- Begin with a review of classifying triangles by sides and angle measures, sum of angle measures = 180^0, using a protractor to measure angles.
- Give students a variety of triangles. Have students sort triangles into groups and explain why they grouped them the way they did. Create common definitions of types of triangles.
- Students should investigate constructing triangles with different side lengths. Conditions may involve points, line segments, angles, parallelism, congruence, angles, and perpendicularity.

-Is it possible to draw a triangle with a 90° angle and one leg that is 4 inches long and one leg that is 3 inches long? If so, draw one. Is there more than one such triangle?

- Draw a triangle with angles that are 60 degrees. Is this a unique triangle? Why or why not?

- Draw an isosceles triangle with only one 80 degree angle. Is this the only possibility or can you draw another triangle that will also meet these conditions?



- *Can you draw a triangle with sides that are 13 cm, 5 cm and 6cm?*
- *Draw a quadrilateral with one set of parallel sides and no right angles.*

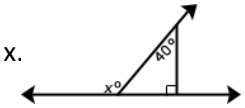
Activity:

Triangular Frameworks task (MAP tasks http://map.mathshell.org.uk/materials/tasks.php?taskid=281

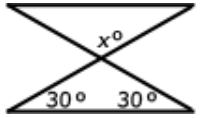
Lesson 2: Solving equations to find missing angle measures

Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. (7.G.5)

- Review solving one-step equations.
- Review/introduce characteristics of parallel and perpendicular lines. Angle relationships that can be explored include but are not limited to:
  - *Supplementary, complimentary, vertical, alternate interior, corresponding, same-side (consecutive) interior and same-side (consecutive) exterior,*
- Write and solve an equation to find the measure of angle x.



- Write and solve an equation to find the measure of angle x.



I have a secret angle (Georgia Unit)
https://www.georgiastandards.org/CommonCore/Common%20Core%20Frameworks/CCGPS_Math_7_7thGrade_Unit5SE.pdf

Lesson 3: Relationship between circumference and diameter of a circle.

Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle. (7.G.4)

- Working cooperatively students will measure the circumference and diameter of several circular objects in the room (clock, trash can, door knob, wheel, etc.).
- Students will organize their information and discover the relationship between circumference and diameter by noticing

the pattern in the ratio of the measures. (circumference / diameter = Pi.)

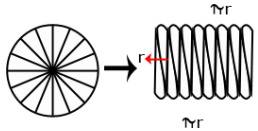
- Students write an expression that could be used to find the circumference of a circle with any diameter and check their expression on other circles.

Activities:
It's easy as Pi (Georgia Unit) https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_7_7thGrade_Unit5SE.pdf

Saving Sir Cumference (Georgia Unit) https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_7_7thGrade_Unit5SE.pdf

Lesson 4: Relationship between circumference and area of a circle.
Using models, students will discover the relationship between the circumference and the area of a circle.

- Students will use a circle as a model to make several equal parts as you would in a pie model. The greater number the cuts, the better. The pie pieces are laid out to form a shape similar to a parallelogram. Students will then write an expression for the area of the parallelogram related to the radius (note: the length of the base of the parallelogram is half the circumference, or πr, and the height is r, resulting in an area of πr2. Extension: If students are given the circumference of a circle, could they write a formula to determine the circle's area or given the area of a circle, could they write the formula for the circumference?



- The seventh grade class is building a mini golf game for the school carnival. The end of the putting green will be a circle. If the circle is 10 feet in diameter, how many square feet of grass carpet will they need to buy to cover the circle? How might you communicate this information to the salesperson to make sure you receive a piece of carpet that is the correct size?

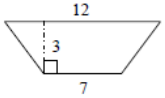
Activities:
Circle Cover-Up (Georgia Unit) https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_7_7thGrade_Unit5SE.pdf

Circle Cover Up – Circles and Parallelograms (Georgia Unit) https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_7_7thGrade_Unit5SE.pdf

Lesson 5: Area

Students will review perimeter and area of polygons. They will find the area of irregular and regular polygons by decomposing the polygon into triangles, squares, and rectangles. Students will use estimation to solve real-world problems.

- Review with students finding perimeter and using formulas to find the area of polygons: square, rectangle, triangle, parallelogram.
- Estimating: Counting Trees http://map.mathshell.org.uk/materials/lessons.php?taskid=422&subpage=problem
- Estimations and Approximations: The Money Munchers http://map.mathshell.org.uk/materials/lessons.php?taskid=220&subpage=problem
- Find the area of a triangle with a base length of three units and a height of four units
- Find the area of the trapezoid shown at the right using the formulas for rectangles and triangles.



- Choose one of the figures shown below and write a step-by-step procedure for determining the area. Find another person that chose the same figure as you did. How are your procedures the same and different? Do they yield the same result?

Activity:
Most Square? Great Tasks Handout 2012

Formative Assessment:
Maximizing Area: Gold Rush http://map.mathshell.org.uk/materials/lessons.php?taskid=415

Lesson 6: Volume and surface area

Students will solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

- Students understanding of volume can be supported by focusing on the area of base multiplied by the height to calculate volume.

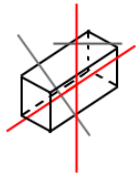
- Students understanding of surface area can be supported by focusing on the sum of the area of the faces. Nets can be used to evaluate surface area calculations.
- A cereal box is a rectangular prism. What is the volume of the cereal box? What is the surface area of the cereal box? (Hint: Create a net of the cereal box and use the net to calculate the surface area.) Make a poster explaining your work to share with the class.

Formative Assessment:
Using Dimensions: Designing a Sports Bag
http://map.mathshell.org.uk/materials/lessons.php?taskid=416&subpage=problem

Lesson 7: Cross sections

Students will describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

- Students should look at a 3-D structure made of cubes and make 2-D drawings of the front, sides and top.
- They should also be able to look at a 2-D drawing of a 3-D structure and do the same. Students can use blocks to build the structure if needed.
- Using a clay model of a rectangular prism, describe the shapes that are created when planar cuts are made diagonally, perpendicularly, and parallel to the base.



- What would the cross sectional view of a cone/cylinder/pyramid/prism look like if it was sliced parallel/perpendicular to the base(s) and viewed from the top.

Teaching Channel Video https://www.teachingchannel.org/videos/visualizing-geometry-lesson

Supplemental Materials and Resources

Online Lessons

- Using Dimensions: Designing a Sports Bag
  http://map.mathshell.org.uk/materials/lessons.php?taskid=416&subpage=problem
- Applying Angle Theorems
  http://map.mathshell.org.uk/materials/lessons.php?taskid=214&subpage=concept
- Roman Mosaic
  http://map.mathshell.org.uk/materials/tasks.php?taskid=391&subpage=expert
- Historic Bicycle
  http://map.mathshell.org.uk/materials/tasks.php?taskid=370&subpage=apprentice
- Photographs
  http://map.mathshell.org.uk/materials/tasks.php?taskid=380&subpage=apprentice
- Short Tasks – Geometry
  http://map.mathshell.org.uk/materials/tasks.php?taskid=401&subpage=novice

Worksheets

- Angles Worksheets for Practice and Study
  http://www.math-aids.com/Geometry/Angles/
- Area and Perimeter Worksheets
  http://www.math-aids.com/Geometry/Perimeter/
- Circle Worksheets
  http://www.math-aids.com/Geometry/Circles/

Videos

- Circle Song
  http://www.gamequarium.org/cgi-bin/search/linfo.cgi?id=9591
- Visualizing Geometry (from TeachingChannel.org)
  https://www.teachingchannel.org/videos/visualizing-geometry-lesson?fd=1
- Mr. McCloud: Discovering Surface Area of a Cylinder (from TeachingChannel.org)
  https://www.teachingchannel.org/videos/surface-area-lesson
- Khan Academy Videos on Geometry
  http://www.khanacademy.org/math/geometry?k

SMART Board Lessons

- Area of a Circle – Formula for area of a circle and how to use a grid and squares to check reasonableness or answer.
  http://exchange.smarttech.com/details.html?id=2b739b92-4d4a-46f1-9bf7-03dd7aebb28b
- Angle Relationships – Students will identify congruent, vertical, supplementary, and complementary angles.
  http://exchange.smarttech.com/details.html?id=4b322c56-62c8-4c5c-9bbd-8a08dcefe18e

Online Interactive Activities & Games

- Kung Fu Angles
- Banana Hunt (Angle Practice)
- Complementary and Supplementary Angle Pairs Practice
- Complementary and Supplementary Angle Pairs Memory Match
- Finding Volume
- Area of a Circle

Literature connections:

Girls Get Curves: Geometry Takes Shape by Danica McKellar

Nonfiction Writing Prompts for Geometry by Advanced Learning Press

Interdisciplinary connections:

Art:

- Recognition of 2D and 3D shapes

Science:

- Measurement
- Surface Area

Tools/Manipulatives

- Geoboards
- Protractors
- Rulers
- Graph Paper
- Small cubes – inch or centimeters
- Circular objects to measure circumference such as lids, CDs, cans, etc.
- String
- Modeling clay
- Geometric Solid figures
- Nets of solid figures
- Styrofoam 3-D figures such as cones ad prisms

Suggested Formative Assessment Practices/Processes
Teacher created exit slips, quizzes Maximizing Area: Gold Rush http://map.mathshell.org.uk/materials/lessons.php?taskid=415 Using Dimensions: Designing a Sports Bag http://map.mathshell.org.uk/materials/lessons.php?taskid=416&subpage=problem

Differentiation and Accommodations
• Provide graphic organizers • Provide additional examples and opportunities for repetition • Provide tutoring opportunities • Provide retesting opportunities after remediation (up to teacher and district discretion) • Teach for mastery not test • Teaching concepts in different modalities • Adjust homework assignments