

Math Journal - Chapter 10 - Perimeter, Area and Volume

- 10.01 The perimeter of a regular heptagon is 63 cm. Create a flow map to show how to find the length of each side.
- 10.02 Create a model to demonstrate that the area of a triangle is $\frac{1}{2}$ of the area of a quadrilateral with the same base and height.
- 10.03 Use a ruler to create an irregular polygon. Create a flow map to show the sequence of steps required to find the area and perimeter of your polygon.
- 10.04 As you saw during the guided practice, the effects of doubling or halving the dimensions of a polygon have a mathematical root. Write a paragraph to explain why you think this is true. (I do not expect a correct answer - just a well thought out argument)
- 10.05 Write a narrative story (3 paragraphs) to tell a fifth grade student about today's discovering π activity. Open with expectations and a hook. Discuss the activity and close your narrative by telling them what you discovered and/or why they should try it out for themselves.
- 10.06 Use graph paper to recreate the nets on page 529. Attempt to create a solid figure with each net.
- 10.07 Write a comparison/contrast piece to discuss how finding the surface area of a rectangular pyramid is different from finding the surface area of a rectangular prism.
- 10.08 Finding the volume of pyramids isn't really harder than finding the volume of a prism, you just have to use a different formula. The formula for finding the volume of a square pyramid is $S^2H \div 3$. Why do you think that finding the volume of prisms is considered a sixth grade objective while finding the volume of pyramids is saved for higher math?
- 10.09 Finding the volume of cones isn't really harder than finding the volume of a cylinder, you just have to use a different formula. The formula for finding the volume of a cone is $\pi r^2 h \div 3$. Why do you think that finding the volume of cylinders is considered a sixth grade objective while finding the volume of cones is saved for higher math?

General Scoring Rubric:

- 0 No Response
- 1 Wrong response
- 2 Weak response
- 3 Showed understanding
- 4 Showed understanding and cited an example
- 5 Showed understanding, cited examples and communicated effectively enough to enable others to understand.

Word List – 3 Column Notes

Word	Definition	Example
area	The amount of surface that an object covers. (measured in square units).	L x W
base		
center		
circle		
circumference		
cone		
cylinder		
diameter		
edge		
face		
net		
perimeter		
<i>pi</i>		
polyhedron		
prism		
pyramid		
radius		
surface area		
vertex		
volume		

Matching

Perimeter, Area, and Volume – Matching

- | | | | |
|----------|---------------|----|--|
| _____1) | area | A. | the middle of a circle. |
| _____2) | base | | the point that is equidistant to all the points in a circle. |
| _____3) | center | B. | the number of cubic units needed to fill the space of a solid.
(measured in cubes) |
| _____4) | circle | C. | the ratio that compares the circumference and diameter of any circle. |
| _____5) | circumference | D. | a pattern made when the surface of a solid is laid out flat (2d). |
| _____6) | cone | E. | a figure that is the set of all points that are the same distance from a given point. |
| _____7) | cylinder | F. | a polyhedron with two congruent and parallel bases.
(made of bases and rectangles) |
| _____8) | diameter | G. | the sum of the areas of all of the surfaces of a solid figure. |
| _____9) | edge | H. | a flat surface(s) of a solid for which the solid is named. |
| _____10) | face | I. | a line segment with one endpoint at the center of a circle and the other endpoint on the circle. |
| _____11) | net | J. | a chord that passes through the center of a circle. |
| _____12) | perimeter | K. | a 3 dimensional object, or solid figure, with flat surfaces |
| _____13) | <i>pi</i> | L. | a point at which three or more edges of a polyhedron meet. |
| _____14) | polyhedron | M. | the measure of the distance around a figure. |
| _____15) | prism | N. | the flat surface of any polyhedron. |
| _____16) | pyramid | O. | a polyhedron with a single polygon shaped base.
(made of a base and triangles) |
| _____17) | radius | P. | formed when two faces of a solid figure share a side. |
| _____18) | surface area | Q. | a solid that has a single circle for a base and a single triangle that comes to a point. |
| _____19) | vertex | R. | a solid that has two congruent circles as bases and a single rectangle to connect them. |
| _____20) | volume | S. | the amount of surface that an object covers.
(measured in square units) |
| | | T. | the measure of the distance around a circle.
(perimeter of a circle) |

Matching

-----Key-----

- 1) **S**
- 2) **H**
- 3) **A**
- 4) **E**
- 5) **T**
- 6) **Q**
- 7) **R**
- 8) **J**
- 9) **P**
- 10) **N**
- 11) **D**
- 12) **M**
- 13) **C**
- 14) **K**
- 15) **F**
- 16) **O**
- 17) **I**
- 18) **G**
- 19) **L**
- 20) **B**

Math Objectives

2.02

The student will be able to solve problems involving perimeter/circumference and area of plane figures.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Finding Perimeter

Essential Question: Over the next two days, we will be working with unmarked side lengths. Students have a great deal of difficulty using spatial reasoning to figure out the length of unmarked sides of a polygon. Teachers have tried for years to figure out why and how to teach it. Can you come up with a plan to help your classmates realize and determine unmarked side lengths?

Objective (s) Numbers: **2.02**
Outcomes: The student will be able to solve problems involving perimeter/circumference and area of plane figures.

Materials: Textbook pages 500-503; 10.1 Practice A and B
Anticipatory Set: Today we will learn to find the perimeter and missing side lengths of a polygon.

During the Lesson

Presentation of Information:
Integration of Other Subjects: Writing (sequencing)
Reading (vocabulary, problem solving, analyzing expectation)
Integration of Reading: Reading for information and interpretation.
Integration of Technology: Computer, Projector, PowerPoint, Internet

Modeling: Review perimeter. Discuss the 5th grade pitfalls of perimeter as it relates to rectangles and squares (2 and 1 value given respectively.)

Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice: Use 10.1 Practice A and B as guided practices for finding the missing side lengths in polygons.

After the Lesson

Independent Practice Text page 502-503 {1–13, 16, 17, 23–30}
AIG: {8–30}
Assign workbook page 10.1

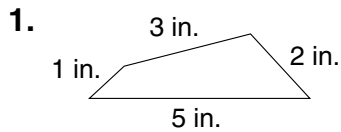
Closure / Assessment: The perimeter of a regular heptagon is 63 cm. Create a flow map to show how to find the length of each side.

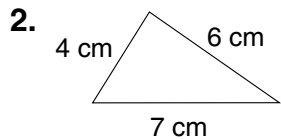
Reflection:

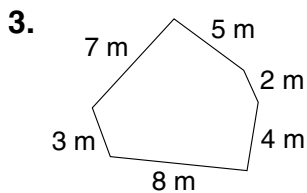
Integration with School-wide Focus: Improve mathematics computation and problem solving.

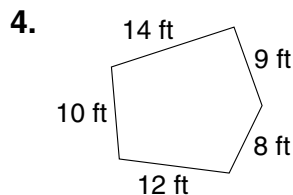
LESSON
10-1 **Practice A**
Finding Perimeter

Find the perimeter of each figure.

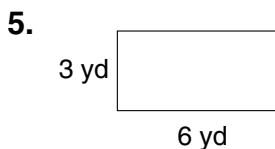




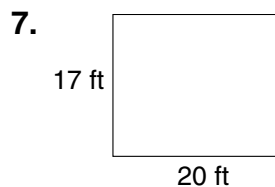




Find the perimeter P of each rectangle.

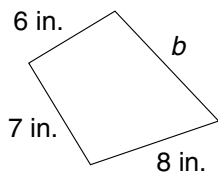




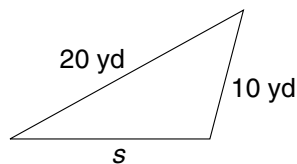


Find the unknown measure.

8. What is the length of side b if the perimeter equals 30 in.?



9. What is the length of side s if the perimeter equals 45 yd?

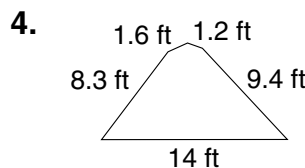
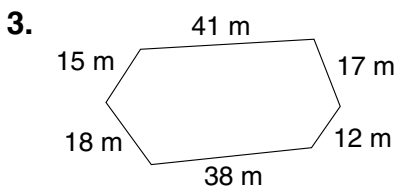
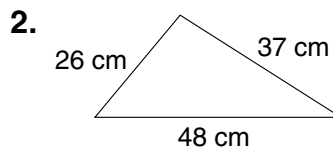
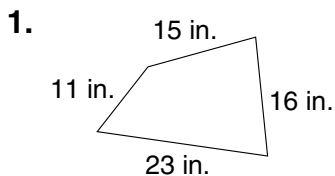


10. A triangular rug has sides that measure 13 feet, 16 feet, and 12 feet. What is the perimeter of that rug?

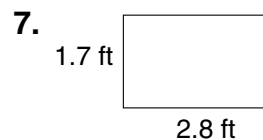
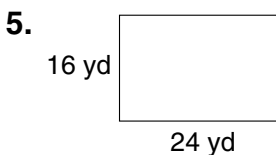
11. The perimeter of a rectangular swimming pool is 140 meters. The pool is 20 meters wide. How long is the pool?

LESSON
10-1 **Practice B**
Finding Perimeter

Find the perimeter of each figure.

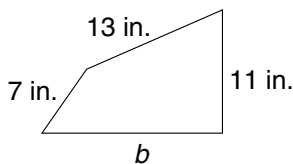


Find the perimeter P of each rectangle.

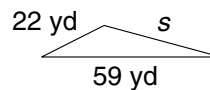


Find the unknown measure.

8. What is the length of side b if the perimeter equals 47 in.?



9. What is the length of side s if the perimeter equals 119 yd?



10. Benjamin is putting a fence around his rectangular-shaped yard. The yard is 38 feet long and 27 feet wide. How many feet of fencing does Benjamin need to surround his entire yard?

11. If you drove from Bakersville to Salem and then to San Mateo, your entire 81-mile journey would form a triangle. The distance from Salem to San Mateo is 24 miles. The distance from Bakersville to San Mateo is 40 miles. How many miles is it from Salem to Bakersville?

Math Objectives

1.04d; 2.01; 2.02

The student will be able to judge the reasonableness of solutions; estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Estimating and Finding Area

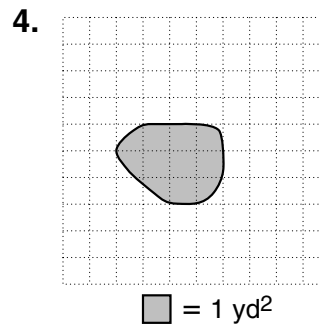
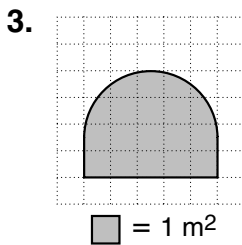
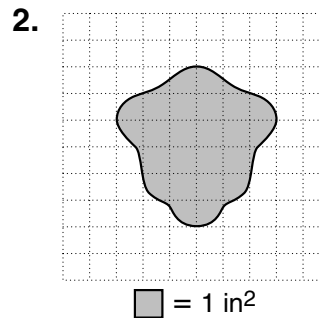
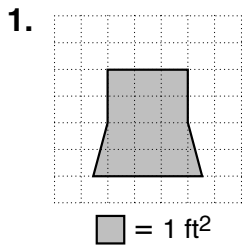
- Essential Question: Students have a great deal of difficulty using spatial reasoning to figure out the length of unmarked sides of a polygon. Teachers have tried for years to figure out why and how to teach it. Can you come up with a plan to help your classmates realize and determine unmarked side lengths?
- Objective (s) Numbers: **1.04d; 2.01; 2.02**
- Outcomes: The student will be able to judge the reasonableness of solutions; estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures.
- Materials: Textbook pages 504-507; 10.2 Practice A and B
- Anticipatory Set: Today we will learn to estimate the area of irregular figures and find the area of rectangles, triangles, and parallelograms.
- Presentation of Information:
- Integration of Other Subjects: Writing (presentation/display)
Reading (vocabulary, problem solving, analyzing expectation)
 - Integration of Reading: Reading for information and interpretation.
 - Integration of Technology: Computer, Projector, PowerPoint, Internet
- Modeling: Review and discuss using formulas for the area of triangles and quadrilaterals.
- Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.
- Guided Practice: Use 10.2 Practice A and B as guided practices for estimating and finding the area of regular polygons.

After the Lesson

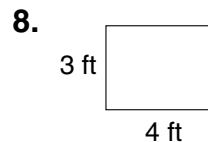
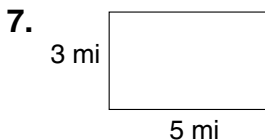
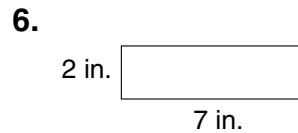
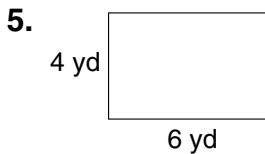
- Independent Practice Text page 506-507 {1-6, 9-14, 17, 21-26}
AIG: {4-6, 9-14, 17-26}
Assign workbook page 10.2
- Closure / Assessment: Create a model to demonstrate that the area of a triangle is $\frac{1}{2}$ of the area of a quadrilateral with the same base and height.
- Reflection:
- Integration with School-wide Focus: Improve mathematics computation and problem solving.

LESSON **Practice A**
10-2 *Estimating and Finding Area*

Estimate the area of each figure.



Find the area of each rectangle.

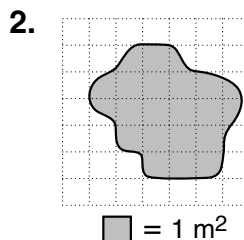
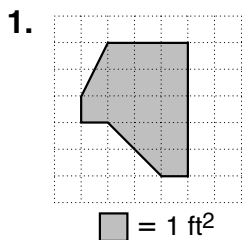


9. A square room has sides that each measure 5 feet. How many square feet of carpet is needed to cover the room's entire floor?

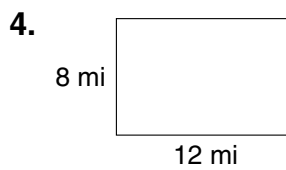
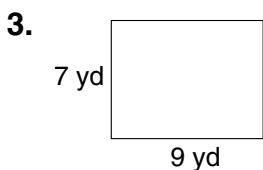
10. A rectangular coffee table is 2 feet wide and 4 feet long. How many square feet of glass is needed to cover the entire table top?

LESSON **Practice B**
10-2 *Estimating and Finding Area*

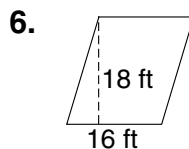
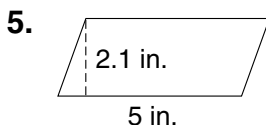
Estimate the area of each figure.



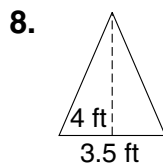
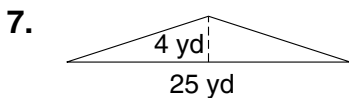
Find the area of each rectangle.



Find the area of each parallelogram.



Find the area of each triangle.



9. A section of a stained-glass window is shaped like a parallelogram. Its base is 6.5 inches, and its height is 4 inches. How much glass is needed to cover the section completely?

10. Your rectangular yard is 10 feet wide and 26 feet long. How many square feet of grass do you need to plant if you want to cover the entire yard?

Math Objectives

2.01; 2.02

The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Problem Solving: Break into Simpler Parts

Essential Question: Consider your response to yesterday's essential question. Do you think that students have an easier time determining unmarked side lengths or finding the area of irregular polygons? (Explain)

Objective (s) Numbers: **2.01; 2.02**

Outcomes: The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures.

Materials: Textbook pages 508-510; 10.3 Practice A and B

Anticipatory Set: Today we learn to break a polygon into simpler parts to find its area.

During the Lesson

Presentation of Information:

Integration of Other Subjects: Writing (sequencing)
Reading (vocabulary, problem solving, analyzing expectation)

Integration of Reading: Reading for information and interpretation.

Integration of Technology: Computer, Projector, PowerPoint, Internet

Modeling: Irregular figures and polygons require an irregular approach to finding the area. An easy way is to break the polygon into simpler parts for which you know mathematical formulae for area computation.

Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice: Use 10.3 Practice A and B as guided practice for breaking irregular polygons into simpler parts.

After the Lesson

Independent Practice Text page 509-510 {1–2, 4–5, 7a–7b, 10–14}
AIG: {1–2, 4–5, 7, 10–14}
Assign workbook page 10.3

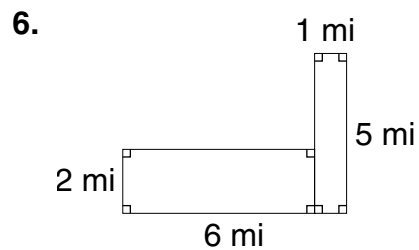
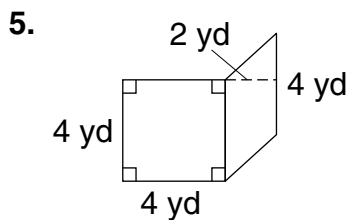
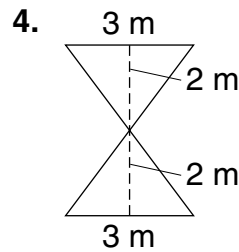
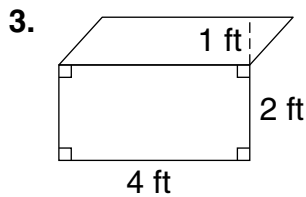
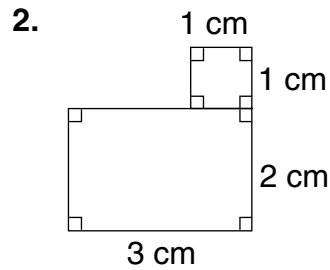
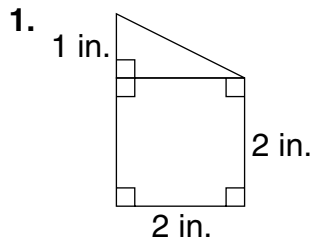
Closure / Assessment: Use a rule to create an irregular polygon. Create a flow map to show the sequence of steps required to find the area and perimeter of your polygon.

Reflection:

Integration with School-wide Focus: Improve mathematics computation and problem solving.

LESSON **Practice A**
10-3 *Break into Simpler Parts*

Find the area of each polygon.

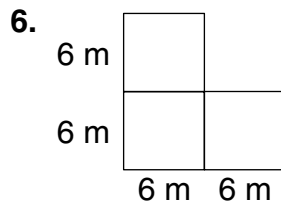
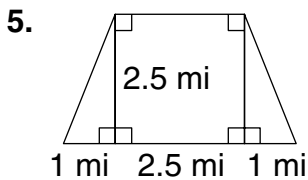
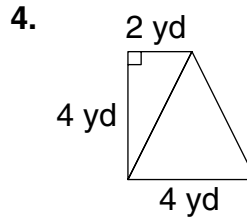
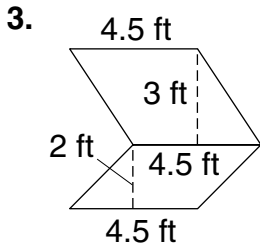
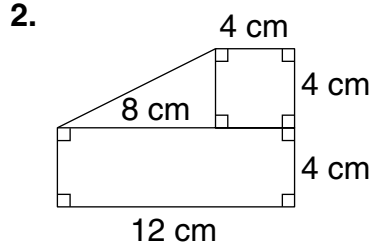
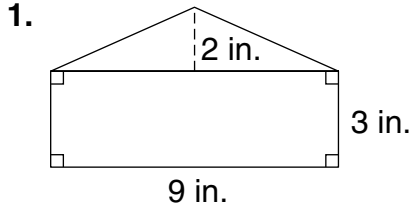


7. A rectangular painting is made up of two congruent squares with sides that measure 2 feet. What is the area of the entire painting?

8. A carpet is made up of two congruent triangles. The base of each triangle is 3 feet and the height is 6 feet. What is the area of the entire carpet?

LESSON **Practice B**
10-3 *Break into Simpler Parts*

Find the area of each polygon.



7. Three paintings are shaped like an 8-foot square, a 7-foot by 4-foot rectangle, and a triangle with a 6-foot base and a height of 7 feet. If those paintings are hung together on the outside of a building, how much of the building's wall will they cover altogether?

8. Two diagonals divide a square carpet into 4 congruent triangles. The base of each triangle is 5 feet and the height is 2.5 feet. What is the area of the entire carpet?

Math Objectives

2.01; 2.02

The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Comparing Area and Perimeter

Essential Question: Examine the table from our Guided Practice. Do you see a pattern that could be used as an algorithm? (Describe)

Objective (s) Numbers: **2.01; 2.02**
Outcomes: The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures.

Materials: Textbook pages 511-513
Anticipatory Set: Today we make a models to explore how area and perimeter are affected by changes in the dimensions of a figure.

During the Lesson

Presentation of Information:
Integration of Other Subjects: Writing (opinion)
Reading (vocabulary, problem solving, analyzing expectation)
Integration of Reading: Reading for information and interpretation.
Integration of Technology: Computer, Projector, PowerPoint, Internet

Modeling: Examine the effects (on area and perimeter) when the dimensions of a triangle are halved and doubled. Repeat with a rectangle.

Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice: Set up a table: Dimensions, Perimeter, Area, Doubled, Area, Perimeter, Percent Change, Percent Change. Using a 2x12, 3x8 and 4x6 rectangles - complete the table and discuss the effects on the new area and perimeter. Repeat with a triangle with similar dimensions.

After the Lesson

Independent Practice Text page 512-513 {1-5, 7, 11-14}
AIG: {5-14}
Assign workbook page 10.4

Closure / Assessment: As you saw during the guided practice, the effects of doubling or halving the dimensions of a polygon have a mathematical root. Write a paragraph to explain why you think this is true. (I do not expect a correct answer - just a well thought out argument)

Reflection:

Integration with School-wide Focus: Improve mathematics computation and problem solving.

Math Objectives

2.02; 3.02

The student will be able to solve problems involving perimeter/circumference and area of plane figures, identify the radius, diameter, chord, center, and circumference of a circle and determine the relationships among them.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Circles

Essential Question: If pi is a constant (though irrational) number, why did our "discoveries" vary? (Explain and give examples)

Objective (s) Numbers: **2.02; 3.02**
Outcomes: The student will be able to solve problems involving perimeter/circumference and area of plane figures, identify the radius, diameter, chord, center, and circumference of a circle and determine the relationships among them.

Materials: Textbook pages 514-520; compasses, rulers, protractors, string, various circular objects, Discovering Pi Practice 10.5 (from Math6.org)

Anticipatory Set: Today we will learn to identify the parts of a circle and find the circumference and area of a circle.

During the Lesson

Presentation of Information:
Integration of Other Subjects: Writing (narrative)
Reading (vocabulary, problem solving, analyzing expectation)
Integration of Reading: Reading for information and interpretation.
Integration of Technology: Computer, Projector, PowerPoint, Internet

Modeling: The students will use the compasses to draw circles and model each of the vocabulary terms; center, radius, diameter, chord, circumference, π

Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice: Students will use string to measure the circumference of various circles, then use calculators to find the relationship between the circumference and the diameter. Students will complete the worksheet - Discovering π Practice 10.5. Students will be shown memorization techniques to memorize circle formulas: $D=2R$, $C=\pi D$; $A=\pi R^2$

After the Lesson

Independent Practice Text page 518-519 {1-3, 6-9, 13-15, 17, 23-30}
AIG: {1-3, 6-9, 16-17, 19-20, 23-30}
Assign workbook page 10.5

Closure / Assessment: Write a narrative story (3 paragraphs) to tell a fifth grade student about today's discovering pi activity. Open with expectations and a hook. Discuss the activity and close your narrative by telling them what you discovered and/or why they should try it out for themselves.

Reflection:

Integration with School-wide Focus: Improve mathematics computation and problem solving.

Activity Sheet

10.5 Circles

Write a **defining** sentence for each of the following words.

Circle	Radii	Circumference
Center	Chord	<i>Pi</i>
Radius	Diameter	

Create a **poster** to model each of the words from above (you may choose radius or radii)

Rewrite and **memorize** each of the following equations.

Diameter = $2 * R$	Circumference = $D * \pi$	$A = \pi * R * R$
Radius = $D \div 2$	Circumference = $\pi * 2R$	$A = \pi R^2$
$Pi \approx 3.14$ or $\frac{22}{7}$		

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Math Objectives

2.01

The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Solid Figures

Essential Question: For some reason, students really struggle to remember that pyramids have 1 base while prisms have 2. Can you develop a plan to help all students easily remember these facts?

Objective (s) Numbers: **2.01**
Outcomes: The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools.

Materials: Textbook pages 524-529; graph paper
Anticipatory Set: Today we will learn to name solid figures.

During the Lesson

Presentation of Information:
Integration of Other Subjects: Reading (vocabulary, problem solving, analyzing expectation)
Integration of Reading: Reading for information and interpretation.
Integration of Technology: Computer, Projector, PowerPoint, Internet

Modeling: Use 3 column notes to present and practice the vocabulary for today's lesson. {polyhedron, face, edge, vertex, prism, base, pyramid, cylinder, cone}

Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice: Have students set up a table to show Name, Bases, Total Faces, Edges, Vertices. Complete the table for each regular pyramid and prism.

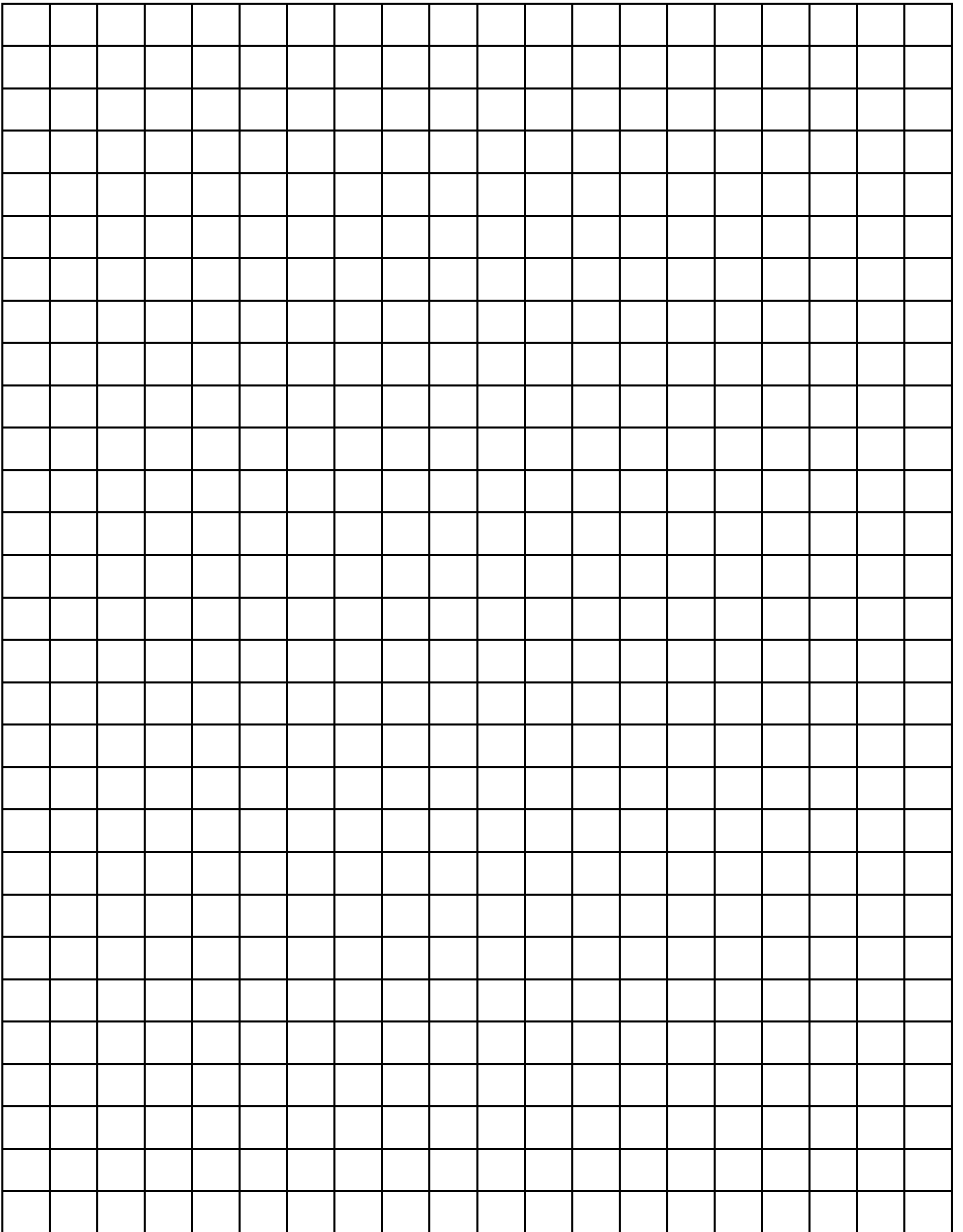
After the Lesson

Independent Practice Text page 526-527 {1-3, 7-9, 20-23, 29-36}
AIG: {1-3, 7-9, 20-23, 29-36}
Assign workbook page 10.6

Closure / Assessment: Use graph paper to recreate the nets on page 529. Attempt to create a solid figure with each net.

Reflection:

Integration with School-wide Focus: Improve mathematics computation and problem solving.



Math Objectives

2.02

The student will be able to solve problems involving perimeter/circumference and area of plane figures.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Surface Area

Essential Question: To find the surface area of a solid, you must break it into all of its pieces, find their area and then add all of the faces together. Do you find it easier to find the surface area of pyramids, prisms or cylinders. (Explain)

Objective (s) Numbers: **2.02**
Outcomes: The student will be able to solve problems involving perimeter/circumference and area of plane figures.

Materials: Textbook pages 530-533; 10.7 Practice A and B
Anticipatory Set: Today we will learn to find the surface areas of prisms, pyramids, and cylinders.

During the Lesson

Presentation of Information:
Integration of Other Subjects: Writing (compare/contrast)
Reading (vocabulary, problem solving, analyzing expectation)
Integration of Reading: Reading for information and interpretation.
Integration of Technology: Computer, Projector, PowerPoint, Internet

Modeling: The surface area of a solid figure is the sum of the areas of **each** of its faces. An easy way to help you find surface area is to create a simple net to model each face.

Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice: Practice identifying solids and then creating nets to model the 3D in 2D. Apply area formulas to find the total surface area of each solid.
Use 10.7 Practice A and B as guided practices and further experiences with surface area.

After the Lesson

Independent Practice Text page 532-533 {1–15, 27–32}
AIG: {13–32}
Assign workbook page 10.7

Closure / Assessment: Write a comparison/contrast piece to discuss how finding the surface area of a rectangular pyramid is different from finding the surface area of a rectangular prism.

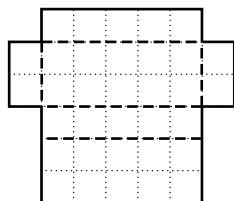
Reflection:

Integration with School-wide Focus: Improve mathematics computation and problem solving.

LESSON
10-7 **Practice A**
Surface Area

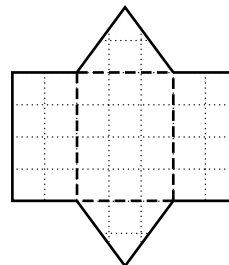
Find the surface area S of each net.

1.



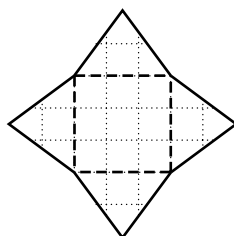
$\square = 1 \text{ ft}^2$

2.



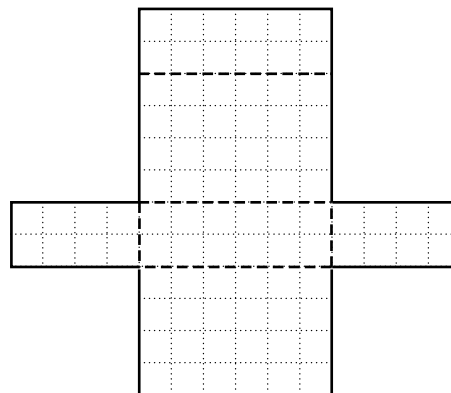
$\square = 1 \text{ in}^2$

3.



$\square = 1 \text{ yd}^2$

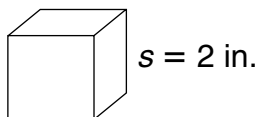
4.



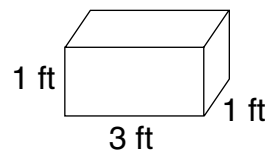
$\square = 1 \text{ m}^2$

Find the surface area S of each prism.

5.



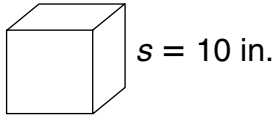
6.



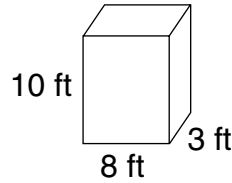
LESSON
10-7 **Practice B**
Surface Area

Find the surface area S of each prism.

1.

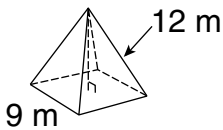


2.

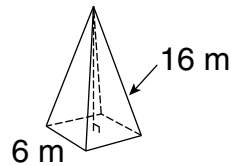


Find the surface area S of each pyramid.

3.

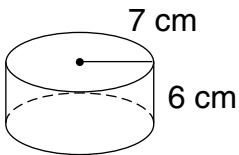


4.

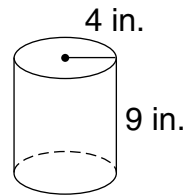


Find the surface area S of each cylinder. Use 3.14 for π .

5.



6.



7. Why can you find an exact surface area measurement for a prism and pyramid but not for a cylinder?

8. The surface area of a rectangular prism is 48 square feet. The area of its front is 4 square feet, and the area of one side is 10 square feet. What is the area of the top of the prism?

Math Objectives

2.01

The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Finding Volume

Essential Question: Over the next two days you will be adding several more formulas to the pile of formulas you must memorize and master. Some students fail to memorize the many formulas that they will need to solve the different geometry problems that they will face in life and on the EOG. The state uses the EOG to rank students and to determine which students are capable of moving to the next grade. Do you think the state is correct in believing that memorizing formulas is part of being a good math student or should the state provide the formulas on the test? (Explain - and don't say provide just because you don't feel like memorizing formulas!)

Objective (s) Numbers: **2.01**
Outcomes: The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools.

Materials: Textbook pages 534-537
Anticipatory Set: Today we will learn to estimate and find the volumes of rectangular prisms and triangular prisms.

During the Lesson

Presentation of Information:
Integration of Other Subjects: Writing (opinion)
Reading (vocabulary, problem solving, analyzing expectation)
Integration of Reading: Reading for information and interpretation.
Integration of Technology: Computer, Projector, PowerPoint, Internet

Modeling: Volume is the number of cubic units needed to fill a space. It is particularly easy to do with rectangular and triangular prisms. Simply find the area of the base times the third dimension Height (H). This formula will work with any prism.

Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice: Model finding the area of triangular prisms. $(3.4 \times 2.6 \times 3)$ $(6 \times 4.4 \times 7.1)$
Model finding the area of rectangular prisms. $(6 \times 4 \times 2.5)$ $(8 \times 8 \times 8)$
Model finding the area of cylinders. $(D=6 H=5)$ $(D=5 H=3)$ $r^2 \pi h$

After the Lesson

Independent Practice Text page 536-537 {1-6, 8-13, 27-33}
AIG: {11-13, 15-23, 27-33}
Assign workbook page 10.8

Closure / Assessment: Finding the volume of pyramids isn't really harder than finding the volume of a prism, you just have to use a different formula. The formula for finding the volume of a square pyramid is $S^2 H \div 3$. Why do you think that finding the volume of prisms is considered a sixth grade objective while finding the volume of pyramids is saved for higher math?

Reflection:

Integration with School-wide Focus: Improve mathematics computation and problem solving.

Math Objectives

2.01; 2.02

The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Volume of Cylinders

Essential Question: Some students fail to memorize the many formulas that they will need to solve the different geometry problems that they will face in life and on the EOG. The state uses the EOG to rank students and to determine which students are capable of moving to the next grade. Do you think the state is correct in believing that memorizing formulas is part of being a good math student or should the state provide the formulas on the test? (Explain - and don't say provide just because you don't feel like memorizing formulas!)

Objective (s) Numbers: **2.01; 2.02**
Outcomes: The student will be able to estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures.

Materials: Textbook pages 538-541
Anticipatory Set: Today we learn to find volumes of cylinders.

During the Lesson

Presentation of Information:
Integration of Other Subjects: Writing (opinion)
Reading (vocabulary, problem solving, analyzing expectation)
Integration of Reading: Reading for information and interpretation.
Integration of Technology: Computer, Projector, PowerPoint, Internet

Modeling: Volume is the number of cubic units needed to fill a space. It is particularly easy to do with rectangular and triangular prisms. Simply find the area of the base times the third dimension Height (H). This formula will work with any prism.

Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice: Model finding the area of triangular prisms. $(6 \times 4 \times 5)$ $(8 \times 3 \times 6)$
Model finding the area of rectangular prisms. $(5 \times 7 \times 3)$ $(3 \times 3 \times 3)$
Model finding the area of cylinders. $(R=5 H=10)$ $(D=9 H=6)$ $r^2 \pi h$

After the Lesson

Independent Practice Text page 540-541 {1-22}
AIG: {9-23, 26}
Assign workbook page 10.9

Closure / Assessment: Finding the volume of cones isn't really harder than finding the volume of a cylinder, you just have to use a different formula. The formula for finding the volume of a cone is $\pi \cdot d \cdot h \div 12$. Why do you think that finding the volume of cylinders is considered a sixth grade objective while finding the volume of cones is saved for higher math?

Reflection:

Integration with School-wide Focus: Improve mathematics computation and problem solving.

Math Objectives

1.04d, 2.01, 2.02, 3.02

The student will be able to judge the reasonableness of solutions; estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures. The student will be able to solve problems involving perimeter/circumference and area of plane figures, identify the radius, diameter, chord, center, and circumference of a circle and determine the relationships among them.

Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Perimeter, Area, and Volume Chapter Review

Essential Question: What steps do you think have been the most helpful in preparing yourself for the examination on a set of skills? (decision making)

Objective (s) Numbers: **1.04d, 2.01, 2.02, 3.02**

Outcomes: The student will be able to judge the reasonableness of solutions; estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures. The student will be able to solve problems involving perimeter/circumference and area of plane figures, identify the radius, diameter, chord, center, and circumference of a circle and determine the relationships among them.

Materials: Textbook pages 546-549; Test Form B

Anticipatory Set: Today we will review the skills that we have been studying during this unit. We will practice test taking skills and remediate those skills about which we don't feel as comfortable as others.

During the Lesson

Presentation of Information:

Integration of Other Subjects:

Reading (vocabulary, problem solving, analyzing expectation)

Integration of Reading:

Reading for information and interpretation.

Integration of Technology:

Computer, Projector, PowerPoint, Internet

Modeling:

Discuss the value of careful review, the process that should occur when errors are made and the importance of reviewing material that students are less comfortable with.

Differentiation:

504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice:

Discuss Instructions for the review on pages 546-549. Have the students review the Headings and address and questions or requests for immediate remediation.

After the Lesson

Independent Practice

Text page 546-549 {1-25}

AIG: {1-25}

Assign Test Form B

Closure / Assessment:

Have co-operative learning groups review and discuss their answers before turning their papers in for correction by the teacher.

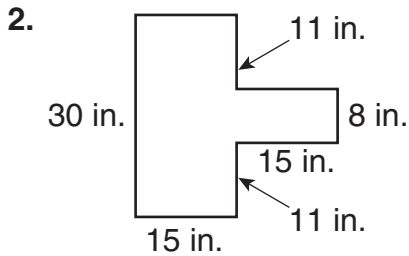
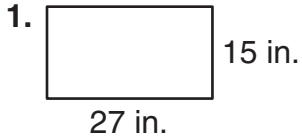
Reflection:

Integration with School-wide Focus: Improve mathematics computation and problem solving.

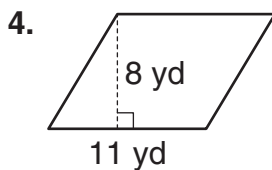
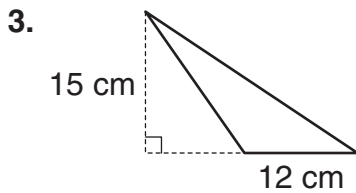
CHAPTER
10 **Form B**

Chapter Test

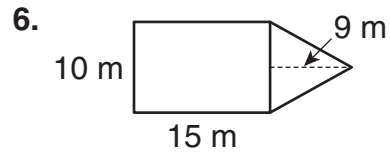
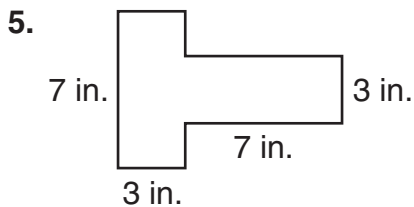
Find the perimeter of each figure.



Find the area of each figure.



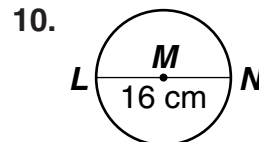
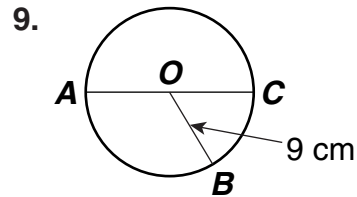
Find the area of each polygon.



7. How does the area of a square change when the side length is doubled?

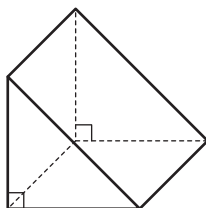
8. The length and width of a rectangle are each multiplied by 6. Find how the perimeter and area of the rectangle change.

Name two radii and find the circumference and area for each circle. Use 3.14 for π and round to the nearest hundredth.

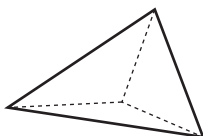


CHAPTER 10 **Chapter Test**
Form B, continued

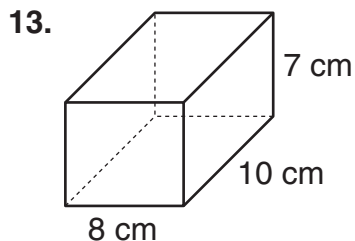
11. Identify the number of faces, edges, and vertices.

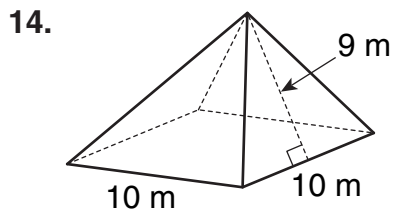


12. Tell whether the figure is a polyhedron and name the solid.

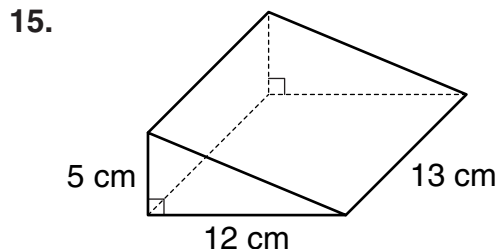


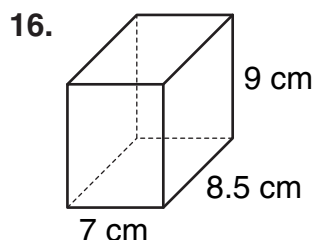
Find the surface area of each figure. Use 3.14 for π .



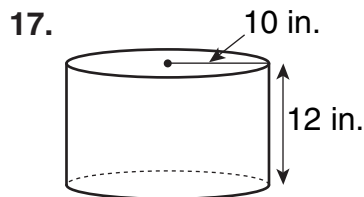


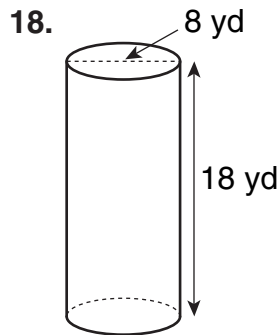
Find the volume of each prism.





Find the volume V of each cylinder to the nearest cubic unit. Use 3.14 for π .





Instructor: _____
Subject: Math Grade 6

Time Frame: **80 minutes**
Date: _____

Perimeter, Area, and Volume Assessment

Essential Question: Did you implement the action plan from yesterday's Essential Question? (Explain)

Objective (s) Numbers: **1.04d, 2.01, 2.02, 3.02**

Outcomes: The student will be able to judge the reasonableness of solutions; estimate and measure length, perimeter, area, angles, weight, and mass of two- and three-dimensional figures using appropriate tools and solve problems involving perimeter/circumference and area of plane figures. The student will be able to solve problems involving perimeter/circumference and area of plane figures, identify the radius, diameter, chord, center, and circumference of a circle and determine the relationships among them.

Materials: Cumulative Assessment (Form B)

Anticipatory Set: Today we will assess our mastery of Perimeter, Area, and Volume.

During the Lesson

Presentation of Information:

Integration of Other Subjects: Writing (evaluation)
Reading (vocabulary, problem solving, analyzing expectation)
Integration of Reading: Reading for information and interpretation.
Integration of Technology: Computer, Projector, PowerPoint, Internet

Modeling: Review the Practice Test, answer questions and model answers.

Differentiation: 504 modifications ET and RA. Additional student and teacher modeling will help to guide all students to reach expected outcomes.

Guided Practice: Discuss the Instructions.

After the Lesson

Independent Practice Assign Cumulative Review Test Form B

Closure / Assessment: Write a paragraph evaluation of your expected performance on this test. What did you do well on? What did you have trouble with? How did you prepare for this test and what would you like to do differently for the next exam?

Choose a Journal entry to share with your class.

Reflection:

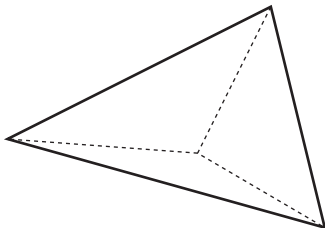
Integration with School-wide Focus: Improve mathematics computation and problem solving.

Cumulative Test**Form B****Select the best answer.**

- What is the perimeter of a rectangle having length 9 cm and width 6 cm?
A 15 cm C 24 cm
B 30 cm D 54 cm
- Which expression has the greatest value?
F 30% of 200 H $7\frac{1}{2} \cdot 3\frac{1}{5}$
G $5^2 + 9 - 2$ J $\frac{2}{3}$ of 70
- Find the difference $90 - 37.23$.
A 67.23 C 52.77
B 57.77 D 32.23
- Which ratio is equivalent to $\frac{3}{20}$?
F 5 to 100 H 140 to 21
G 100 to 5 J 21 to 140
- In which quadrant on a coordinate plane is the point $(-3, 4)$ located?
A I C III
B II D IV
- Solve $6z = \frac{1}{9}$.
F $z = 54$ H $z = 30$
G $z = 15$ J $z = \frac{1}{54}$
- Which phrase matches the algebraic expression $\frac{x}{5}$?
A the product of x and 5
B the sum of x and 5
C the quotient of x and 5
D five less than x
- Add $-19 + 21$.
F -2 H -40
G 2 J 40
- Which of the following is the best deal?
A 3 lb for \$7.60 C 5 lb for \$12.70
B 4 lb for \$10.00 D 6 lb for \$15.30
- What is the perimeter of a square with an area of 169 cm^2 ?
F 13 cm H 52 cm
G 26 cm J 84.5 cm
- Yancy has a board 25 feet long. He wants to cut it into $4\frac{1}{2}$ -foot lengths. Into how many $4\frac{1}{2}$ -foot lengths can he cut it?
A 2 C 5
B 4 D 6
- What is the circumference of a circle with a radius of 7.5 cm? Use 3.14 for π .
F 23.55 cm H 47.1 cm
G 176.625 cm J 94.2 cm
- Divide 19.24 by 2.6.
A 50.024 C 500.24
B 7.4 D 74

CHAPTER 10 **Cumulative Test**
Form B, continued

14. Identify the figure shown.



- F** triangular pyramid
 - G** triangular prism
 - H** rectangular prism
 - J** rectangular pyramid
15. Len bought $1\frac{1}{4}$ pounds of pecans.
Lisa bought $1\frac{1}{2}$ pounds of pecans.
How many more pounds did Lisa buy?
- A** $2\frac{3}{4}$ lb
 - B** 2 lb
 - C** $\frac{3}{4}$ lb
 - D** $\frac{1}{4}$ lb
16. Adrian is training for a 5K race. She ran 5.5 miles the first week, 7.25 miles the second week and 10 miles the third week. On the average, how many miles did she run per week? Round to the nearest hundredth.
- F** 22.75 mi
 - G** 8.00 mi
 - H** 7.58 mi
 - J** 7.25 mi
17. Batteries are packed 12 packages to a box. A box of batteries costs \$51.00. How much do 7 packages cost?
- A** \$4.25
 - B** \$7.29
 - C** \$29.75
 - D** \$87.43

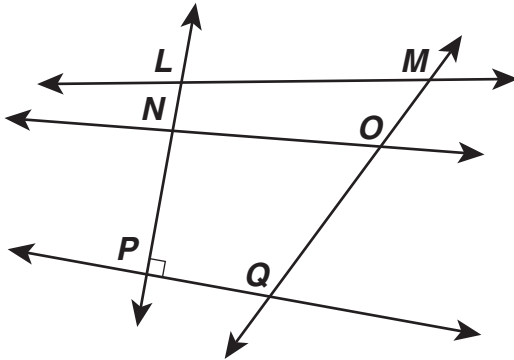
Carter's Lunch Counter Specials	
Chili	\$3.95
Garden Salad	\$4.75
Vegetable Soup	\$2.25
Turkey Sandwich	\$4.95

18. How much more does the garden salad cost than the vegetable soup?
- F** \$2.25
 - G** \$2.50
 - H** \$3.00
 - J** \$7.00
19. What is the prime factorization of 96?
- A** $2^4 \times 3$
 - B** 2×48
 - C** $2^5 \times 3$
 - D** 2×3^4
20. What is the GCF of 54 and 72?
- F** 1
 - G** 6
 - H** 9
 - J** 18
21. There are 126 students in Jennifer's senior class. One-third of the students live over 8 miles from school. How many students live over 8 miles from school?
- A** 16
 - B** 42
 - C** 48
 - D** 63
22. Which expression illustrates the Associative Property?
- F** $24 \times 2 = 2 \times 24$
 - G** $(53 + 17) + 10 = 53 + (17 + 10)$
 - H** $12 + 13 + 18 + 37 = 80$
 - J** $9 \times (20 + 6) = (9 \times 20) + (9 \times 6)$
23. Express 5.37×10^5 in standard form.
- A** 5,370,000
 - B** 537,000
 - C** 53,700
 - D** 5,370

CHAPTER 10 **Cumulative Test**
Form B, continued

24. Which pair of angles is supplementary?
F $45^\circ, 45^\circ$ **H** $90^\circ, 180^\circ$
G $120^\circ, 60^\circ$ **J** $30^\circ, 70^\circ$

Use the diagram for question 25.



25. Which two lines meet at a right angle?
A \overline{LN} and \overline{PQ} **C** \overline{NO} and \overline{PL}
B \overline{QM} and \overline{NO} **D** \overline{PQ} and \overline{MQ}

26. Which statement is false?
F Every square is a parallelogram.
G Every parallelogram is a square.
H Some rectangles are squares.
J All squares are rectangles.

27. A triangle with angles measuring 95° , 45° , and 40° is what type of triangle?
A acute **C** equilateral
B obtuse **D** isosceles

28. The measures of two angles in a triangle are 45 and 55 degrees. What is the measure of the third angle?
F 80 degrees **H** 100 degrees
G 90 degrees **J** 110 degrees

29. What is the area of a rectangle if its length is 15 cm and its width is 13 cm?
A 28 cm **C** 56 cm^2
B 56 cm **D** 195 cm^2

30. What is the area of a circle with a diameter of 6 cm? Use 3.14 for π .
F 18.84 cm^2 **H** 76.43 cm^2
G 28.26 cm^2 **J** 113.04 cm^2

31. In one field, a farmer finds crop circle with a diameter of 110 feet. How many square feet does the crop circle cover? Use 3.14 for π .
A 172.7 ft^2 **C** $9,498.5 \text{ ft}^2$
B 345.4 ft^2 **D** $37,994 \text{ ft}^2$

32. Which number has the *least* value?
F 12.2 **H** 12.5
H 12.25 **J** 12.52

33. Which set of integers is ordered from least to greatest?
A $-18, -15, -4, 0$
B $-19, -23, -26, -30$
C $10, -2, -15, -12$
D $12, -4, -7, 12$

CHAPTER
10 **Cumulative Test**
Form B, continued

34. Bart had \$377 in his savings account. He attempted to withdraw \$390 from an ATM machine. How much money would he need to deposit in his savings account to cover his withdrawal?

- F -\$13 H \$767
 G \$13 J \$780

35. Solve $d + 3.5 = 9.8$.

- A $d = 2.8$ C $d = 13.3$
 B $d = 6.3$ D $d = 34.3$

36. Simplify $48 \div 4 + 6 \times 7 - 5$.

- F 5 H 49
 G 20 J 121

37. Tony is 185 cm tall. He is 12 cm taller than Catherine. How tall is Catherine?

- A 197 cm C 150 cm
 B 173 cm D 15 cm

38. What is the value of 3^4 ?

- F 9 H 27
 G 12 J 81

39. Which value is a solution of the equation $4y = 124$?

- A 6 C 31
 B 20 D 496

Use the rate schedule for questions 40 and 41.

Electric Rate Schedule	
First 2,000 kWh	\$0.053 per kWh
Over 2,000 kWh	\$0.04 per kWh

40. To the nearest penny, what is the charge for using 1,195 kWh of electricity?

- F \$63.34 H \$47.80
 G \$60.80 J \$35.10

41. Delsin runs a small used bookstore. Last month his store used 8,000 kWh of electricity. What was his bill?

- A \$375 C \$320
 B \$346 D \$240

42. What is seventy thousand three hundred five and twelve hundredths in numerals?

- F 7,030,512 H 70,305.012
 G 70,315 J 70,305.12

43. How many liters are equal to 8,000 kL?

- A 8 C 800,000
 B 800 D 8,000,000

44. Which number is prime?

- F 27 H 51
 G 47 J 81

Name _____

Perimeter, Area, and Volume Assessment

1	A	B	C	D
2	F	G	H	J
3	A	B	C	D
4	F	G	H	J
5	A	B	C	D
6	F	G	H	J
7	A	B	C	D
8	F	G	H	J
9	A	B	C	D
10	F	G	H	J
11	A	B	C	D
12	F	G	H	J
13	A	B	C	D
14	F	G	H	J
15	A	B	C	D
16	F	G	H	J
17	A	B	C	D
18	F	G	H	J
19	A	B	C	D
20	F	G	H	J
21	A	B	C	D
22	F	G	H	J
23	A	B	C	D

24	F	G	H	J
25	A	B	C	D
26	F	G	H	J
27	A	B	C	D
28	F	G	H	J
29	A	B	C	D
30	F	G	H	J
31	A	B	C	D
32	F	G	H	J
33	A	B	C	D
34	F	G	H	J
35	A	B	C	D
36	F	G	H	J
37	A	B	C	D
38	F	G	H	J
39	A	B	C	D
40	F	G	H	J
41	A	B	C	D
42	F	G	H	J
43	A	B	C	D
44	F	G	H	J

Name _____

Perimeter, Area, and Volume Assessment

1	A	B	C	D
2	F	G	H	J
3	A	B	C	D
4	F	G	H	J
5	A	B	C	D
6	F	G	H	J
7	A	B	C	D
8	F	G	H	J
9	A	B	C	D
10	F	G	H	J
11	A	B	C	D
12	F	G	H	J
13	A	B	C	D
14	F	G	H	J
15	A	B	C	D
16	F	G	H	J
17	A	B	C	D
18	F	G	H	J
19	A	B	C	D
20	F	G	H	J
21	A	B	C	D
22	F	G	H	J
23	A	B	C	D

24	F	G	H	J
25	A	B	C	D
26	F	G	H	J
27	A	B	C	D
28	F	G	H	J
29	A	B	C	D
30	F	G	H	J
31	A	B	C	D
32	F	G	H	J
33	A	B	C	D
34	F	G	H	J
35	A	B	C	D
36	F	G	H	J
37	A	B	C	D
38	F	G	H	J
39	A	B	C	D
40	F	G	H	J
41	A	B	C	D
42	F	G	H	J
43	A	B	C	D
44	F	G	H	J

Perimeter, Area, and Volume Assessment

1	A		C	D
2		G	H	J
3	A	B		D
4	F	G	H	
5	A		C	D
6	F	G	H	
7	A	B		D
8	F		H	J
9	A		C	D
10	F	G		J
11	A	B		D
12	F	G		J
13	A		C	D
14		G	H	J
15	A	B	C	
16	F	G		J
17	A	B		D
18	F		H	J
19	A	B		D
20	F	G	H	
21	A		C	D
22	F		H	J
23	A		C	D

24	F		H	J
25		B	C	D
26	F		H	J
27	A		C	D
28		G	H	J
29	A	B	C	
30	F		H	J
31	A	B		D
32		G	H	J
33		B	C	D
34	F		H	J
35	A		C	D
36	F	G		J
37	A		C	D
38	F	G	H	
39	A	B		D
40		G	H	J
41	A		C	D
42	F	G	H	
43	A	B	C	
44	F		H	J

Chapter 10 Assessment

8	100%
7	88%
6	75%
5	63%
4	50%
3	38%
2	25%
1	13%
0	0%