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LESSON PLAN 1: SOLIDS

OBJECTIVES: For all four levels.

1. Describe, model, draw and classify geometric solids.
2. Discuss surfaces, edges and corners.
3. Relate geometric solids to the real world.
4. Use isometric dot paper to reproduce and enlarge plane and solid figures.

NOTE: Read the Math History below to the class. Students may research and write a brief report on these events for extra credit. Also, be sure each student has a Math Notebook. This can be a purchased three-prong pocket folder, or have students make one for a math art project. Directions for making a folder from a brown grocery bag can be found in *Math Phonics™—Multiplication*, page 7. Keep flash cards, worksheets, clue words, definitions, math spelling words and wall charts here.

MATH HISTORY: *Geometry* literally means "earth measure." The Egyptians gave us many of the early developments in geometry. They did measure the Earth after the annual flooding of the Nile to find land boundaries destroyed by the floods. Although they had only primitive tools, they built the pyramids with great precision. The Greeks reached some of the same conclusions as the Egyptians, but they were more interested in proving why something worked than in using it in the real world.

LEVEL 1: Use for third grade or as needed.

1. Introduce six solids.
2. Discuss flat and curved surfaces.

CLASSROOM PRESENTATION: Solids have thickness—plane figures do not. Bring models of the six solids to the classroom. Show flat and curved surfaces.

sphere: tennis ball, etc., one curved surface
hemisphere: orange cut in half, globe (Point out each hemisphere.) one curved, one flat surface
cylinder: soup can or mailing tube, two flat, one curved surface
cone: pointed ice cream cone, one flat, one curved surface
cube: alphabet blocks, dice, sugar cubes, storage cube, Rubik's Cube™, six flat surfaces
rectangular solid: shoe box, cereal box, six flat surfaces

A cube is a rectangular solid with all edges the same length.

TAKE-HOME: Two sets of flash cards are on page 12. The first six cards are for this lesson. The others are for Lesson 2. Place in a zip-type bag in the math folder to study at home or school. Have a class aid or volunteer check students verbally. Give points to students who can name all the solids correctly. Worksheet A, page 17.

WALL CHART: Enlarge, color and laminate one uncut set of Level 1 flash cards. Use it as a wall chart.

OPTIONAL: Math Spelling Test
Spelling words: sphere, hemisphere, cylinder, cone, cube, rectangular solid

PYRAMIDS & PRISMS
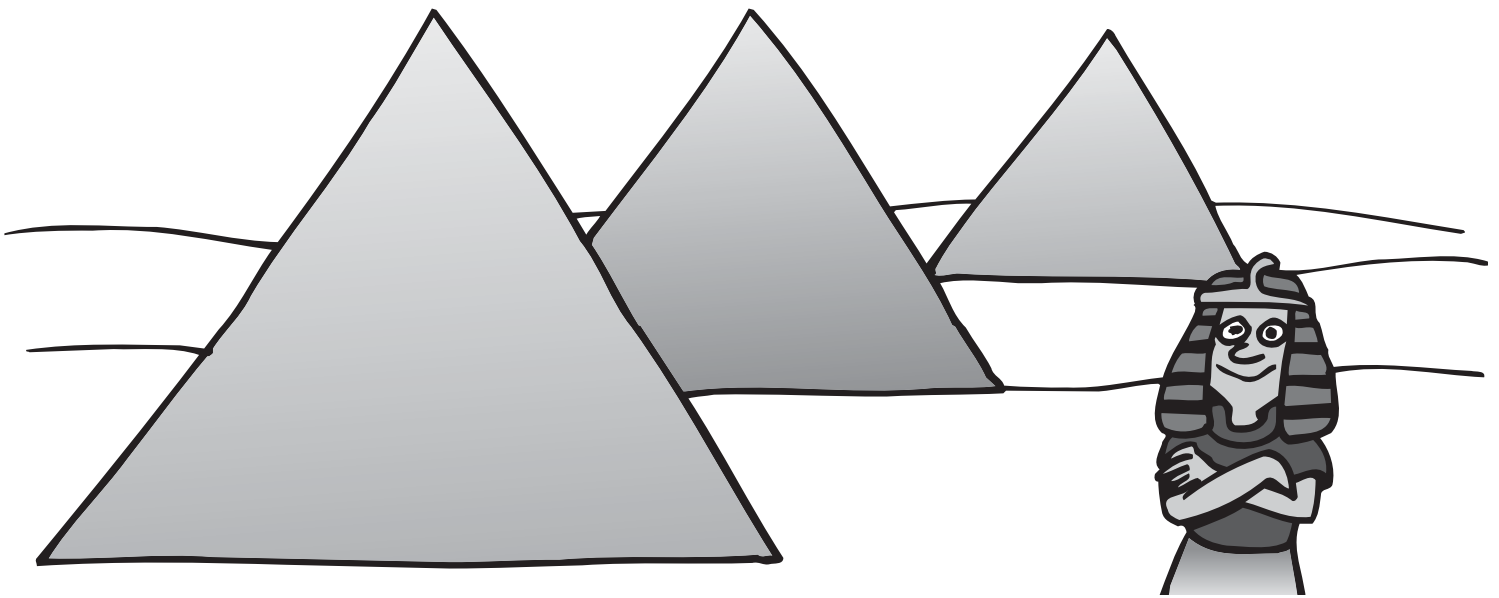
These three pyramids are located near Gizeh, Egypt.
The true pyramid exists only in Egypt, although other cultures had similar structures.
The largest of these three is called the Great Pyramid of Cheops* and is one of the
Seven Wonders of the World. It is the largest pyramid ever built.
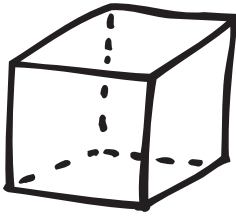
*(2680 B.C.)

pyramid: solid shape with polygon base and triangular sides which meet at one point.
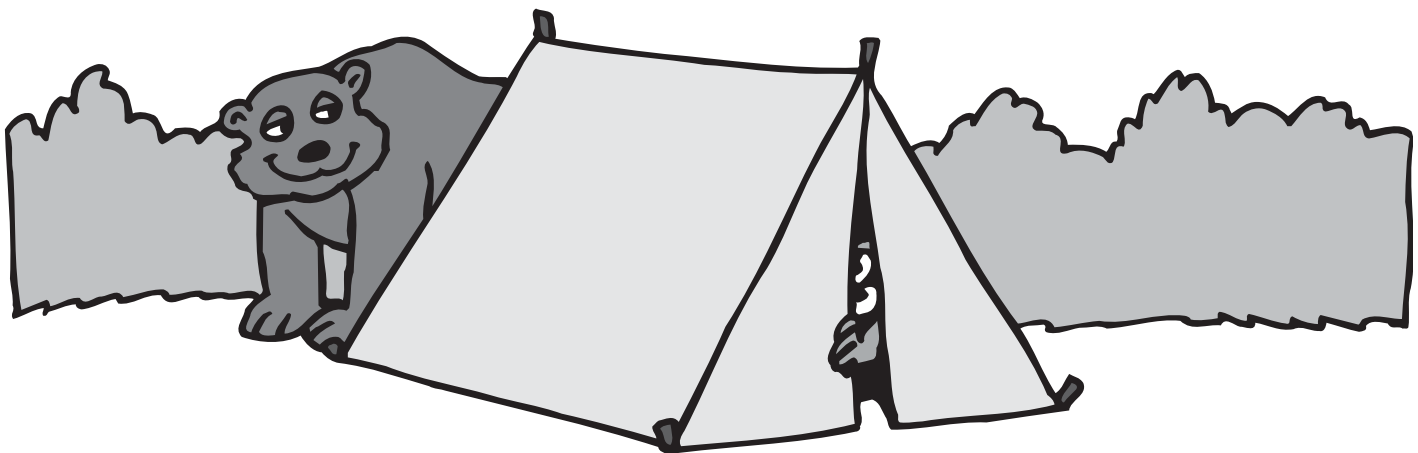
Some tents are triangular prisms. They have two triangular faces, but they do not meet at one point. (Refer to triangular prism on page 14.)

prism: solid shape with polygon top and base and rectangular sides.

Name _____

LEVEL 1, SOLIDS
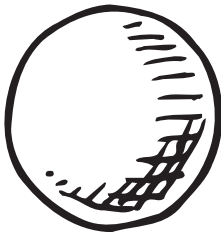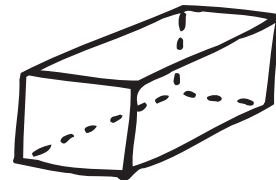

cube

cylinder

cone

sphere

hemisphere

rectangular solid

Name each solid.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. Give the number of surfaces.

FIGURE	sphere	cube	cylinder	cone	hemisphere	rectangular solid
curved						
flat						

11. On the back, list all the objects you can find or think of that have the shape of one of these six solids. Look around your home, at city buildings, in magazines and in books.

CHALLENGE:

Battle Creek, Michigan, produces more breakfast cereal than any other American city. Which of the six solids named on this page describes a cereal box?

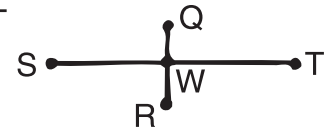# LEVEL 1, POINTS & SEGMENTS

1. Circle the line segments.

X
Y
M N
Q
R
T U
C D

2. What are the two names for this segment? A—B

_____ _____   Name the endpoints. _____

3. Name the segments that form this triangle. _____

_____ _____

K
M
L

4. Name the point at which these two segments intersect. _____

Q
S   T
W
R

5. How many line segments in each shape?

a. _____   b._____   c._____   d. _____

C
A
B

D   E
G   F

I   J
H   K
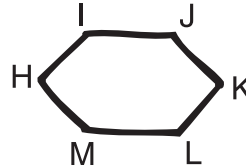M   L

O
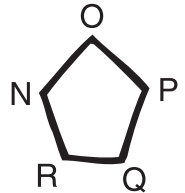N   P
R   Q

REVIEW

6. Name each solid.

a. _____   b._____   c._____   d. _____
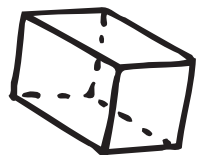
7. Name each plane figure.

a. _____   b._____   c._____   d. _____

MATCHING

8. ____ decagon   a. four sides

____ octagon   b. eight sides
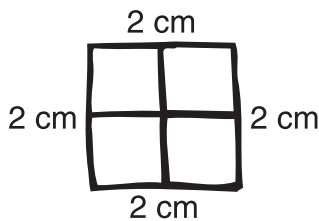
____ quadrilateral   c. 10 sides

CHALLENGE:

The lowest "point" in the Western Hemisphere is located at Death Valley in California, 282 feet below sea level. How many line segments are there in the outline of the map of California?
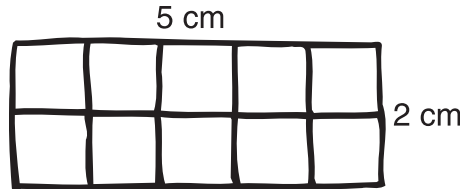
Name _____

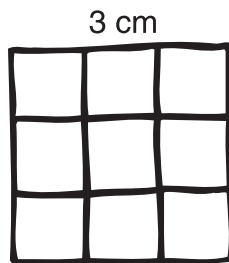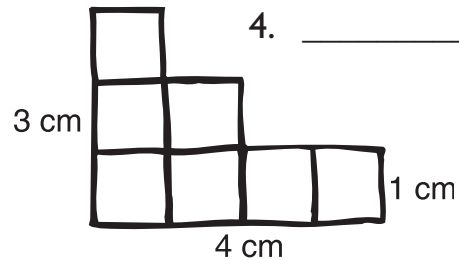# LEVEL 1, PERIMETER

Find the perimeter in centimeters for each.

1. _____

2 cm

2 cm 2 cm

2 cm

2. _____

5 cm

2 cm

3. _____

3 cm

4. _____

3 cm

1 cm

4 cm

Find the perimeter for each.

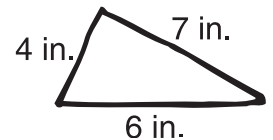5. _____

5 in.
3 in.
4 in.

6. _____

10 ft.
3 ft.
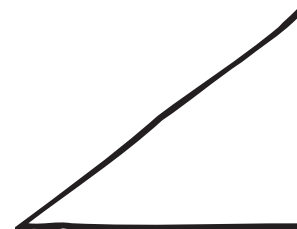
7. _____

4 in. 7 in.
6 in.
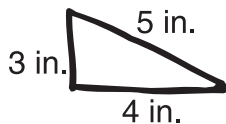
Cut out the centimeter stick on this page. Measure these figures and find the perimeter.

8. _____

9. _____

REVIEW

10. a. 1 m = _____ cm   b. 500 cm = _____ m

11. Name a four-sided plane figure. _____

12. What is the name of the solid shaped like a soup can? _____

CHALLENGE:
The view from Colorado's Pikes Peak inspired Katherine Lee Bates to write "America, the Beautiful." Find the perimeter of the state of Colorado if it is 370 miles wide and 280 miles long.

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