NCLB Math Institute Summer 2011

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School: Cypress Park Elementary

Grade Level: 4

2D or Not 2D?
That is the Question!
3D or Not 3D?
That is the Question!

1. **Teaching Objective(s):** Analyze and describe the similarities and differences between and among two and three-dimensional geometric shapes, figures, and models using mathematical language.

2. **Instructional Activities:**

- Tell the students they will be learning about two-dimensional and three-dimensional shapes. Help students to understand that shapes are everywhere.

- Check students' prior knowledge to see if they know something about 2D and 3D shapes. (What are shapes called that are flat and have length and width? What are shapes called that have a thickness and have length, width, and height? Is a cube a 2D shape or a 3D shape? Why? Is a triangle a 2D shape or a 3D shape? Why?)

- The teacher will introduce the vocabulary for the lesson. Pass out **attachment #1** and discuss the vocabulary. (Display vocabulary on the overhead).

- The teacher will call the students' attention to objects in a bag. Have each student to pull an object from the bag. Tell the students to think about the vocabulary words discussed. The students will identify the object by stating whether it's two-

dimensional or three-dimensional. The students will justify their responses by describing the object. (real-world connections)

- The students will be placed in groups of 3 or 4.   Give each group a bag of solids (plastic or wooden manipulatives-cube, cone, cylinder, rectangular prism, sphere, and square pyramid) Discuss faces, vertices, and edges. Ask the students the following question: How are these three-dimensional (3D) shapes? Discuss.

- Give the students a sheet of typing paper. The students will use the 3D shapes to trace 4 different 2D shapes. Ask the students the following question: How are these two-dimensional (2D) shapes? Discuss.

- The students will complete two charts. **Attachment #2**, Write everything you know about each 2D shape**. Attachment #3**, Write everything you know about each 3D shape. The students will use the information from the charts to tell the similarities and differences between 2 shapes of their choice. The students will record this information on an activity sheet, **attachment #4.** Have students to share.   Display the students' work in the classroom.

3. **Materials and Resources:**

- overhead
- attachment # 1- vocabulary (1 per student and teacher transparency)
- real- world objects in a bag
- manipulatives (plastic or wooden solids-cube, cone, cylinder, rectangular prism, sphere, and square pyramid)
- typing paper
- attachment # 2-(chart for 2D shapes, 1 per student or per group)

- attachment # 3-(chart for 3D shapes, 1 per student or per group)
- attachment # 4-activity sheet to record similarities and differences
- Daily journals (fold typing paper in half to use for journal for this activity)
- attachment #5- Rubric for grading journal
- Navigating through Geometry in Grades 3-5, p. 26 and 27, NCTM, 2001
- Mathematics Dictionary and Handbook, Nichols Schwartz Publishing, 1999
- MathThematics, McDougal Littell, Houghton Mifflin Company, 2005

4. **Assessment:**

The students will write in their journals what they learned about 2D and 3D shapes. The teacher will evaluate each journal by giving points for correct information about 2D and 3D shapes. (**See attachment #5, Rubric for grading journal)**

Attachment # 1   Vocabulary

1. <u>two-dimensional</u> (2D) - a plane figure; A plane is a flat surface that extends infinitely (endless) in all directions. It has length and width. It has no thickness.
2. <u>three-dimensional</u> (3D) – a figure that is called a solid (space within is filled); It has length, width, and height. It has a thickness. It pops out. It can stand up.
3. <u>face</u>- a flat side of a solid figure
4. <u>edge</u>- a line segment or line that is formed when two faces intersect (to cross)
5. <u>vertex</u>- the point where two or more edges intersect (corner)
6. <u>side</u>- line segments on plane figures
7. <u>angle</u>-two line segments that have the same endpoint called a vertex
8. <u>hollow</u>- empty inside
9. <u>base</u>- a bottom side or face of a geometric figure
     *****Solids: cube, cone, cylinder, rectangular prism, sphere, square pyramid

Attachment # 2

Name_____Date_____

Write everything you know about each 2D shape.

circle	square
triangle	rectangle

Attachment #3

Name_____Date_____

Write everything you know about each 3D shape.

cube	cylinder	cone
sphere	rectangular prism	square pyramid

Attachment #4

Two- and Three- Dimensional Shapes

Name_____Date_____

The 2 shapes I chose were a _____and a

_____.

List all the ways these two shapes are alike.

List all the ways these two shapes are different.

Attachment #5

Rubric for grading journal

0   No response

1   Effort (attempted to explain- nothing correct)

2   1 to 2 facts about 2D shapes or 3D shapes

3   2 facts about 2D shapes and 2 facts about 3D shapes

4   3 or more facts about both 2D and 3D shapes

5   3 or more facts about both 2D and 3D shapes with examples

      for each (excellent explanation)