Algebra / Geometry Summer 2006

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School: Grenada Middle School   Grenada, MS
Grade level: 6
Three-Dimensional Figures

1. Teaching Objective: 2. d
The student will explore relationships of three - dimensional figures including vertices, faces, and edges using manipulatives.

2. Instructional Activities:

The teacher will write the terms vertex, face, and edges on the board. The students will copy the terms. Allow time to copy. Ask the students if they understand these words. If they have a problem allow time to discuss the problem with the students.

Vertex - the point where the edges of a three - dimensional figure intersect.

Face - the flat surface of a three- dimensional figure.

Edge- the intersection of faces of a three- dimensional figure.

Explain each word. Show the students the tissue box on your desk. Explain that the box is a three- dimensional figure. Point out the flat surfaces on the box. Tell the students that these are the faces of the box. Show the students the edges of the tissue box. Explain to the students that the line segments are formed by two intersecting faces. Point out the vertices (vertex). Explain that the edges intersect at the vertices. Tell the students that vertices is the plural form of the word vertex.

Using various objects (cans, boxes, books, pencils, and wooden geometric solids) around the room have students identify the flat and curved surfaces. Allow the students to respond to their discoveries. Ask the question, "does a pencil have a face." Ask the question, " does a can have a face." Continue to ask questions about the objects that the students are viewing. Ask, " does a cube have faces". How many faces does a cube have? How many edges does a cube have? How many vertices does it have? Ask the question, "how many faces a square pyramid will have" How many edges will a square pyramid have? How many vertices will a square pyramid have?

While using an overhead transparency draw various shapes on the overhead. Have the students identify the shapes. Using different color markers trace the edges and vertices of each figure as students count them. Allow the students to respond to each line or point that is drawn. Show the faces of each figure. Ask the students how they know it is a face.

Explain to the students that now they are ready to create their own three- dimensional

figure. Distribute the Polydrons (Tell the students that the pieces snap together to form a three- dimensional figure.). Explain to the students that the pieces will form a three-dimensional figure. Ask the students if they remember some of the three - dimensional figures that we have studied. Some responses may be cone, rectangular prism, square pyramid, triangular pyramid

Explain to the students that after each figure is completed they will name that figure, telling the number of faces, vertices, and edges. What do the three terms have in common? Do all objects have faces, edges, and vertices? Ask the students to find one object in the room. The student will then describe the object telling the faces, edges, and vertices.

3. Materials and Resources:

Glencoe Mathematics Course 1 Glencoe McGraw – Hill 2004 ed.
Polydrons^{TM} A construction manipulative in which triangles, squares, pentagons, and hexagons snap together. Allows user to construct a very wide range of two-dimensional and three-dimensional geometric and abstract shapes.
can
pencil
box
overhead projector
transparency
wooden geometric solids
books

4. Assessment:

Students will complete the activity using the Polydrons. Teacher will walk around the room observing as the students work.

After the work is completed the students will describe their Polydrons telling the number of faces, edges and vertices.

Attachment 1

Figure	Number of faces	Number of edges	Number of vertices