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Appendix:

Lesson Plan #6: Constructing Nets for Polyhedrons

I. Prerequisite Knowledge and Skills

Students know how to construct polyhedrons from nets. Students know what attributes are necessary for a figure to be a polyhedron. Students have designed their own nets for a predetermined figure (cube, lesson # 4).

II. New Learning

Students will learn what polyhedrons they can make from nets of their own design.

III. Rationale

Students have explored the use of pre-prepared nets to make regular polyhedrons as well as the cutting up of polyhedrons to make nets. This lesson challenges students to design their own polyhedrons based on their knowledge of nets and polyhedrons. Students are able to synthesize their knowledge to see how different figures can be created.

IV. Goals

Students will understand how different polyhedrons can be created from various self-created nets.

a. Performance Objective

The student will design at least three nets for polyhedrons at least two of which must be different than those already explored in previous lessons (#4 & 5).

V. Materials

1. Several sheets of graph paper for each student
2. Scissors for each student
3. Markers for each student
4. Rulers for each student
5. Sets of attribute blocks
6. Overhead projector
7. Overhead attribute blocks
8. Polyhedron or Math Journal

VI. Procedure

a. Opener

1. Using overhead attribute blocks as examples of shapes, ask students which shapes can be used to form polyhedrons (Anything with a curved edge cannot be used). Discuss why certain shapes can be used and others cannot i.e. that by definition only polygons can be used to form polyhedrons.

2. Have a student manipulate pieces on overhead so that a mock net of a cube is created. Ask students if there is any other way the pieces might be arranged to make a cube. Test out two or three more solutions.

b. Development

3. Tell students they are going to have the opportunity to make their own polyhedron nets.
4. Pass out paper, rulers, markers, attribute blocks, and scissors to students.
5. Ask students to create their own polyhedron nets. Designate to students that they must make at least three different nets, and that only one of them can be based on a shape they have already created. Tell students the attribute blocks are to be used as models for figures if they want to use them. This is a great time for students to be creative in their designs. There are a myriad of polyhedrons that can be created with a little imagination.
6. Ask students to create names for their polyhedrons based on the shapes use to create them.

c. Closing

7. After students have put their names on the nets, collect the nets and redistribute one to each student so that each student has a net different than her/his own.
8. Ask students to trace the net in their polyhedron journal. Have students write two or three sentences describing what they predict the figure from this net will look like.
9. Have students construct the polyhedron and then compare in their journal what the actual polyhedron looks like to their prediction of the figure. Students should address among other things the shape of faces, the number of faces, corners, and edges of each figure.

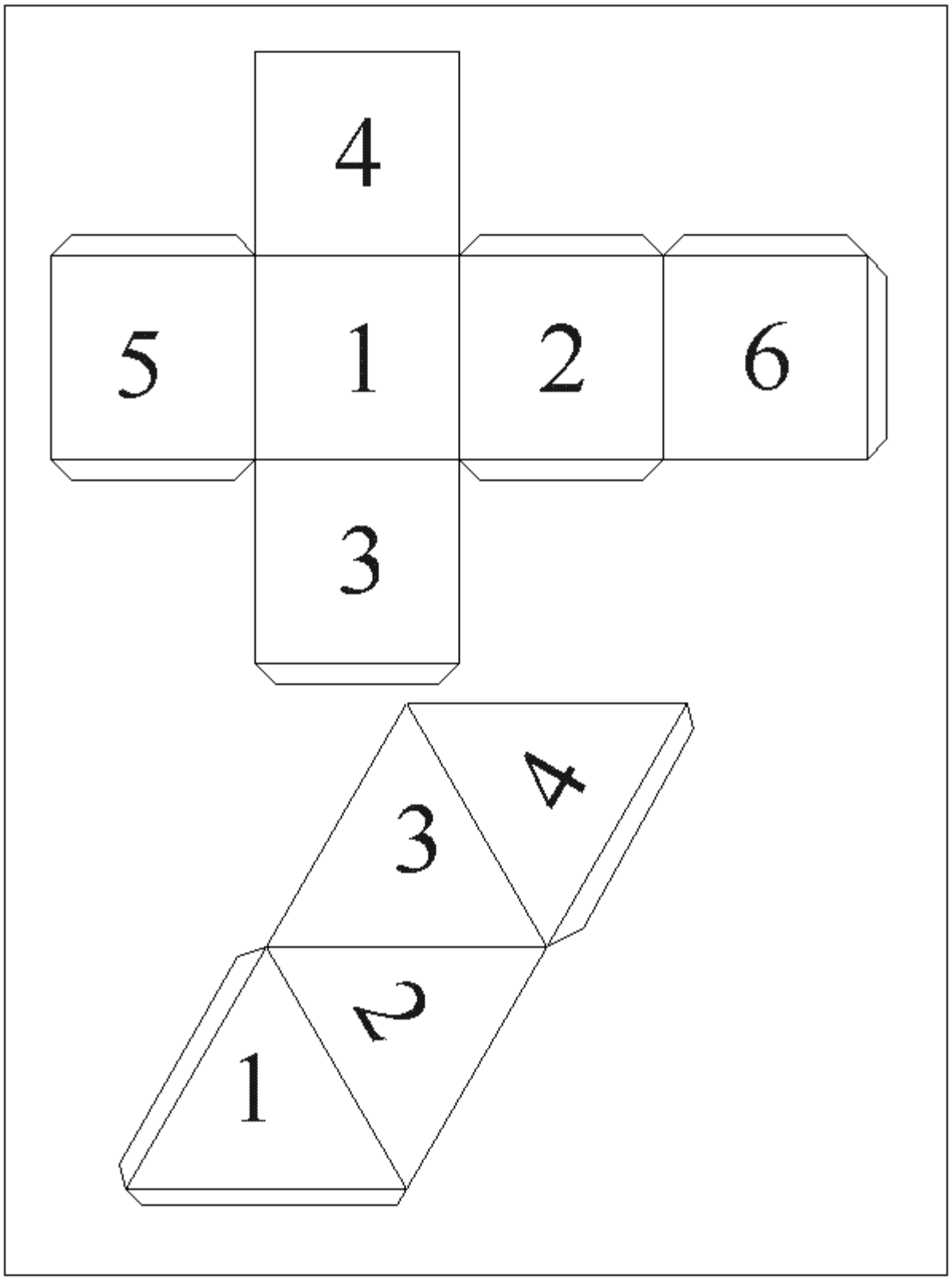
VII. Evaluation

Student nets will be evaluated for their conformity to the assignment in that they do make polyhedrons and are different than those already discussed in previous lessons.

VIII. Extensions

a. Within this lesson:
Student nets will be placed at mathematics center. At various times students, will be asked to explore different nets in their polyhedron journal describing what different figures look like in terms of faces, edges, and corners.

b. Beyond this lesson:
The students will decorate one of their nets. The decorated nets will be placed on a bulletin board with the title "What figures can you make from these patterns?"



Cube and Tetrahedron Nets