

WHERE HAS POLLY GONE?

ITV SERIES

THE EDDIE FILES #103c:
The Invasion of the Polygons

GRADES 4-6

PREVIEWING ACTIVITY

Draw and label the following figures on the chalkboard:

square
triangle
rectangle
hexagon
rhombus
trapezoid
parallelogram

Tell the students that they are to make a picture of an object or several objects using the figures on worksheet #1. They are to cut out the figures, form their object on the construction paper, and glue the figures down. Then they are to write the name of each figure on the figure or beside it.

When they have finished the above task, students may share their work with their classmates.

Note to Teacher: This video deals with a New York boy, Eddie, who has a wonderful teacher who makes learning math exciting. This lesson deals with plane and solid geometric shapes.

FOCUS FOR VIEWING

The focus for viewing is a specific responsibility or task that students are responsible for during or after the viewing to focus and engage students' viewing attention.

Tell the students that they are going to be watching a video where a class learns about different shapes. During the first section they are to find two pieces of information: (1) What does Eddie call the mess in his room? (2) What is a polygon?

VIEWING ACTIVITIES

START THE VIDEO at the beginning of the episode. **PAUSE THE VIDEO** at the picture of Miss Tolliver's classroom where Eddie says, "We were studying polygons, . . . you know . . . those closed flat shapes with three or more sides." Ask the students to tell you the answers to the above questions.

As a focus for viewing for the next segment of the video have the students discover the names of some polygons. **RESUME THE VIDEO.**

OVERVIEW

In this lesson students will explore polygons and their uses. They will use polygon shapes to construct various polyhedra. They will learn about careers which use polygons. Students will use observation skills to discover polygon shapes in man-made articles and in nature. In a strong science component, they will use their findings to construct a strong structure using polygon shapes.

LEARNING OBJECTIVES

Students should be able to:

- Name and describe several types of polygons
- Describe the difference between a polygon and a polyhedron
- List several uses of polygons in buildings
- Observe and describe polygon shapes in structures and in nature
- Create a strong structure using polygon shapes

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MATERIALS

Previewing Activity

Per student:

- one copy of Worksheet #1
- one piece of colored construction paper
- scissors
- glue

Build a Polygon

Per class:

- twelve copies of figures on Worksheets #'s 2, 3, 4, and 5 (cut out of heavy paper)

Per group:

- transparent tape

Polygons in the Classroom

Per student:

- journal

Polygons in Nature

Per student:

- journal

Per class:

- one microscope
- samples of sugar, salt, and sand

Build for Strength

Per group:

- twenty drinking straws
- transparent tape

VIEWING ACTIVITIES (continued)

PAUSE THE VIDEO when Miss Tolliver holds up a three dimensional figure and says, “What name do I give to this structure?” Ask the students what polygons were mentioned in the previous segment.

Also ask the student if any of them can predict the name of the structure that Miss Tolliver was holding. Have students listen for the name and for the difference between that object and a polygon. **RESUME THE VIDEO.**

PAUSE THE VIDEO with the picture of the classroom when Miss Tolliver puts the polyhedron away and says, “I want you to clear your desks.” Ask students to tell the difference between a polygon and a polyhedron. (The polygon is flat, and the polyhedron has space.) Ask students to watch what the students do to build polyhedra. **RESUME THE VIDEO.**

PAUSE THE VIDEO when Eddie says, “Everywhere I looked, all I saw was polygons.”

Build a Polygon

Tell the students that they will be building a polyhedron like the students did in Miss Tolliver’s class. Supply the class with the cutouts from Worksheets #'s 2, 3, 4, and 5. Have them work in groups to build a polyhedron. Set a time limit such as twenty minutes to complete the construction. Have groups describe the polygons which make up their polyhedrons.

As a focus for viewing for the next video segment, have the students find out what assignment Miss Tolliver gives to the students in her class. **RESUME THE VIDEO.**

PAUSE THE VIDEO when Miss Tolliver says, “Let’s get out our journals.” Have students follow Miss Tolliver’s instructions. In the next segment students should make a list of some of the polygons which Eddie discovers and list some careers which make use of polygons or polyhedra. **RESUME THE VIDEO.**

PAUSE THE VIDEO where Eddie says, “. . . the invasion of the polygons.” Discuss the polygons Eddie discovered and the careers which use these geometric shapes. (builder, architect, structural engineer, inventor) Ask students to watch the next segment to see what happens with polygons in Eddie’s

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VIEWING ACTIVITIES (continued)

imagination. **RESUME THE VIDEO.**

PAUSE THE VIDEO where Miss Tolliver says, "Eddie, I don't know what you're dreaming about, but would you like to tell us about the polygons you found?" Discuss the polygons in Eddie's imagination. **RESUME THE VIDEO.**

STOP THE VIDEO at the end of the episode.

POST VIEWING ACTIVITIES

Polygons in the Classroom

Have students use their journal to describe polygon or polyhedra shapes which they find in the classroom. Describe the shapes and their uses.

Polygons in Nature

Have students use their journal to describe any polygon or polyhedra shapes which they find in the natural world. This is more difficult than man-made objects, but some items can be found which resemble a polygon shape. An example is a leaf of a cottonwood or poplar tree.

Set up the microscope and allow students to view the crystals in salt, sugar, and sand to see if they can describe the geometric shape.

Build for Strength

Divide the students into cooperative groups. Give each group twenty straws and a roll of transparent tape. They are to become structural engineers. Using the materials they have been given, they are to construct a structure which is strong enough to hold up an encyclopedia volume.

Have a contest between the groups to see which one built the strongest structure. Discuss the shapes which provide the most strength.

VIDEO AVAILABLE FROM

ITV Overnight Block Feed. Consult your local PBS station for broadcast schedule.

Lesson Plan Created by Master Teacher Sandra Calkins,
Richfield Elementary School, Richfield, Idaho

EXTENSIONS

Language Arts: Research careers which use geometry. Find out the educational requirements to become a member of each profession. Write reports on the profession and add them to an ongoing class book on careers.

Music: Write a polygon song. Perform it for another class.

Art: Study cubist pictures by Picasso or Dali. Create your own picture using polygon shapes.

Technology: Investigate the following math sites on the Internet:

<http://forum.swarthmore.edu/dr.math/dr-math.html>

<http://www.aplusmath.com/>

ACTION PLAN

Take a walk around the town or the neighborhood to discover polygons the way Eddie did in the video.

Take digital photographs of polygons in buildings. Or, take regular photographs and scan them into a computer. Have the students choose a photograph and write an explanation of the geometric shapes. Post these on a classroom bulletin board.

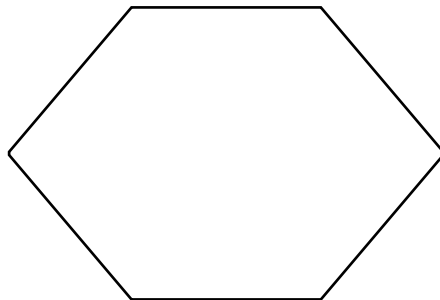
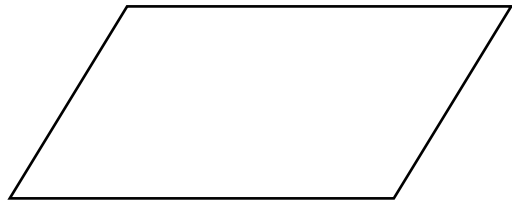
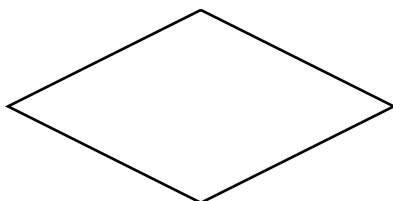
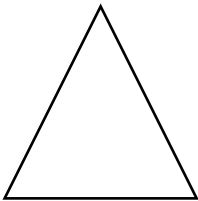
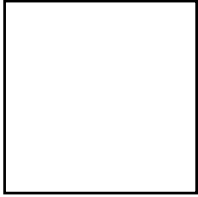
Invite any or all of the following speakers to talk to the class about their professions: architect, builder, inventor.

Visit the site of a building in progress.



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Worksheet #1

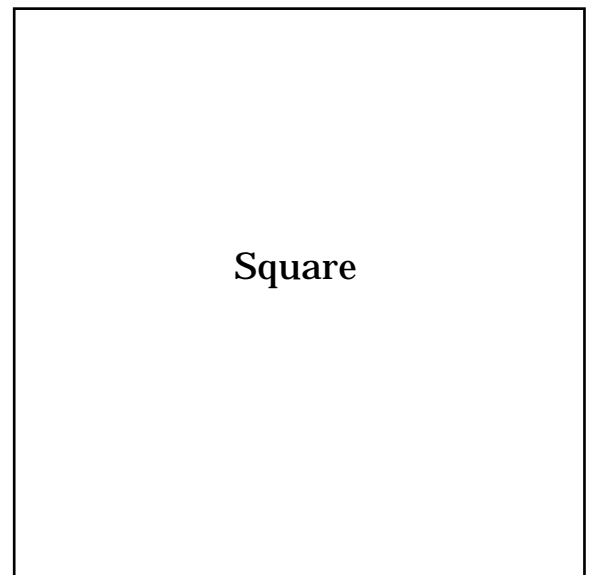
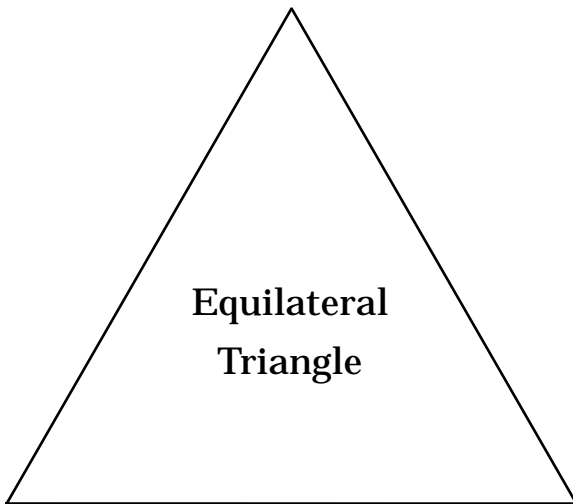
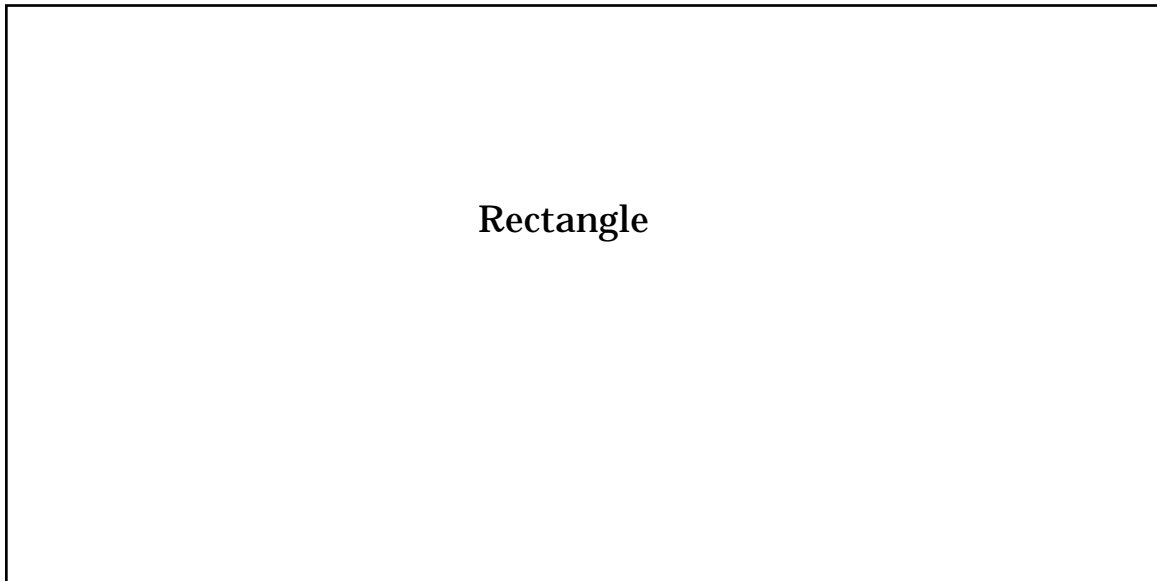


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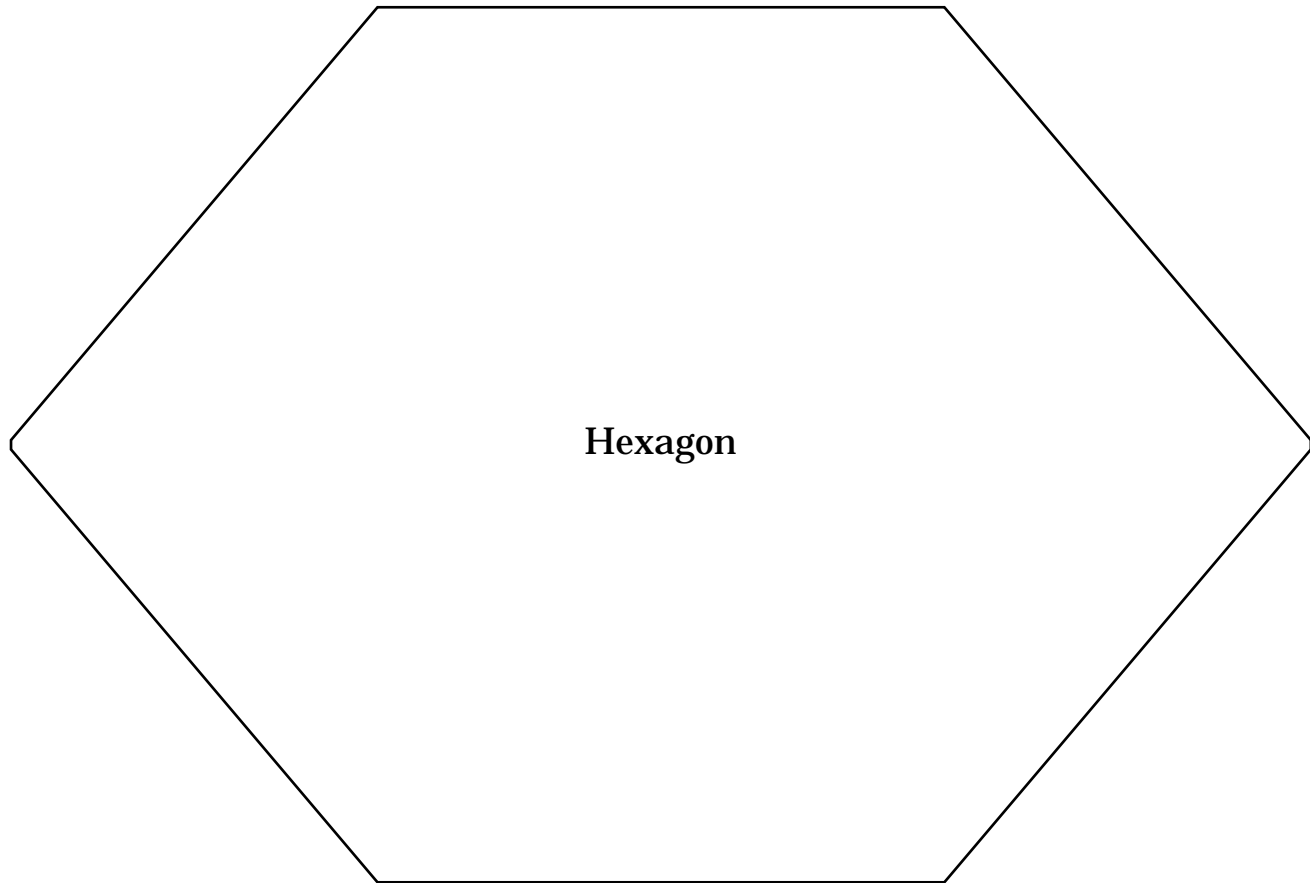
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Worksheet #2



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Worksheet #3

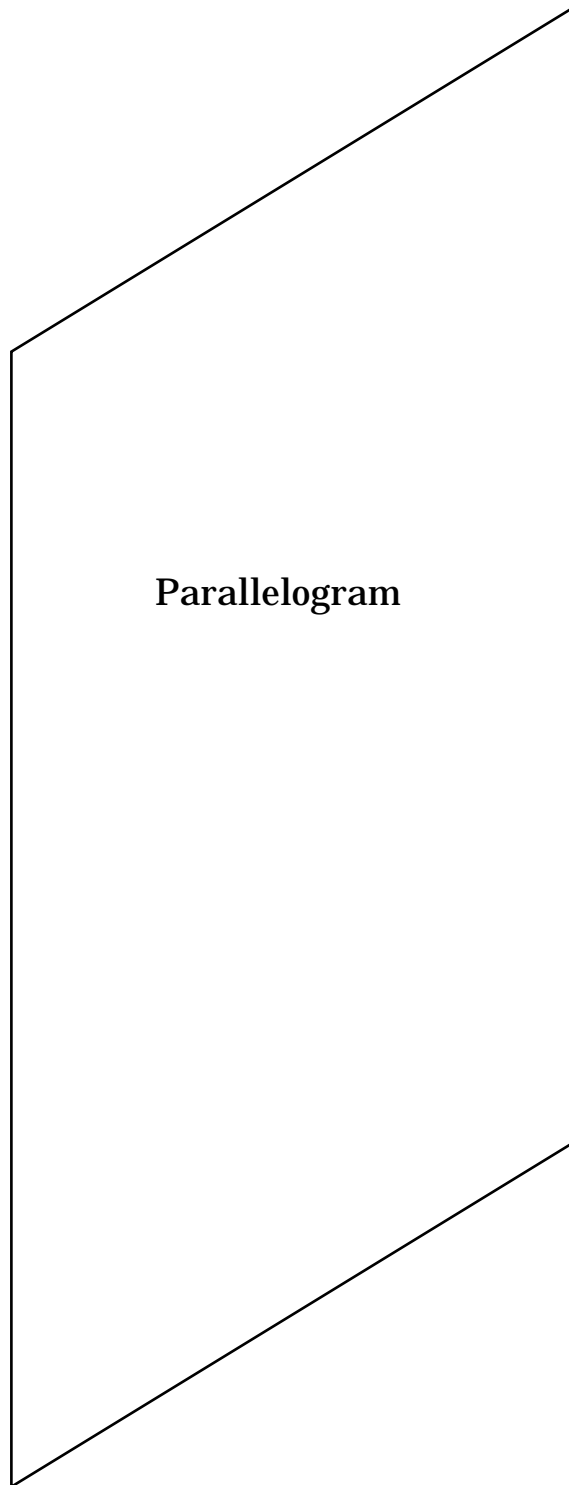


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Worksheet #4



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Worksheet #5

