GEOMETRY

GRADE 3

Ministry of Education
Mathematics Curriculum 1999

OBJECTIVE	ACTIVITY	ASSESSMENT
1. Classify common shapes (plane and solid) and explain their properties in simple terms (sphere, cylinder, cone, cuboid, cube, pyramid).	a. Place students in small groups. Give each group a bag with cut out shapes. Ask students to sort the shapes. Write at least three reasons why they sorted the shapes the way they did. NB. The shapes should be big, small, thick, thin, different colours. b. *See* "Properties of Solids" in the ***appendix G-1.*** c. Make clay models of solids. Use the models to record the number of sides and corners of each shape. What do you notice about the number of sides and corners of each shape? d. Students look for and record different shapes in the classroom. Which shapes are most common in the room? e. Place students into small groups. Give each group a geoboard and rubber bands. Have each group create a shape on the geoboard. Teacher should develop a rule to classify the shapes (e.g. 4 sided figures) then select and display student geoboards in 2 groups - those that fit the rule and those that don't. Have students figure out what is the same about those which share the rule without knowing the rule. f. Take students outside and look for shapes in the environment. Write in their journals about their findings. g. Use tangrams to have the students reproduce given figures such as a square using all pieces, or an animal shape, etc.	a. Make a worksheet for students to write the names for the given shapes. b. Have students select a real life object that is made up of geometric shapes. Let them name the shapes that can be seen in the object. Encourage students to make a drawing to illustrate each object that is described.

OBJECTIVE	ACTIVITY	ASSESSMENT
2. Identify and draw points, lines and line segments using rulers and straight edges.	a. Ask students to name places where they can see lines in the classroom. Describe a line (it is straight and can go on forever). b. Use the geoboard to show a line. Explain what was done.	a. Make a worksheet with pictures for students to identify a line; points, line segments
3. Identify lines of symmetry in familiar shapes.	a. Take a symmetry walk through the school yard in pairs. Let each pair find 1 example of something with 1 (or 2) lines of symmetry but not tell any other pair what they found. Come back to the classroom and have each pair draw their symmetrical object. Guess where each other group found their symmetry from the drawings. b. Explore flags of Caribbean (or world) nations to see which have lines of symmetry. c. Create your own school flag that has 1 (or 2) lines of symmetry. d. Find letters of the alphabet that are symmetrical. e. Find words that are symmetrical.	
4. Explore "slides," "flips" and "turns".	a. Give each small group of students small squares (1"). Each group must see in how many unique ways they can arrange 4 squares. Squares must be connected by common side(s). Explore the results and determine that some arrangements are the same (i.e. not all unique) – only transformed through motions of slides, flips and turns. Repeat with 5 squares.	

GEOMETRY AND SPATIAL SENSE

Evidence suggests that the development of geometric ideas progresses through a hierarchy of levels. Students first learn to recognize whole shapes and then to analyze the relevant properties of a shape. (NCTM 1989a, p. 48)

Many primary geometry activities provide an ideal way for your children to develop spatial perception. They also give teachers an excellent opportunity to observe and assess children's spatial abilities.

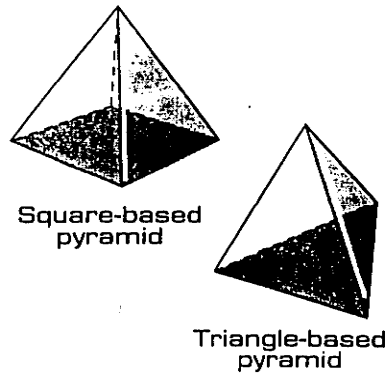
Using manipulative materials to develop geometric concepts and spatial sense remains important at third grade. Exploring materials in a number of different contexts helps children generalize. In addition, using nonexamples as well as examples ("These are triangles; these are not triangles.") helps children identify the commonalities necessary for accurate generalizations.

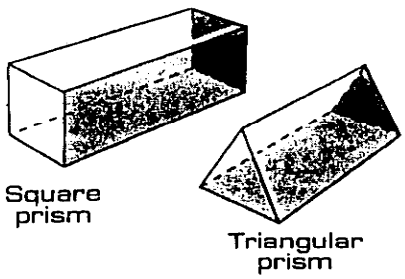
Children of this age are extending their understanding of cause and effect and their ability to make conjectures. They want to know "Why...?" This curiosity can be used to explore geometric ideas further.

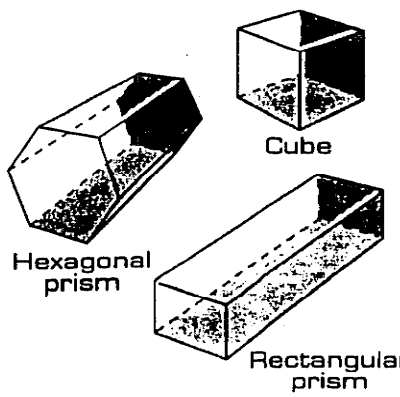
What if there were no squares in the world? What things would have to change?

What if there were no triangles? (Consider the use of the triangle in the construction industry to make rigid structures.)

Why are most packages on the supermarket shelves shaped like rectangular prisms?







PROPERTIES OF SOLIDS

Get ready. The purpose of this activity is to have children explore the properties of particular solids by investigating the faces, the edges, and the corners of the solids.

Students should have had considerable experiences with solids in previous grades. In this activity, they are asked to focus their attention on the *faces* of a solid. They draw, describe, and relate a set of faces to the associated solid.

Materials needed are solids such as cubes, triangular, square, rectangular, and hexagonal prisms, and square-based, hexagonal-based, and triangular-based pyramids, as well as a collection of boxes used for packaging. Children might gather these from the home or the classroom.

Get going. Show the class two solids, for example, a square prism and a triangular prism.

How are these two solids the same?

[Typical answers: They are both wood or plastic; they are the same or different colors; both have corners or flat faces; and so on.]

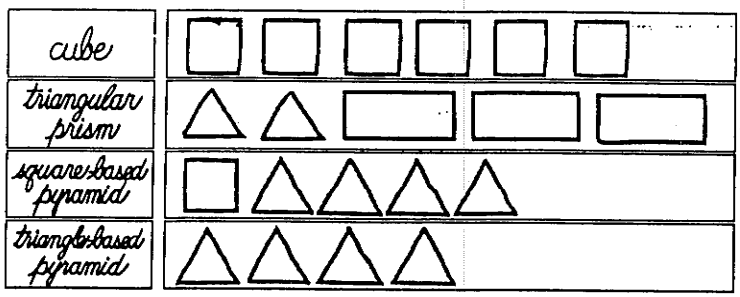
How are these two solids different?

[Typical answers: One has a square face, the other has a triangle face; one has 6 corners, the other has 8 corners; they are different colors.]

Repeat these questions for two other solids, for example, a square-based pyramid and a triangle-based pyramid.

Give each child or group of children a copy of the following chart and a set of solids that includes a cube, a triangular prism, a rectangular prism, a square-based pyramid, a triangle-based pyramid, and a hexago-

nal prism. Ask each child to trace around all the faces of each solid and record the results on the chart as shown in the following example. (If you wish, add another column showing a picture of each solid. Then modify the following activities to include this column.)



Some children will have difficulty remembering which faces they have traced and which ones they have not traced. Help them by suggesting that they mark each face with chalk or tape as they trace it.

Have the children show and discuss their charts. Then cut apart one chart horizontally and vertically, creating rectangular strips containing *either* the name or the faces of a solid. Choose one set of faces and ask,

Which solid has these faces?

Ask the children to verify their answers by selecting the appropriate solid and placing it, one face at a time, on the strip. Have them find the matching name of the solid.

An alternative activity is to trace the faces of each solid on a transparency. Display the faces on the overhead projector, and ask the children to identify the solid. They then come to the projector with the solid they selected and place it on each face in turn.

Keep going. Have the children cut their charts as described above in order to play a matching game. Several children sit in a circle and in the middle mix the solids, the cut-apart names, and the cut-apart faces. One child chooses one item, such as a solid. The child to the right must find either the matching set of faces or the name and place it with the solid. The next child must find the final matching item and place all three items—solid, faces, and name—together. One child chooses an item for a different solid, and the activity continues. (If the picture of the solid was included on the chart, four items would be matched.)

In learning geometry, children need to investigate, experiment, and explore with everyday objects and other physical materials. (NCTM 1989a, p. 48)