

Mosaics

Summary

This activity will help develop student's knowledge of shapes and their properties.

Group Size

Individual

Materials

For each student:

- [Seven Piece Mosaic Puzzle](#) (pdf)
for each student
- [Parallelogram](#) (pdf)
Envelopes
Paper

Additional Resources

- *Developing Geometric Thinking Through Activities That Begin with Play*
, by Piere M. van Hiele, Teaching Children Mathematics, NCTM, February, 1999, pp. 310-316.

Background for Teachers

"The most important connections for early mathematics development is between the intuitive, informal mathematics that students have learned through their own experiences and the mathematics they are learning in school. All other connections...are supported by the link between the students' informal experiences and more formal mathematics." (*Principals and Standards for School Mathematics*, NCTM, p. 132).

The following activity is taken from *Developing Geometric Thinking Through Activities That Begin with Play*, by Pierre M. van Hiele, Teaching Children Mathematics, NCTM, February, 1999, pp. 310-316.

This activity can enrich the students' store of visual structures. It will help develop a knowledge of shapes and their properties. Throughout this activity the teacher directs students' attention to geometric shapes and terminology, and engages students in problem solving discussions using these terms. Remember, geometry begins with play.

Intended Learning Outcomes

1. Demonstrate a positive learning attitude toward mathematics.
2. Become mathematical problem solvers.
3. Reason mathematically.
4. Communicate mathematically.

Instructional Procedures

Invitation to Learn

Provide each student with a *Seven Piece Mosaic Puzzle*. Begin by asking, "What can we do with these pieces?" As students begin to explore, have them share and talk about what they have built. They may use all the pieces or only a few. "*Children need ample time to explore and share their creations. Such play gives teachers a chance to observe how children use the pieces and to assess informally how they think and talk about pieces.*" (Van Hiele, p. 312)

Instructional Procedures

Ask students to sort geometric shapes from the *Seven Piece Mosaic Puzzle* and discuss how they sorted them.

Have them explore all the possible ways to make the *Parallelogram*.

The students may slide, flip, turn (rotate) their pieces.

What two-piece combinations are possible?

Ask the students which pieces were not used?

Have students choose any two pieces, set the others to one side, and see how many different shapes can be made by joining them at the sides that match. Try pieces five and six.

Ask what pieces can be made from two others? Which ones cannot?

Challenge: Find the one piece that can be made from three others.

Solutions can be recorded by tracing around the larger pieces and then draw how the larger shape was made with the other pieces.

Can students make the Parallelogram with three pieces?

Have students make a short house and trace around it. Can they make the shape with two other pieces? Three pieces? Four pieces? Can they create a tall house with two pieces? Three pieces? (Remember: Touching edges have to be the same length.)

Each student creates his/her own puzzle using two, three, or four pieces; trace around the shape. Can students make this shape with other pieces? Write his/her name and a title for the shape.

Extensions

Family Connections

Have family members try to cover the parallelogram, houses, and new puzzle pieces created by the student with the geometric shapes from the Seven Piece Mosaic Puzzle used in class. They may also create new shapes for the student to try to cover in a variety of ways.

Assessment Plan

Observe students as they create their puzzles. What strategies do they use?

Provide opportunities for students to share their strategies for solving puzzles.

Have students record their findings in a journal.

After students trace the shape they made, have them go back and draw the two or three shapes they used to make the shape.

Authors

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