



Here, There & Everywhere

Math Grows Up (Patterns/Relationships)

Objective

Students will recognize, describe, and create repeating patterns.

Overview of the Lesson

Students use a variety of sensory modalities to gain experiences with identifying, describing and creating repeating patterns. By reading and acting out the book, Brown Bear, Brown Bear What Do You See?, students work with word patterns in literature. They explore musical sounds and rhythms by playing keyboards and water glass xylophones. Using tempera paints and sponge shapes, students create wrapping paper by repeating shape and color patterns. Even the sense of taste is used in pattern explorations as students make fruit shish kabobs that have a definitive repeating pattern. Students are challenged to find patterns in nature as they examine a snake's skin and discuss patterns in other animals.

Materials

Teacher:

- Brown Bear, Brown Bear, What Do You See? (see resources)
- Large masks for main characters in Brown Bear, Brown Bear, What Do You See? (Brown Bear, Red Bird, Yellow Duck, Blue Horse, Green Frog, Black Sheep, Purple Cat, Goldfish, White Dog, Mother)

Each Center:**Reading Center**

- Chart with common word endings or word families - at - it - ack - ick, etc.
- White unlined paper (one piece for each student)
- Pencil for each student

Sponge Painting Center

- A variety of sponge shapes (hearts, stars, circles, dinosaurs, etc.)
- Tempera paints (3-5 colors)
- One large sheet of white unlined paper for each student, approximately 36" x 20"
- One piece of unlined paper for each student, approximately 12" x 5"

Listening Center

- 12 water glasses with various amounts of water (food coloring may be added to color the water)
- Xylophone mallet
- Labels for water glasses
- Keyboards

Math Center

- Bowls of pieces of fruit and marshmallows
- Shish kabob skewer with blunt end for each student

Science Center

- 24-36 plastic eggs of different colors
- 6 ice cube trays
- Charts showing pictures of birds, butterflies, snakes, etc.

Art Center

- Yarn about 18 inches in length for each student
- A variety of beads, pieces of straws, uncooked pasta

Literature Center

- Collection of books with repeating phrases (Polar Bear, Polar Bear, Three Billy Goats Gruff, The Three Little Pigs, The Very Busy Spider)

Procedure

Ask students to describe and give examples of patterns they have seen or heard. Examples could include patterns on clothing, in literature, music, and on the calendar.

To reinforce the concept of patterns in literature, introduce the book Brown Bear, Brown Bear, What Do You See? by Bill Martin, Jr. This book utilizes repeating phrases to capture children's interest. Have the students read the book in unison as you turn the pages. When finished, ask the students to identify patterns that they noticed. (Students should identify the phrases, "What do you see?" and "Looking at Me.") Choose students to act out the story. Large cut-out masks of the main characters can be used to add further excitement to the dramatization.

To give students further practice in identifying and repeating a given pattern, show students a pattern using your hands by clapping three times and then snapping your fingers twice. Challenge students to repeat the pattern. Add more parts to the pattern as they show readiness.

Students will then play the game, What's My Pattern? To play the game, choose students to stand in front of the class and arrange them in a particular pattern such as T-shirt, buttoned shirt; T-shirt, buttoned shirt, etc. Challenge the students to describe the pattern that has been created.

Students will then work at learning centers to further practice identifying and creating repeating patterns. Create a choice board by using pictures and labels to identify all of the possible centers the students may visit. Children are given tags with their names on them. They put their name on a hook by the center that they selected.

Centers:

Reading Center

Students will identify common word endings or families as they write them on paper. Examples could include endings such as -ap, -an, -at, -ack, -ick, etc. Using the -ap ending, they could write tap, map, sap, trap, flap, cap, nap, etc.

Sponge Painting Center

Show the students examples of wrapping paper and ask them to describe the patterns on the paper. Give the students paint and sponge pattern shapes to create a pattern unit (Examples: red heart, yellow star, green circle) on a piece of unlined paper about 12" x 5". Have students use their pattern units as a guide to make repeating patterns on a large white sheet of wrapping paper. Encourage students to describe the patterns that they made.

Listening Center

Create a water xylophone by obtaining 12 water glasses of the same type and size. Label glasses with the letters A, B, and C. Pour the same amount of water in each glass that has the same letter so that the sound will be the same. Students may arrange the glasses in a different order to form a repeating pattern. (A, B, C, A, B, C, or A, A, B, B, C, C, etc.) Students will strike the glasses with a mallet and hear the repeating pattern they made. Use keyboards if available to have students create repeating tunes or patterns.

Math Center

Give each student a wooden shish kabob rod. Make sure the ends of the rods are not sharp. You may need to cut off a sharpened end. Display bowls of fruit pieces and marshmallows and have students create repeating patterns by skewing pieces of fruit on the rod. Make a chart to display examples students could make. For example, one student might create a pattern of cherry, cherry, pineapple, cherry, cherry, pineapple. Have students describe the pattern they made before they eat the fruit.

Science Center

Arrange a row of empty ice cube trays or egg cartons. Have students use colored plastic eggs to make rows of repeating patterns (other objects could be used). Show students pictures of animals that have patterns such as butterflies, birds, snakes, and lizards. Challenge the students to describe patterns they may find on these animals. If you have the opportunity, using live animals is even better!

Art Center

Students may create necklaces that display a repeating pattern using beads, uncooked pasta, and pieces of straw.

Literature Center

Provide students with books that contain word patterns that they can read. Some examples are Polar Bear, Polar Bear, The Very Busy Spider, Three Billy Goats Gruff, The Three Little Pigs, Roundtrip.

After students have been given opportunities to work at centers, have the students summarize what they have learned about patterns.

Mathematically Speaking...

Recognizing patterns is a crucial mathematical skill which provides the foundation that will empower young students to be critical thinkers and good problem solvers. Young children love to explore repeating patterns even if they cannot formally explain and describe the pattern yet. They can clap rhythms and sing songs with repeating choruses. Children should be encouraged to look for patterns in their world whether its the order of the traffic lights on the traffic signal or the patterns on their clothing. Using concrete manipulatives, physical motor activities, and musical rhythms before introducing symbolic representations is especially helpful for young learners. Patterns can easily be integrated across the elementary curriculum through the development of language and math concepts as well as art, music, and movement.

Extensions & Connections

Have students collect items from home that have a repeating pattern. Make a display or bulletin board showing their real-world examples.

Collect rubber stamps and stickers. Using adding machine tape, have students make repeating patterns.

Resources

Crayola Painting Sponges — Shapes (contains 6 painting sponges, found at any craft store), Binney & Smith Inc., Easton, PA, 1993.

Brown Bear, Brown Bear What Do You See?
Bill Martin Jr., Henry Holt & Company (ISBN 08050 02614)
Holt, Rinehart, and Winston, New York, NY, 1983.

Patterns, Addenda Series
National Council of Teachers of Mathematics, 1993.

Ideas for Online Discussion

(Some ideas may apply to more than one standard of the **NCTM Professional Standards for Teaching Mathematics**.)

Standard 1: Worthwhile Mathematical Tasks

- “Teachers should aim for tasks that are likely to engage their students’ interests.” (p. 27). How do you select tasks that capitalize on students’ interests and experiences?

Standard 3: Students’ Role in Discourse

- Sometimes a wide variety of experiences can be potentially confusing to students. How did the teacher try to connect students’ comments to develop understanding of the concept of patterns?

Standard 5: Learning Environment

- This lesson involved stations that were diverse in terms of the expectations and experiences students would encounter as they examined the concept of patterns. Discuss how the physical space was organized to promote student learning.

Standard 6: Analysis of Teaching and Learning

- How did the teacher monitor what students were learning? How would you report the progress of students when using learning centers in your classroom?