

ACTIVITY 13

ROCKET PATTERNS

Objective

Students use paper rockets to practice recognizing, creating, and extending patterns.

Standards

Mathematics, Language Arts

Materials

- Copies of the small rocket drawing page (Figure 7, page 79), copied on different colors of paper; each student will need approximately 12 rockets
- Small closeable plastic bags, 1 per student
- Small plastic containers or bowls
- Pieces of paper
- Long strips of paper or sentence strips, at least 1 per student
- Journal or piece of paper, 1 per student
- Pencils, markers, or crayons
- Glue or glue sticks
- Assorted math manipulatives such as interlocking cubes, plastic links, or counters
- Variety of items from the classroom, appropriate for making patterns

Educator Information

- This activity may need four class periods to complete.
- Reviewing the concept of a pattern requires several days.
- Copy the small rocket drawing page on different colored paper. Be sure there are an adequate number of rockets for students to use in patterns. Each student will need approximately 12 rockets. If colored paper is not available, copy the page on white paper. Have students or adults color the rockets, using a single color, before the activity begins. To make patterns, rockets must be in assorted colors. The educator may have adults or students cut out the rockets before the activity begins.
- Sort the rockets by colors and place in plastic bowls or plastic containers.
- Assemble math manipulatives and items from the classroom appropriate for making patterns.
- Be prepared to review or introduce the concept of a pattern using math manipulatives. Be prepared to discuss sequencing from left to right.



Procedure

First Class Period:

1. Introduce or review the concept of a pattern. Use math counters, plastic links, interlocking cubes or other math manipulatives to demonstrate patterns. Color patterns are often easiest for young students to identify. Have students orally identify the pattern. For example, students say *green, blue, yellow, green, blue, yellow, green, blue, yellow*.
2. Be sure that students understand that there must be a least two repetitions before a pattern can be determined. Create a pattern using one of the suggested materials. Cover everything except the first element in the pattern. Ask students if they can guess what the pattern is. Continue revealing elements until students recognize repetition.
3. Discuss how students know what element comes next in the pattern. Ask how many times the pattern had to repeat. To help students visualize repetitions, the educator may wish to separate the elements in each repetition. Practice using ordinal numbers, *first, second, and third*, to describe the position of the elements.
4. Have students practice making and predicting patterns. Allow students to make a pattern out of math manipulatives. To help pattern recognition, have students orally repeat or draw the pattern. Ask students if they can predict what the next element of the pattern will be. Continue until they have extended the pattern several repetitions. Repeat the activity several times.
5. Allow students to practice this activity in groups of two. Students take turns being the pattern maker or the person to predict and extend the pattern. Have students draw or repeat the pattern orally. Monitor the activity.

Second Class Period:

1. Review the concept of making a pattern using math manipulatives. Allow students to practice making patterns.
2. Discuss the concept of a pattern that does not repeat or is “broken.” Make a pattern with math manipulatives. Be sure that one of the elements is incorrect. Let students look at the pattern.
3. Have students apply what they have learned about patterns. Have them identify the element that is not in the right place. Have students correct the pattern so that it repeats.
4. Depending on the ability of students, allow practice making and correcting “broken patterns” independently in groups of two. Students may use math manipulatives to make the patterns. Monitor the activity.

Third Class Period:

1. Demonstrate a simple pattern made out of math manipulatives. Use three different colors. Ask students to identify the pattern. Ask them to say or draw the pattern. For example, *red, white, blue, red, white, blue, red, white, blue*.
2. Tell students that patterns are created from items with many different attributes, not just color. Create simple patterns out of math manipulatives using different attributes such as size. Ask students to identify the patterns. Ask students to say or draw the patterns. For example, *big, little, big, little, big, little*.
3. Make a pattern using different shapes such as triangles, squares, and circles. To help students recognize the patterns, let them orally repeat or draw the pattern.
4. Show students patterns made with different objects found in the classroom. Make a simple pattern using crayons, chalk, and pencils. Have students say or draw the pattern.



5. Ask students if they can find objects in the room to use to make a pattern. Have them create and share the pattern with the class. Ask the class to say or draw the pattern.
6. Ask students if they can find patterns in the classroom. For example, find a pattern on a poster or on someone's clothes. Ask students to say or draw the pattern.
7. Encourage students to identify a pattern in the classroom that is similar to one that they created.
7. When students are satisfied with their patterns, distribute the strips of paper or sentence strips.
8. Direct students to place the paper above or below the rocket pattern they created.
9. Have students carefully glue their pattern on the paper. Monitor sequencing from left to right. Some students may want to use more than one strip of paper.
10. Display the patterns in the classroom. These strips make excellent borders for bulletin boards.

Fourth Class Period (or at any appropriate time in the lesson cycle):

1. Review pattern concepts. Allow students to practice making patterns.
2. Tell students that they will use paper rockets to make a pattern. Demonstrate how to make a simple pattern using different colored paper rockets. For example, *red rocket, blue rocket, red rocket, blue rocket, red rocket, blue rocket*. Repeat using other colors of rockets. Repeat using more than two elements.
3. Students sit at tables or desks. The educator distributes the rockets, already sorted by color. Students select 12 rockets, 6 of one color, 6 of another color.
4. Request that students create a simple pattern using the rockets. For example, *yellow, orange, yellow, orange, yellow, orange*.
5. Ask students if they can change the pattern by changing the repetition of the elements. For example, *yellow, yellow, orange, yellow, yellow, orange, yellow, yellow, orange*. The complexity of the pattern will depend on the ability of the student.
6. Students can also make their pattern more complex by increasing the number of colors. For example, *green, red, white, green, red, white, green, red, white*. The complexity of the pattern will depend on the ability of the student.

Review

1. Students continue to make and identify patterns.
2. Incorporate the use and identification of patterns into your daily classroom routine and activities.

Assessment

- Evaluate the patterns students create out of paper rockets.

Enrichment

- Encourage students to make their patterns more complex by increasing the number of elements. For independent practice, provide a student with cards numbered 2 to 5 and math manipulatives. Turn the cards face down on the table. Let the student select a card. The numeral on the card will dictate the number of the elements in the pattern. Direct the student to make a pattern with that number of elements out of the math manipulatives. Repeat this activity using cards with number words.



- Challenge students to make a pattern using one color of rocket. Create the pattern by turning the rocket in different directions. For example, students could make a pattern by having the rocket *point up, point down, point up, and point down*.
- Have students look at a pattern created out of colored rockets and count how many of each rocket there is in the pattern. For example, the pattern has *7 green rockets, 7 yellow rockets, and 7 blue rockets*. If the pattern repeats one more time, ask students to figure out the number of each colored rocket.
- Provide students with sidewalk chalk for the playground. Ask them to draw patterns using different colors and shapes on the pavement.
- Students can create different representations of the same pattern. Have students create a pattern out of math manipulatives. The pattern could be *red, blue, yellow, red, blue, yellow, red, blue, and yellow*. Instead of using color words, have students use the letters *A, B, and C* to represent the pattern. Numerals, such as *1, 2, 3*, may also be used. Use movements to represent the pattern. For example, *clapping hands, snapping fingers, and patting the head*, could represent this pattern. Compare and contrast each representation with the others. Have students apply this concept to patterns they create or find in the classroom.
- Have students look carefully at a chart showing numerals to 100. Ask students if they can identify patterns created by the numerals.
- Encourage students to draw a representation of a pattern they create or find in a journal or on a piece of paper. Label the pattern with letters or numerals to create another representation of the pattern.
- Share books with the class that have verbal patterns in them. Help students identify the word patterns that are found in the books. Make a class book using a word pattern. Read books such as *Rockets* by Betsy Buttonwood that help students learn to identify color words. Find additional books that encourage color word recognition. Have students practice identifying color words when describing patterns.



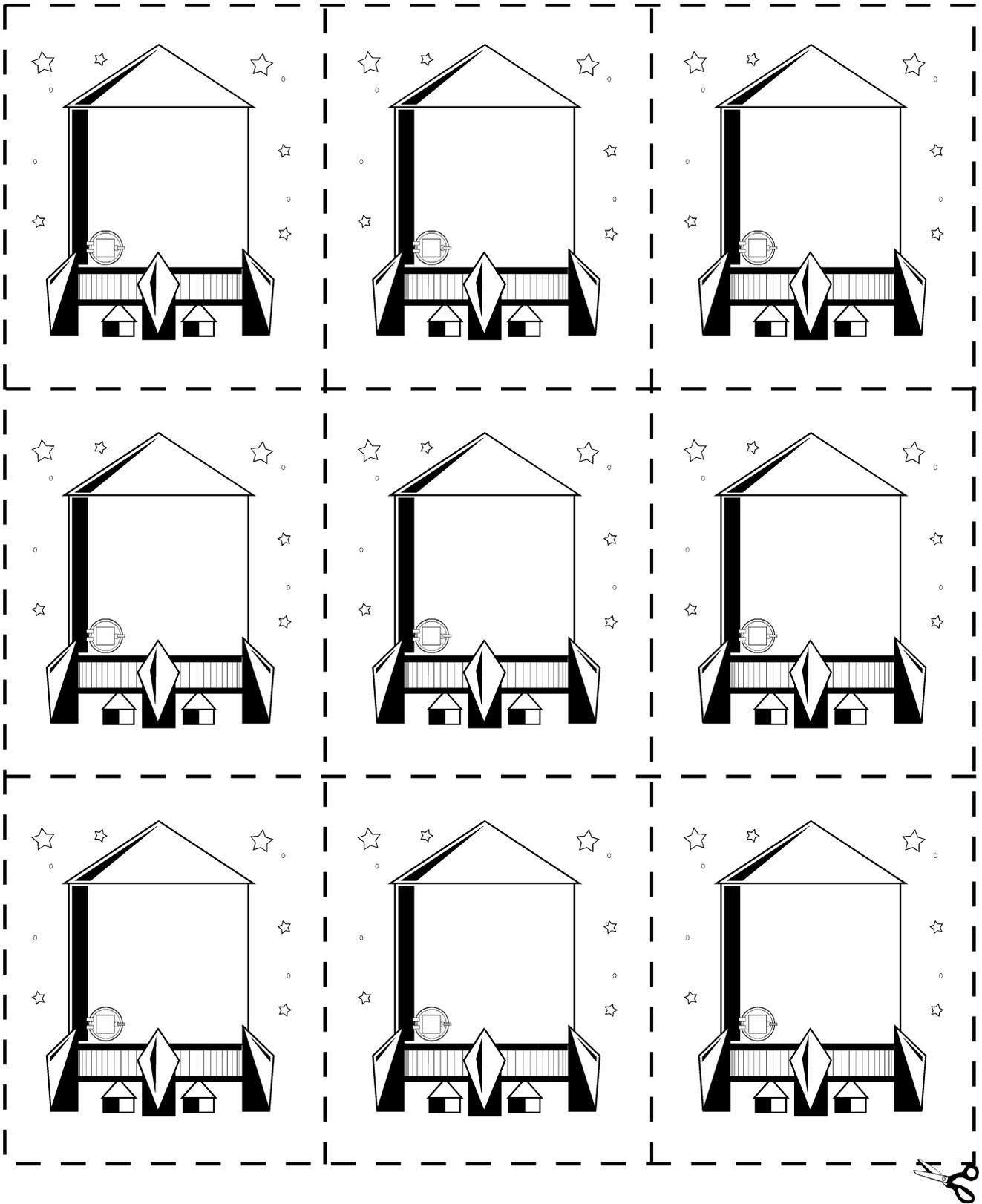


Figure 7. Small Rocket Drawings

