

The learner will recognize and represent patterns and simple mathematical relationships.

5

5.01 Identify, describe, translate, and extend repeating and growing patterns.

Notes and textbook references

A. Ask students to point out patterns in the classroom or find pictures of patterns in magazines (clothing, wallpaper, floor and ceiling tiles, bricks, sidewalks).

B. Ask students to name ways in which things have been sorted. Give child some examples, if necessary, to clarify what you are asking for (clothes in certain drawers, vegetables in the grocery store, books in the library).

C. Ask children to describe how toys might be placed in the store or at home so that they are organized in some way. Have students organize something in the classroom (materials at the art table, the puzzle center, etc.).

D. What might these numbers be: 786-3278 or 843-8524? (*telephone numbers*) What might these numbers be: 5/9/88 or 11/9/88? (*dates*). How do we usually sort them? Are there many ways to sort or only one?

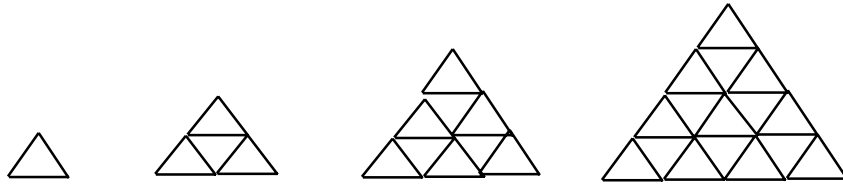
E. Have students identify and record examples of patterns through crayon rubbings. (*Check the bottoms of tennis shoes!*)

F. Have students find examples of patterns in books, songs, and poems. Ask student to find examples of patterns in other content areas (calendar, seasons, etc.). What patterns are in the Hokey Pokey or in Old Mac Donald?

G. Use the squares in the pattern blocks to build growing squares. Start with one square. How many squares will you need to build the next size square? Build at least 5 squares. Discuss the pattern in the number of squares used.

Do the same thing with the triangles.

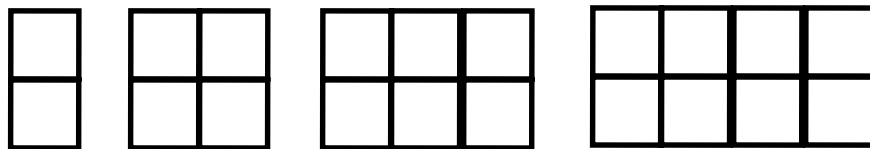
What happens? Record the numerical sequence.



H. Read a book with quilts as its theme, such as Sam Johnson and the Blue Ribbon Quilt by Lisa Campbell Ernst. Study the geometric patterns. Have students design their own quilts with scraps of wallpaper or cloth. Students can also design borders around their stories or papers.

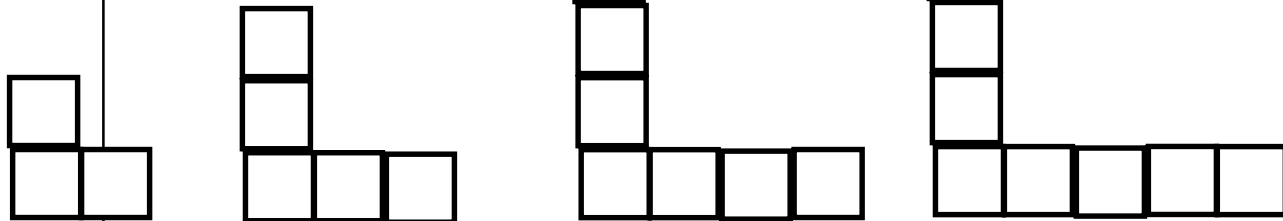
I. Have students bring in quilts from home. Discuss the designs and make-up of the geometric patterns.

J. Study sequences like:



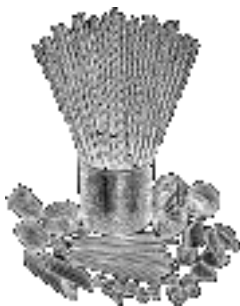
What comes next? How do you know?

K. Use patterns like



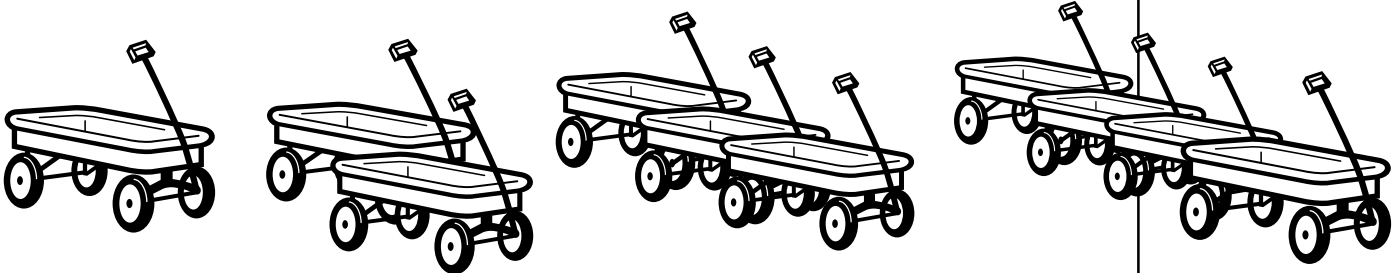
to help students see that patterns can grow in more than one direction.

L. Pasta pieces glued to construction paper make good vehicles for illustrating patterns. Use varieties such as spaghetti, rigatoni, elbows, shells, ziti, penne and bow ties.



M. Use small plastic toys such as dinosaurs or wagons and have children record the pattern of how many legs or wheels they have. For example, with the wagons the pattern would be 4, 8, 12, 16, . . .

Notes and textbook references



N. On a hundred board cover 1, 3, 5, 7, 9, 11. Ask student to cover the next three numbers in sequence. Skip-count by 3's starting with the number three. On a hundred board cover a pattern such as 2, 7, 12, 17, 22. What are the next three numbers which need to be covered in the sequence? What is the pattern?

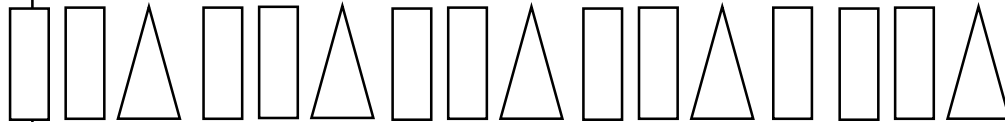
O. Write (or have student cover on a hundred board if needed) 94, 84, 74, 64, 54. Ask student to write (tell or cover) the next three numbers.

P. Read the book Rooster Off To See The World by Eric Carle. Ask the students to write the pattern made by the animals. Also ask them to write the numerical recording to go along with the pattern. This can also be used for the book 1 Hunter by Pat Hutchins and Ten Black Dots by Donald Crews.

Q. Calendar numbers: Look at the numbers for all the Mondays in a given month. Is there a pattern?

R. Show students a picture (diagram) of three places set at a table. Ask students to tell what is not correct (for example, silverware not properly placed). "How could the mistake be corrected?"

S. Given a pattern in blocks, have student correct the errors. Ask student to identify mistakes in patterns that are pictured on workbook pages. “How would you correct the mistakes?”



T. Have students discuss in a group the patterns in place value. Model and explain why one of these examples is correct and one is wrong.

$$\begin{array}{r} 36 \\ +18 \\ \hline 54 \end{array}$$

$$\begin{array}{r} 36 \\ +18 \\ \hline 414 \end{array}$$

U. Have children work with a partner. Each child builds a pattern that has a mistake in it. The children then exchange patterns and correct each others’ pattern. These can be done with manipulatives or at a symbolic level.

V. Show students a pattern made with objects such as hexagon, triangle, triangle, hexagon, triangle, triangle, hexagon, triangle, triangle, . . . Ask the student to identify the pattern unit (that which is repeated). What will the next four pieces be? *Have student complete the same task with patterns pictured on a worksheet after the students have concrete experiences with many different materials. Beware of allowing children to string numerous different blocks together and never focus on the basic idea of pattern as they create their own patterns. They will enjoy working with the manipulatives, but they may not be developing an understanding of pattern unless they are exposed to discussions about the concept. Students should be able to tell about the patterns they create and define the term “pattern” by giving different examples.* Show student a pattern such as AABBAABBAABB. Ask child to model the same pattern with actions, with blocks, and with words.

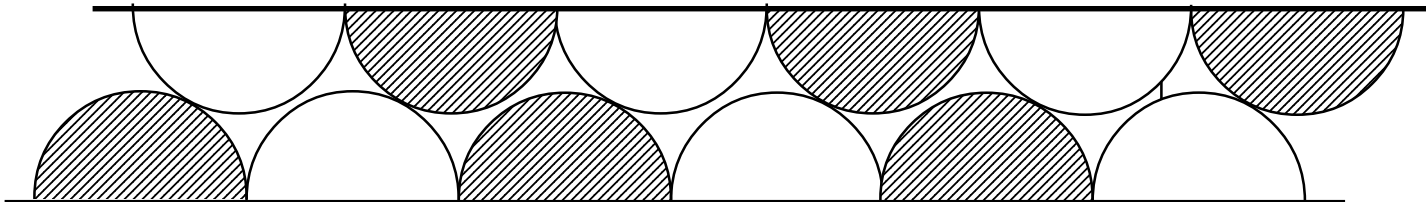
W. Have students create patterns and make bulletin board borders (use adding machine tape, construction paper, etc.). Use templates, stamps, and cut out shapes. Ask students to explain what the pattern unit is and to tell about its repetition. Students can create pattern endpapers for the books they make or pattern “frames” to display their work.

X. Have students cut out 20 circles of the same size in one or two colors. Cut each circle in half. “What patterns could you create with these

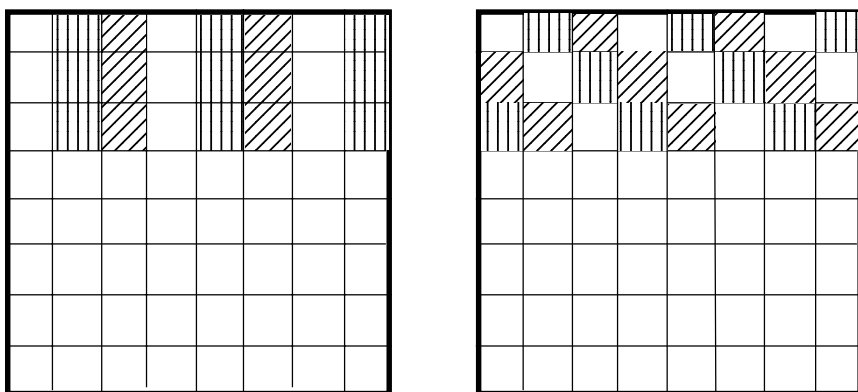
It is important to remember that at least three steps or stages of a pattern should be shown before a student is asked to identify or continue a pattern.

semi-circles?" Parents may be willing to donate stick-on circles such as Avery labels. Cut these in half. Students can make and redo designs on waxed paper.

Notes and textbook references



Y. Have the students make wrapping paper for a special occasion. For a student who has difficulty creating a pattern unit tell the child the pattern to use, but allow each student to interpret it in a special way. *Notice that if the number of squares on a row of the paper is evenly divisible by the number of elements in the pattern unit, a striped wrapping paper is created. If the number of squares in a row is not evenly divisible by the number of parts in the pattern unit, a diagonal design appears.*



Z. Have students discover skip-counting patterns on a hundred board. Use one color of unifix cubes or other markers to cover the numbers. Have students color the same pattern on a 100 chart. Ask student to write number sequences that were colored.

AA. Place 15 counters (skip-counting by 3's or 4's or 5's) on a hundred board on the overhead. Have students place counters on a board at the same time. Ask a child to place the next ten counters on the board and explain the reasons for their placement.

BB. Have students create unusual patterns on their hundred boards. For example, “Begin at three; cover five; cover eight; cover ten; cover thirteen; cover fifteen. What is the pattern?” or “What rule did I use to place the markers?” (plus two, plus three) Have students examine each other’s patterns and try to tell the next five numbers. Be certain that students can explain the patterns they create.

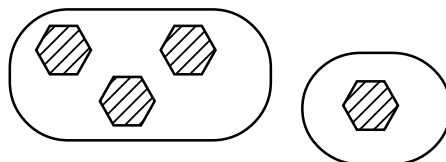
CC. Have children build a pattern with a manipulative materials such as color tiles. Then have the children translate the pattern into another form by building the same pattern with another manipulative such as pattern blocks.

DD. Have students create a pattern unit on an index card. Using sentence strips they can then repeat the pattern several times for display. Let students exchange index cards. “What is the tenth element of this new pattern? Can you prove your answer?”

5.02 Write addition and subtraction number sentences to represent a problem; use symbols to represent unknown quantities.

A. Given counters and an addition sentence such as $4 + 5 = \underline{\quad}$, ask student to explain and show what it means. Repeat the process with $3 + 5 + 4 = \underline{\quad}$.

B. Model a simple addition or subtraction problem. Have the student select the correct number sentence. See Blackline Masters V - 35 to V - 37.



$4 + 2 = 6$	$1 + 2 = 3$
	$3 + 1 = 4$

*Notes and textbook
references*