

Grade 4 Mathematics

Patterns, Relations and Functions: Lesson 5

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students, will have an arrow symbol (↓) by them.

Purpose of Lesson 5:

- In this lesson, the tutor and the students will
 - ✓ generalize pattern rules.

Equipment/Materials Needed:

- Copies of Student Sheet 87
- Paper and pencils
- Chalkboard

Preparations before beginning Lesson 5:

- Run one copy of Student Sheet 87 for each student.
- Have paper and pencils available.

Lesson 5: Patterns

This lesson will be similar to Lessons 2 and 3 in Patterns. The questions will be asked in a different way.

Say:

We are going to look at patterns. It will be your job to see whether you can find a rule that will give you the next number in the pattern.

Write 100, 80, 60, 40, ... on the board.

Say:

I have written a pattern of numbers on the board. What do the 3 dots stand for? (The pattern continues.) What operation would I use to find the next number in the pattern? (subtraction) How much would I subtract? (20) What are the next three numbers in the pattern? (20, 10, 0) If someone said that I should divide the numbers by 2, would that operation give the numbers in this pattern? (No. It would give 100, 50, 25, 12½, ...)

Say:

I want you to start with 100 and create a pattern using addition. Write down at least 4 other numbers in your pattern. We will guess what numbers you added.

The patterns will vary greatly, but these are examples.

100, 101, 102, 103, 104, ... Add 1.

100, 110, 120, 130, 140, ... Add 10.

100, 200, 300, 400, 500, ... Add 100.

Note: If the students are having trouble with this type of patterning, give them more practice. Start with other numbers, and ask them to make patterns using addition, subtraction, multiplication, and division. In division, use starting numbers such as 100, 64, 50, or 32: ones that are easy to divide.

Give students Student Sheet 87.

Answers:

- | | | | | |
|------|------|------|------|-------|
| 1. D | 2. C | 3. A | 4. C | 5. B |
| 6. D | 7. B | 8. C | 9. A | 10. D |

Have one student summarize today's lesson. Recognizing patterns in numbers is critical to understanding mathematics.

Student Sheet 87 (Patterns: Lesson 5)

Choose the correct rule for each pattern.

1. 6, 12, 18, 24, ...

- A. Multiply by 2.
- B. Multiply by 6.
- C. Add 2.
- D. Add 6.

2. 99, 93, 87, 81, ...

- A. Divide by 3.
- B. Multiply by 3.
- C. Subtract 6.
- D. Subtract 16.

3. 200, 100, 50, 25, ...

- A. Divide by 2.
- B. Divide by 5.
- C. Subtract 100.
- D. Subtract 25.

4. 4, 16, 64, 256, ...

- A. Add 12.
- B. Add 216.
- C. Multiply by 4.
- D. Multiply by 2.

5. 106, 97, 88, 79, ...

- A. Subtract 79.
- B. Subtract 9.
- C. Add 9.
- D. Add 97.

6. 64, 32, 16, 8, ...

- A. Subtract 32.
- B. Subtract 8.
- C. Divide by 8.
- D. Divide by 2.

7. 9, 7, 5, 3, ...

- A. Add 2.
- B. Subtract 2.
- C. Multiply by 2.
- D. Divide by 2.

8. 10, 20, 40, 80, ...

- A. Add 40.
- B. Add 10.
- C. Multiply by 2.
- D. Multiply by 8.

9. 200, 197, 194, 191, ...

- A. Subtract 3.
- B. Subtract 191.
- C. Add 3.
- D. Add 191.

10. 10,000; 1000; 100; 10; ...

- A. Subtract 90.
- B. Multiply by 10.
- C. Add 9.
- D. Divide by 10.