


## Grade 8 Mathematics

### Patterns, Relations, and Functions: Lesson 6

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 6:*

- In this lesson, the tutor and the students will
  - ✓ complete input/output tables;
  - ✓ generalize rules for input/output tables, or function tables; and
  - ✓ write an equation describing the rule.

*Equipment/Materials Needed:*

- Copies of Student Sheet 122
- Paper and pencils
- Chalkboard


*Preparations before beginning Lesson 6:*

- Run one copy of Student Sheet 122 for each student.
- Have paper and pencils available.


## Lesson 6: Patterns, Relations, and Functions

Say:

**In this lesson, I will give you information in tables. Look for patterns in the information so that you can answer the questions. The number in the first column is the number you “put in” or your *input* number. The number in the second column is the number that “comes out” or your *output* number. Remember that the output number is related in some way to the input number.**

 Give students Student Sheet 122. Have the students discuss how they found the answers.

1. seconds
2. inches
3. 50 inches
4. 3 seconds
5. 250 inches
6. 300 inches
7. 1000 in. or 83 ft.
8. between 2 and 3 seconds
9. 24 seconds
10. For every second, the roach crawls 50 inches. The distance crawled is fifty times the number of seconds. The output number is fifty times the input number.
11.  $D = 50t$
12. \$15
13. 3 pairs
14. \$60
15. \$75
16. 6 pairs
17. \$135
18. 7 pairs
19. She makes \$15 for each pair sold. The amount of money earned is \$15 times the number of earrings sold.
20.  $E = 15N$

 Have one student summarize today's lesson. Generalizing a rule for a function table requires that students see patterns or relationships in the table.

## Student Sheet 122 (Patterns: Lesson 6)

**Look for patterns in the data in the tables.**

- A. Large tropical cockroaches can move at very rapid speeds.  
The table shows how fast one type of cockroach can move.

Input Numbers	Output Numbers
Time (seconds)	Distance (inches)
1	50
2	100
3	150
4	200
5	?
?	?

1. In what units is time measured?
2. In what units is distance measured?
3. How far can this roach crawl in one second?
4. How long does it take this roach to move 150 inches?
5. How far could this roach run in five seconds?
6. How far could this roach run in six seconds?
7. How far could this roach run in 20 seconds? How far is this distance in feet?
8. If the roach needed to run 10 feet to get to food, about how long would it take the roach to get there?
9. If the roach needed to crawl 100 feet to get to food, about how long would it take the roach to get there?
10. What rule could you write to show how distance is related to time in this problem?
11. If you let distance =  $D$ , and time =  $t$ , write an equation showing this relationship.

## Student Sheet 122 (Patterns: Lesson 6) (continued)

- B. Trudy has a jewelry business. She sells earrings all at one price. The table shows how much she earns for the different number of earrings sold.

Number of pairs of earrings	Amount earned
1	\$15
2	\$30
3	\$45
4	\$60
5	?
?	?

12. How much money does Trudy make on each pair of earrings sold?
13. How many pairs of earrings does Trudy need to sell to make \$45?
14. How much money would she make if she sold four pairs of earrings?
15. How much money would she make if she sold five pairs of earrings?
16. How many pairs of earrings does she need to sell to make \$90?
17. How much money would she make if she sold nine pairs of earrings?
18. How many pairs of earrings does she need to sell to make at least \$100?
19. What rule could you write to show how the amount of money earned is related to the number of pairs of earrings sold?
20. If  $N$  = number of pairs of earrings sold and  $E$  = the amount earned, write an equation showing the relationship.