Unit 1 Show What You Know

LESSON

1

1. The pattern rule that relates the input to the output is:
Divide the input by 5, then subtract 1.

a) Check the data in the table.
Identify any output numbers that are incorrect.
How do you know they are incorrect?

b) Write the pattern rule for the input.

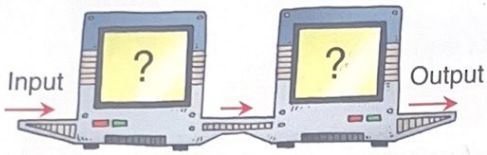
c) Write the pattern rule for the corrected output.

d) The pattern continues.
Write the next 4 input and output numbers.

Input	Output
5	0
10	2
15	3
30	7
45	8
50	11

2

2. The table shows the input and output for this machine.



Input	Output
1	0
2	2
3	4
4	6
5	8
6	10
7	12

a) Identify the numbers and operations in the machine.

b) Write a pattern rule that relates the input to the output.

c) Choose 4 different input numbers.
Find the output for each input.

d) Predict the output when the input is 11. Check your prediction.

4

3. In a dogsled race, teams of 6 dogs race to the finish.

a) Make a table to show the numbers of dogs in a race when 2, 3, 4, 5, and 6 teams are entered.

b) Write a pattern rule that relates the number of dogs to the number of teams entered.

c) Write an expression to represent this pattern.

d) Use the expression to find the number of dogs when 13 teams are entered.
How can you check your answer?

5

4. Draw and label a coordinate grid.
Plot each point on the grid.
How did you decide which scale to use on the axes?

a) A(10, 5) **b)** B(0, 20) **c)** C(20, 30) **d)** D(0, 0) **e)** E(30, 0)

6

5. Use dot paper.
   a) Draw a pattern to model the data in the table. Extend the pattern to Figure 6.
   b) Graph the data in the table.
   c) Describe the relationship shown on the graph.
   d) Write an expression to represent the pattern.
   e) Find the number of shapes in the 21st figure. Which strategy did you use? Why?

Figure Number	Number of Shapes
1	4
2	8
3	12
4	16

7

6. Rewrite each expression using a commutative property.
   a) 24×3
   b) $121 + 27$
   c) $46 + 15$
   d) 9×12
   e) 11×8
   f) $37 + 93$

8

7. For each equation below:
   - Model the equation with counters.
   - Use counters to model the preservation of equality. Use a different operation for each equation.
   - Draw diagrams to record your work.
   - Use symbols to record your work.

   a) $11 - 3 = 8$
   b) $3 \times 1 = 5 - 2$
   c) $3 + 4 = 7$
   d) $12 \div 6 = 9 - 7$

8. For each equation below:
   - Apply the preservation of equality. Write an equivalent form of the equation.
   - Use paper strips to check that equality has been preserved.

   Try to use a different operation for each part.
   a) $4b = 8$
   b) $t = 3$
   c) $12 = 6s$
   d) $4 = 2s$

   How do you know that equality has been preserved each time?

UNIT 1 Learning Goals

- ☑ describe patterns and relationships using graphs and tables
- ☑ use equations to represent number relationships
- ☑ use relationships within tables of values to solve problems
- ☑ identify and plot points in a Cartesian plane
- ☑ demonstrate the preservation of equality