LESSON MAKER PRO

Pattern Detectives

Use tables and graphs to predict what comes next.

GRADE 5 · 5.A.1.1

5.A.1.1 "Use tables and rules with up to two operations to describe patterns of change and make predictions and generalizations about various mathematical situations."

NAME _____ DATE _____

FIND THE RULE

When inputs increase by 1, compare the outputs to see how much they change. A rule may multiply the input, then add or subtract a number. Check your rule with the known values before using it to predict a new one.

WORKED EXAMPLE

Use the table to find the output for input 19. Write the rule.

INPUT AND OUTPUT

Input	Output
16	91
17	96
18	101

1. Each time the input increases by 1, the output increases by 5.
2. For input 16, 5 × 16 = 80, and 91 - 80 = 11.
3. The rule is: multiply the input by 5, then add 11. For input 19, 5 × 19 + 11 = 106.

Answer: 106; multiply the input by 5, then add 11.

PRACTICE 6 problems

1 Use the table. What is the output for input 6?

PATTERN A

Input	Output
0	2
1	8
2	14
6	?

ANSWER _____

2 Use the table. Write the rule and find the output for input 7.

PATTERN B

Input	Output
0	1
1	8
2	15
7	?

ANSWER _____

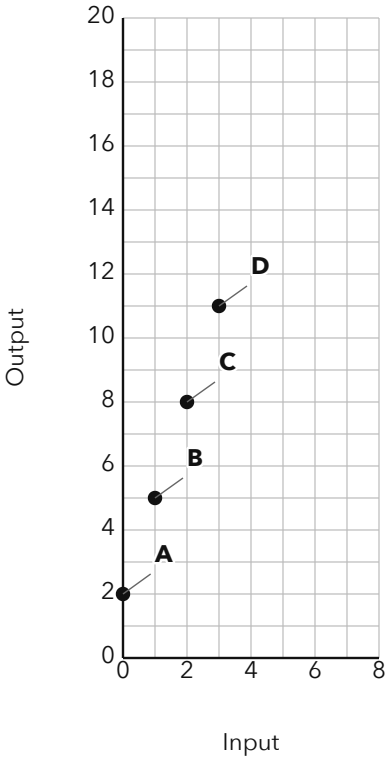
3 Use the table. What is the output for input 7?

PATTERN C

Input	Output
0	40
1	36
2	32
7	?

ANSWER _____

4 Look at the plotted points. If the pattern continues, what is the output for input 6?



ANSWER _____

5 Use the table. Find the missing input and write the rule.

PATTERN D

Input	Output
0	9
1	15
2	21
?	45

ANSWER _____

6 Use the table. Write the rule and predict the output for input 6.

PATTERN E

Input	Output
0	3
1	12
2	21
3	30

ANSWER _____

APPLY IT Show your work

1 You have 7 stickers in your album. Each new pack adds 8 stickers. The table shows how many stickers you have after opening some packs. How many stickers will you have after opening 6 packs? Write the rule.

STICKER ALBUM

Packs opened	Stickers
0	7
1	15
2	23

ANSWER _____

2 In a game, you start with 50 energy points and use 6 points each round. Use the table to predict how many points you will have after 7 rounds. Write the rule.

GAME ENERGY

Rounds played	Energy points
0	50
1	44
2	38

ANSWER _____

CHALLENGE One step up

The table shows two patterns. What is the first whole-number input for which Pattern B has a greater output than Pattern A? Explain using a rule for each pattern.

TWO PATTERNS

Input	Pattern A	Pattern B
0	10	2
1	14	8
2	18	14

WORK SPACE AND ANSWER

ANSWER KEY

Pattern Detectives

GRADE 5 · 5.A.1.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the table. What is the output for input 6?	**38**
2	Use the table. Write the rule and find the output for input 7.	**Multiply the input by 7, then add 1; 50.**
3	Use the table. What is the output for input 7?	**12**
4	Look at the plotted points. If the pattern continues, what is the output for input 6?	**20**
5	Use the table. Find the missing input and write the rule.	**6; multiply the input by 6, then add 9.**
6	Use the table. Write the rule and predict the output for input 6.	**Multiply the input by 9, then add 3; 57.**

PART 2 · APPLY IT

1. **55 stickers; multiply the number of packs by 8, then add 7.** Each pack adds 8 stickers to the starting 7. After 6 packs, 8 × 6 + 7 = 55.
2. **8 energy points; subtract 6 times the number of rounds from 50.** The energy drops by 6 points each round. After 7 rounds, 50 - 6 × 7 = 8.

CHALLENGE

Input 5. Pattern A is 4 times the input plus 10, and Pattern B is 6 times the input plus 2. Both outputs are 26 at input 4; at input 5, Pattern A is 30 and Pattern B is 32.

Accept equivalent verbal or numerical rules. For the challenge, an explanation that extends both patterns to inputs 4 and 5 is also sufficient.