LESSON MAKER PRO

Pattern Power

Find the rule, then make the pattern grow or shrink.

GRADE 4 · 4.PFA.1.a

4.PFA.1.a "Identify, describe, extend, and create increasing and decreasing patterns using various representations (e.g., objects, pictures, numbers, number lines, input/output tables, and function machines)."

NAME _____ DATE _____

FIND THE CHANGE

A pattern follows a rule. Look at how each number changes, then use the same change to extend the pattern. In a table or function machine, use the input and output to find the rule.

WORKED EXAMPLE

What number comes next? 61, 70, 79, 88, ____

1. 70 - 61 = 9.
2. 79 - 70 = 9, and 88 - 79 = 9.
3. The pattern increases by 9 each time.
4. 88 + 9 = 97.

Answer: 97

PRACTICE 6 problems

1 Extend the increasing pattern: 12, 16, 20, ___, ___. Describe the rule.

ANSWER _____

2 Extend the decreasing pattern: 63, 56, 49, ___, ___. Describe the rule.

ANSWER _____

3 A number line is marked 4, 8, 12, 16, ___. What are the next three marked numbers?

ANSWER _____

4 Complete the input/output table. Then describe the rule. Input: 1 | 3 | 5 | 6 Output: 4 | 12 | 20 | ___

ANSWER _____

5 A function machine has this pattern: 8 goes to 12, 13 goes to 17, and 18 goes to ___. What is the rule?

ANSWER _____

6 Start at 40. Make a decreasing pattern by subtracting 6 each time: 40, 34, ___, ___, ___.

ANSWER _____

APPLY IT Show your work

1 In a video game, Kai earns 12 points on Monday and 16 points on Tuesday. Each day, Kai earns 4 more points than the day before. How many points does Kai earn on Friday?

WORK SPACE

ANSWER _____

2 For friendship bracelets, Elena uses 72 beads for the first bracelet. Each new bracelet uses 8 fewer beads than the one before it. How many beads does she use for the fifth bracelet?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Complete the table and describe the function rule. Input: 2 | 4 | 6 | 8 | 10 Output: 14 | 20 | 26 | 32 | ___

_____

_____

ANSWER KEY

Pattern Power

GRADE 4 · 4.PFA.1.a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Extend the increasing pattern: 12, 16, 20, ___, ___. Describe the rule.	**24, 28; add 4 each time**
2	Extend the decreasing pattern: 63, 56, 49, ___, ___. Describe the rule.	**42, 35; subtract 7 each time**
3	A number line is marked 4, 8, 12, 16, ___. What are the next three marked numbers?	**20, 24, 28**
4	Complete the input/output table. Then describe the rule. Input: 1 | 3 | 5 | 6 Output: 4 | 12 | 20 | ___	**24; multiply the input by 4**
5	A function machine has this pattern: 8 goes to 12, 13 goes to 17, and 18 goes to ___. What is the rule?	**22; add 4**
6	Start at 40. Make a decreasing pattern by subtracting 6 each time: 40, 34, ___, ___, ___.	**28, 22, 16**

PART 2 · APPLY IT

1. **28 points** Continue the pattern: Wednesday is 20, Thursday is 24, and Friday is 28.
2. **40 beads** The bead pattern is 72, 64, 56, 48, 40. The fifth bracelet uses 40 beads.

CHALLENGE

38; multiply the input by 3, then add 8

Accept equivalent rule language, such as “increase by 4” for “add 4.” For the challenge, students must identify both steps of the rule, multiply by 3 and then add 8.