LESSON MAKER PRO

Rule Trail

Find the pattern that connects inputs and outputs.

GRADE 4 · TEKS 4.1.F

4.1.F "analyze mathematical relationships to connect and communicate mathematical ideas; and"

NAME _____ DATE _____

FOLLOW THE RULE

A number rule changes every input in the same way. In the worked example and Practice 1–6, the rule multiplies or divides every input by one constant; no adding or subtracting is allowed there. Find the constant from the known pair and use it for the new input. The challenge uses multiplication followed by addition.

WORKED EXAMPLE

A rule multiplies or divides every input by one constant. Input 3 gives output 21. Using that rule, input 5 gives output ____.

1. 21 ÷ 3 = 7.
2. The rule is multiply by 7.
3. 5 × 7 = 35.

Answer: 35

PRACTICE 6 problems

1 Use one constant multiplication or division rule. Input 4 gives output 24. Using the same rule, input 8 gives output ___. State the rule.

ANSWER _____

2 Use one constant multiplication or division rule. Input 2 gives output 18. Using the same rule, input 4 gives output ___. State the rule.

ANSWER _____

3 Use one constant multiplication or division rule. Input 9 gives output 72. Using the same rule, input 6 gives output ___. State the rule.

ANSWER _____

4 Use one constant multiplication or division rule. Input 48 gives output 8. Using the same rule, input 54 gives output ___. State the rule.

ANSWER _____

5 Use one constant multiplication or division rule. Input 12 gives output 48. Using the same rule, input 14 gives output ___. State the rule.

ANSWER _____

6 Use one constant multiplication or division rule. Input 11 gives output 88. Using the same rule, input 16 gives output ___. State the rule.

ANSWER _____

APPLY IT Show your work

1 In a robotics game, each completed mission earns 8 energy points. Diego completes 9 missions. How many energy points does he earn?

WORK SPACE

ANSWER _____

2 Lena uses 64 beads to make 8 matching bracelets. Each bracelet uses the same number of beads. How many beads will she need to make 6 bracelets?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A rule first multiplies every input by one constant, then adds one constant. It changes 12 to 50 and 16 to 66. Input 24 gives output ___. Explain your rule.

WORK SPACE AND ANSWER

ANSWER KEY # Rule Trail

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use one constant multiplication or division rule. Input 4 gives output 24. Using the same rule, input 8 gives output ___. State the rule.	**Rule: multiply by 6. Missing output: 48.**
2	Use one constant multiplication or division rule. Input 2 gives output 18. Using the same rule, input 4 gives output ___. State the rule.	**Rule: multiply by 9. Missing output: 36.**
3	Use one constant multiplication or division rule. Input 9 gives output 72. Using the same rule, input 6 gives output ___. State the rule.	**Rule: multiply by 8. Missing output: 48.**
4	Use one constant multiplication or division rule. Input 48 gives output 8. Using the same rule, input 54 gives output ___. State the rule.	**Rule: divide by 6. Missing output: 9.**
5	Use one constant multiplication or division rule. Input 12 gives output 48. Using the same rule, input 14 gives output ___. State the rule.	**Rule: multiply by 4. Missing output: 56.**
6	Use one constant multiplication or division rule. Input 11 gives output 88. Using the same rule, input 16 gives output ___. State the rule.	**Rule: multiply by 8. Missing output: 128.**

PART 2 · APPLY IT

1. **72 energy points** Multiply 8 points per mission by 9 missions. 8 × 9 = 72.
2. **48 beads** Divide 64 by 8 to find that each bracelet uses 8 beads. Multiply 8 by 6 to get 48 beads.

CHALLENGE

98. The rule is multiply the input by 4, then add 2. 24 × 4 = 96, and 96 + 2 = 98.

Accept equivalent wording for each rule, such as “times 6” for “multiply by 6.” For the challenge, accept any clear explanation showing multiplication by 4 followed by adding 2. The worked example and Practice 1–6 are restricted to one constant multiplication or division, making the accepted rules determinate. The challenge is restricted to constant multiplication followed by constant addition: the output increase 16 for input increase 4 gives multiplier 4, then 50 - 12 × 4 = 2.