

Name _____

Write a Rule for Number Patterns in Tables

I Can write a rule to describe a pattern.



UNLOCK the Problem

When the output in a pattern depends on the input, you can write a rule to describe the relationship between inputs and outputs.

Ellery wants to buy light-up balls for a party. They cost \$1 each. The store charges the same shipping fee regardless of how many light-up balls are ordered. So, Ellery has to pay for the light-up balls and pay a shipping fee. The table below shows the cost c for w light-up balls. How much will Ellery pay for 12 light-up balls?

Write a rule to describe the pattern in the table.

Input	w	2	4	6	8
Output	c	4	6	8	10

STEP 1 Describe the relationship between the number of light-up balls and the cost.

Think:	Input	Output
	↓	↓
	$2 + 2 = 4$	2 light-up balls + 2 = cost
	$4 + 2 = 6$	4 light-up balls + 2 = cost
	$6 + 2 = 8$	6 light-up balls + 2 = cost
	$8 + 2 = 10$	8 light-up balls + 2 = cost

Math Talk

MTR 4.1 Engage in discussions on mathematical thinking.

Explain how you can find the cost for 5 light-up balls.

The output is _____ more than the input.

STEP 2 Decide what operation to use to write a rule.

$c = \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$ **Think:** Add 2 to the input to get the output. Since the pattern is additive, use addition to write a rule.

STEP 3 Use the rule to find the cost of 12 light-up balls.

$$c = w + 2$$

$c = \underline{\hspace{2cm}} + 2$ Replace w with the number of light-up balls.

$c = \underline{\hspace{2cm}}$ Add to find the cost.

So, the 12 light-up balls cost \$ _____.



Example Find the rule.

Patterns can also involve multiplication.

The output is _____ times the input. The pattern is multiplicative.

The rule is $y = \underline{\hspace{1cm}} \times \underline{\hspace{1cm}}$.

Think:

$$1 \times \underline{\hspace{1cm}} = 7$$

$$2 \times \underline{\hspace{1cm}} = 14$$

$$3 \times \underline{\hspace{1cm}} = 21$$

$$4 \times \underline{\hspace{1cm}} = 28$$

Input	Output
n	y
1	7
2	14
3	21
4	28

Try Another Problem

- Use a rule to describe the pattern in the table.

Input	s	1	2	3	4
Output	t	9	18	27	36

Multiply by _____.

Rule: _____

Decide if the pattern shown in the table is additive or multiplicative.

Write a rule to describe the pattern.



2.

Input	Output
a	c
2	5
4	7
6	9
8	11

The pattern is _____.

Rule: _____



3.

Input	r	1	2	3	4
Output	p	13	26	39	52

The pattern is _____.

Rule: _____