Growing Tile Rows

Sort patterns by how their shaded tiles grow.

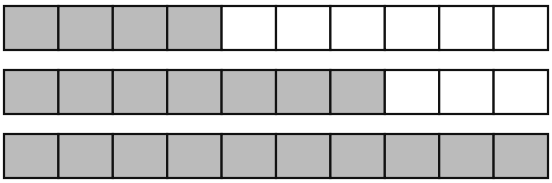
4.A.1.3 "Construct models to show growth patterns involving geometric shapes and define the single operation rule of the pattern."

NAME _____ DATE _____

ADD THE SAME NUMBER

Each new row has the same number of extra shaded tiles. Count how many tiles are added each time.

The rows have 4, 7, and 10 shaded tiles. Add 3 each time.



MULTIPLY BY THE SAME NUMBER

Each new row has the same number of times as many shaded tiles. The number of tiles is multiplied by the same number each time.

The rows have 4, 8, and 16 shaded tiles. Multiply by 2 each time.



1 SORT

8 items

Read each figure from top to bottom, circle ADD or TIMES, then choose two figures and explain how you knew where each belonged.

1.

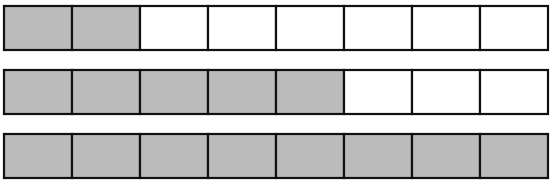


Figure 1

ADD TIMES

2.

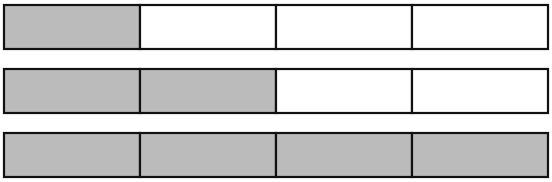


Figure 2

ADD TIMES

3.

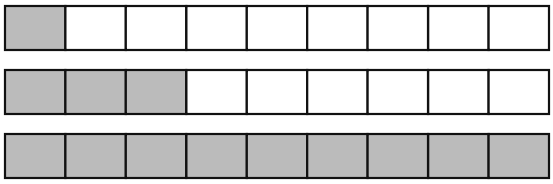


Figure 3

ADD TIMES

4.

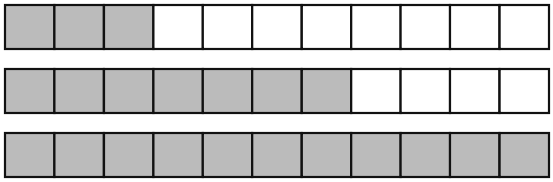


Figure 4

ADD TIMES

5.

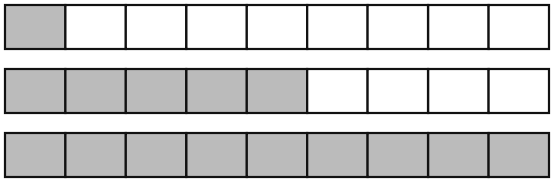


Figure 5

ADD TIMES

6.

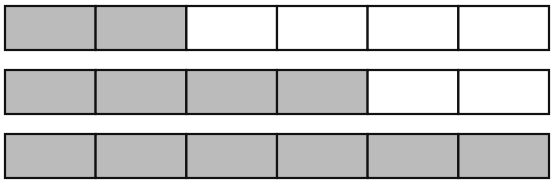


Figure 6

ADD TIMES

7.

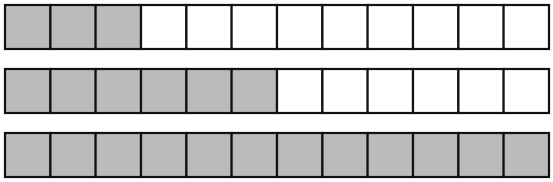


Figure 7

ADD TIMES

8.

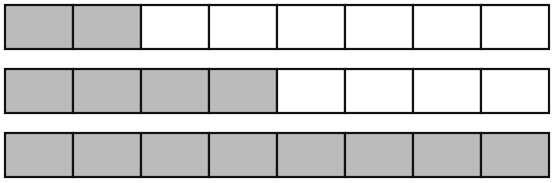


Figure 8

ADD TIMES

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Draw three rows of tiles for a new ADD pattern and three rows for a new TIMES pattern, shading the tiles in each row and writing both rules.

ADD

TIMES

CHALLENGE

Draw five rows of tiles that follow one TIMES rule, then write the shaded-tile count for each row and name the rule.

ANSWER KEY

Growing Tile Rows

GRADE 4 · 4.A.1.3

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Figure 1 (fractionbars)	**ADD**	The counts are 2, 5, 8. Add 3 each time.
2	Figure 2 (fractionbars)	**TIMES**	The counts are 1, 2, 4. Multiply by 2 each time.
3	Figure 3 (fractionbars)	**TIMES**	The counts are 1, 3, 9. Multiply by 3 each time.
4	Figure 4 (fractionbars)	**ADD**	The counts are 3, 7, 11. Add 4 each time.
5	Figure 5 (fractionbars)	**ADD**	The counts are 1, 5, 9. Add 4 each time.
6	Figure 6 (fractionbars)	**ADD**	The counts are 2, 4, 6. Add 2 each time.
7	Figure 7 (fractionbars)	**TIMES**	The counts are 3, 6, 12. Multiply by 2 each time.
8	Figure 8 (fractionbars)	**TIMES**	The counts are 2, 4, 8. Multiply by 2 each time.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **ADD**: Rows with 3, 5, and 7 shaded tiles. Rule: add 2 tiles each time.
- **TIMES**: Rows with 2, 6, and 18 shaded tiles. Rule: multiply by 3 each time.

Challenge: Rows with 1, 2, 4, 8, and 16 shaded tiles. Rule: multiply by 2 each time.

For Part 2, accept any two explanations that correctly compare both steps in a figure. For Part 3, check that the drawn rows match the counts and written rules.