# 4.1.2: How Does It Grow?

EQ: How can you create a rule based on a pattern?

## Tile Pattern #1
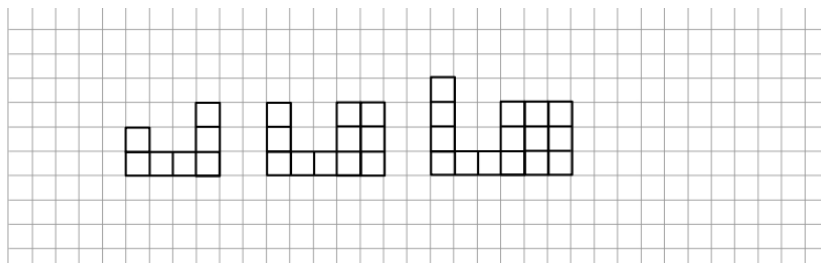
Figure 0    Figure 1    Figure 2    Figure 3    Figure 4
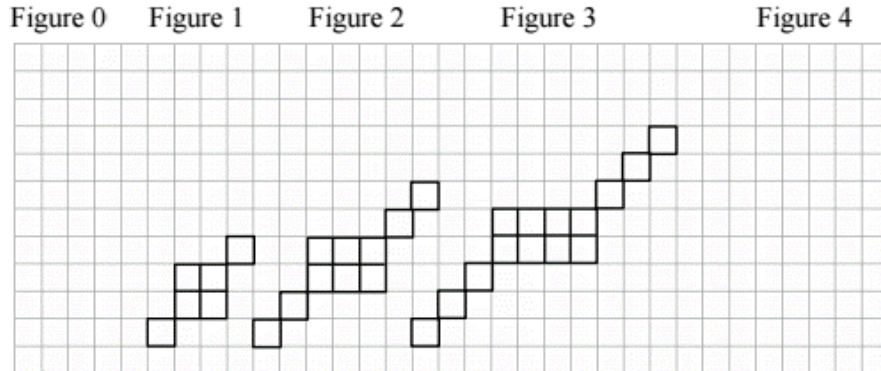


1) Highlight the tiles that are added to each new figure in pink.

2) How is the pattern growing? Where are the tiles being added with each new figure?

3) Use what you have learned from highlighting the figures, to sketch figure 4 above.

4) Use what you have learned from highlighting the figures, to sketch figure 0 above. How many tiles in figure 0?

5) Find an equation (rule) for the number of tiles in each pattern, where x is the figure number and y is the number of tiles.

6)  What would figure 100 look like? Describe it in words.

7) How many tiles would figure 100 have?  Justify.

# Tile Pattern #2
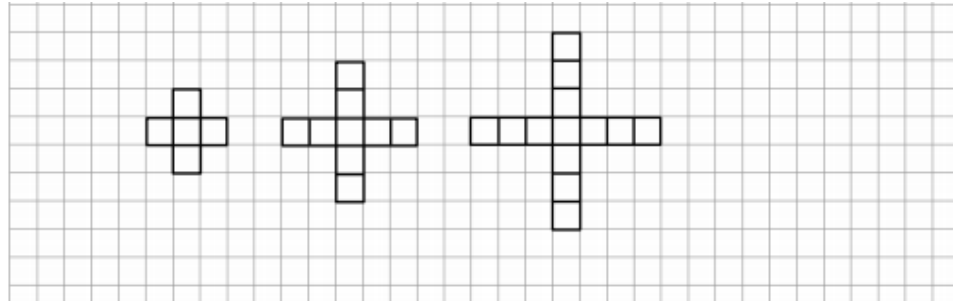


1) Highlight the tiles that are added to each new figure in green.

2) How is the pattern growing? Where are the tiles being added with each new figure?

3) Use what you have learned from highlighting the figures, to sketch figure 4 above.

4) Use what you have learned from highlighting the figures, to sketch figure 0 above. How many tiles in figure 0?

5) Find an equation (rule) for the number of tiles in each pattern, where x is the figure number and y is the number of tiles.

6)  What would figure 100 look like? Describe it in words.

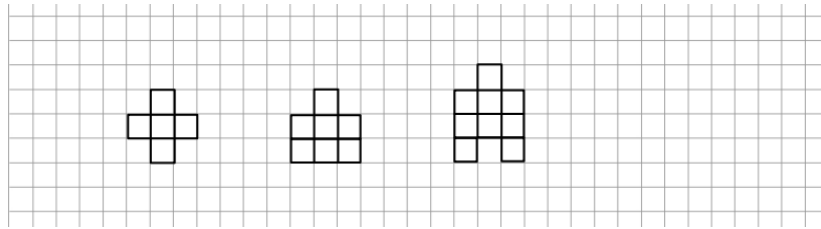7) How many tiles would figure 100 have?  Justify.

# Tile Pattern #3



1) Highlight the tiles that are added to each new figure in blue.

2) How is the pattern growing? Where are the tiles being added with each new figure?

3) Use what you have learned from highlighting the figures, to sketch figure 4 above.

4) Use what you have learned from highlighting the figures, to sketch figure 0 above. How many tiles in figure 0?

5) Find an equation (rule) for the number of tiles in each pattern, where x is the figure number and y is the number of tiles.

6)  What would figure 100 look like? Describe it in words.

7) How many tiles would figure 100 have?  Justify.

# Tile Pattern #4

1) Highlight the tiles that are added to each new figure in yellow.

2) How is the pattern growing? Where are the tiles being added with each new figure?

3) Use what you have learned from highlighting the figures, to sketch figure 4 above.

4) Use what you have learned from highlighting the figures, to sketch figure 0 above. How many tiles in figure 0?

5) Find an equation (rule) for the number of tiles in each pattern, where x is the figure number and y is the number of tiles.

6) What would figure 100 look like? Describe it in words.

7) How many tiles would figure 100 have? Justify.

## Comparing The Patterns

| Pattern Number | # of tiles being added | # of tiles in figure 0 | Equation |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |

1) In patterns 1 – 3, what is the same and what is different?

2) What do pattern 4 & 3 have in common? What is different?

3) What connections do you see between your equations and growth and number of tiles in figure 0?

4) Imagine that the team next to you created a pattern that grows in the same way as patterns 1 to 3, but they refused to show you the pattern. What other information would you need to be able to predict the number of tiles in figure 100?

Summary:

Today, we learned how to create a rule based on a growing pattern without creating a table. To create a rule based on a pattern, first notice how many tiles are being _____ each time. This number is being _____ by ____. Next, figure out how many tiles are in figure _____. _____ this to the equation. This is called the constant. For example, if a pattern was growing by 5 and there were 2 tiles in figure 0, the rule would be

y = __x + ___. This is how you create an equation based on a pattern.