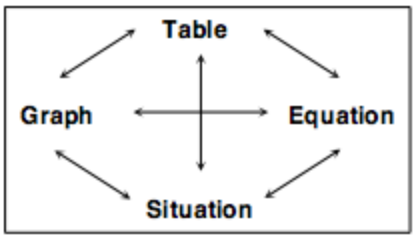
2.1.1 How does it grow?

Seeing Growth in Linear Representations



Throughout this chapter you will explore the multiple representations of a linear relationship. You will use the growth and starting value of linear relationships to find specific connections between situations, tables, graphs, and equations.

The specific situation you will work with today is the growth of tile patterns.

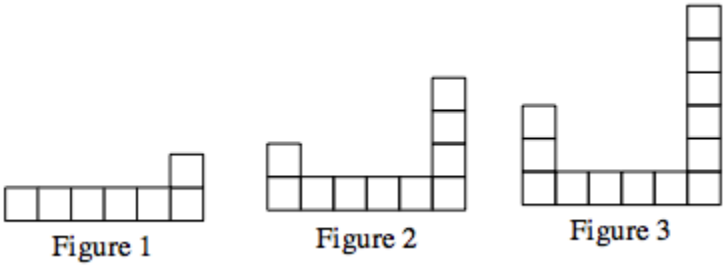
As you work today, keep these questions in mind:

How can you see growth in the tile pattern?

What is the starting value for the tile pattern?

What is the connection to the equation? To the table?

2-1. TILE PATTERN INVESTIGATION



a. Write down what you notice about the pattern After everyone has had a moment on his or her own to examine the figures, discuss what you see with your team.

b. Find Pattern A on the resource page.

- Sketch the next figure in the sequence (Figure 4) for Pattern A
- Sketch Figure 0. It is the figure that comes before Figure 1.
- Color in the new tiles for each next figure of pattern A with a colored pencil.

c. By how much is tile Pattern A growing?

d. What would Figure 100 look like for Pattern A? Describe it in words. How many tiles would be in the 100th figure? Find as many ways as you can to justify your conclusion. Be prepared to report back to the class with your team's findings and methods.

e. Write an equation that relates the figure number, *x*, to the number of tiles, *y*.

2-2. As you did for Pattern A, complete the resource page for Pattern B.

a. Create a table of input out values for this Pattern B. Let the input value, x, be the figure number, and the output value, y, be the number of tiles.

Figure # (*x*)	0	1	2	3	4
# of Tilies (*y*)					

2-3. The growth of a tile Pattern C is represented by the equation $y = 3x + 1$.

Fill in the table for Pattern C.

Figure # x	0	1	2	3	4
# of Tiles y					

a. By how many tiles is Pattern C growing? What is the starting value?

b. Where do you look in the table to see the growth and starting value?

c. Where do you look in the equation to see the growth and starting value?

2-5. Now consider Tile Pattern D. Draw Figures 0 and 4 for this pattern.

a. Write an equation for the number of tiles in this pattern. Use x for the figure number, and y for the number of tiles in the figure.

b. Make a table for the equation you wrote in part (a) above. Does the information in your table match the diagrams for Pattern D?

Figure # (x)				
# of Tilies (y)				

c. What is the same about this pattern and Pattern C? What is different? What do the similarities and differences look like in the tile pattern?

d. What do the similarities and differences in part look like in the equations?

e. What do the similarities and differences look like in the table?