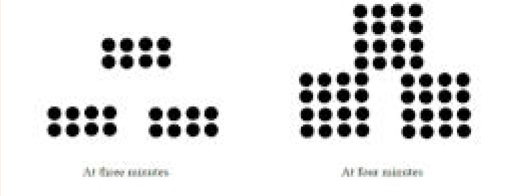
Representing Sequences

Lesson 6

Learning Target

I can represent a sequence in different ways.

Let’s look at different ways to represent a sequence.



6.1 Reading Representations

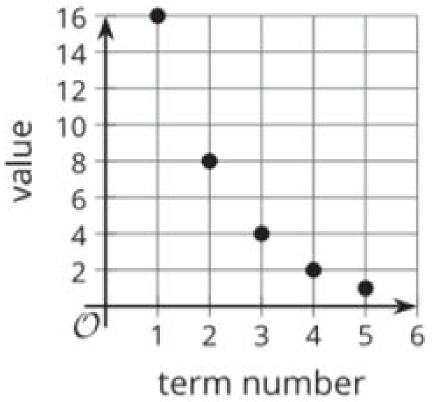
For each sequence shown, find either the growth factor or rate of change.

- Be prepared to explain your reasoning.

1. 5, 15, 25, 35, 45, . . .

2. Starting at 10, each new term is $\frac{5}{2}$ less than the previous term.

4. $g(1) = -5, g(n) = g(n-1) \cdot -2$ for $n \geq 2$



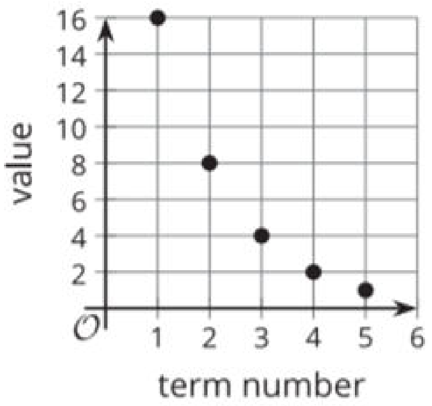
n	$f(n)$
1	0
2	0.1
3	0.2
4	0.3
5	0.4

Activity Synthesis

1. 5, 15, 25, 35, 45, . . .

2. Starting at 10, each new term is $\frac{5}{2}$ less than the previous term.

4. $g(1) = -5, g(n) = g(n-1) \cdot -2$ for $n \geq 2$



n	$f(n)$
1	0
2	0.1
3	0.2
4	0.3
5	0.4

How did you identify the growth factor or the rate of change in each problem?

6.2 Matching Recursive Definitions

Take turns with your partner to match a sequence with a recursive definition. It may help to first figure out if the sequence is arithmetic or geometric.

- For each match that you find, explain to your partner how you know it's a match.
- For each match that your partner finds, listen carefully to their explanation. If you disagree, discuss your thinking and work to reach an agreement.

There is one sequence and one definition that do not have matches. Create their corresponding match.

Activity Synthesis

How did you decide which definitions to match to sequence 3, 6, 12, 24 and sequence 18, 36, 72, 144 when they both involve doubling?

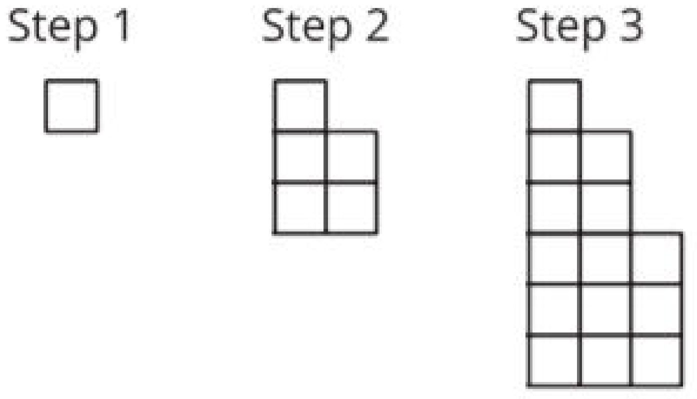
Sequences:

1. 3, 6, 12, 24
2. 18, 36, 72, 144
3. 3, 8, 13, 18
4. 18, 13, 8, 3
5. 18, 9, 4.5, 2.25
6. 18, 20, 22, 24

Definitions:

- $G(1) = 18, G(n) = \frac{1}{2} \cdot G(n-1), n \geq 2$
- $H(1) = 3, H(n) = 5 \cdot H(n-1), n \geq 2$
- $J(1) = 3, J(n) = J(n-1) + 5, n \geq 2$
- $K(1) = 18, K(n) = K(n-1) - 5, n \geq 2$
- $L(1) = 18, L(n) = 2 \cdot L(n-1), n \geq 2$
- $M(1) = 3, M(n) = 2 \cdot M(n-1), n \geq 2$

6.3 Squares of Squares



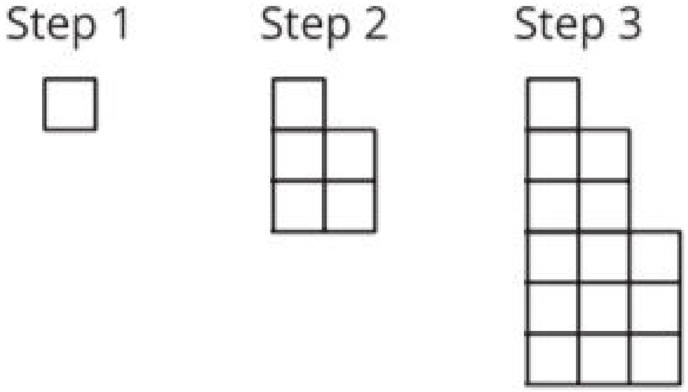
How would you describe the total number of small squares in Step 3 compared to the total number of small squares in Step 2?

Complete the task with your partner.

What do you notice? What do you wonder?

Activity Synthesis

How did you reason the recursive definition for *S?*



How did you create your graph for Steps 1-7?

Did anyone use a different strategy for writing your definition?