

Name \_\_\_\_\_

## Numerical Patterns

A soccer league has 7 teams. How many players are needed for 7 teams? How many soccer balls are needed by the 7 teams?

	<b>Number of Teams</b>	1	2	3	4	7
Add <u>8</u>	<b>Number of Players</b>	8	16	24	32	56
Add <u>4</u>	<b>Number of Soccer Balls</b>	4	8	12	16	<b>28</b>

**Step 1** Find a rule that could be used to find the number of players for the number of teams.

Think: In the sequence 8, 16, 24, 32, you add 8 to get the next term.

As the number of teams increases by 1, the number of players increases by 8. So the rule is to add 8.

**Step 2** Find a rule that could be used to find the number of soccer balls for the number of teams.

Think: In the sequence 4, 8, 12, 16, you add 4 to get the next term.

As the number of teams increases by 1, the number of soccer balls needed increases by 4. So the rule is to add 4.

**Step 3** For 7 teams, multiply the number of players by  $\frac{1}{2}$  to find the number of soccer balls.

So, for 7 teams, 56 players will need 28 soccer balls.

Complete the rule that describes how one sequence is related to the other. Use the rule to find the unknown term.

<b>Number of Teams</b>	1	2	3	4	8	10
<b>Number of Players</b>	15	30	45	60	120	
<b>Number of Bats</b>	5	10	15	20		50

1. Divide the number of players by \_\_\_\_\_ to find the number of bats.
2. Multiply the number of bats by \_\_\_\_\_ to find the number of players.

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## Problem Solving • Find a Rule

Samantha is making a scarf with fringe around it. Each section of fringe is made of 4 pieces of yarn with 2 beads holding them together. There are 42 sections of fringe on Samantha’s scarf. How many wooden beads and how many pieces of yarn are on Samantha’s scarf?

Read the Problem	Solve the Problem						
<p><b>What do I need to find?</b> Possible answer: I need to find the number of beads and the number of pieces of yarn on Samantha’s scarf.</p>	<b>Sections of Fringe</b>	1	2	3	4	6	42
<p><b>What information do I need to use?</b> Possible answer: I need to use the number of sections on the scarf, and that each section has 4 pieces of yarn and 2 beads.</p>	<b>Number of Beads</b>	2	4	6	8	12	84
<p><b>How will I use the information?</b> I will use the information to search for patterns to solve a simpler problem.</p>	<b>Pieces of Yarn</b>	4	8	12	16	24	168
	<p>Possible answer: I can multiply the number of sections by 2 to find the number of beads. Then, I can multiply the number of sections by 4, or the number of beads by 2, to find the number of pieces of yarn. So, Samantha’s scarf has <math>2 \times 42</math>, or 84 beads, and <math>4 \times 42</math>, or 168 pieces of yarn.</p>						

1. A rectangular tile has a decorative pattern of 3 equal-sized squares, each of which is divided into 2 same-sized triangles. If Marnie uses 36 of these tiles on the wall behind her kitchen stove, how many triangles are displayed?

2. Leta is making strawberry-almond salad for a party. For every head of lettuce that she uses, she adds 5 ounces of almonds and 10 strawberries. If she uses 75 ounces of almonds, how many heads of lettuce and how many strawberries does Leta use?

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## Graph and Analyze Relationships

The scale on a map is 1 in. = 4 mi. Two cities are 5 inches apart on the map. What is the actual distance between the two cities?

**Step 1** Make a table that relates the map distances to the actual distances.

<b>Map Distance (in.)</b>	1	2	3	4	5
<b>Actual Distance (mi)</b>	4	8	12	16	?

**Step 2** Write the number pairs in the table as ordered pairs.

(1, 4), (2, 8), (3, 12), (4, 16), (5, ?)

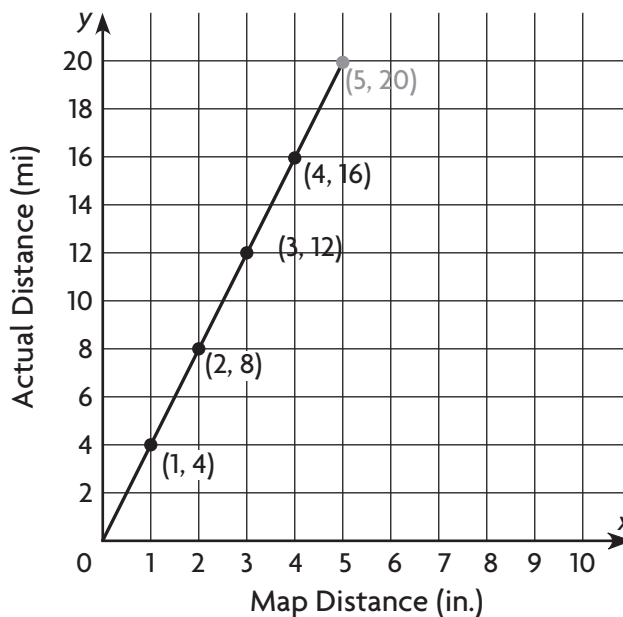
**Step 3** Graph the ordered pairs. Connect the points with a line from the origin.

Possible rule: Multiply the map distance by 4 to get the actual distance.

**Step 4** Use the rule to find the actual distance between the two cities.

So, two cities that are 5 inches apart on the map are actually  $5 \times 4$ , or 20 miles apart.

Plot the point (5, 20) on the graph.



**Graph and label the related number pairs as ordered pairs. Then complete and use the rule to find the unknown term.**

- Multiply the number of yards by \_\_\_\_\_ to find the number of feet.

<b>Number of Yards</b>	1	2	3	4	5
<b>Number of Feet</b>	3	6	9	12	

