

NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Home Connection 50 ★ Worksheet

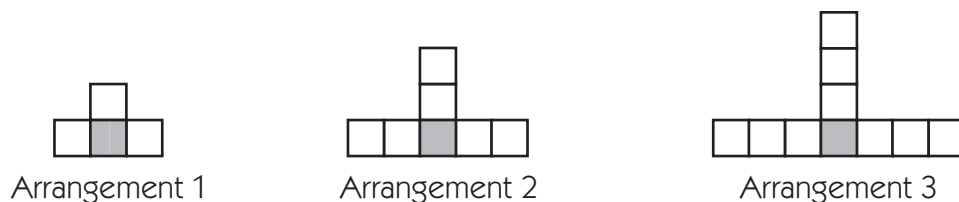


## NOTE TO FAMILIES

We have just started a new unit on algebraic thinking. Over the next few weeks, we will be spending lots of time building, extending, and graphing patterns such as these. The purpose of this work is to help fourth-graders begin to think in ways that will enable them to succeed in algebra. Please work with your student to examine the two different tile patterns on these sheets. The first three arrangements are shown for both. How would each pattern look if it kept on growing? You could build the 16th, or 25th, or 125th arrangement of each, but can you find ways to think about the patterns that enable you to make predictions without actually doing the work of building them? Your participation in this assignment will help your fourth-grader see that there is more than one way to think about these patterns.

## Extending Tile Patterns

**1** Here are the first 3 arrangements in a tile pattern. (Note: The gray tile count as part of each arrangement. Be sure to count them too.)



**a** Sketch the 4th and 5th arrangements in this pattern.

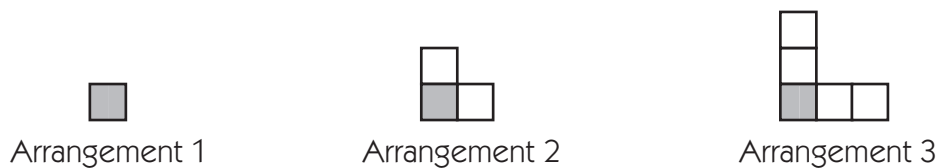
**b** Sketch the 10th arrangement in this pattern.

**c** How many tile would it take to build the 16th arrangement in this pattern? How do you know?

(Continued on back.)

## Home Connection 50 Worksheet (cont.)

**2** Here are the first 3 arrangements in another tile pattern. (Note: The gray tile count as part of each arrangement. Be sure to count them too.)



**a** Sketch the 4th and 5th arrangements in this pattern.

**c** How would you describe the 125th arrangement? How many tile would it take to build it?

**b** Sketch the 10th arrangement in this pattern.

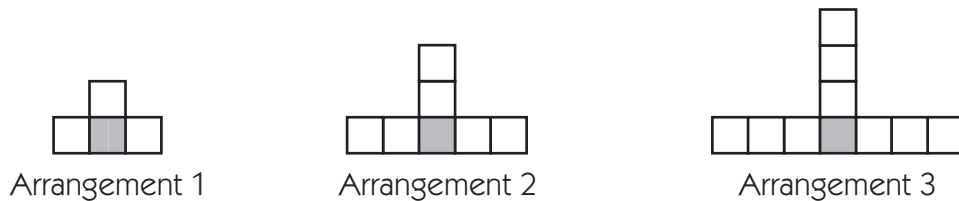
NAME \_\_\_\_\_

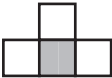
DATE \_\_\_\_\_

# Home Connection 51 ★ Worksheet

## Describing Tile Patterns

**1** Here are the first 3 arrangements in a pattern. Complete the chart below and record your results on the graph on page 159. Use pennies or pieces of cereal to build the arrangements if needed. For the larger arrangements, make labeled generalized sketches instead of drawing each tile.



Picture of Arrangement	Arrangement Number	Number of Tile in Arrangement
<p><b>a</b></p> 	1	4
<p><b>b</b></p>	2	7
<p><b>c</b></p>	3	

(Continued on back.)

## Home Connection 51 Worksheet (cont.)

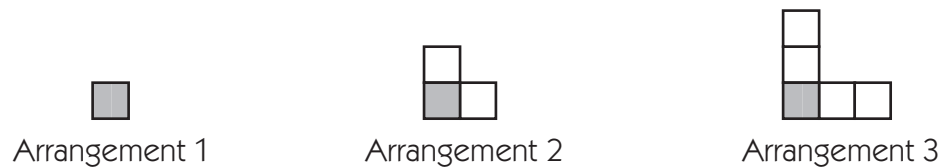
Picture of Arrangement	Arrangement Number	Number of Tile in Arrangement
<b>d</b>	4	
<b>e</b>	5	
<b>f</b>	10	
<b>g</b>	25	

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Home Connection 51** Worksheet (cont.)

**2** Here are the first 3 arrangements in a different pattern. Complete the chart below and record your results on the graph on page 159. Use pennies or pieces of cereal to build the arrangements if needed. For the larger arrangements, make labeled generalized sketches instead of drawing each tile.



Picture of Arrangement	Arrangement Number	Number of Tile in Arrangement
<b>a</b>	1	1
<b>b</b>	2	3
<b>c</b>	3	

(Continued on back.)

## Home Connection 51 Worksheet (cont.)

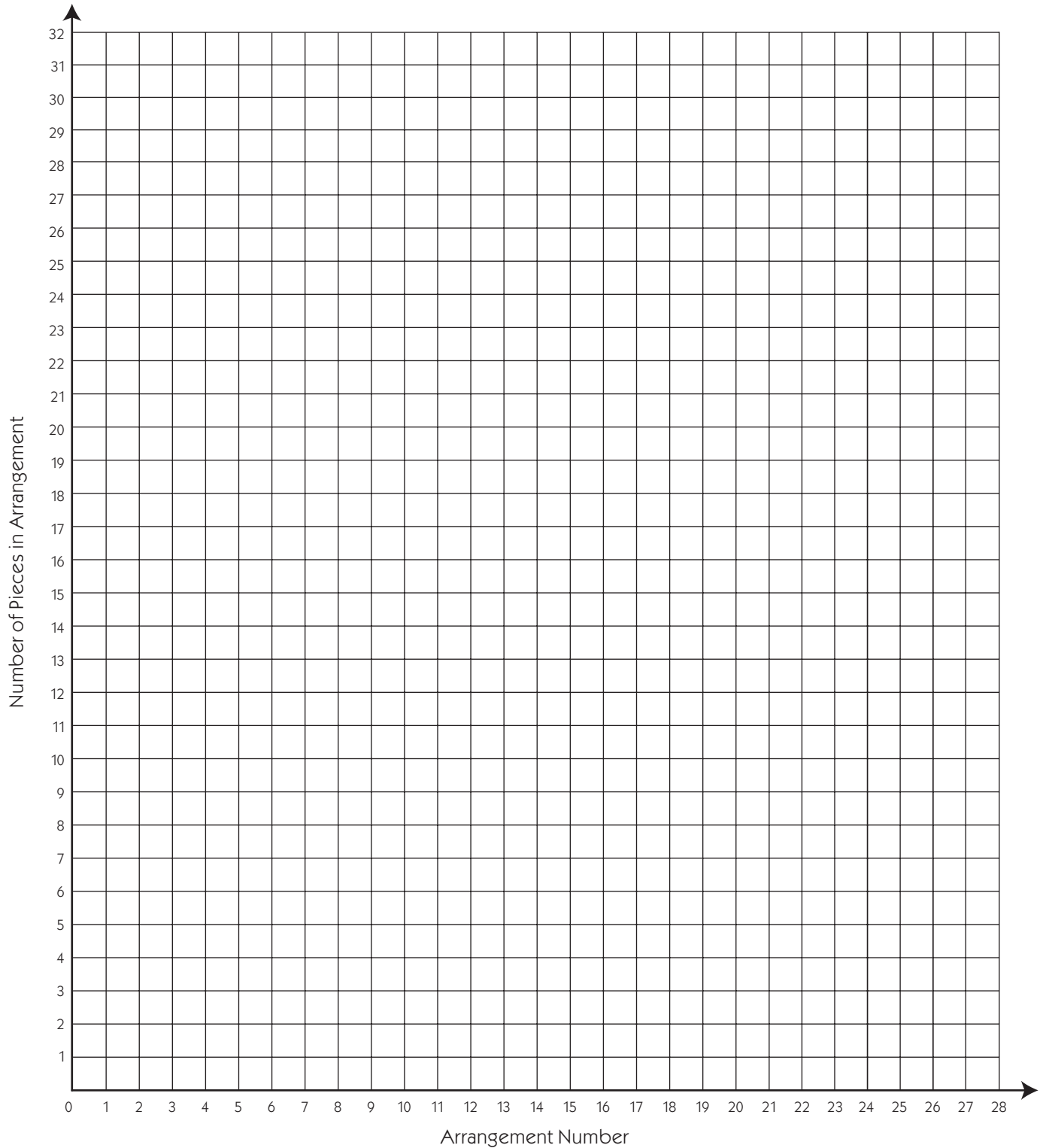
Picture of Arrangement	Arrangement Number	Number of Tile in Arrangement
<b>d</b>	4	
<b>e</b>	5	
<b>f</b>	10	
<b>g</b>	25	

NAME \_\_\_\_\_

DATE \_\_\_\_\_

**Home Connection 51** Worksheet (cont.)

**3** Show the results from the first 4 worksheets on this graph. Use a different color for each of the two tile patterns.







NAME \_\_\_\_\_

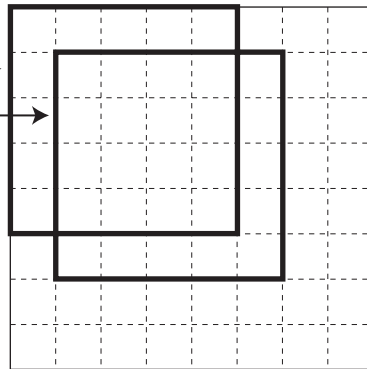
DATE \_\_\_\_\_

## Home Connection 52 ★ Activity

### Squares on a Checkerboard

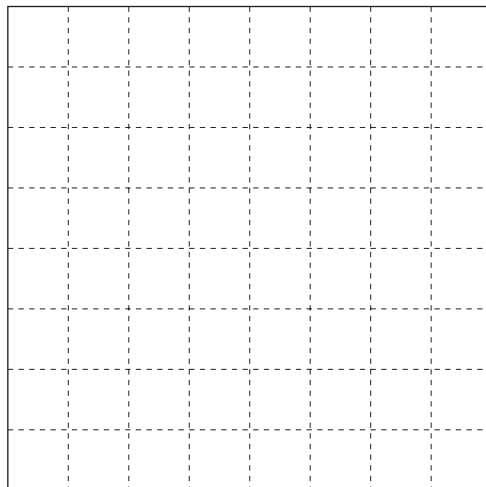
Below is an 8-by-8 grid broken up into squares like a checkerboard. This activity invites you to count the total number of squares (of any size) in the grid. For instance, there are lots of little squares, and the entire grid is 1 big square. There are also lots of squares in between these sizes. Also, the squares you count can overlap as shown below.

You can count both of these 5-by-5 squares (and all the other 5-by-5 squares you can find on this grid) even though they overlap.



**1** Before you count, estimate about how many squares there are in all on the checkerboard. Ask some friends or family members to also make estimates. Record these estimates on page 163.

**2** Count the squares, and record your total on page 163. Now ask the other people to count as many squares as they can find, and record their totals too.





NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Home Connection 52 ★ Worksheet

## Squares on a Checkerboard

**1** List the estimates and counts you and your friends/family members made.

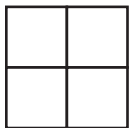
Name	Estimate	Actual Count

**2** How many  $1 \times 1$  squares did you count on the checkerboard?



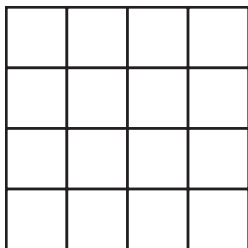
\_\_\_\_\_

**3** How many  $2 \times 2$  squares did you count on the checkerboard?



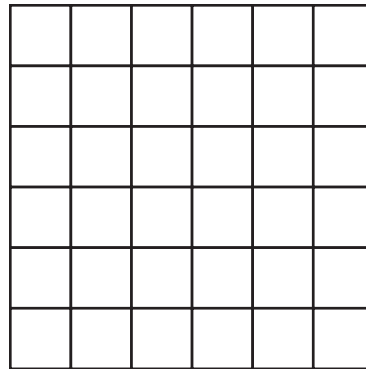
\_\_\_\_\_

**4** How many  $4 \times 4$  squares did you count on the checkerboard?



\_\_\_\_\_

**5** How many  $6 \times 6$  squares did you count on the checkerboard?



\_\_\_\_\_

**6** What do you notice or observe about the numbers of squares or how to count the squares?



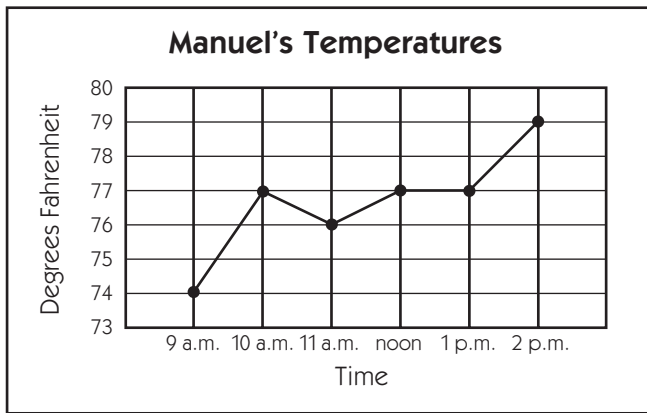
NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Home Connection 53 ★ Worksheet

## Temperature Graphs

**1** Below is a graph of the temperatures during a school day at Manuel's school near Miami, Florida.

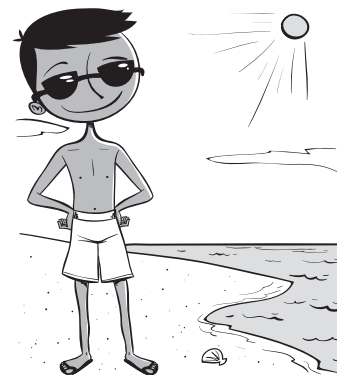


**a** Fill out the temperature for each time on the chart below.

Time	Temperature
9 a.m.	74° F
10 a.m.	
11 a.m.	
noon	
1 p.m.	
2 p.m.	

**b** Between which 2 hours was there the greatest change in temperature? Show your thinking below.

**c** What do you predict the temperature will be at 3:00 p.m.? Explain your thinking.



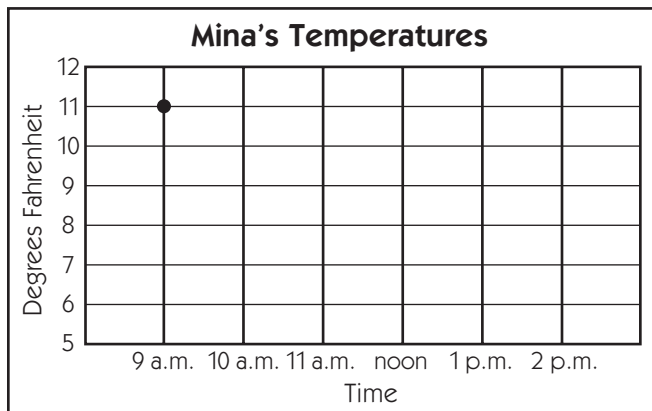
(Continued on back.)

## Home Connection 53 Worksheet (cont.)

**2** Below is a chart giving the temperatures during a school day at Mina's school near Juneau, Alaska.

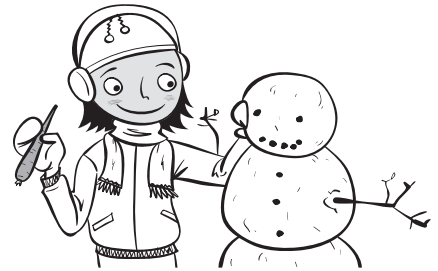
Time	Temperature
9 a.m.	11° F
10 a.m.	10° F
11 a.m.	9° F
noon	8° F
1 p.m.	7° F
2 p.m.	8° F

**a** Plot the temperature for each time on the graph below. Connect the dots to create a line graph.



**b** What do you think the temperature was at 11:30 a.m.? Show your thinking.

**c** What do you predict the temperature will be at 3:00 p.m.? Explain your thinking.

**CHALLENGE**

**3** See if you can collect a single day's worth of hourly temperature data for the place you live. You can use thermometer readings or look up temperatures in a newspaper or on the internet. Create a chart and line graph for the temperatures.





NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Home Connection 54 ★ Worksheet

## Toothpick Patterns

1 Complete the table below for the toothpick pattern. Use toothpicks, pieces of spaghetti, or sketches to make each arrangement if needed.





Picture of Arrangement	Arrangement Number	Number of Toothpicks in Arrangement
a 	1	
b 	2	
c 	3	
d	4	
e	5	
f	10*	
g	25*	
h	100*	
i 		71

\*You can describe this arrangement in words or make a general sketch.

(Continued on back.)

## Home Connection 54 Worksheet (cont.)

**2** Complete the table below for the toothpick pattern. Use toothpicks, pieces of spaghetti, or sketches to make each arrangement if needed.

Picture of Arrangement	Arrangement Number	Number of Toothpicks in Arrangement
<b>a</b> 	1	
<b>b</b> 	2	
<b>c</b> 	3	
<b>d</b>	4	
<b>e</b>	5	
<b>f</b>	10*	
<b>g</b>	25*	
<b>h</b>	100*	
<b>i</b> 		245

\*You can describe this arrangement in words or make a general sketch.



NAME \_\_\_\_\_

DATE \_\_\_\_\_

## Home Connection 54 ★ Activity

### Toothpick Puzzle

Create the figure below with toothpicks. Remove 6 toothpicks to leave ten. Sketch the toothpicks you had left below. If you don't have toothpicks, you can use sketches below or pieces of spaghetti to solve the puzzle.



1 Sketch the toothpicks you had left here:

Use the space below to make sketches if needed.

