

**The Number System****Performance Task****Of Kites and Fishing Hooks**

The heights of kites and the depths of fishing hooks can be recorded using positive and negative integers and rational numbers. Use the table below. Show your work.

Kite	Height (ft)	Fishing Hook	Depth (ft)
A	21	E	-7.1
B	35.4	F	-5.6
C	$28\frac{3}{4}$	G	$-6\frac{2}{3}$

1. Kite A is at a height of 21 feet. It ascends 15 feet. At what height is it now?

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2. Fishing Hook E is at -7.1 feet. It descends another 3.25 feet. What is its depth now?

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3. The string on Kite C is tripled. How high can Kite C fly now?

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4. Fishing Hook E is dropped 2.5 times its present depth. Where is Fishing Hook E now?

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5. What is the distance from Kite C (in Exercise 3) to Fishing Hook E (in Exercise 4)?

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6. Fishing Hook G is let down  $2\frac{1}{2}$  times its present depth. Where is Fishing Hook G now?

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7. Write your own problem using the data in the table.

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**UNIT**  
**2**

# Ratios and Proportional Relationships

## Performance Task

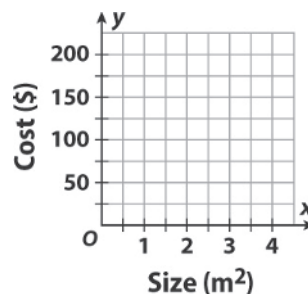
### In the Doghouse

Two companies, Barkly and Woof-Woof, both sell doghouses. The cost of each doghouse depends on the size of its base.

Use the table and the blank graph below for 1–4.

- Barkly Doghouses charges \$50 per square meter for their doghouses. Complete the table to show this proportional relationship.

<b>Size (m<sup>2</sup>)</b>	0.5	1	2.5	4
<b>Cost (\$)</b>				



- Graph the proportional relationship.
- Write an equation to show the relationship in your table and graph. Use  $x$  for size and  $y$  for cost.

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- Woof-Woof Doghouses charges half as much per square meter as Barkly. Draw the graph for Woof-Woof. Label both graphs with their equations.
- Barkly Doghouses increased their prices by 10%. Complete the chart below to show their new prices.

<b>Size (m<sup>2</sup>)</b>	0.5	1	2.5	4
<b>Cost (\$)</b>				

- How will the graph change?

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- Write an equation to show the new relationship.

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- Woof-Woof decided to increase their prices by 40%. Complete the table to show their increased prices.

<b>Size (m<sup>2</sup>)</b>	0.5	1	2.5	4
<b>Cost (\$)</b>				

- The town has decided to add a sales tax of 2.3%. Using the new price and the town tax, calculate the cost of a 2 square-meter doghouse from each company.

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**UNIT**  
**3****Expressions, Equations, and Inequalities****Performance Task****Jessica's Cell Phone Plan**

<b>Number of Text Messages</b>	50	75	100	125
<b>Cost (\$)</b>	35.00	35.75	36.50	37.25

1. Jessica's cell phone plan charges her a monthly fee plus a charge for each text message she sends. The cost of her cell phone is shown in the table above. How much does Jessica pay for each text message? Show your work.

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2. What is the monthly fee for Jessica's plan if she does not send any text messages? Show your work.

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3. What is an equation that shows the monthly fee,  $m$ , based on the number of text messages sent,  $t$ ?

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4. Jessica's bill last month was \$77.00. Use the equation you wrote in Exercise 3 to find the number of text messages Jessica sent last month. Show your work.

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5. Jessica wants to spend less than \$80.00 per month on her cell phone. Write and solve an inequality that shows how many text messages Jessica must limit herself to in order to keep her monthly bill less than \$80.00. Show your work.

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6. Jessica has the option to switch to a plan that charges \$65.00 per month with unlimited text messages. Jessica typically sends about 900 text messages per month. Does it make sense for her to switch to the new plan? Explain.

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**UNIT**  
**4**

# Geometry

## Performance Task

**Answer the questions.**

1. Alex is making a clock to give to his grandfather. To make the clock, he saws a slice of wood from a cylindrical log. What is the shape of the cross section of the log?

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2. Alex then paints the face of the clock with white paint. It has a diameter of 14 inches. What is the area of the clock face?

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3. Next, Alex glues a band of metal around the circumference of the clock. What is the length of the metal band?

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4. After installing the clock mechanism, Alex positions the hours hand and minutes hand on the clock to show 12:30. The seconds hand forms a  $60^\circ$  angle with the minutes hand. What is the angle between the seconds hand and the hours hand?

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5. Alex mounts the clock on a wood base with the shape shown at the right. What is the area of the wood base?

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6. Since the clock is a gift, Alex puts it in a box. The box is 22 inches  $\times$  4 inches  $\times$  20 inches. What is the volume of the box?

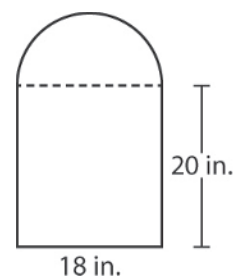
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7. Alex then wraps the box in wrapping paper. How much wrapping paper does Alex use, not including any overlap?

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8. Finally, Alex is ready to deliver the gift. On a map, it is 2.5 inches between Alex's town and his grandfather's town. The scale on the map is 1 in. : 12 miles. What is the actual distance between the towns?

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**UNIT**  
**5**

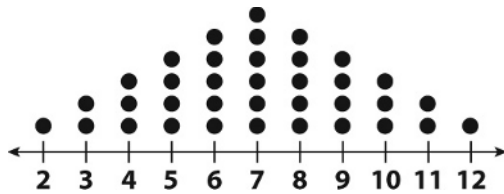
**Statistics**

**Performance Task**

When two number cubes are rolled, which sum is most likely? In this activity, you will generate a random sample to simulate sums of rolling the cubes.

- You will Need**
- 10 landline phone numbers with *the same* area code
  - 10 cell phone numbers with *various* area codes
  - Paper for making dot plots and box plots

1. This dot plot shows the possible sums when two number cubes are rolled. For example there are 3 different ways to get a sum of 4: (1, 3), (2, 2), and (3, 1).



On a separate sheet of paper, make a box plot for this data.

2. Use your calculator to simulate rolling the number cubes 18 times. For the simulated sample, use randInt(1, 6) and generate 18 pairs of numbers. Add each pair to represent the sum of a pair of rolled number cubes. Make a chart like the one below to record the sums.

<b>Sum</b>	2	3	4	5
<b>Rolls</b>				

3. On a separate sheet of paper, make a dot plot and a box plot to display the data from Exercise 2.
4. Why are your results different from the data display in Exercise 1?

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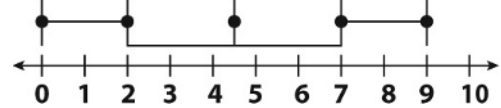
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Are the digits 0 through 9 equally distributed in phone numbers? You will analyze and compare landline and cell phone data in box plots and dot plots.

5. Imagine that the 10 digits in 10 phone numbers were equally distributed. A box plot for the data would look like this.



Find the range, interquartile range, and median. (The median can be two numbers.)

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6. On a separate sheet of paper, make a dot plot showing data in Exercise 5. What is the mean? \_\_\_\_\_
7. Use the landline phone numbers. On a separate sheet of paper, make a dot plot. Which digits appear most often? Why did this happen?
8. Use the cell phone numbers. On a separate sheet of paper, make a dot plot and a box plot.
9. Compare the cell phone box plot with the one from Exercise 5.

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**UNIT**  
**6**

# Probability

## Performance Task

1. A spinner is divided into 4 equal-size sections. The 4 sections are colored red, green, orange, and blue. If Ana spins the spinner twice, what are the possible outcomes?

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2. If Ana spins the spinner once, what is the theoretical probability that she will spin green?

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3. Ana spins the spinner 10 times. She spins green 4 times. What is the experimental probability that Ana will spin green on the next spin?

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4. Why is your answer to Exercise 2 different from your answer to Exercise 3?

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5. Use the theoretical probability. If Ana spins the spinner 400 times, how many times can she expect to spin green?

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6. Ana wants to use a simulation to predict the number of times she will spin green. If she uses a random number generator and the digits 1 through 8, what is one way she can set up the simulation?

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