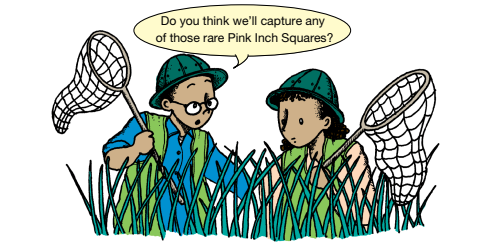
Experiment: Searching the Forest

You should have a bag that another group has "populated" with colored tiles. Your job is to predict the number of each color in the bag. But you cannot dump all the tiles out and count them! You are like a scientist exploring a big, deep forest. You can only look at a little bit of the forest at a time.

You are only allowed to take samples of the tiles. Each sample must have exactly ten tiles in it. After each sample, return the tiles to the bag and shake it up before you take the next sample.



1. Draw a picture of the experiment. Label the variables in your picture.
2. **A.** What are the two main variables in your experiment?
   B. Tell whether each of the main variables is categorical or numerical.

Copyright © Kendall Hunt Publishing Company

***Student Guide* - Page 36**

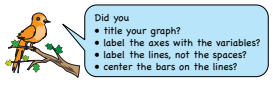
3. Take at least three samples from the "forest." Each sample should have ten tiles in it. Remember to return all the tiles to the bag and shake after each sample. You will need the data table on the *Searching the Forest Lab* pages in the *Student Activity Book*.
4. Why is it a good idea to shake the bag before taking each sample?

Number of Each Color in a Sample

C Color	N Number Pulled			
	Sample 1	Sample 2	Sample 3	Median

5. When you finish filling in your data table, find the median number of each color.

6. Use the *Centimeter Graph Paper* to make a bar graph of your data. Use the median for each color.



Copyright © Kendall Hunt Publishing Company

***Student Guide* - Page 37**

Student Guide

Searching the Forest (SG pp. 36–39)
Questions 1–15

1.* See sample picture in Figure 1 in the lesson.
2. **A.** Color and Number Pulled
   B. Color is categorical and Number Pulled is numerical
3.* See sample data table in Figure 2 in the lesson.
4.* Possible response: So the person who pulls the next sample does not pull the same tiles as the person who pulled the previous sample.
5.* See sample data table in Figure 2 in the lesson.
6.* See the sample graph in Figure 3 in the lesson.

***Answers and/or discussion are included in the lesson.**

Copyright © Kendall Hunt Publishing Company

The answers to ***Questions 7–12*** are based on the sample data in Figures 2–3 in the lesson.

7. A. Answers will vary. Using sample data, red.

B. Answers will vary. Using sample data, 4.

8. A. Answers will vary. Using sample data, green, blue, yellow.

B. Answers will vary. Using sample data, 2, 2, 2.

9–10.* See sample table in Figure 4 and in Figure 5 and discussion of possible responses.

11. Answers will vary. See discussion in the Lesson for possible strategies.

12. A. Answers will vary. Using sample data, red.

B. Answers will vary. Using sample data: green, blue, yellow.

13. A–B.* Yes, it was reasonable. Both yellow and blue had the highest median. Either choice would be a reasonable prediction.

C.* Yes, it is possible. Possible response: Even though it is likely that they would have pulled more reds in their samples, it is possible that 3 random samples could show more of another color.

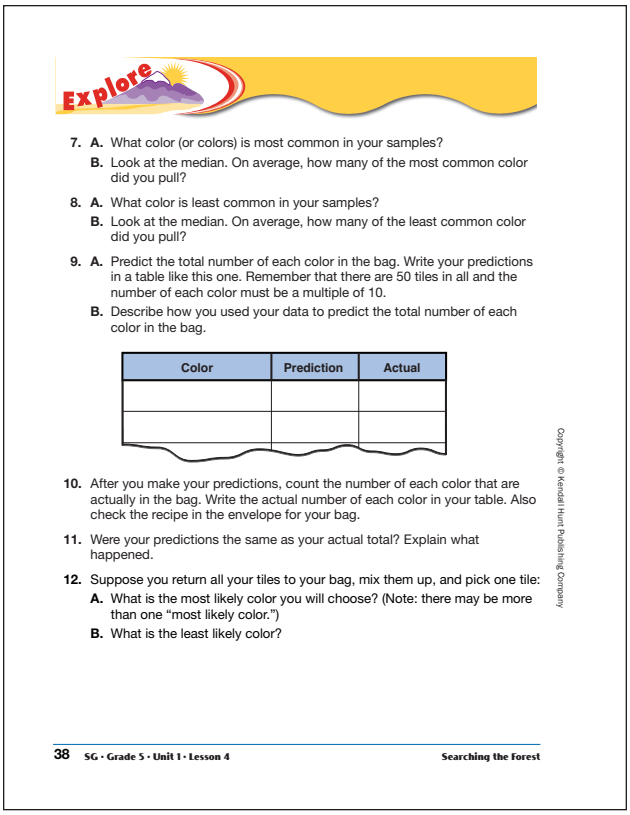
D. Yes, it is possible that the same kind of skewed sample could occur in the rain forest investigation.

14. A. $\frac{20}{50}$

B. $\frac{10}{50}$

C. $\frac{20}{50}$

15. blue or red



Explore

7. A. What color (or colors) is most common in your samples?

B. Look at the median. On average, how many of the most common color did you pull?

8. A. What color is least common in your samples?

B. Look at the median. On average, how many of the least common color did you pull?

9. A. Predict the total number of each color in the bag. Write your predictions in a table like this one. Remember that there are 50 tiles in all and the number of each color must be a multiple of 10.

B. Describe how you used your data to predict the total number of each color in the bag.

Color	Prediction	Actual

10. After you make your predictions, count the number of each color that are actually in the bag. Write the actual number of each color in your table. Also check the recipe in the envelope for your bag.

11. Were your predictions the same as your actual total? Explain what happened.

12. Suppose you return all your tiles to your bag, mix them up, and pick one tile:

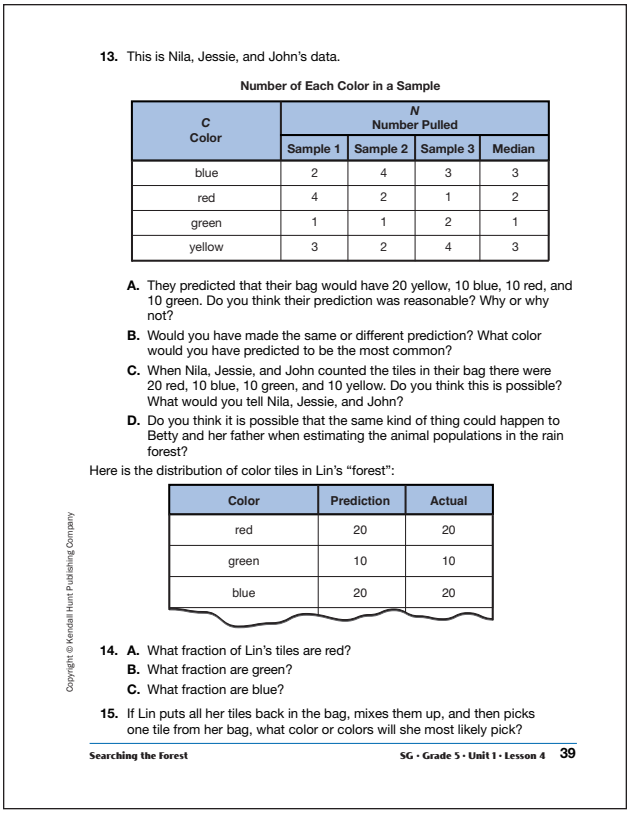
A. What is the most likely color you will choose? (Note: there may be more than one "most likely color.")

B. What is the least likely color?

Copyright © Kendall Hunt Publishing Company

38 SG • Grade 5 • Unit 1 • Lesson 4 Searching the Forest

Student Guide **- Page 38**



13. This is Nila, Jessie, and John's data.

Number of Each Color in a Sample

C Color	N Number Pulled			
	Sample 1	Sample 2	Sample 3	Median
blue	2	4	3	3
red	4	2	1	2
green	1	1	2	1
yellow	3	2	4	3

A. They predicted that their bag would have 20 yellow, 10 blue, 10 red, and 10 green. Do you think their prediction was reasonable? Why or why not?

B. Would you have made the same or different prediction? What color would you have predicted to be the most common?

C. When Nila, Jessie, and John counted the tiles in their bag there were 20 red, 10 blue, 10 green, and 10 yellow. Do you think this is possible? What would you tell Nila, Jessie, and John?

D. Do you think it is possible that the same kind of thing could happen to Betty and her father when estimating the animal populations in the rain forest?

Here is the distribution of color tiles in Lin's "forest":

Color	Prediction	Actual
red	20	20
green	10	10
blue	20	20

14. A. What fraction of Lin's tiles are red?

B. What fraction are green?

C. What fraction are blue?

15. If Lin puts all her tiles back in the bag, mixes them up, and then picks one tile from her bag, what color or colors will she most likely pick?

Copyright © Kendall Hunt Publishing Company

Searching the Forest SG • Grade 5 • Unit 1 • Lesson 4 39

Student Guide **- Page 39**

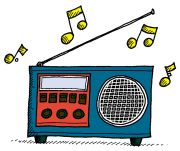
***Answers and/or discussion are included in the lesson.**

Copyright © Kendall Hunt Publishing Company

Homework

Radio Favorites

Michael asked some fifth-grade students at his school about the type of music they play on their favorite radio stations. This is what he found:



M Type of Music	*N* Number of Students
classical	2
rhythm and blues	4
oldies	4
country and western	6
rock	5
rap	4

1. How many students did Michael survey?
2. **A.** Is Type of Music a numerical or categorical variable? How can you tell?
   B. Is Number of Students a numerical or categorical variable? How can you tell?
3. What was the most popular type of music?
4. You may want to organize your answers to this question in a table.
   A. There are 100 fifth-grade students in Michael's school. Estimate how many fifth graders like each type of music.
   B. Describe how you used the data to make your estimate.
5. Describe a survey you would like to carry out. Tell what variables you would study and what values of those variables you would expect. For example, the variables Michael studied were Type of Music and Number of students. The values for the type of music were classical, rhythm and blues, oldies, country and western, rock, and rap.

Copyright © Kendall Hunt Publishing Company

***Student Guide* - Page 40**

Candy Grab

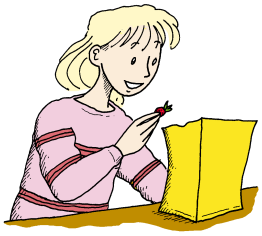
You will need a piece of graph paper to complete this part of the homework.

Alexis pulled candies from a brown bag. This is her data:

Number of Each Color in a Sample

C Color	*N* Number Pulled			
	Sample 1	Sample 2	Sample 3	Median
red	6	8	5	
green	2	1	2	
blue	2	1	3	

6. What is the median number for each color?
7. Make a bar graph of Alexis's data.
8. If Alexis takes another sample, which color would be most common? Why do you think so?
9. Alexis's bag has 50 candies. The number of each color is a multiple of 10. How many candies of each color do you think are in the bag?



Copyright © Kendall Hunt Publishing Company

***Student Guide* - Page 41**

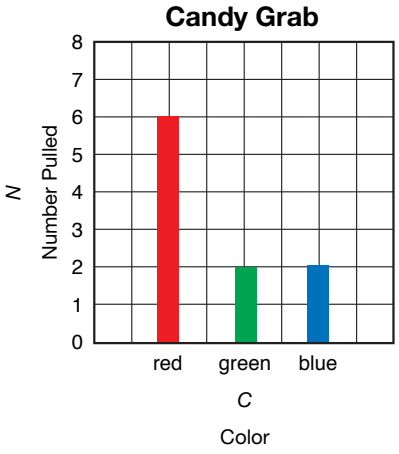
Homework (SG pp. 40–41)
Questions 1–9

1. 25 students
2. **A.** categorical; the values are not numbers.
   B. numerical; the values are given in numbers.
3. country and western
4. **A.** Answers will vary. Multiplying each number in the sample by 4: classical is 8 students, rhythm and blues is 16 students, oldies is 16 students, country and western is 24 students, rock is 20 students, rap is 16 students.

Favorite Music Types

Type of Music	Number of Students
classical	8
rhythm and blues	16
oldies	16
country and western	24
rock	20
rap	16

   B. Possible response: since there are 25 students in the survey, I multiplied each of the numbers in the table by 4 because $4 \times 25 = 100$.
5. Answers will vary.
6. red is 6, green is 2, blue is 2.
7.



8. Red is the most likely color because it had the highest median for the first three samples.
9. Based on the data: 30 red, 10 green, 10 blue.

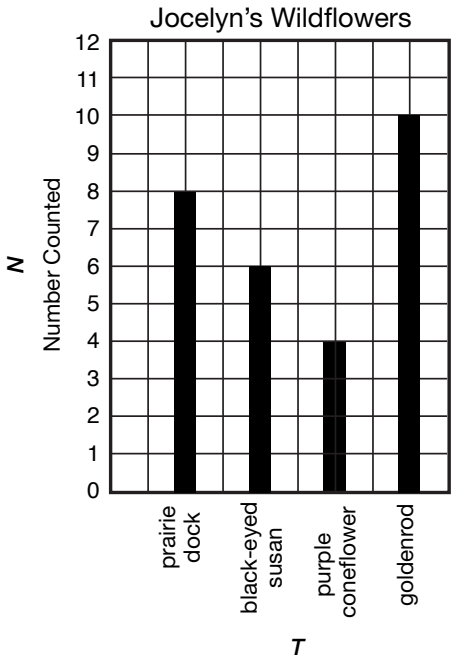
Copyright © Kendall Hunt Publishing Company

Teacher Guide

Jocelyn's Wildflowers (TG pp. 1–2)
Questions 1–3

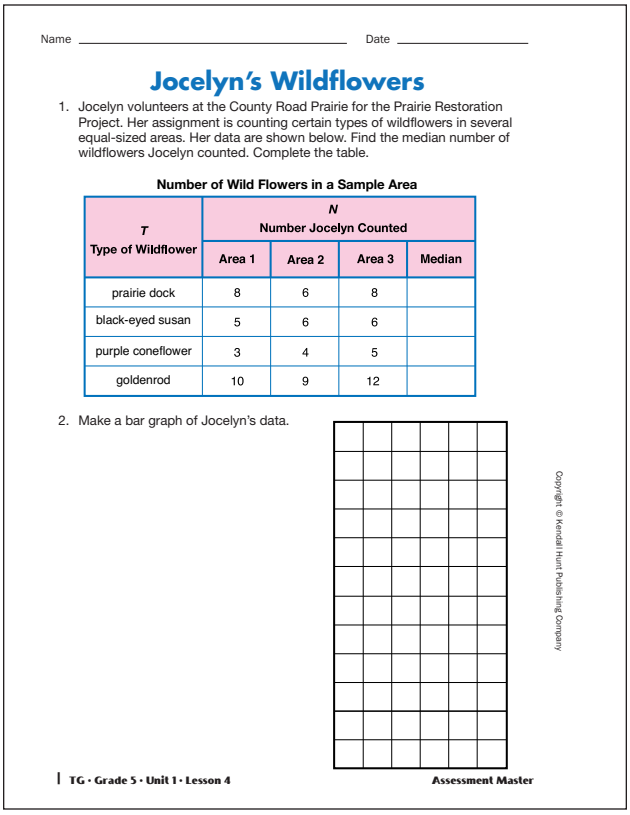
1. 8, 6, 4, 10

2.



3. Estimates based on multiplying the median numbers of flowers by 50

Type of Wildflower	Estimated Number in County Road Prairie
prairie dock	400
black-eyed susan	300
purple coneflower	200
goldenrod	500



Name _____ Date _____

Jocelyn's Wildflowers

1. Jocelyn volunteers at the County Road Prairie for the Prairie Restoration Project. Her assignment is counting certain types of wildflowers in several equal-sized areas. Her data are shown below. Find the median number of wildflowers Jocelyn counted. Complete the table.

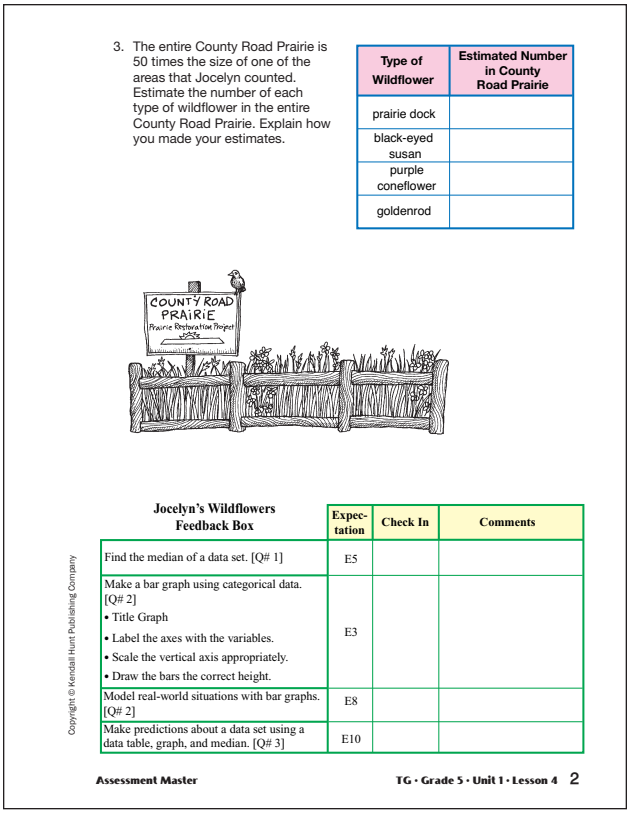
Number of Wild Flowers in a Sample Area

T Type of Wildflower	*N* Number Jocelyn Counted			
	Area 1	Area 2	Area 3	Median
prairie dock	8	6	8	
black-eyed susan	5	6	6	
purple coneflower	3	4	5	
goldenrod	10	9	12	

2. Make a bar graph of Jocelyn's data.

Copyright © Kendall Hunt Publishing Company

Teacher Guide - Page 1



3. The entire County Road Prairie is 50 times the size of one of the areas that Jocelyn counted. Estimate the number of each type of wildflower in the entire County Road Prairie. Explain how you made your estimates.

Type of Wildflower	Estimated Number in County Road Prairie
prairie dock	
black-eyed susan	
purple coneflower	
goldenrod	

Jocelyn's Wildflowers Feedback Box	Expectation	Check In	Comments
Find the median of a data set. [Q# 1]	E5		
Make a bar graph using categorical data. [Q# 2] • Title Graph • Label the axes with the variables. • Scale the vertical axis appropriately. • Draw the bars the correct height.	E3		
Model real-world situations with bar graphs. [Q# 2]	E8		
Make predictions about a data set using a data table, graph, and median. [Q# 3]	E10		

Copyright © Kendall Hunt Publishing Company

Teacher Guide - Page 2

Copyright © Kendall Hunt Publishing Company