

LETTER HOME

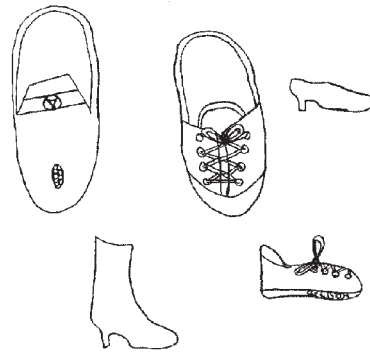
Populations and Samples

Dear Family Member:

Welcome to Math Trailblazers. This curriculum is based on two foundational ideas: the scientific investigation of everyday situations is an ideal setting for learning mathematics, and all students deserve a rich and challenging curriculum.

Throughout the year, we will create a mathematics classroom where students work together on challenging tasks and discuss ideas with their peers, teacher, and family. At times I will ask you to participate by sending small items to school, playing a math game, or helping with homework assignments.

We begin this year by collecting and using data about our classroom. This first unit, Populations and Samples, addresses ways of collecting, organizing, describing, and making generalizations and predications about a data set. The unit begins with students studying the number of eyelets in their shoes. Your child will then develop questions that will lead to surveys that can be used to collect and analyze data about the class using both categorical and numerical variables. Your child will use data tables, line plots, and bar graphs to represent the data collected. He or she will also use averages to describe the data that is collected. In this unit, your child will use two types of averages to represent the data: the median and the mode.



E = number of eyelets on two shoes

P = number of pairs of shoes with that number of eyelets

Students draw pictures to show what an experiment is about and what the important variables are.

Your child will also conduct an investigation in which students study a small sample of a larger population in order to make estimates about the population. Your child will organize the data, make and interpret a bar graph, and make and check predictions.

As we explore mathematics concepts in the classroom, you can help by providing additional mathematics opportunities at home. For example:

- **Averages.** Watch for the word “average”. It may appear on food labels, in weather reports, in sporting events, or in newspapers and magazines. Discuss these averages with your child.
- **Graphs and Tables.** Invite your child to look for graphs and tables in printed materials such as newspapers, magazines, and books. Discuss the graphs with your child. You might ask questions like:
 - What information does the graph show?
 - Does anything surprise you about the graph?
 - What else would you like to know based on what you see?
 - What variables are being compared?
- **Kinds of Data.** Encourage your child to talk about the Searching the Forest Lab. Ask your child to describe what was investigated, how he or she carried out the investigation, and what your child learned about using samples to make generalizations about a population.

Thank you for taking time to talk with your child about what he or she is doing in math. I look forward to working with you and your child during this school year. Please feel free to contact me with any questions, concerns, or comments.

Sincerely,

Unit 1: Home Practice

Part 1 Variables and Values

1. **A.** David asks each of his family members what their favorite vegetable is. Is he collecting data on a numerical or categorical variable?

B. List four possible values for this variable.

2. **A.** Alexis asks her classmates how long it takes them to get to school. What variable is she studying? Is it numerical or categorical?

B. List four possible values for this variable. (*Hint:* How long does it take you to get to school? How long does it take your friends?)

3. **A.** Brandon asks his friends what type of sandwiches they are going to order at the restaurant. Is he collecting data on a numerical or categorical variable?

B. List four possible values for this variable.

Part 2 Find the Median

Find the median for each set of data given below. Show how you decided.

1. Roberto, David, Nila, Lee Yah, and Romesh compare the number of movies their families own. Roberto owns 47 movies while David only owns 4. Nila owns 23 movies, Lee Yah owns 18 movies, and Romesh owns 15 movies. What is the median number of movies? (*Hint:* First list the number of movies owned by each family in order from smallest to largest. You should list five numbers.)
2. Brandon compares five different types of basketball shoes. His favorite brand has 24 eyelets. His least favorite has 32 eyelets. Two brands have pairs of shoes with 20 eyelets. Another brand has 28 eyelets. What is the median number of eyelets? (*Hint:* List the number 20 twice since two pairs of shoes have 20 eyelets.)
3. There are seven people in Felicia's family. Four members of her family have 5 pairs of shoes. Two members of her family have 3 pairs of shoes. Her mother has 15 pairs of shoes. What is the median number of pairs of shoes in Felicia's household? What is the mode?
4. Four people in David's family celebrate birthdays in September. David buys 4 cards. The card for his mother costs \$2.25. The cards for his two brothers are \$1.25 and \$1.40. The card for his cousin is \$1.50. What is the median price of the birthday cards?
5. What is the median height in your household? How did you decide?

Part 3 Sums and Differences

1. Solve the following problems using paper-and-pencil or mental math. Use the *Addition* and *Subtraction Strategies Menus* in the *Student Guide* Reference section. Estimate to make sure your answers are reasonable.

A. $75 + 39 =$ B. $167 + 74 =$ C. $254 - 118 =$

D. $7046 + 856 =$ E. $9233 - 560 =$ F. $8570 + 2545 =$

G. $5649 - 1850 =$ H. $5503 + 7098 =$ I. $6800 - 4874 =$

- J. Explain how you used mental math to solve one of the problems.

- K. Explain how you used estimation to make sure your answer for Question F is reasonable.

2. Solve the following problems in your head.

A. $30 + 90 =$ _____ B. $50 + 60 =$ _____ C. $160 - 90 =$ _____

D. $148 - 50 =$ _____ E. $240 + 80 =$ _____ F. $100 - 32 =$ _____

G. $650 + 250 =$ _____ H. $732 + 632 =$ _____ I. $389 + 11 =$ _____

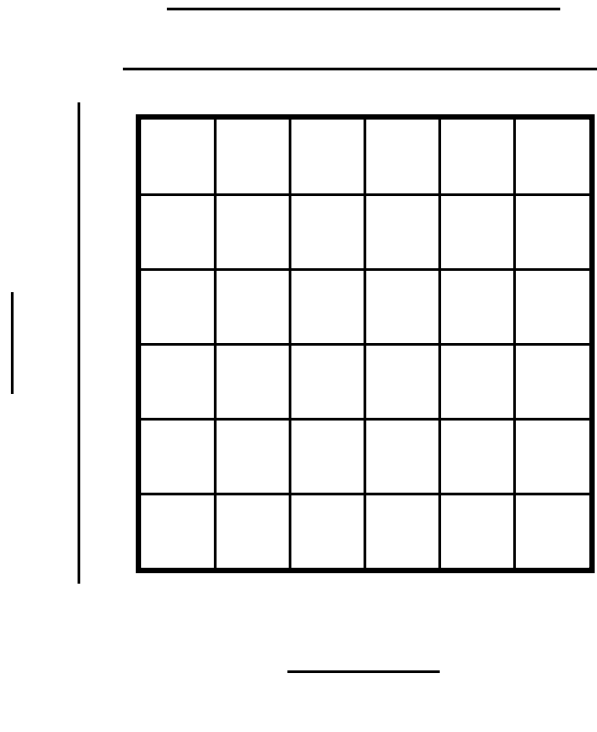
3. On another sheet of paper, choose two of the problems and then explain how you solved them using mental math.

Part 4 Brandon's Data

Brandon collected data on the number of windows in each room of his home. His data is shown below. Make a bar graph of Brandon's data. Label the horizontal axis with the variable, Number of Windows. Then answer the questions.

Brandon's Data

<i>W</i> Number of Windows	<i>R</i> Number of Rooms
0	0
1	2
2	3
3	0
4	1

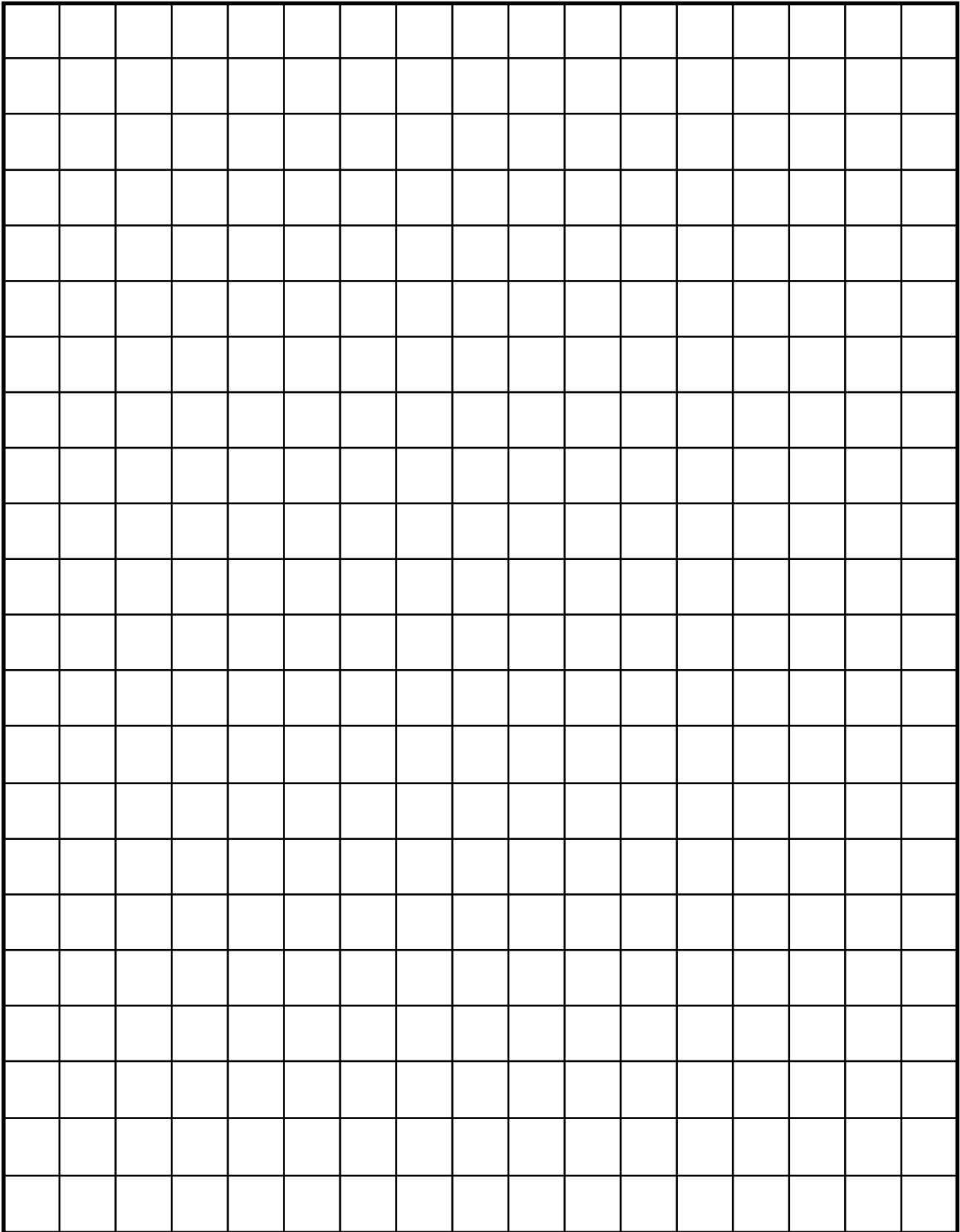


1. What is the most common number of windows in the rooms in Brandon's home? _____
2. How many windows are in Brandon's home altogether? Show or tell how you know.

Part 5 Problem Solving

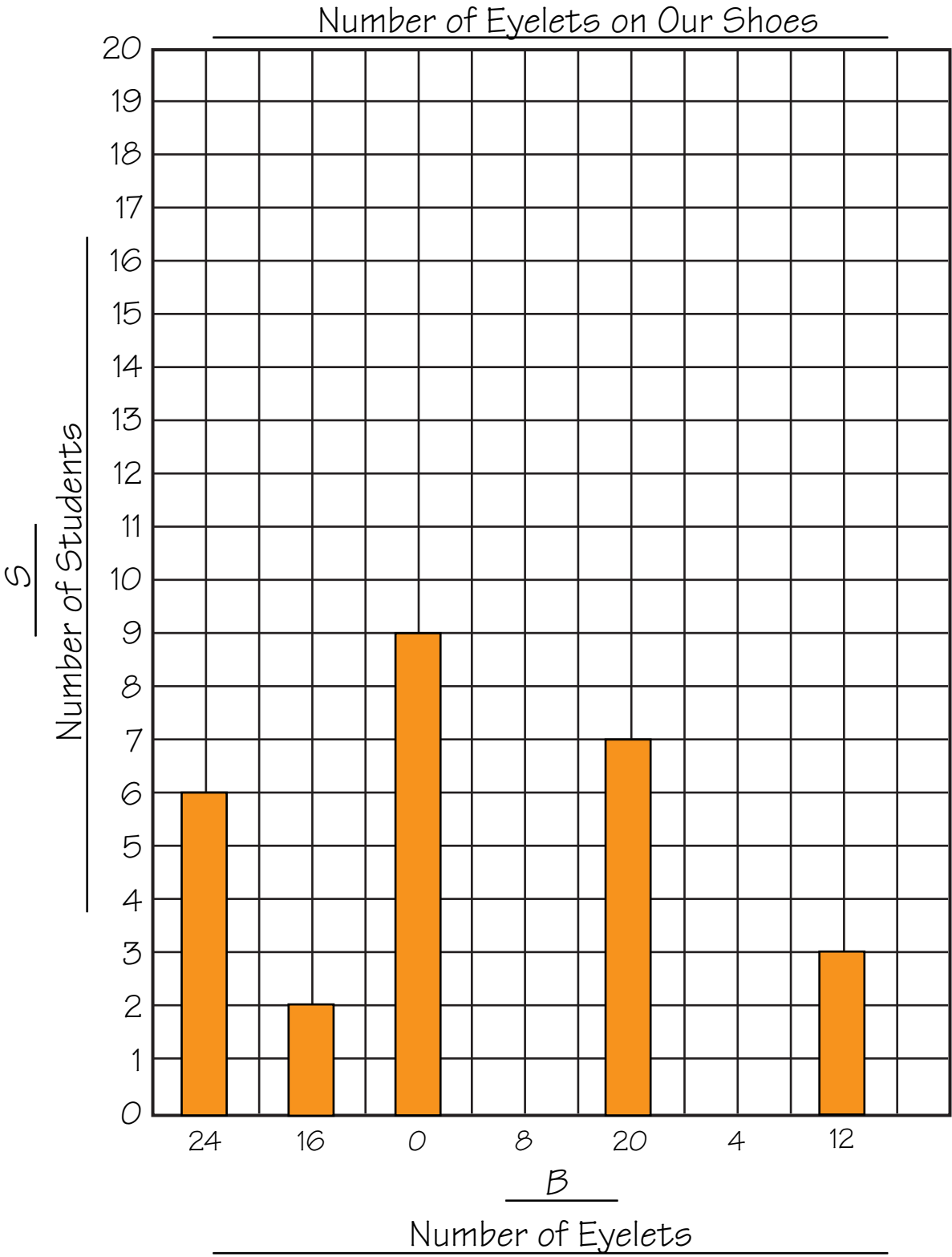
Choose an appropriate method to solve each of the following problems. For some questions you may need to find an exact answer, but for others you may need only an estimate. For each question, you may choose to use paper and pencil, mental math, or a calculator. Be prepared to tell the class how you solved each problem.

1. Michael's mother baked 3 dozen cookies for Michael's birthday party. If seven friends are coming to the party, how many cookies can each child have if they share the cookies equally? (*Hint: Don't forget to give Michael some cookies.*)
2. The gym teacher bought 50 balls for the high school. He bought 35 tennis balls which cost 60¢ each. The rest of the balls were golf balls which cost \$1.25 each. How much money did he spend altogether?
3. Mr. Moreno went to Springfield for a four-day weekend. He stayed at a hotel for three nights. The bill was \$267. What was the rate for each night?
4. Irma is shopping with her cousin Maria, who recently got married. As a wedding gift, Maria received a \$100 gift certificate to a department store. She finds the following items that she wants to buy: a comforter for \$48, two pillows for \$23 each, a waffle maker for \$39, three picture frames for \$5.95 each, and a cookbook for \$12. Make a list of the items she can purchase with her gift certificate. Explain your thinking.



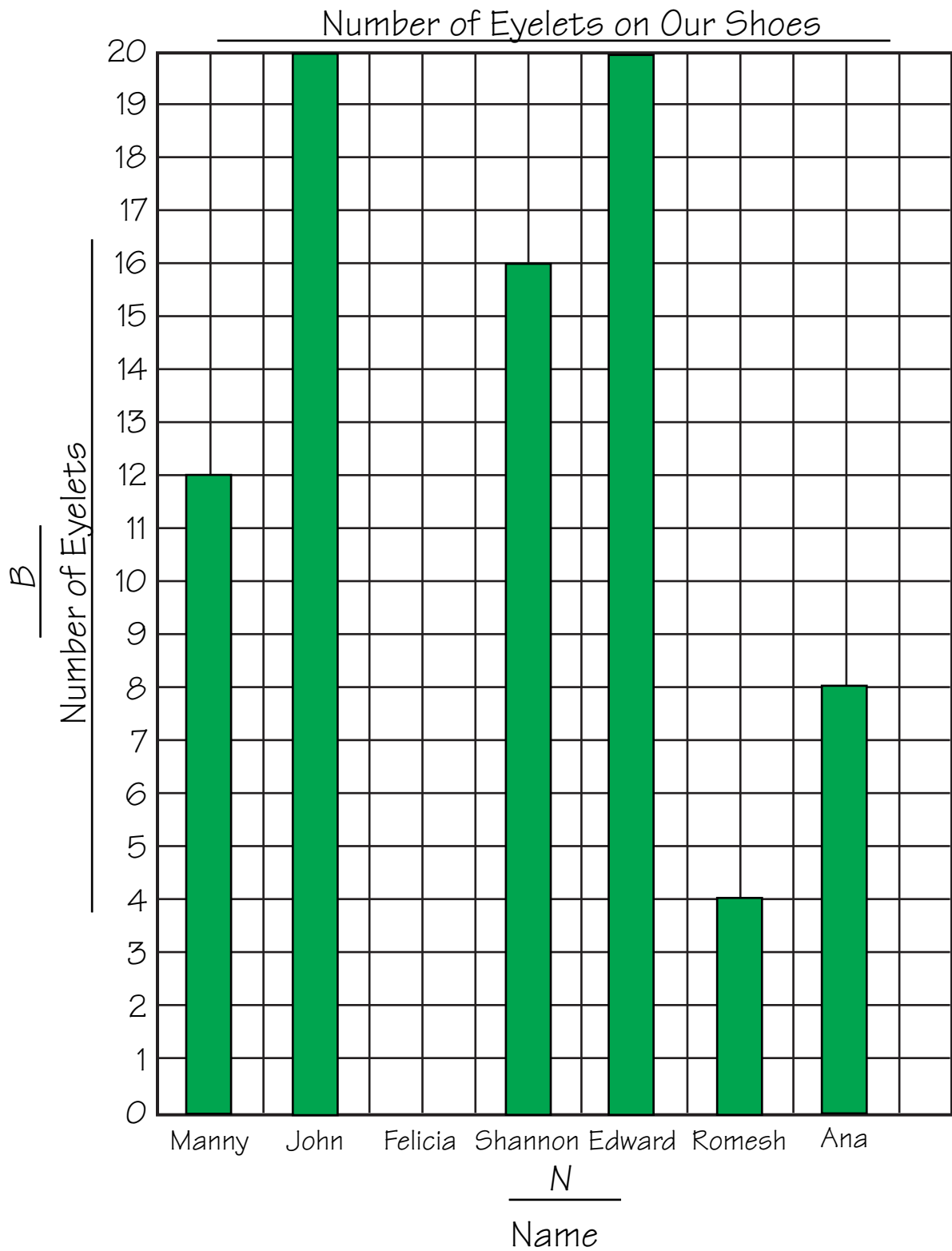
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Bar Graph I: How Can It Be Improved



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Bar Graph II: How Can It Be Improved



Pockets at St. Crispin's

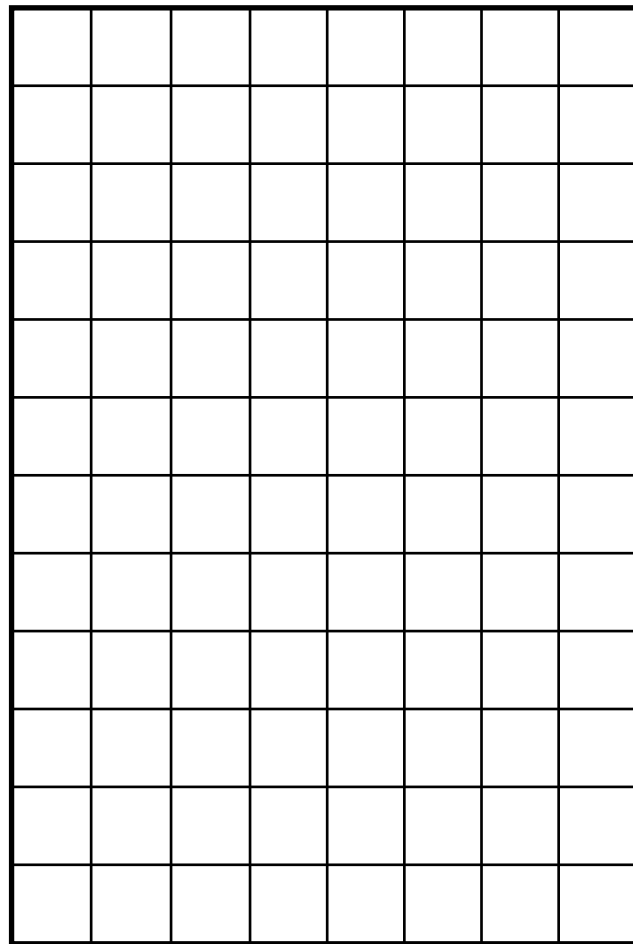
One day, the students in Mrs. Judd's fifth-grade class at St. Crispin School counted the pockets on their clothes. The table on the left shows their data.

To understand this data, you must know that the students at St. Crispin's wear uniforms. The girls wear white blouses and plaid skirts; the boys wear dark blue pants and light blue shirts.

- Make a bar graph of the data.

**Students per
Number of Pockets**

N Number of Pockets	S Number of Students
0	0
1	5
2	6
3	0
4	0
5	12
6	0
7	0



- How many students are in Mrs. Judd's class?

Show or tell how you know.

- What is the mode? _____

4. Describe the shape of the graph.
 - A. How many bars are on your graph?
 - B. Are all the bars about the same height or are some bars much taller than the others?
 - C. Which is the tallest bar?
 - D. Why do you think the bars on the graph are where they are?

5. Describe how the pocket graph might change if the girls wore pants instead of skirts.



**Pockets at St. Crispin’s
Feedback Box**

	Expectation	Check In	Comments
Make a bar graph using numerical data. [Q# 1]	E4		
Find the mode of a data set. [Q# 3, 4C]	E6		
Read a table or bar graph to find information about a data set. [Q# 2, 4A–C]	E7		
Model real-world situations with bar graphs. [Q# 4D, 5]	E8		

Yes ...

Yes, but ...

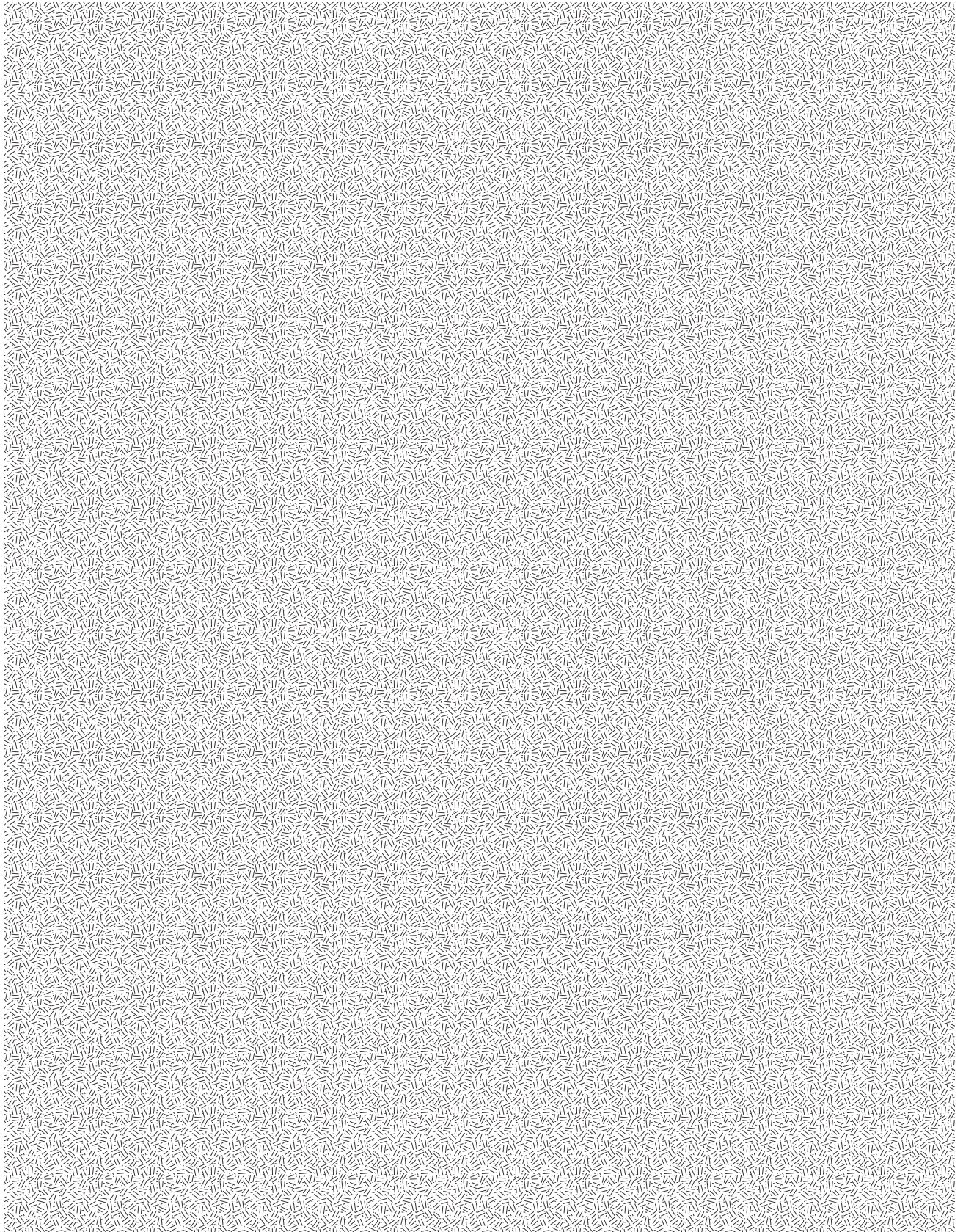
No, but ...

No ...

<p>MPE5. Show my work. I show or tell how I arrived at my answer so someone else can understand my thinking. [Q# 4–5]</p>				
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Digit Cards 0-9

5	0
6	1
7	2
8	3
9	4



Name _____ Date _____

Using Averages to Answer Questions
Check-In: Questions 2–5 Feedback Box

	Expectation	Check In	Comments
Make a bar graph using numerical data. [Q# 3]	E4		
Find the median of a data set. [Q# 4]	E5		
Find the mode of a data set. [Q# 4]	E6		
Read a table or bar graph to find information about a data set. [Q# 2]	E7		
Model real-world situations with bar graphs. [Q# 3]	E8		
Make predictions and generalizations about a data set using a median and mode. [Q# 5]	E9		
Make predictions and generalizations about a data set using a data table and graph. [Q# 5]	E10		

Yes ...

Yes, but ...

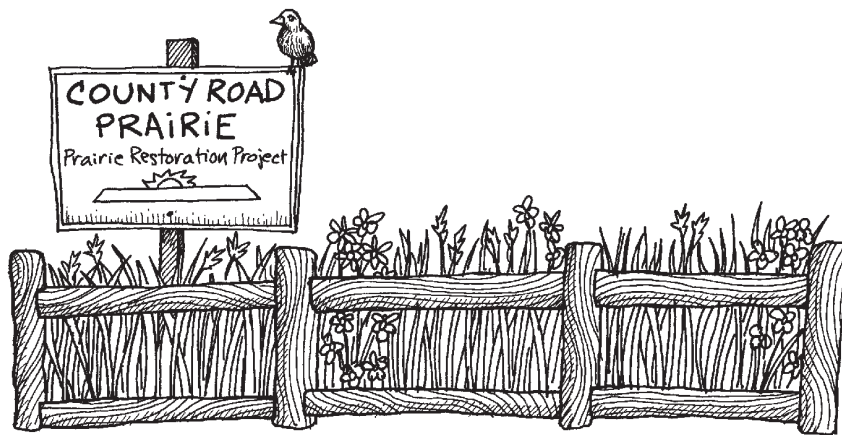
No, but ...

No ...

	Yes ...	Yes, but ...	No, but ...	No ...
MPE1. Know the problem. I read the problem carefully. I know the questions to answer and what information is important. [Q# 2]				
MPE5. Show my work. I show or tell how I arrived at my answer so someone else can understand my thinking. [Q# 5]				
MPE6. Use labels. I use labels to show what numbers mean. [Q# 3, 5]				

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		

Name _____ Date _____

Line Plot Paper



Test Your Knowledge: Using Data to Solve Problems

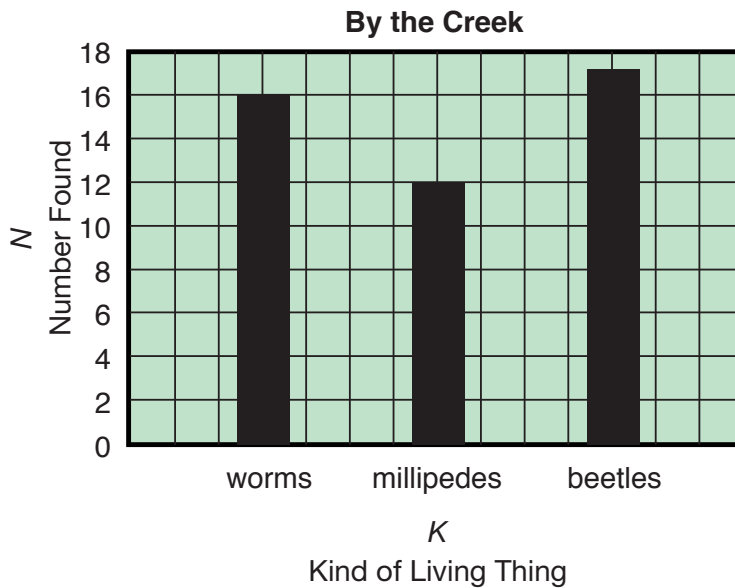
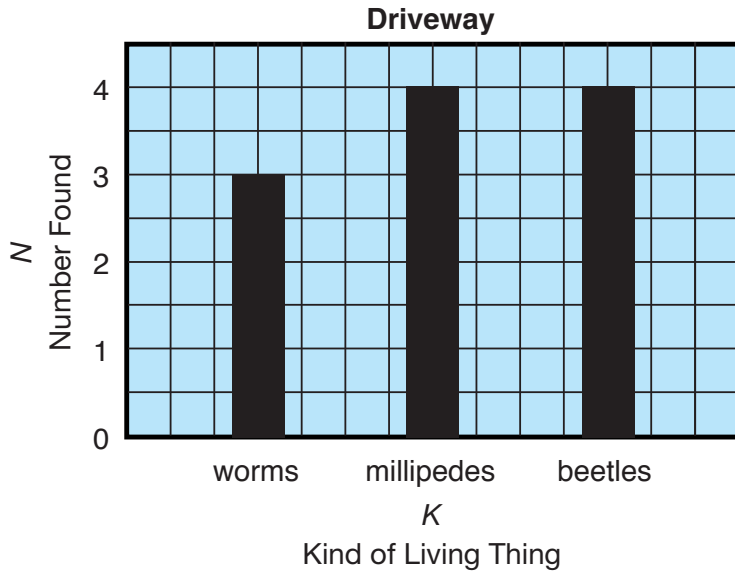
- I. Grace's Grandmother Kruger lives on a farm. For a science experiment, Grace dug up three buckets of dirt from her grandmother's flower garden. Then she looked at what was in each bucket and put the information into this data table.

Living Things in Grandmother's Flower Garden

<i>K</i> Kind of Living Thing	<i>N</i> Number of Living Things			Median
	Bucket 1	Bucket 2	Bucket 3	
worms	8	18	15	
millipedes	8	8	11	
beetles	9	8	17	

- A. What are the variables in Grace's investigation?
- B. Are the variables categorical or numerical?
- C. Find the median for the number found of each kind of living thing.
- D. Use a piece of *Centimeter Graph Paper* to make a graph of Grace's data. Use the median values.
- E. Grace took another bucketful of dirt from the same garden. Predict what kind of living thing she will find the most. Which do you think will be the least? Explain how you made your predictions.

2. Next Grace took a bucketful of dirt from the gravel driveway and one from the creek bank near her grandmother’s house. She graphed the data from the two sites and compared them. Here are her graphs.



- A.** Alexis looked at the graphs and said since both graphs have two taller bars and one shorter bar there is not much difference in the graphs. She decided that both buckets of dirt were pretty much the same. Do you agree with Alexis? Why or why not?
- B.** Use the graphs to describe the two buckets of dirt. What do they tell you about the living things in the driveway and by the creek?

3. The students in Mr. Moreno's class are keeping track of the number of laps they run during warm-up time in gym class. They record their progress on a chart on the wall. Here is their chart after the first day.

Student's Name	Number of Laps Completed
Michael	5
Nicholas	8
Keenya	4
Grace	7
John	8
Jackie	10
Irma	6
Jessie	4
Luis	5
Frank	7
Shannon	9
Ming	9
Roberto	10
Nila	5
Ana	7
Linda	7
Jacob	6
Lee Yah	7
Tanya	5
Romesh	7
Jerome	9
Maya	6

- A. If one of the variables is Number of Laps Completed, what is the second variable?
- B. Are the two variables categorical or numerical? How do you know?

4. **A.** Use the data collected on the chart in Question 3 to complete the data table.

Laps Run in Gym Class

Number of Laps	_____
0	
2	
6	

- B.** Use *Centimeter Graph Paper* to make a bar graph representing the data collected.

5. **A.** What is the median number of laps that the students in Mr. Moreno’s class ran on the first day? Explain how you decided.

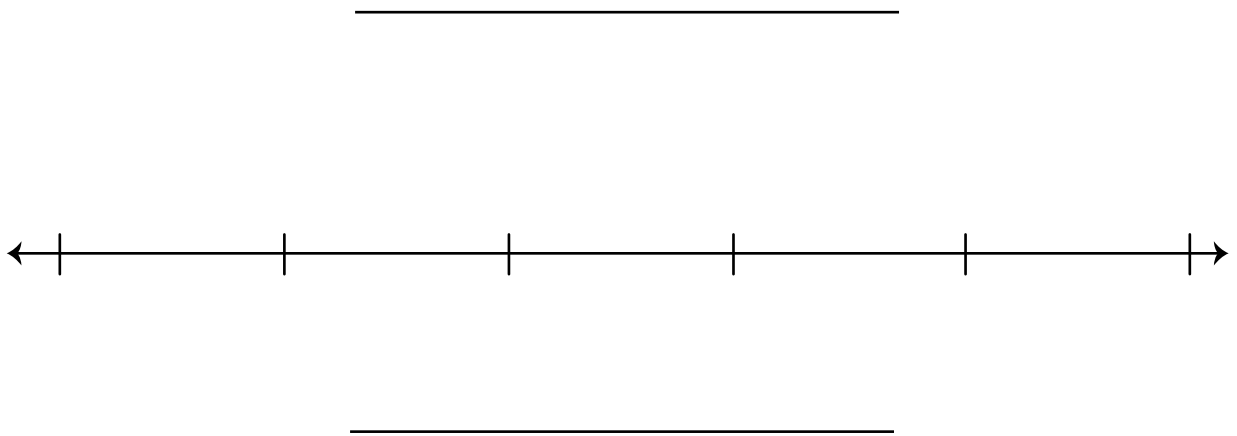
- B.** How many students ran fewer than the median number of laps? How many students ran more than the median number of laps?

6. Jackie is helping her grandmother organize her sewing room. She found a box of fabric remnants in the closet that her grandmother used in quilting. She sorted the remnants and made a table to show what was in the box.

Remnants

Length of Remnant in Yards	Number of Remnants
$\frac{1}{4}$	3
$\frac{1}{2}$	8
$\frac{3}{4}$	2
1	7
$1\frac{1}{4}$	5
$1\frac{1}{2}$	2

Complete the line plot to represent the data in Jackie’s data table.



7. **A.** How many remnants did Jackie find in the box?
B. What is the median length of the remnants she found?
C. What is the mode for the length of the remnants?

8. Jackie’s grandmother needs 4 pieces of fabric that when put together will be 3 yards in length. Each piece of fabric must be a different length. Find two different combinations of remnants that Jackie can give to her grandmother. Show or tell how you decided.

Test Your Knowledge: Using Data to Solve Problems

	Expectation	Check In	Comments
Make a bar graph with categorical data. [Q# 1D]	E3		
Make a line plot or bar graph using numerical data. [Q# 4B, 6]	E4		
Read a table, line plot, or bar graph to find information about a data set. [Q# 1A–C, 3A–B, 4A, 5A–B, 7A–C]	E7		
Make predications or generalizations about a data set using a data table and graph. [Q# 1E, 2A–B, 8]	E10		