Blanca and Irma did their survey. They studied the kinds of shoes the students in their class wore the first day of school. This is what they found:

Kind of Shoes

K Kind of Shoe	*N* Number of Pairs of Shoes
Gym Shoes	5
Flats	9
Lace-up Boots	2
Sandals	4
Flip-flops	7

Discuss

1. **A.** Do you think Blanca's data will help convince her mother that flats are okay for school? Why or why not?
   B. Would a graph help? If so, how?
2. What is the most common kind of shoe in Blanca's class?
3. If you surveyed your class, how do you think the data would compare with Blanca's?
4. What kind of shoes do you think are most popular in your school?

Variables are things that change or vary in an experiment or survey. The two main variables in Blanca and Irma's survey are Kind of Shoe and Number of Pairs of Shoes. The kinds of shoes vary from gym shoes to flip-flops.

The possible outcomes for each variable are called **values.** Gym Shoes, Lace-Up Boots, and all the kinds of shoes listed in the first column of the data table are values of the variable Kind of Shoe. The number of pairs of shoes varied from 2 to 9 pairs. We can say that 2, 4, 5, 7, and 9 are values of the variable Number of Pairs of Shoes.

Student Guide - Page 3

5. What else can you study about the way people look and the way they dress? Make a list of variables you can study. List two or three values for each variable. Make a table like the one shown.

Variables and Possible Values

Variables	Values
Kind of Shoe	Gym Shoes, Lace-up Boots, Flats, Flip-flops
Number of Pairs of Shoes	0, 3, 5
Shirt Color	White, Red, Plaid
Height	56 in., 58 in.

Numerical variables are variables with values that are numbers. Number of Pairs of Shoes and Height are numerical variables. **Categorical variables** have values that are not numbers. Kind of Shoe and Shirt Color are examples of categorical variables.

6. On the data table you made for Question 5, write an *N* beside the numerical variables and a *C* beside the categorical variables.

Eyelets

In this lab, you will answer a certain question about how the students in your class dress for school using the TIMS Laboratory Method. This method is very much like the method scientists use in their investigations.

Usually, an investigation begins with a question. For this investigation, we ask the question: *How many eyelets are on students' shoes in your class?*

7. Look around your classroom. Talk with a partner to answer the questions below. Be ready to explain your thinking.
   A. What do you think is the most common number of eyelets?
   B. How many pairs of shoes have 0 eyelets? 5 eyelets? 8 eyelets? Why do you think so?
   C. Estimate the total number of eyelets in the class.

Student Guide - Page 4

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

Student Guide

Eyelets Labs (SG pp. 3–7)
Questions 1–19

1. **A.** Yes. The data show that the most popular type of shoe is flats.
   B. Answers will vary. However, a graph would show that the tallest bar is for flats.
2. Flats.
3. Answers will vary.
4. Answers will vary.
5.* Data tables will vary. Some possible responses include:

Variables	Values
Color of Hair	blond, brown, black, gray, red
Color of Eyes	blue, green, brown
Number of Buttons on Clothes	0, 1, 2, 3

6.* Answers will vary. For the possible responses listed above:

Variables	Values
Color of Hair	blond, brown, black, gray, red
Color of Eyes	blue, green, brown
Number of Buttons on Clothes	0, 1, 2, 3

7.* **A–C.** Answers will vary.
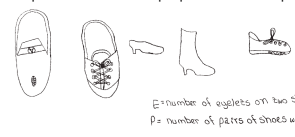
8.* **A.** Students' pictures will vary. See the *Student Guide* for a sample picture.

   B. See Figure 3 in Lesson 1 for a sample data table.

Student Guide - Page 5

9.* See Figure 4 in Lesson 1 for a sample graph.

The answers to *Questions 10–14* and *17–19* are based on the sample data in Figures 3 and 4 in Lesson 1.

10. **A.*** 3 pairs of shoes

   B.* 0 pair of shoes.

   C.* 6 pair of shoes.

11. **A.*** 0 eyelets.

   B.* The Number of Eyelets with the tallest bar is the mode.

12. **A.*** 0, 12, 16, 20, 24, 28, 32, 36.

   B.* They are all even. They are all multiples of four.

13.* No. Although 14 is even, it is not a multiple of four.

Student Guide - Page 6

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

Student Guide - **Page 7**

14. **A.*** 8 bars.

    B.* some bars are taller than others.

    C.* The tallest bars are at the left and in the middle on the graph.

    D.* See discussion in the Lesson.

15.* Answers will vary. Possible responses include: The graph would show more people with a larger number of eyelets. Basketball players are tall and have large feet. Large feet need larger shoes and larger shoes have more eyelets. Most players would have over 28 eyelets. So there wouldn't be any small number of eyelets shown.

16. Answers will vary. Possible responses include: The tallest bars would be at the beginning because sandals usually don't have eyelets. There would be a few bars since some people would wear shoes with eyelets.

17.* 412 eyelets.

18.* Answers will vary. One possible response is: If one class has 412 eyelets and there are 4 fifth-grade classrooms in the school, then there are about 1600 eyelets.

19. The shape of the graph would be the same as our graph but all the bars would be taller.

*Answers and/or discussion are included in the lesson.
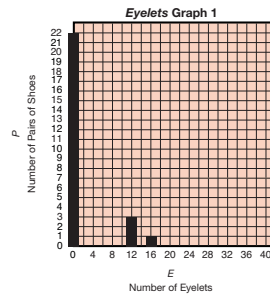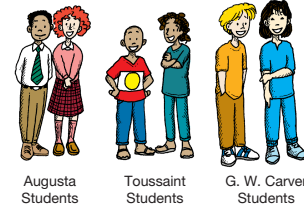
Homework (SG pp. 8–9)
Questions 1–4

1. Graph 1 goes with Toussaint School because many of the students wear sandals with no eyelets. The bar for zero is the tallest bar. Graph 2 goes with Augusta Academy because the students wear uniforms and the same shoes. So, there is one bar for boys with 16 eyelets and one for girls with no eyelets. (See the illustration in the *Student Guide.*) Graph 3 goes with G.W. Carver School because students wear a variety of shoes. The bars are all over the graph showing the variety of shoes.

2. Graph 1: The mode is 0 eyelets.
Graph 2: The mode is 0 eyelets.
Graph 3: The mode is 28 eyelets.

3. Answers will vary. Graph 3 is most like the sample graph in Figure 4 of Lesson 1 because the bars are spread across the graph.

4. Possible response: Adult might have larger shoes and therefore more eyelets. The graph will probably lock like Graph 3 but represent larger numbers like 20–40 eyelets.
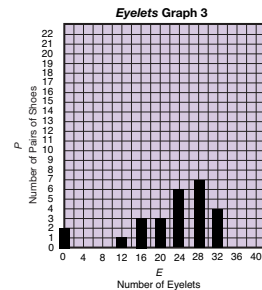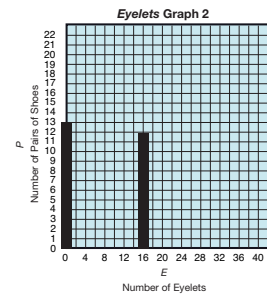
Student Guide - Page 8

Student Guide - Page 9