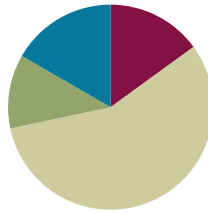# Lesson 1

Objective: Generate and organize data.

Related Topics: [More Lesson Plans for the Common Core Math](#)

Suggested Lesson Structure

■ Fluency Practice	(9 minutes)	
■ Application Problem	(7 minutes)	
■ Concept Development	(34 minutes)	
■ Student Debrief	(10 minutes)	
Total Time	**(60 minutes)**	

Fluency Practice (9 minutes)

- Group Counting on a Vertical Number Line **3.OA.1**   (3 minutes)
- Model Division with Tape Diagrams **3.MD.4**   (6 minutes)

Group Counting on a Vertical Number Line (3 minutes)

Note: Group counting reviews interpreting multiplication as repeated addition.

> T: (Project a vertical number line partitioned into intervals of 6, as shown. Cover the number line so that only the numbers 0 and 12 show.) What is halfway between 0 and 12?
>
> S: 6.
>
> T: (Write 6 on the first hash mark.)

Continue for the remaining missing hashes so that the number line shows increments of 6 to 60.

> T: Let's count by sixes to 60.

Direct students to count forward and backward to 60, occasionally changing the direction of the count. Repeat the process with the following possible suggestions.

- ■ Sevens to 70
- ■ Eights to 80
- ■ Nines to 90

Model Division with Tape Diagrams (6 minutes)

Materials: (S) Personal white boards

Note: This fluency reviews using tape diagrams to model division.

> T: (Project tape diagram with 6 as the whole.) What is the value of the whole?

S: 6.

T: (Partition the tape diagram into 2 equal parts.) How many equal parts is 6 broken into?

S: 2 equal parts.

T: Tell me a division problem to solve for the unknown group size.

S: 6 ÷ 2 = 3.

T: (Beneath the diagram, write 6 ÷ 2 = 3.)

T: On your boards, draw a rectangle with 8 as the whole.

S: (Draw a rectangle with 8 as the whole.)

T: Divide it into 2 equal parts, write a division equation to solve for the unknown, and label the value of the units.

S: (Partition the rectangle into 2 equal parts, write 8 ÷ 2 = 4, and label each unit with 4.)
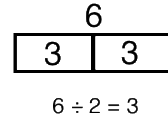
Continue with the following possible suggestions, alternating between teacher drawings and student drawings: 6 ÷ 3, 8 ÷ 4, 10 ÷ 5, 10 ÷ 2, 9 ÷ 3, 12 ÷ 2, 12 ÷ 3, and 12 ÷ 4.

Application Problem (7 minutes)

Damien folds a paper strip into 6 equal parts. He shades 5 of the equal parts and then cuts off 2 shaded parts. Explain your thinking about what fraction is unshaded.

Note: This Application Problem reviews the concept of defining the whole from G3–Module 5. Some students may say that one-fourth is unshaded if they see the strip as a new whole in fourths.
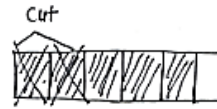
Concept Development (34 minutes)

Materials: (S) Problem Set, class list (preferably in alphabetical order as shown to the right)

Part 1: Collect data.

List the following five colors on the board: green, yellow, red, blue, and orange.

T: Today you will collect information, or **data**. We will **survey** to find out each person's favorite color from one of the five colors listed on the board. How can we keep track of our data in an organized way? Turn and talk to your partner.

S: We can write everyone's name with their favorite color next to it. → We can write each name and color code it with their favorite color. → We can put it in a chart.

Room 7 – Third Grade

Mrs. Lee/ Mrs. Prescott

Anna
Bradley
Caroline
Colin
Dana
Elaine
Fatima
Grace
Grant
Hailey
Ivanka
Jolie
Katelyn
Kyle
Leonard
Mason
Nariman
Riley
Spencer
Stephanie
Tanner
Yelena

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T: All of those ways work. One efficient way to collect and organize our data is by recording it on a tally chart. (Draw a single vertical tally mark on the board.) Each tally like the one I drew has a value of 1 student. Count with me. (Draw tally marks as students count.)

S: 1 student, 2 students, 3 students, 4 students….

T: (Draw ⊞⊞.) This is how 5 is represented with tally marks. How might writing each fifth tally mark with a slash help you count your data easily and quickly? Talk to your partner.

S: It's bundling tally marks by fives. → We can bundle 2 fives as ten. → Counting by fives is super easy.

T: (Pass out the Problem Set and class list.) Find the chart on Problem 1 of your Problem Set. Take a minute now to choose your favorite color out of those listed on the chart. Record your favorite color with a tally mark on the chart now, and cross off your name.

T: (Allow time for students to record favorite color.) Take six minutes to ask each of your classmates, "What is your favorite color?" Record their answer with a tally mark next to their favorite color. Once you're done with each person, cross his or her name off your class list to help you keep track of who you still need to ask. Remember, you may not change your color throughout the survey.

S: (Conduct survey for about six minutes.)

T: How many total students said green was their favorite color?

S: (Say the number of students.)

T: I am going to record it numerically on the board below the label *Green*.

Continue with the rest of the colors.

T: This chart is another way to show the same information.

T: How many students were surveyed?

S: 22.

T: Discuss your mental math with your partner for 30 seconds.

S: I added 4 then 2 to get 6. 6 and 6 is 12, and then I noticed I had 10 left. 12 and 10 is 22. → I made 2 tens, 6 plus 4 and 7 plus 3, then I added 2 more.

> **NOTES ON MULTIPLE MEANS OF REPRESENTATION:**
>
> Familiarize English language learners and others with common language used to discuss data, such as *most common, favorite, how many more*, and *how many fewer*. Offer explanations in students' first language, if appropriate. Guiding students to use the language to quickly ask questions about the tally chart at this point in the Concept Development prepares them for independent work on the Problem Set.

Example Board:

Green	Yellow	Red	Blue	Orange
4	2	6	7	3

Total: $4 + 2 + 6 + 7 + 3 = 22$

Part 2: Construct a picture graph from the data.

T: Let's graph the data we collected using pictures, or a picture graph. Read the directions for Problem 3 on your Problem Set. (Allow time for students to read.) What is different about these two picture graphs?

S: The keys are different! → Yeah, in Problem 3(a), one heart represents 1 student, but in Problem

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3(b), one heart represents 2 students.

T: Good observations! Talk to a partner: How would you represent 4 students in Problems 3(a) and 3(b)?

S: In 3(a), I would draw 4 hearts. → In 3(b), I would only draw 2 hearts because the value of each heart is 2 students.

T: (Draw ♡ ♡ ♡.) Each heart represents 2 students, like in Problem 3(b). What is the value of this picture?

S: 6 students.

T: Write a number sentence to represent the value of my picture where the number of hearts is the number of groups and the number of students is the size of each group.

S: (Write $3 \times 2 = 6$.)

MP.6

T: Turn and talk: How can we use the hearts to represent an odd number like 5?

S: We can cross off a part of the heart to represent 5. → We can show half of a heart to represent 1 student.

T: What is the value of half of 1 heart?

S: 1 student.

T: I'll estimate to erase half of 1 heart. (Erase half of 1 heart to show ♡ ♡ ♢ .) Now my picture represents a value of 5.

T: Begin filling out the picture graphs in Problem 3. Represent your tally chart data as hearts and half-hearts to make your picture graphs.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Precise sketching of hearts drawn in the picture graph of Problem 3 may prove challenging for students working below grade level and others. The task of completing the picture graph may be eased by providing pre-cut hearts and half-hearts that can be glued. Alternatively, you can offer the option to draw a more accessible picture, such as a square. If students choose a different picture, they need to be sure to change the key in order to reflect their choice.

Problem Set (10 minutes)

Students should do their personal best to complete Problems 2 and 4 within the allotted 10 minutes. Some problems do not specify a method for solving. This is an intentional reduction of scaffolding that invokes MP.5, Use Appropriate Tools Strategically. Students should solve these problems using the RDW approach used for Application Problems.

For some classes, it may be appropriate to modify the assignment by specifying which problems students should work on first.   With this option, let the careful sequencing of the Problem Set guide your selections so that problems continue to be scaffolded. Balance word problems with other problem types to ensure a range of practice. Assign incomplete problems for homework or at another time during the day.

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Student Debrief (10 minutes)

Lesson Objective: Generate and organize data.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- Compare the picture graphs in Problems 3(a) and 3(b). How are they the same? How are they different?
- Share answers to Problems 4(c) and 4(d). Some students may write a multiplication sentence in

  Problem 4(d) since it is called out in 4(c).
- How does a tally chart help you record and organize data?
- Compare picture graphs with tally charts. What makes each one useful? What are the limitations of each?
- Why is it important to understand the value of a unit in a picture graph?
- What new math vocabulary did we use today to talk about recording and gathering information? (**Data**, **survey**.)

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

Name _____   Date _____

1. "What is your favorite color?" Survey the class to complete the tally chart below.

Color	Number of Students
Green	
Yellow	
Red	
Blue	
Orange	

2. Use the tally chart to answer the following questions.

   a. How many students chose orange as their favorite color?

   b. How many students chose yellow as their favorite color?

   c. Which color did students choose the most? How many students chose it?

   d. Which color did students choose the least? How many students chose it?

   e. What is the difference between the number of students in (c) and (d)? Write a number sentence to show your thinking.

   f. Write an equation to show the total number of students surveyed on this chart.

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3. Use the tally chart in Problem 1 to complete the picture graphs below.

   a.

Favorite Colors				
Green	**Yellow**	**Red**	**Blue**	**Orange**

   Each ♡ represents 1 student.

   b.

Favorite Colors				
Green	**Yellow**	**Red**	**Blue**	**Orange**

   Each ♡ represents 2 students.
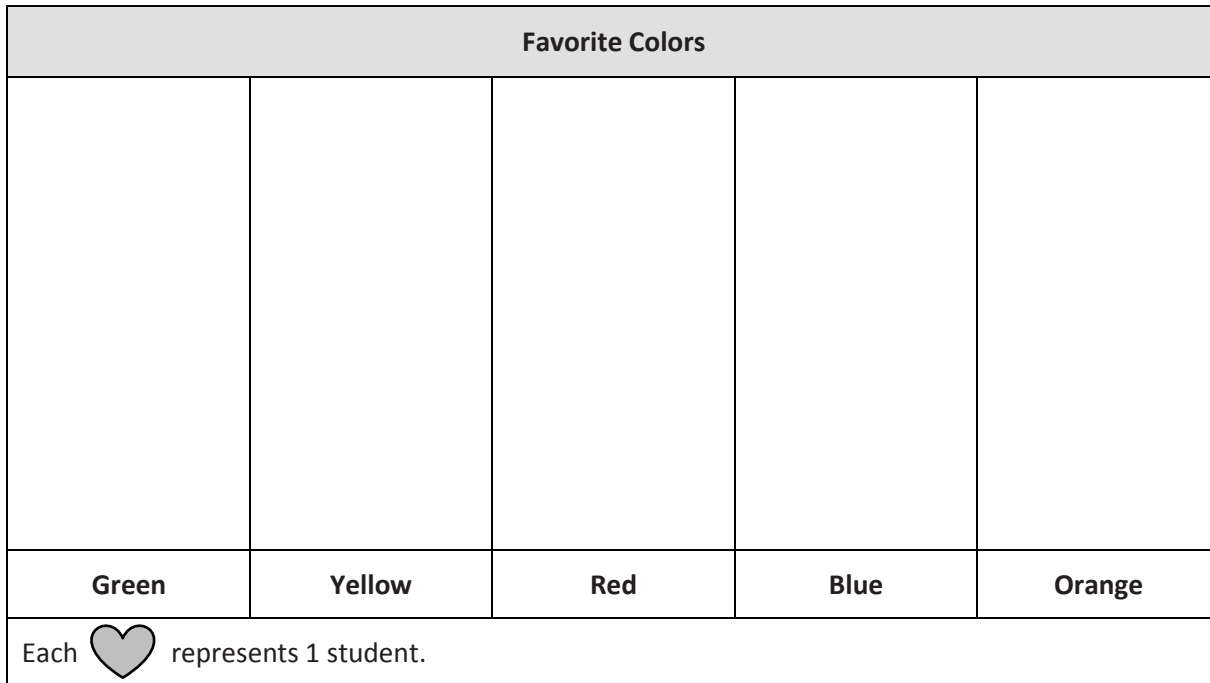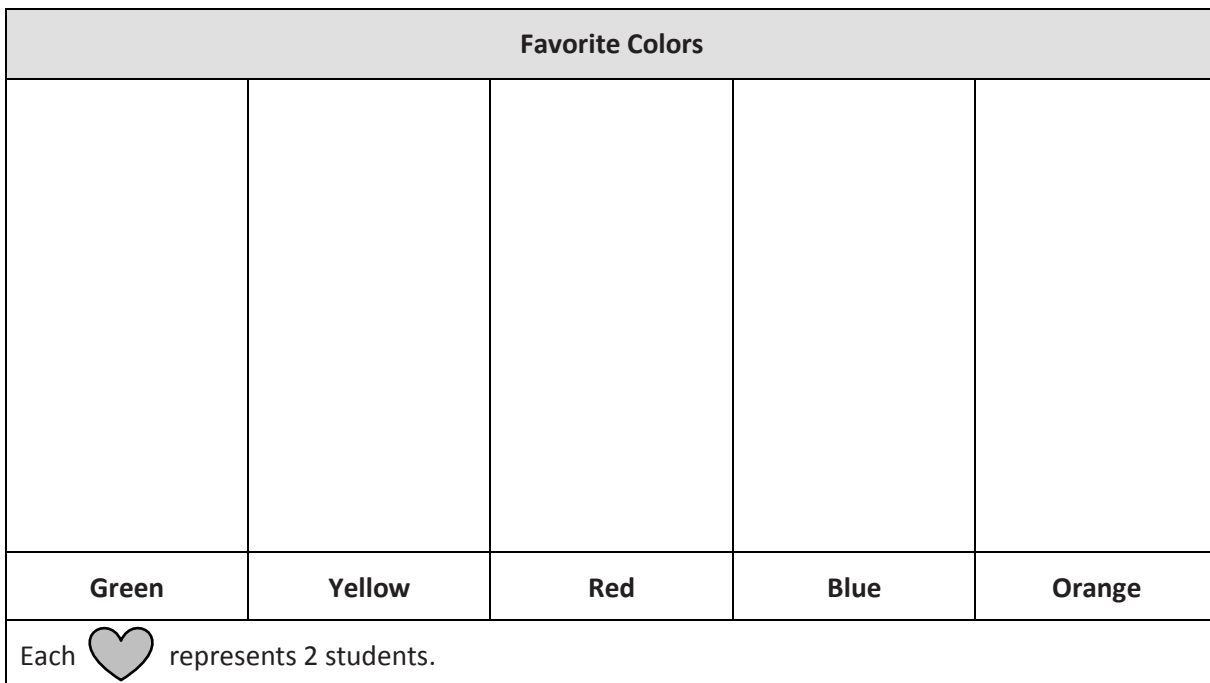
4. Use the picture graph in Problem 3(b) to answer the following questions.

    a. What does each ♡ represent?

    b. Draw a picture and write a number sentence to show how to represent 3 students in your picture graph.

    c. How many students does ♡ ♡ ♡ ♡ ♡ ♡ ♡ represent? Write a number sentence to show how you know.

    d. How many more ♡ did you draw for the color that students chose the most than for the color that students chose the least? Write a number sentence to show the difference between the number of votes for the color that students chose the most and the color that students chose the least.

Name _____   Date _____

The picture graph below shows a survey of students' favorite sports.

Favorite Sports			
◯◯	◯◯◯◯	◯◯◯	◯◯
Football	**Soccer**	**Tennis**	**Hockey**

Each ◯ represents 3 students.
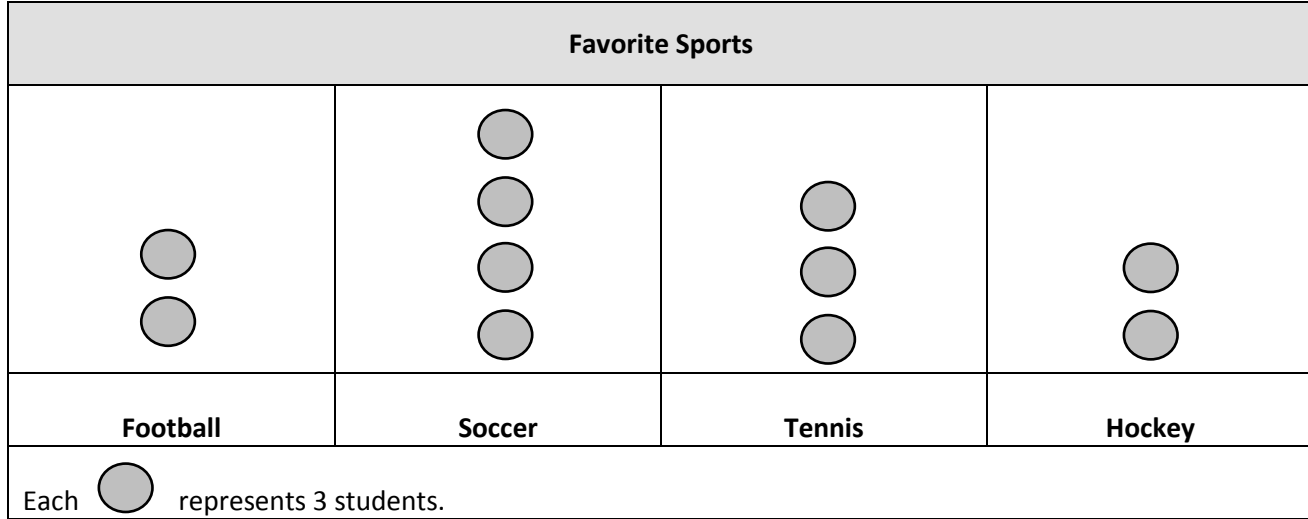
a. The same number of students picked _____ and _____ as their favorite sport.

b. How many students picked tennis as their favorite sport?

c. How many more students picked soccer than tennis? Use a number sentence to show your thinking.

d. How many students took part in the survey?

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Name _____ Date _____

1. The tally chart below shows a survey of students' favorite pets. Each tally mark represents 1 student.

Favorite Pets	Number of Students
Cats	~~////~~ /
Turtles	////
Fish	//
Dogs	~~////~~ ///
Lizards	//

The chart shows a total of _____ students.

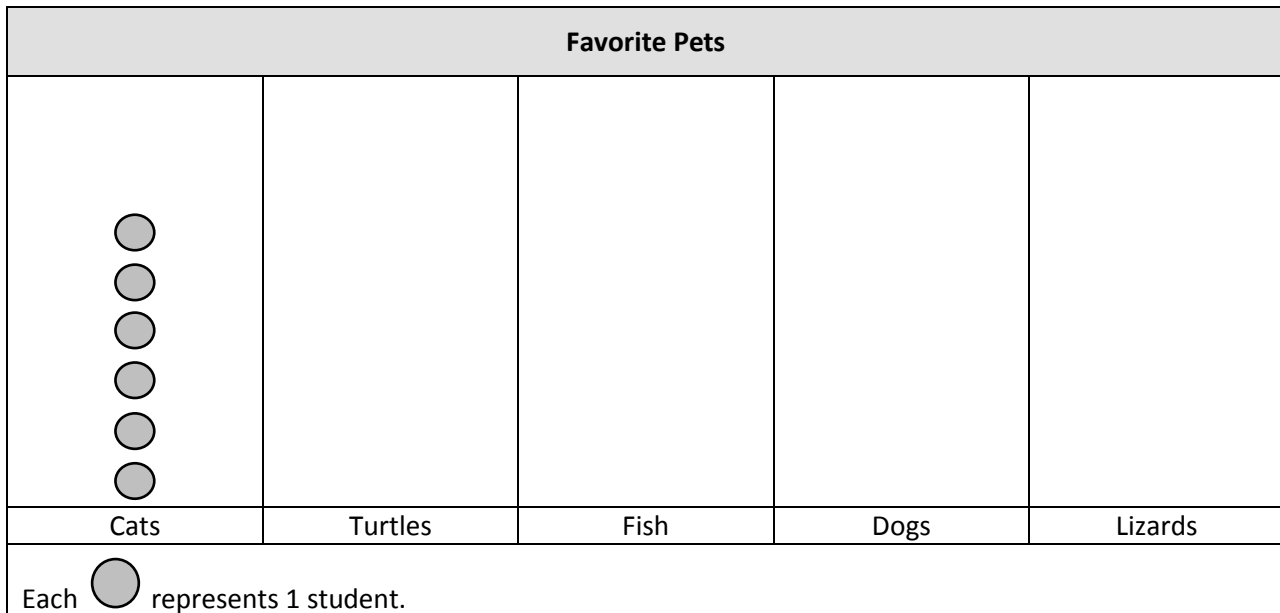2. Use the tally chart in Problem 1 to complete the picture graph below. The first one has been done for you.

Favorite Pets				
◯ ◯ ◯ ◯ ◯ ◯				
Cats	Turtles	Fish	Dogs	Lizards

Each ◯ represents 1 student.

a. The same number of students picked _____ and _____ as their favorite pet.

b. How many students picked dogs as their favorite pet?

c. How many more students chose cats than turtles as their favorite pet?

3. Use the tally chart in Problem 1 to complete the picture graph below.

Favorite Pets				
Cats	Turtles	Fish	Dogs	Lizards

Each ⬜ represents 2 students.
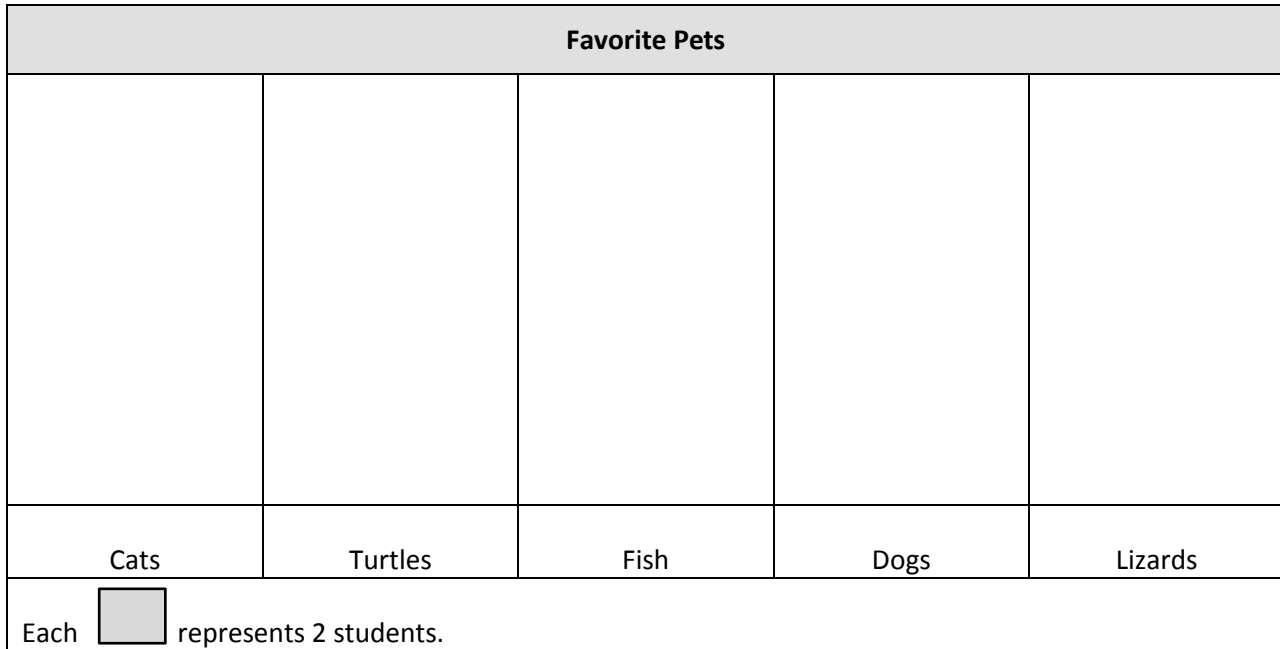
a. What does each ⬜ represent?

b. How many does ⬜⬜⬜⬜⬜ represent? Write a number sentence to show how you know.

c. How many more ⬜ did you draw for dogs than for fish? Write a number sentence to show how many more students chose dogs over fish.