

Got Data?

Goals

- Ask survey questions (orally) and record responses (in writing). Include units of measurement when reporting numerical data (orally and in writing).
- Comprehend and use the terms “numerical” and “categorical” to describe data sets (orally and in writing).
- Interpret various representations of data sets and determine whether it is reasonable that a verbal description represents a given numerical data set.

Learning Targets

- I can collect the correct data to answer a question and use the correct units.
- I can explain the difference between categorical and numerical data.

Student Learning Goal

Let's explore different kinds of data.

Lesson Narrative

Students begin the unit by collecting data about themselves by measuring and answering survey questions, studying the different types of responses collected, and identifying the appropriate variables and units being measured.

Students learn about **categorical** and **numerical** data then determine whether a particular survey question will produce one type of data or the other. They also use dot plots (similar to line plots in earlier grades) as a way to represent data and make sense of what data points mean in context.

Access for Students with Diverse Abilities

- Action and Expression (Activity 1, Activity 2)

Access for Multilingual Learners

- MLR2: Collect and Display (Activity 1, Activity 2)

Instructional Routines

- MLR2: Collect and Display
- Notice and Wonder

Required Materials

Materials to Gather

- Blank paper: Activity 1
- Measuring tapes: Activity 1
- Rulers: Activity 1
- Sticky notes: Activity 1

Required Preparation

Lesson:

For the activity **Surveying the Class**:

Choose 4–5 survey questions and measurement activities in advance. Be sure to include questions and activities that would produce both categorical and numerical data. The questions about how and how long it takes students travel to school (the first two prompts) and students' heights in centimeters (the third prompt) will be used in a later lesson, so be sure to include these questions. Provide sticky notes to each student on which they can record their responses. For each selected question, set up one position in the room where students may put their sticky notes to have a visual display of responses. To collect measurements, prepare measuring stations equipped with the necessary tools like rulers or measuring tapes, instructions on how to measure, and a way to record the measurements. Students can then rotate through the stations.

Lesson Timeline

10
min

Warm-up

20
min

Activity 1

10
min

Activity 2

10
min

Lesson Synthesis

Assessment

5
min

Cool-down

Warm-up

Dots of Data

10
min

Activity Narrative

The purpose of this *Warm-up* is to review students' prior knowledge about representation of numerical data. Students may be familiar with line plots from previous grades but unfamiliar with the term **dot plot**, which is what will be used in this unit and beyond. Students learn that both terms are commonly used for the same type of diagram.

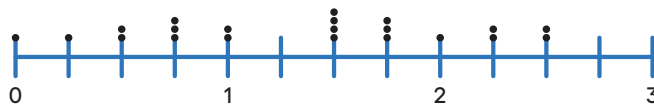
Students examine a dot plot of data and consider which contexts may make sense for the data shown. Then students invent their own context for the data and interpret what additional data in that set would mean in their context.

This is an opportunity to see how students make sense of a data representation in the context of situations.

Launch

Display the image and data for all to see.

0	0.25	0.5	0.5	0.75	0.75	0.75	1	1	1.5	1.5
1.5	1.5	1.75	1.75	1.75	2	2.25	2.25	2.5	2.5	



Ask students what they notice and wonder about the image.

Students may notice:

- There are 21 dots over the number line.
- The data match the dots over the number line.
- Some of the dots are over fractional values.
- Some values have no dots.

Students may wonder:

- What do the dots and data represent?
- Why are there no dots over 1.25 or after 2.5?
- Why are there so many dots over 1.5?
- Is this a line plot?

If not mentioned by students, remind them that the display is interpreted like a line plot. Tell students that this is called a dot plot, and that line plots use Xs and dot plots use dots, but the meaning is very similar.

Give students 2 minutes of quiet work time to complete the task, followed by a whole-class discussion.

Instructional Routines

Notice and Wonder

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Student Workbook

LESSON 1

Got Data?

Let's explore different kinds of data.

Information Data of Data

Here is a dot plot for a data set.



1. Determine if each of these would be an appropriate label to represent the data in the dot plot. Be prepared to explain your reasoning.

- a. Number of children per class. ☐ Yes ☐ No
 b. Distance between home and school, in miles. ☐ Yes ☐ No
 c. Favorite subject in school. ☐ Yes ☐ No
 d. Weight of elephants, in pounds. ☐ Yes ☐ No
 e. Points received on a homework assignment. ☐ Yes ☐ No

2. Think of another label that can be used with the dot plot.

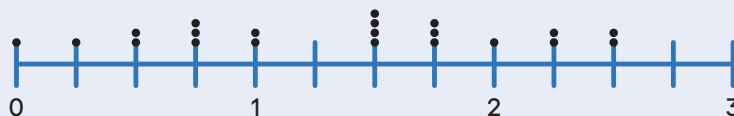
- a. Write it below the scale of the dot plot. Be sure to include the unit of measurement.
 b. In your scenario, what does one dot represent?

- c. In your scenario, what would a data point of 0 mean? What would a data point of $3\frac{1}{4}$ mean?

64

GRADE 6 • UNIT 8 • SECTION A | LESSON 1

Student Task Statement

Here is a **dot plot** for a data set.

1. Determine if each of these would be an appropriate label to represent the data in the dot plot? Be prepared to explain your reasoning.

- a. Number of children per class. **No**

Sample response: We cannot have partial children.

- b. Distance between home and school, in miles. **Yes**

Sample response: The distances are reasonable for the context and can be fractional.

- c. Favorite subject in school. **No**

Sample response: The dot plot shows numerical values, not lists of school subjects.

- d. Weight of elephants, in pounds. **No**

Sample response: The unit of measurement (pounds) does not work with the context. Elephants weigh much more than several pounds.

- e. Points received on a homework assignment. **Yes**

Sample response: A teacher could grade a homework assignment on a scale of 1 to 4 and assign partial points.

2. Think of another label that can be used with the dot plot.

- a. Write it below the scale of the dot plot. Be sure to include the unit of measurement.

Time spent napping, in hours

- b. In your scenario, what does one dot represent?

A dot represents the length of a nap (in hours) on one day.

- c. In your scenario, what would a data point of 0 mean? What would a data point of $3\frac{1}{4}$ mean?

A day without a nap. A nap that lasts 3.25 hours.

Activity Synthesis

The purpose of the discussion is for students to understand how to read a dot plot, including what dots represent in context.

Invite students to share their responses to each scenario presented in the first question, and ask a few students to explain their reasoning for each.

Invite a few students to share another label that they think could be used with the set of data and what each dot would represent. Based on each response, ask the class these questions:

“What would a data point of 0 mean in the context mentioned?”

“What would a data point of $3\frac{1}{4}$ mean in the context mentioned?”

Activity 1

Surveying the Class

20
min

Activity Narrative

Students begin their statistical explorations with data collection. They answer several survey questions, take some measurements, or do both. This data gathering activity gives students firsthand experience in gathering and organizing data. It then prompts students to notice different types of data that could be collected. The activity also provides the class with authentic data that can later be analyzed as students gain and expand the skills to do so.

The task statements show a range of survey questions and ideas for collecting measurements. To optimize the data gathering, have several survey questions and measuring activities identified ahead of time, and consider how to best collect the responses or measurements.

Launch



Explain to students that they will gather data to learn more about the students in the class. Tell them which data sets will be collected, and give instructions on the collection process. If students are to do a gallery walk or rotate through measuring stations, consider arranging them into groups of 3–4 to facilitate the rotation.

Use *Collect and Display* to create a shared reference that captures students' developing mathematical language. Collect the language that students use to describe data during the gallery walk. Display words and phrases such as “numerical,” “categories,” “choose from a list,” or “units.”

Student Task Statement

Here are some survey questions. Your teacher will explain which questions can be used to learn more about the students in your class and how the responses will be collected. The data that your class collects will be used in upcoming activities.

Answers vary, based on data collected.

- How long does it usually take you to travel to school? Answer to the nearest minute.
- How do you travel to school on most days? Choose one.
 - Walk
 - Bike
 - Scooter or skateboard
 - Car
 - School bus
 - Public transport
 - Other
- How tall are you without your shoes on? Answer to the nearest centimeter.
- What is the length of your right foot without your shoe on? Answer to the nearest centimeter.

Instructional Routines

MLR2: Collect and Display

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Access for Multilingual Learners (Activity 1)

MLR2: Collect and Display.

This activity uses the *Collect and Display* math language routine to advance conversing and reading as students clarify, build on, or make connections to mathematical language.

Access for Students with Diverse Abilities (Activity 1, Student Task)

Action and Expression: Internalize Executive Functions.

To support development of organizational skills in problem-solving, chunk this task into more manageable parts. For example, demonstrate the data collection process, and provide graphic organizers for collecting data from the survey questions.

Supports accessibility for: Organization, Attention

Student Workbook

Surveying the Class

Here are some survey questions. Your teacher will explain which questions can be used to learn more about the students in your class and how the responses will be collected. The data that your class collects will be used in upcoming activities.

- How long does it usually take you to travel to school? Answer to the nearest minute.
- How do you travel to school on most days? Choose one.
 - Walk
 - Bike
 - Scooter or skateboard
 - Car
 - School bus
 - Public transport
 - Other
- How tall are you without your shoes on? Answer to the nearest centimeter.
- What is the length of your right foot without your shoe on? Answer to the nearest centimeter.
- What is your arm span? Stretch your arms open, and measure the distance from the tip of your right hand's middle finger to the tip of your left hand's middle finger, across your back. Answer to the nearest centimeter.
- How important are the following issues to you? Rate each on a scale from 0 (not important) to 10 (very important).
 - a. Reducing pollution
 - b. Recycling
 - c. Conserving water

Building on Student Thinking

When taking measurements, students might not remember to attend to the right units, to start from 0, or to hold the measuring tool so that measurements can be precisely taken. Remind students about these issues as needed.

Student Workbook

1 Surveying the Class

1 Do you have any siblings? ☐ Yes ☐ No

2 How many hours of sleep per night do you usually get when you have school the next day? Answer to the nearest half hour.

3 How many hours of sleep per night do you usually get when you do not have school the next day? Answer to the nearest half hour.

4 Other than traveling from school, what do you do right after school on most days?

- Have a snack
- Do homework
- Read a book
- Talk on the phone
- Practice a sport

- Do chores
- Use the computer
- Participate in an extracurricular activity

5 If you could meet one of these celebrities, who would you choose?

- A city or state leader
- A champion athlete
- A movie star

- A musical artist
- A best-selling author

GRADE 4 • UNIT 8 • SECTION A | LESSON 1

Student Workbook

2 Practice Problems

3 From Unit 8, Lesson 12
Producers of 2 TV shows ask 100 viewers for their ages. For one show, the mean age of the viewers is 35 years and the MAD is 20 years. For the other show, the mean age of the viewers is 30 years and the MAD is 5 years.
A sixth-grade student says he watches one of the shows. Which show do you think he watches? Explain your reasoning.

4 Learning Targets

- I can use a box plot to answer questions about a data set.
- I can use medians and IQRs to compare groups.

GRADE 4 • UNIT 8 • SECTION D | LESSON 17

5. What is your arm span? Stretch your arms open, and measure the distance from the tip of your right hand’s middle finger to the tip of your left hand’s middle finger, across your back. Answer to the nearest centimeter.

6. How important are the following issues to you? Rate each on a scale from 0 (not important) to 10 (very important).

a. Reducing pollution

b. Recycling

c. Conserving water

7. Do you have any siblings? _____ Yes _____ No

8. How many hours of sleep per night do you usually get when you have school the next day? Answer to the nearest half hour.

9. How many hours of sleep per night do you usually get when you do not have school the next day? Answer to the nearest half hour.

10. Other than traveling from school, what do you do right after school on most days?

- Have a snack
 - Do homework
 - Read a book
 - Talk on the phone
 - Participate in an extracurricular activity

- Practice a sport
 - Do chores
 - Use the computer

11. If you could meet one of these celebrities, who would you choose?

- A city or state leader
 - A champion athlete
 - A movie star

- A musical artist
 - A best-selling author

12. Estimate how much time per week you usually spend on each of these activities. Answer to the nearest quarter of an hour.

a. Playing sports or doing outdoor activities

b. Using a screen for fun (watching TV, playing computer games, etc.)

c. Doing homework

d. Reading

Activity Synthesis

Tell students to put their responses to the selected questions in the appropriate place in the room. Allow them to do a gallery walk of the data sets and to discuss with their group things they notice about each question.

Direct students' attention to the reference created using *Collect and Display*. Ask students to share what they noticed about the different kinds of data the questions produced. Invite students to borrow language from the display as needed, and update the reference to include additional phrases as they respond. (For example, "Some of the questions required numerical answers and others were choices from a list of categories.")

Students are likely to notice that responses to some questions are numbers and others are not. If it does not come up, point out the questions that have numerical data in their responses and ask students what these questions have in common.

Explain that responses that are measurements or quantities are called **numerical data**. For example, the first question about the travel time to school produces numerical data because the responses are quantities, measured in minutes.

Point out that responses to other questions are not quantities but can be sorted into categories. Explain that these types of responses are called **categorical data**. For example, the second question about ways of traveling to school produces categorical data because the responses can be sorted into categories.

Explain that numerical and categorical data will continue to be investigated in upcoming lessons.

The data from the first three questions regarding travel time, travel method, and height will be used in future lessons. Collect this data in an organized way to redistribute and use with students later.

Activity 2

Numerical and Categorical Data

10
min

Activity Narrative

In the previous activity, students responded to survey questions and collected data. They learned that data can be categorical or numerical. In this activity, students practice distinguishing **categorical** and **numerical** data, using the same survey questions and additional ones. They think about the kind of responses these questions would yield. For numerical responses, they consider the units of measurement. For categorical responses, they identify the characteristic being studied.

Note that some data may have numbers for their values but are categorical rather than numerical. Area codes and zip codes are examples of such categorical data. They are not ordered quantities or measurements, but rather labels that happen to be numbers. We can meaningfully compare quantities or measurements (for example, 6 minutes is greater than 4 minutes, or 7 years is less than 12 years), but we cannot do the same with the numbers in area codes or zip codes. It would not make sense to say, for example, that the zip code is 19104 is less than 63105.

Instructional Routines

MLR2: Collect and Display

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Access for Multilingual Learners (Activity 2)

MLR2: Collect and Display.

This activity uses the *Collect and Display* math language routine to advance conversing and reading as students clarify, build on, or make connections to mathematical language.

Access for Students with Diverse Abilities (Activity 2, Student Task)

Action and Expression: Internalize Executive Functions.

To support organization, provide students with a Venn diagram with which to compare the similarities and differences between numerical and categorical data.

Supports accessibility for: Language, Organization

Building on Student Thinking

Students may mistake numbers such as area codes, zip codes, or the numbers we use to represent months as numerical data. Be sure to discuss this common confusion if it arises. See the *Activity Narrative* section for ideas for addressing it.

Student Workbook

1 Surveying the Class

Estimate how much time per week you usually spend on each of these activities. Answer to the nearest quarter of an hour.

- Playing sports or doing outdoor activities
- Using a screen for fun (watching TV, playing computer games, etc.)
- Doing homework
- Reading

2 Numerical and Categorical Data

The list of survey questions in the activity earlier can help you complete these exercises.

3 The first survey question about travel time produces **numerical data**. Identify two other questions that produce numerical data. For each, describe what was measured and its unit of measurement.

- Question #: _____
What was measured: _____
Unit of measurement: _____
- Question #: _____
What was measured: _____
Unit of measurement: _____

4 The second survey question about travel method produces **categorical data**. Identify two other questions that produce categorical data. For each, describe what characteristic or feature was being studied.

- Question #: _____
Characteristic being studied: _____
- Question #: _____
Characteristic being studied: _____

As students work and discuss, notice students who could succinctly articulate the variables being investigated in both numerical and categorical questions. Also notice any disagreements that partners might have about whether a question results in numerical or categorical data. The questions about rating important issues and hours spent on activities are likely to generate conversations as they may appear less straightforward than the others.

Launch

Arrange students in groups of 2. Tell students they will need the list of survey questions from the previous activity. Give them 3–4 minutes of quiet work time to complete the first three questions. Ask them to briefly discuss their responses with their partner before completing the last question.

Use *Collect and Display* to direct attention to words collected and displayed from an earlier activity. Invite students to borrow language from the display as needed, and update it throughout the lesson.

Student Task Statement

The list of survey questions in the activity earlier can help you complete these exercises.

- The first survey question about travel time produces **numerical data**. Identify two other questions that produce numerical data. For each, describe what was measured and its unit of measurement.

Questions 3, 4, 5, 6, 8, 9, 12 produce numerical data. Sample responses:

- a. Question #:** 3

What was measured: height of student without shoes on

Unit of measurement: centimeters

- b. Question #:** 12

What was measured: amount of time spent on different activities

Unit of measurement: minutes

- The second survey question about travel method produces **categorical data**. Identify two other questions that produce categorical data. For each, describe what characteristic or feature was being studied.

Questions 7, 10, 11 produce categorical data. Sample responses:

- a. Question #:** 7

Characteristic being studied: whether a student is the only child

- b. Question #:** 11

Characteristic being studied: first activity after school

3. Think about the responses to these survey questions. Do they produce numerical or categorical data? Be prepared to explain how you know.
- a. How many pets do you have? Numerical

b. How many years have you lived in this state? Numerical

c. What is your favorite band? Categorical

d. What kind of music do you like best? Categorical

e. What is the area code of your school’s phone number? Categorical

f. Where were you born? Categorical

g. How much does your backpack weigh? Numerical
4. Name two characteristics you could investigate to learn more about your classmates. Make sure one would give categorical data and the other would give numerical data.
- Sample response:
- Numerical: The number of people in a student’s household.

◦ Categorical: The name of the street where a student lives.

Are You Ready for More?

Priya and Han collected data on the birth months of students in their class. Here are the lists of their records for the same group of students.

This list shows Priya’s records.

Jan Apr Jan Feb Oct May June July Aug Aug

Sep Jan Feb Mar Apr Nov Nov Dec Feb Mar

This list shows Han’s records.

1 4 1 2 10 5 6 7 8 8 9 1 2 3 4 11 11 12 2 3

1. How are their records alike? How are they different?
- Sample response:
- Alike: They both collected the data of the same students and in the same order.

◦ Different: Priya recorded the names of the month, while Han recorded the numbers showing the order in which the months appear in the year.
2. What kind of data—categorical or numerical—do you think the variable “birth month” produces? Explain how you know.
- Birth month is categorical
- Sample explanation: The numbers that Han wrote are labels or names for months, which cannot be measured or compared. They appear in a certain order, but they are not quantities.

Student Workbook

2 Numerical and Categorical Data

3 Think about the responses to these survey questions. Do they produce numerical or categorical data? Be prepared to explain how you know.

a. How many pets do you have?

b. How many years have you lived in this state?

c. What is your favorite band?

d. What kind of music do you like best?

e. What is the area code of your school's phone number?

f. Where were you born?

g. How much does your backpack weigh?

4 Name two characteristics you could investigate to learn more about your classmates. Make sure one would give categorical data and the other would give numerical data.

Student Workbook

5 Numerical and Categorical Data

Are You Ready for More?

Priya and Han collected data on the birth months of students in their class. Here are the lists of their records for the same group of students.

This list shows Priya's records.

Jan Apr Jan Feb Oct May June July Aug Aug

Sep Jan Feb Mar Apr Nov Nov Dec Feb Mar

This list shows Han's records.

1 4 1 2 10 5 6 7 8 8 9 1 2 3 4 11 11 12 2 3

1 How are their records alike? How are they different?

2 What kind of data—categorical or numerical—do you think the variable “birth month” produces? Explain how you know.

Activity Synthesis

The purpose of the discussion is for students to be able to identify data collected as either numerical or categorical.

Select a few previously identified students to share their responses to the first two questions. After each student shares, ask the rest of the class if they agree or disagree, and discuss any disagreements.

Direct students' attention to the reference created using *Collect and Display*. Ask students to share whether each word applies to the idea of numerical data, categorical data, neither, or both. Then ask students to share their reasoning for how they classified the questions. Invite students to borrow language from the display as needed, and update the reference to include additional phrases as they respond. (For example, "Where I was born is categorical because it does not use ordered numbers in the response.")

Lesson Synthesis

The purpose of the discussion is to clarify the new vocabulary. Ask students,

💬 "What are some examples of categorical data?"

brand of a product, color, location

💬 "What are some examples of numerical data?"

how many of something, the length of something, volume of something

💬 "What is a dot plot?"

A dot plot is a representation of numerical data.

💬 "How does it represent data?"

It represents each data value with a point above a number line.

Consider creating a permanent display of the new terms introduced throughout the unit including "numerical data," "categorical data," and "dot plot" for this lesson.

Lesson Summary

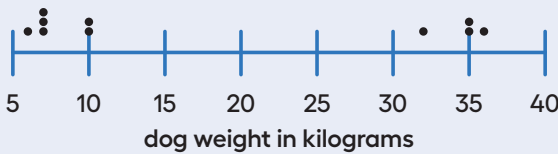
The table contains data about 10 dogs.

dog name	weight (kg)	breed
Duke	36	German shepherd
Coco	6	pug
Pierre	7	pug
Ginger	35	German shepherd
Lucky	10	beagle
Daisy	10	beagle
Buster	35	German shepherd
Pepper	7	pug
Rocky	7	beagle
Lady	32	German shepherd

- The weights of the dogs are an example of **numerical data**, which are data that are numbers, quantities, or measurements. The weights of the dogs are measurements in kilograms.
- The dog breeds are an example of **categorical data**, which are data containing values that can be sorted into categories. In this case, there are three categories for dog breeds: pug, beagle, and German shepherd.

Some data with numbers are categorical because the numbers are not quantities or measurements. For example, telephone area codes are categorical data, because the numbers are labels rather than quantities or measurements.

Numerical data can be represented with a **dot plot** (sometimes called a line plot). Here is a dot plot that shows the weights of the dogs.



We can collect and study both kinds of data by doing surveys or taking measurements. When we do, it is important to think about what feature we are studying (for example, breeds of dogs or weights of dogs) and what units of measurement are used.

Student Workbook

1 Lesson Summary

The table contains data about 10 dogs.

dog name	weight (kg)	breed
Duke	36	German shepherd
Coco	6	pug
Pierre	7	pug
Ginger	35	German shepherd
Lucky	10	beagle
Daisy	10	beagle
Buster	35	German shepherd
Pepper	7	pug
Rocky	7	beagle
Lady	32	German shepherd

• The weights of the dogs are an example of **numerical data**, which are data that are numbers, quantities, or measurements. The weights of the dogs are measurements in kilograms.

• The dog breeds are an example of **categorical data**, which are data containing values that can be sorted into categories. In this case, there are three categories for dog breeds: pug, beagle, and German shepherd.

Some data with numbers are categorical because the numbers are not quantities or measurements. For example, telephone area codes are categorical data, because the numbers are labels rather than quantities or measurements.

Numerical data can be represented with a **dot plot** (sometimes called a line plot). Here is a dot plot that shows the weights of the dogs.

We can collect and study both kinds of data by doing surveys or taking measurements. When we do, it is important to think about what feature we are studying (for example, breeds of dogs or weights of dogs) and what units of measurement are used.

Responding To Student Thinking**Points to Emphasize**

If students struggle with identifying whether data is numerical or categorical, use the data sets in upcoming lessons as opportunities to ask whether the data set is numerical or categorical and why.

Cool-down**What's the Question?****5**
min**Student Task Statement**

Would each survey question produce categorical data or numerical data?

1. What is your favorite vegetable?

categorical

2. Have you been to the capital city of your state?

categorical

3. How old is the youngest person in your family?

numerical

4. In which zip code do you live?

categorical

5. What is the first letter of your name?

categorical

6. How many hours do you spend outdoors each day?

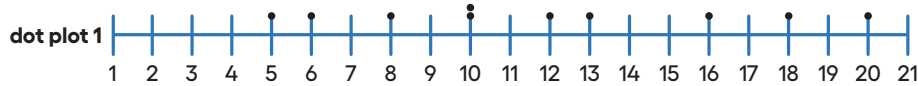
numerical

Practice Problems

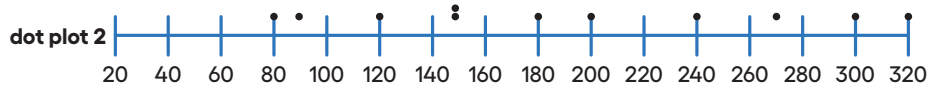
6 Problems

Problem 1

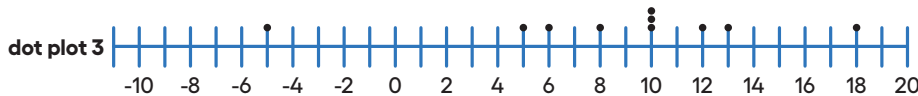
Tyler asked 10 students at his school how much time in minutes it takes them to get from home to school. Determine if each of these dot plots could represent the data Tyler collected. Explain your reasoning for each dot plot.



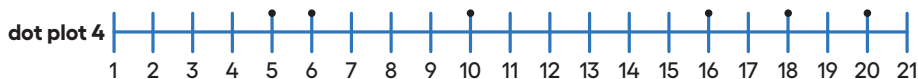
Sample response: This could be a dot plot of the time it takes to get to school in minutes for 10 students. The times range from 5 minutes to 20 minutes, which seems reasonable.



Sample response: This couldn't be a dot plot of the time it takes to get to school in minutes because the values seem too big. The shortest time would be 80 minutes, which is more than an hour. The longest time would be 300 minutes, which is 5 hours. These don't seem like reasonable times that would be responses to the question that Tyler asked.



Sample response: This couldn't be a dot plot of the time it takes to get to school in minutes because there are some negative values represented in the dot plot. The time it takes to get to school can't have a negative value.



Sample response: This couldn't be a dot plot of the time it takes to get to school in minutes for 10 students because there are not 10 data values represented on the dot plot.

Student Workbook

LESSON 1
PRACTICE PROBLEMS

1 Tyler asked 10 students at his school how much time in minutes it takes them to get from home to school. Determine if each of these dot plots could represent the data Tyler collected. Explain your reasoning for each dot plot.



Student Workbook

1 Practice Problems

dot plot 4

Here is a list of questions. For each question, decide if the responses will produce numerical data or categorical data, and give two possible responses.

a. What is your favorite breakfast food?

b. How did you get to school this morning?

c. How many different teachers do you have?

d. What is the last thing you ate or drank?

e. How many minutes did it take you to get ready this morning—from waking up to leaving for school?

GRADE 4 • UNIT 4 • SECTION A • LESSON 1

Student Workbook

1 Practice Problems

a. Write two questions that you could ask the students in your class that would result in categorical data. For each question, explain how you know that responses to it would produce categorical data.

b. Write two questions that you could ask the students in your class that would result in numerical data. For each question, explain how you know that responses to it would produce numerical data.

GRADE 4 • UNIT 4 • SECTION A • LESSON 1

Problem 2

Here is a list of questions. For each question, decide if the responses will produce numerical data or categorical data, and give two possible responses.

- a. What is your favorite breakfast food?
Categorical
Sample responses: cereal, toast
- b. How did you get to school this morning?
Categorical
Sample responses: walked, took the bus
- c. How many different teachers do you have?
Numerical
Sample responses: 3, 5
- d. What is the last thing you ate or drank?
Categorical
Sample responses: water, apple
- e. How many minutes did it take you to get ready this morning—from waking up to leaving for school?
Numerical
Sample responses: 30, 45

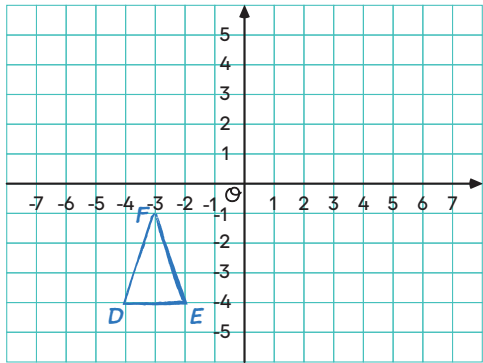
Problem 3

- a. Write two questions that you could ask the students in your class that would result in categorical data. For each question, explain how you know that responses to it would produce categorical data.
Sample response: What is your favorite ice cream flavor? What town do you live in? These questions result in categories.
- b. Write two questions that you could ask the students in your class that would result in numerical data. For each question, explain how you know that responses to it would produce numerical data.
Sample response: How many push-ups can you do in 1 minute? What is the distance from your home to the school? These questions result in quantities or measurements.

Problem 4

from Unit 7, Lesson 15

Triangle *DEF* has vertices *D*(-4, -4), *E*(-2, -4), and *F*(-3, -1).



- a. Plot the triangle in the coordinate plane and label the vertices.
- b. Name the coordinates of 3 points that are inside the triangle.
Sample response: (-3, -2), (-3, -3), (-3, -2.5)
- c. What is the area of the triangle? Show your reasoning. 3 square units
Sample response: the base is 2 units, the height is 3 units, and $3 \cdot 2 \div 2 = 3$

Problem 5

Andre collects data measured in centimeters.

- | | | |
|--------|--------|--------|
| • 8.5 | • 10.5 | • 7.8 |
| • 9.5 | • 8.1 | • 9.0 |
| • 10.2 | • 9.6 | • 11.2 |
| • 10.9 | • 12.7 | • 9.8 |

What could he be investigating? Select **all** that apply.

- A. The weight of a dozen eggs.
- B. The length of leaves from a tree.
- C. The height of cups and mugs in a cupboard.
- D. Type of shoes sold at a store.
- E. The length of colored pencils in a box.

Student Workbook

1 Practice Problems

from Unit 7, Lesson 15
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Student Workbook

1 Practice Problems

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Learning Targets

- + I can collect the correct data to answer a question and use the correct units.
- + I can explain the difference between categorical and numerical data.