Student Edition
Grade 3 • Volume 2
UAE Edition
Grade 3
2021-2022

Reveal

MATH®

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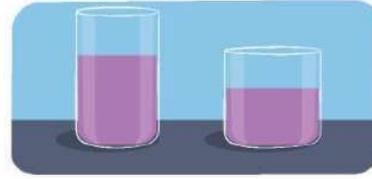Graw
Hill

T3 -Unit 12 answers
measurement and data
Don by Mrs. Noura Alobeidli

Learn
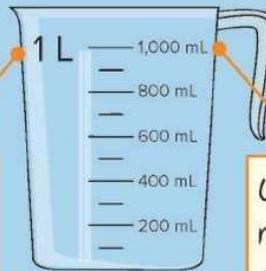
Jana thinks the tall glass has more juice.

How can you determine which glass has more juice?

You can use **milliliters (mL)** or **liters (L)** to measure an amount of liquid, or **liquid volume**.

1 liter is equal to 1,000 milliliters.

1 L — 1,000 mL
— 800 mL
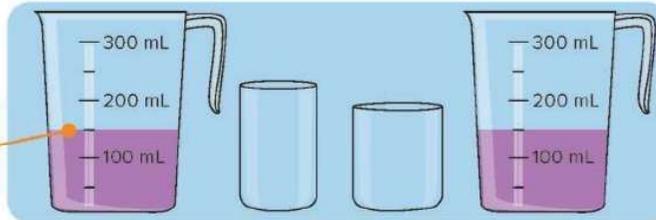— 600 mL
— 400 mL
— 200 mL

Use liters to measure greater amounts of liquid.

Use milliliters to measure lesser amounts of liquid.

Measure the amounts using milliliters to compare.

150 mL is halfway between 100 mL and 200 mL.

— 300 mL
— 200 mL
— 100 mL

— 300 mL
— 200 mL
— 100 mL

Both glasses have 150 milliliters of juice.

The amount of liquid in a container is called liquid volume.

Math is... **Choosing Tools**

How do you decide whether to measure liquid volume in milliliters or liters?
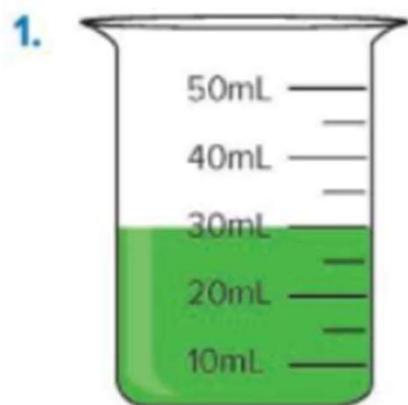
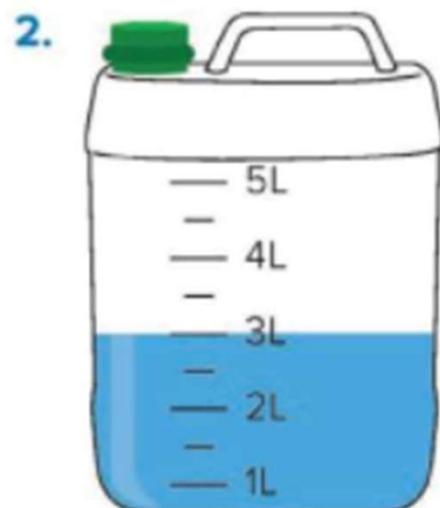## 🗨 Work Together

How much vegetable oil is in the container?

Sample answer: It fills to the line between 3 and 4 liters. There are $3\frac{1}{2}$ liters of vegetable oil in the container.

— 5L
— 4L
— 3L
— 2L
— 1L

What is the volume of the liquid in the container?

1.

__30__ milliliters
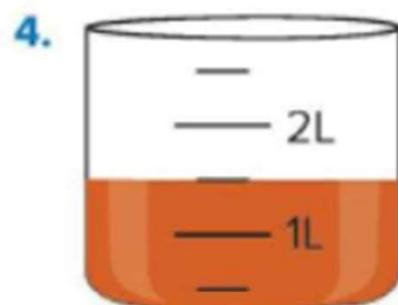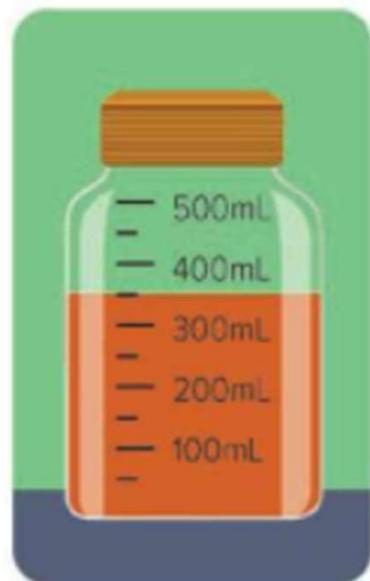
2.

__3__ liters

3.

__450__ milliliters
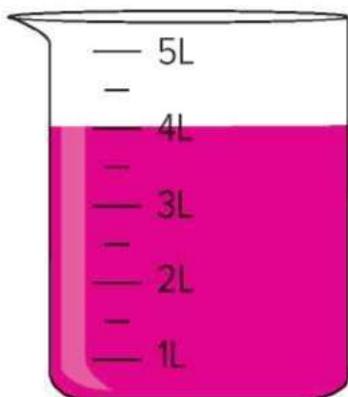
4.

$1\frac{1}{2}$ liters

5. Error Analysis Alex pours soup into a jar. He says he has 400 milliliters of soup. How do you respond to Alex?

Sample answer: The soup fills to the line halfway between 300 and 400, so the exact amount would be 350 milliliters.
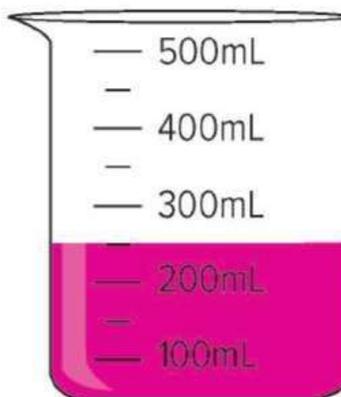
Shade the container to show the given liquid volume.

6. 4 liters

— 5L
—
— 4L
— 3L
— 2L
— 1L

7. 250 milliliters

— 500mL
—
— 400mL
—
— 300mL
— 200mL
—
— 100mL

8. Brayden's water bottle is marked with lines that represent milliliters. He fills his bottle with water to a line that does not have a label. How might he determine the liquid volume of the water?

Sample answer: He can use the lines that do have labels to determine the size of the intervals on the bottle.

9. You have two different glasses of water. How might you determine which glass has more water?

Sample answer: I could pour the water from each glass into a measuring cup one at a time and compare the liquid volumes.

10. Extend Your Thinking Sameer drank 1 liter of water and Meredith drank 1,000 milliliters of water. Who drank more water? Explain your reasoning.

They drank the same amount. Sample answer: 1,000 milliliters is equal to 1 liter.

Reflect

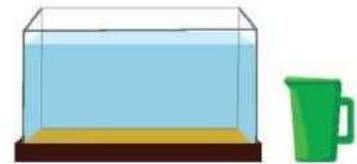How can you explain liquid volume and when it might be useful in your life?

Answers may vary.

Math is... **Mindset**

What did you do to avoid feeling stressed today?

Learn

Sawyer fills her fish tank with 10 full pitchers of water.

About how many liters of water are in the tank?

You can use the liquid volume of everyday containers to help you estimate.

1 L   240 mL   1 mL

About 4 bottles of water fill the pitcher.

The pitcher holds about 4 liters of water.

Multiply to find how many liters are in the tank.

$$10 \times 4 = t$$
$$40 = t$$

There are about 40 liters of water in the tank.

Math is...   In My World

Why is it helpful to know the liquid volume of different containers?

Everyday containers of liquid can be used to estimate liquid volume.

You can solve problems involving liquid volume by representing the problem with an equation and using strategies to solve.

Work Together

Which container has about one liter of liquid? Explain your reasoning.

A; Sample answer: The carton (A) has about the same liquid volume as a water bottle.

A   B   C

On My Own

Name _____

Which is the best estimate for the liquid volume?

1. cup of tea

18 milliliters
(180 milliliters)
180 liters

2. bowl of soup

24 liters
24 milliliters
(240 milliliters)

3. bathtub of water

3 liters
(300 liters)
300 milliliters

4. bottle of soap

(200 milliliters)
20 liters
200 liters

5. bucket of water

(10 liters)
100 milliliters
10 milliliters

6. bottle of ketchup

(450 milliliters)
45 milliliters
45 liters

7. Justin pours 95 milliliters of pineapple juice and 425 milliliters of cranberry juice in a pitcher. How much juice does Justin pour in the pitcher? Show your work.

520 milliliters; Sample answer: $j = 95 + 425$; $j = 520$

8. The table shows the liquid volume of three different bottles of lotion in milliliters. How much more lotion is in Bottle B than in Bottle A?

Bottle A	Bottle B	Bottle C
235 mL	475 mL	290 mL

240 milliters; Sample answer: 475 − 235 = w; w = 240

9. Kim sells 3 liters of lemonade each day. How much lemonade does Kim sell in a week? Explain your thinking.

21 liters; Sample answer: 7 × 3 = p; p = 21

10. Wayne uses 40 liters of water to water 10 tomato plants. He uses the same amount of water for each plant. How much water does each plant get?

4 liters; Sample answer: 40 ÷ 10 = 4

11. Extend Your Thinking Write a problem that involves liquid volume. Write an equation to represent your problem and solve. **Sample answer: Marco drank 4 liters of water every day for a week. How much water did he drink in a week? 7 × 4 = 28; 28 liters**

Reflect

What are some ways you can estimate liquid volume?

Answers may vary.

> **Math is... Mindset**
> Which of your strengths in math did you use today?

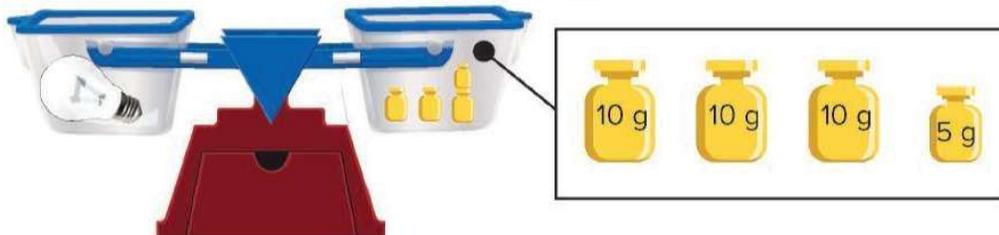# On My Own

Name _____

1. What is the mass of the brick? **2 kilograms**

1 kg   1 kg

2. What is the mass of the lightbulb? **35 grams**

10 g   10 g   10 g   5 g

3. What is the mass of the orange? **261 grams**

100 g   100 g   50 g   10 g   1 g
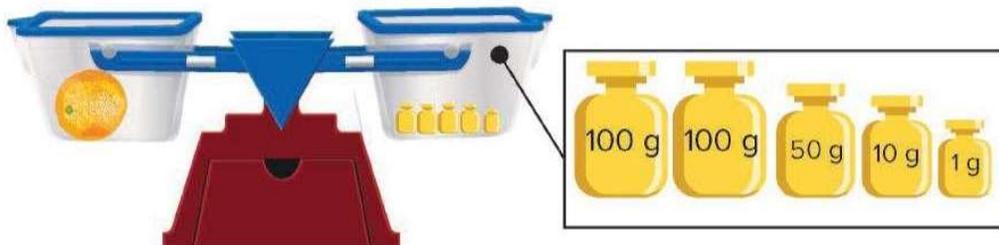
4. What is the mass of the carrot? **68 grams**

50 g   10 g   5 g   1 g   1 g   1 g

5. How can you decide whether a marker or a glue stick has a greater mass without using gram weights? **Sample answer: You can place the marker in one bucket of a balance scale and the glue stick in the other bucket. The scale will tilt toward the object with the greater mass.**

6. **Error Analysis** Maeve says that a balloon has more mass than a stapler because it is bigger. Do you agree? Explain.
No; Sample answer: The size of the object does not necessarily impact the mass of the object.

7. Faris is measuring the mass of a pencil. Which of the weights do you think he should place on the scale first? Explain.

1 kg   500 g   100 g   50 g   20 g   10 g   5 g   1 g

Sample answer: He should start with the 1 g weight because the pencil is a lighter object.

8. How can you use a balance scale to determine whether two objects have the same mass without using gram weights?
Sample answer: You can place one object in each bucket on the scale. If the scale is level, the objects have the same mass.

9. **Extend Your Thinking** Cherise is measuring the mass of a small toy on a balance scale. She does not have any gram weights, but she has crayons that each have a mass of about 5 grams. How can she estimate the mass of the toy?
Sample answer: She can add crayons to the scale until it is level. Then she can multiply the number of crayons used by 5 to estimate the mass of the small toy.

🔁 **Reflect**

How can you use a balance scale to measure the mass of an object?

Answers may vary.

Math is... **Mindset**

How did you show you understood how others were feeling today?

Learn

A toothbrush has a mass of about 15 grams.

About how much more mass does a toothbrush have than a bar of soap?

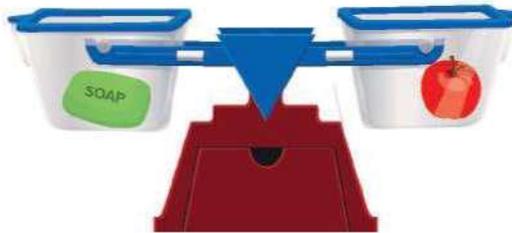You can use the mass of everyday objects to help you estimate.

| 1 gram | 100 grams | 1 kilogram |

You can use a balance scale to compare masses.

A bar of soap has about the same mass as an apple, 100 grams.

You can use a subtraction equation to find the difference in mass.

$$100 - 15 = d$$
$$85 = d$$

A bar of soap has about 85 grams more mass than a toothbrush.

Math is... Choosing Tools

What other objects might you use to estimate mass?

Everyday objects can be used to estimate mass. You can solve problems involving mass by representing the problem with an equation and using strategies to solve.

Work Together

How can you estimate whether the mass of an object is greater than or less than 1 kilogram?

Sample answer: I can use a balance scale and an object I know has a mass of 1 kilogram to compare.

On My Own

Name _____

Which is the best estimate for the mass of the object?

1. nickel

5 grams ⬭
50 grams
5 kilograms

2. loaf of bread

50 grams
500 grams ⬭
5 kilograms

3. three oranges

6 grams
600 grams ⬭
6 kilograms

4. hamster

20 grams
200 grams ⬭
2 kilograms

5. cantaloupe

1 kilogram ⬭
10 kilograms
100 kilograms

6. sandwich

2 grams
250 grams ⬭
25 kilograms

7. Sylvia feeds her dog 128 grams of dog food two times each day. How many grams of dog food does she feed her dog each day? Show your work.

256 grams; Sample answer: 128 + 128 = 256

8. Eight apple slices have a mass of 32 grams. Each slice has the same mass. What is the mass of each apple slice? Show your work.

4 grams; Sample answer: 32 ÷ 8 = 4

9. Rakesh bought blueberries, raspberries, blackberries, and strawberries for his bakery. He bought 4 kilograms of each type of berry. How many kilograms of berries did he buy?

16 kilograms; Sample answer: $4 \times 4 = 16$

10. Vince's backpack full of books has a mass of 850 grams. What is the mass of his backpack full of books if he removes a book with a mass of 415 grams?

435 grams; Sample answer: $850 - 415 = 435$

11. **Error Analysis** Shane finds the mass of a box of markers and a thumbtack. He says he can use these masses to estimate the mass of a notebook. How do you respond to Shane?

100 grams   1 gram

I agree with Shane; Sample answer: He can compare the mass of the notebook to the box of markers and thumbtack to see if it has more, less, or the same mass as the objects.

12. **Extend Your Thinking** Shoshi's packed bag cannot have a mass greater than 15 kilograms. Her empty bag has a mass of 2 kilograms. She packs 5 items that have a mass of 3 kilograms each in her bag. Will her packed bag be less than 15 kilograms? Explain your reasoning.

No; Sample answer: The total mass of the 5 items is 15 kilograms. The mass of the items and the bag is 17 kilograms. $5 \times 3 = 15$; $15 + 2 = 17$

⟳ Reflect

How can using everyday objects help you estimate mass?

Answers may vary.

Math is... **Mindset**

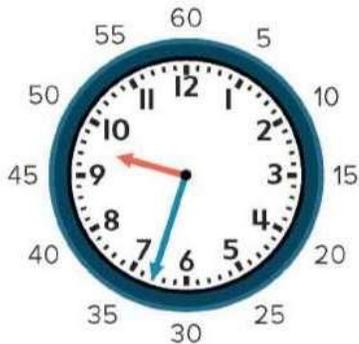How have you worked to accomplish your goal today?

Learn

The clock shows the time Landon's train leaves the station.

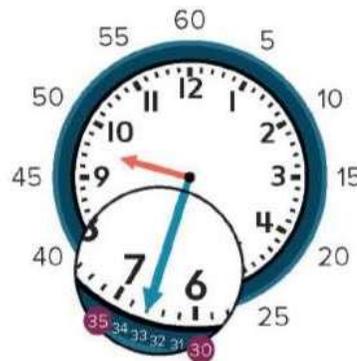**What time does Landon's train leave?**

You know each number on the clock represents 5-minute intervals.

The departure time is between 9:30 and 9:35.

Each tick mark between the numbers represents 1 minute. The minute hand is 3 tick marks, or 3 minutes, after 9:30.

The departure time is 9:33.

You can read the time as *9:33, 33 minutes past 9,* or *27 minutes before 10*. On a digital clock, the same time looks like this.

9:33

On an analog clock, you can count tick marks from a given number to tell time to the nearest minute.

Math is... **In My World**

Why might you need to know the exact time?

Work Together

How can you determine the time shown on the clock?

Sample answer: The hour hand is between the 4 and 5, and the minute hand is at 2 tick marks past 50. The time on the clock is 4:52.

On My Own

Name _____

What time is shown on the clock?

1.

___6___ : ___24___

2.

___4___ : ___36___

3.

___12___ : ___47___

Tina, Troy, and Tim went to bed at different times.

4. What time did Tina go to bed?

Tina

___9___ : ___24___

5. What time did Troy go to bed?

Troy

___8___ : ___56___

6. What time did Tim go to bed?

Tim

___9___ : ___03___

7. What would Tina's clock look like if she went to bed at 9:38?

8. What would Tim's clock look like if he went to bed at 9:12?

9. Ray went for a walk at 8:54. Circle the clock that shows the time he left for his walk.
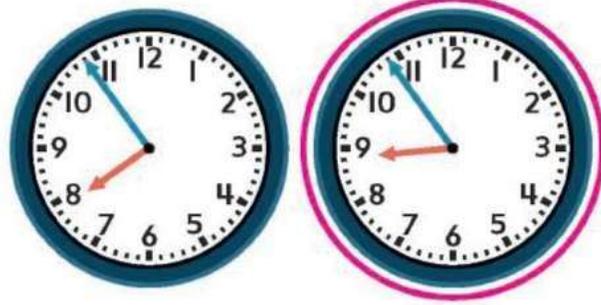
10. What time does the other clock show?

7:54

11. What is the difference between the two times? Explain your answer.

1 hour; Sample answer: The minute hand is in the same position, and the hour hand has increased by 1 number. The difference between 7:54 and 8:54 is 1 hour.

12. STEM Connection Maya and Lamar arrive at an excavation site at different times one morning. Who arrived first? Explain your answer.

Maya

Lamar

8:46

Sample answer: Lamar arrived first because 8:46 is earlier than 8:49.

13. Extend Your Thinking Jenette went outside to play at 11:27. Camden went outside 2 hours later. How can you show the time each girl went outside on the clocks?

Jenette

Camden

Reflect

How can you tell time to the nearest minute?

Answers may vary.

Math is... Mindset

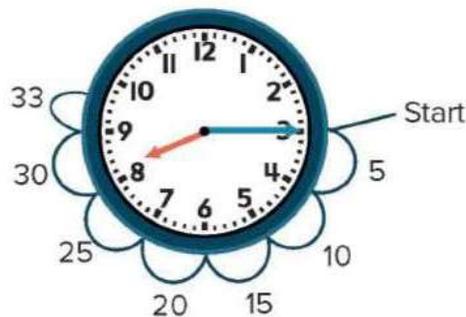How were you a part of the classroom community today?

Learn

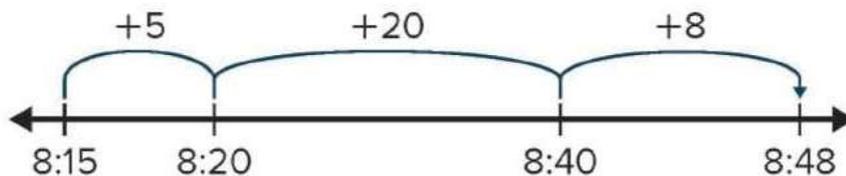Chloe's hike started at 8:15 a.m. and ended at 8:48 a.m.

How many minutes was her hike?

▶ **One Way** Use a clock. Start at 8:15. Count on by 5s the minutes from 8:15 to 8:45. Then count on 3 from 8:45 to 8:48.

▶ **Another Way** Use a number line. Start at 8:15. Count on from 8:15 to 8:48. Add to find the total number of minutes.

+5   +20   +8

8:15   8:20   8:40   8:48

Chloe's hike was 33 minutes.

You can solve problems involving time intervals using an analog clock or a number line.

Math is... **Thinking**

How can you determine the number of minutes in a different way?

🔍 Work Together

Kendrick gets on the bus at 3:15. The bus ride takes 25 minutes. Then he walks 17 minutes home. What time does he arrive home? Show your work on the number line. **3:57; See students' work.**
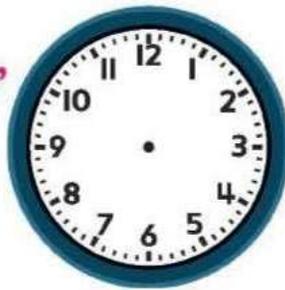
On My Own

Name _____

How long was the activity?
Show your work on the clock or number line.

1. George started his walk to school at 7:15 a.m. and ended his walk at 7:35 a.m. How long was his walk to school?

   20 minutes; See students' work

2. Band practice started at 3:08 p.m. and ended at 3:56. How long was band practice?

   48 minutes; See students' work

3. Rita visited her friend from 4:12 p.m to 4:49 p.m. How long was her visit? **37 minutes; See students' work.**

4. The party started at 3:25 p.m. and lasted 45 minutes. When did the party end?

   4:10 p.m.

5. Sam's art class started at 4:05 p.m. It lasted 48 minutes. When did the class end?

   4:53 p.m.

6. Sara finished cooking at the a.m. time shown. She cooked for 32 minutes. What time did she start cooking?
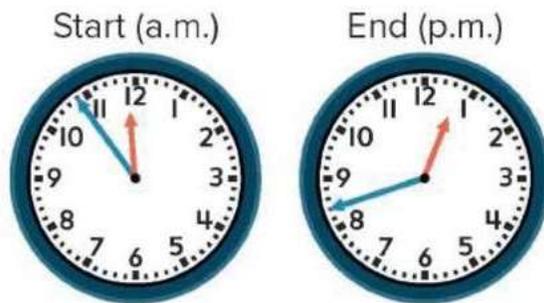
   11:03 a.m.

7. Aaron's game lasted 37 minutes It ended at 12:59 p.m. When did his game start?

   12:22 p.m.

8. The clocks show when Dion started reading and when he ended. How long did he read?

Start (a.m.)　　　End (p.m.)

48 minutes

9. Raj and Erik got home from school at the times shown. Who arrived earlier and by how many minutes?

Raj　　　Erik

4:41 PM　　**4:28** PM

Erik; 13 minutes

10. It took Wen 23 minutes to walk from school to home. When she got home, she worked on her math homework for 25 minutes. She finished her math homework at 3:48 p.m. What time did Wen start her walk home?

3:00 p.m.

11. STEM Connection Maya monitored an earthquake that occurred at 11:05 a.m. An aftershock happened 43 minutes after the earthquake. What time did the aftershock take place?

11:48 a.m.

12. Extend Your Thinking Gia's concert starts at 7:35 p.m. and lasts 45 minutes. When does her concert end?

8:20 p.m.

Reflect

How can you determine how much time has passed from the start of an activity to the end of an activity?

Answers may vary.

Math is... Mindset

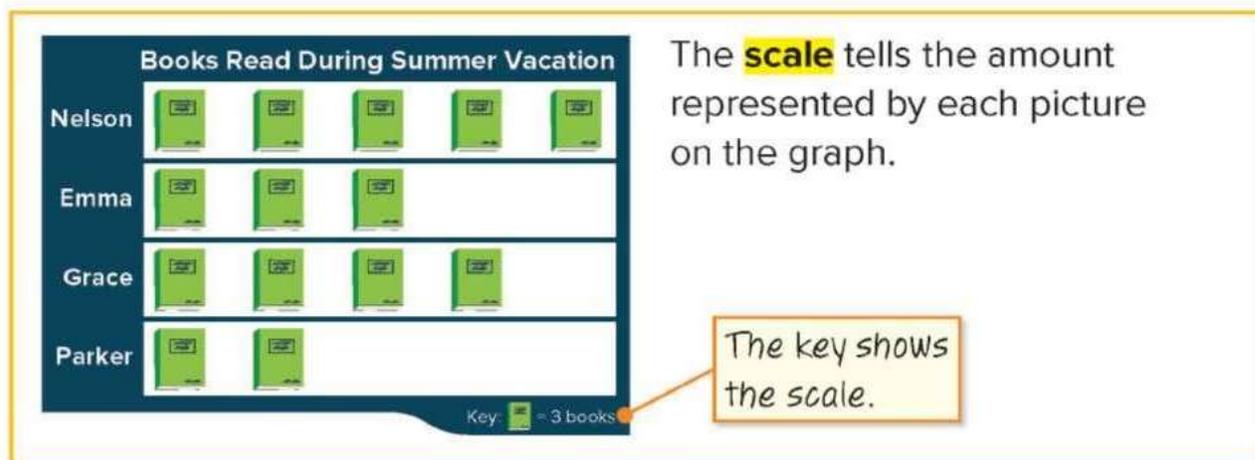How did you contribute to a productive classroom culture?

Learn

Emma surveyed three friends about the number of books they read during summer vacation. The table shows the results.

How can you display the data?

You can use a scaled picture graph.

Person	Books Read
Nelson	15
Emma	9
Grace	12
Parker	6

Books Read During Summer Vacation

Nelson 📗 📗 📗 📗 📗
Emma 📗 📗 📗
Grace 📗 📗 📗 📗
Parker 📗 📗

Key: 📗 = 3 books

The **scale** tells the amount represented by each picture on the graph.

The key shows the scale.

A scaled picture graph uses pictures or symbols to represent more than one data point.

Math is... Precision

When creating a picture graph, how can you decide the scale of the graph?

Work Together

How can you display the data in a picture graph?

Grade	Number of Students
2nd Grade	4
3rd Grade	12
4th Grade	11
5th Grade	7

Students in the School Play

2nd Grade ★ ★
3rd Grade ★ ★ ★ ★ ★ ★
4th Grade ★ ★ ★ ★ ★ ⭐
5th Grade ★ ★ ★ ⭐

Key: ★ = 2 students

On My Own

Name _____

Use the picture graph to complete exercises 1 and 2.

Days of Rain

June	💧💧💧💧💧
July	💧💧💧💧💧💧
August	💧💧💧
September	💧💧

Key: 💧 = 2 days

1. How many days of rain are represented by each picture? Explain how you know.

   2; Sample answer: The key shows that 1 picture represents 2 days of rain.

2. How many days did it rain in June? Explain how you know.

   10; Sample answer: There are 5 pictures. Each picture represents 2 days of rain, 5 × 2 = 10.

3. The table shows each third grader's favorite subject. How can you display the data in the picture graph?

Favorite Subject	Third Graders
Math	9
Reading	12
Social Studies	6
Science	15

Favorite Subject

Math	▲ ▲ ▲
Reading	▲ ▲ ▲ ▲
Social Studies	▲ ▲
Science	▲ ▲ ▲ ▲ ▲

Key: ▲ = 3 students
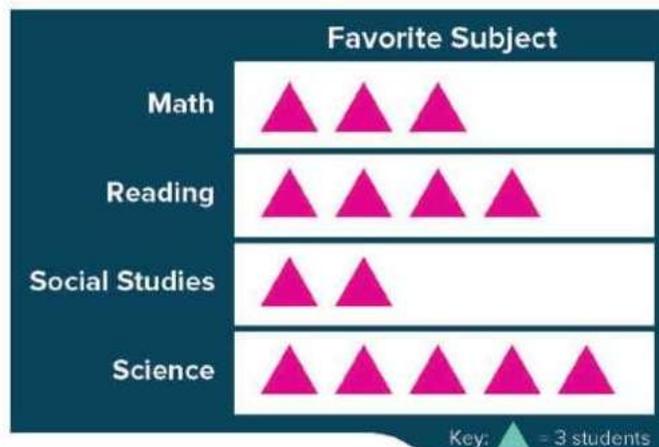
4. The table shows the number of points each player scored in a basketball game. How can you display the data in a scaled picture graph?

	Points Scored in the Game
Matt	● ● ● ●
Alexa	● ●
Jim	● ● ●
Heidi	● ● ● ● ● ●

Key: ● = 3 points

Players	Points
Matt	12
Alexa	6
Jim	9
Heidi	18

5. Extend Your Thinking What are 3 different scales you could use in a picture graph to represent the data shown in the table?

Sample answer: I could use a picture to represent 2 students, 4 students, or 8 students.

Students	Votes
Arthur	24
Susan	16
Sabine	32
Rich	8
Juan	40

Reflect

How can you display data using a scaled picture graph?

Answers may vary.

Math is... Mindset

What behaviors did you use to show respect towards someone today?

Learn

Duncan surveys his friends about their favorite outdoor activity. He shows the results in a table.

How can you display the data in another way?

You can use a scaled bar graph to display the data.

Activity	Number of Friends
Hiking	8
Jogging	4
Fishing	16
Biking	14

Decide on a scale, or the amount each interval represents.

Each interval represents 4 friends.

Favorite Outdoor Activity

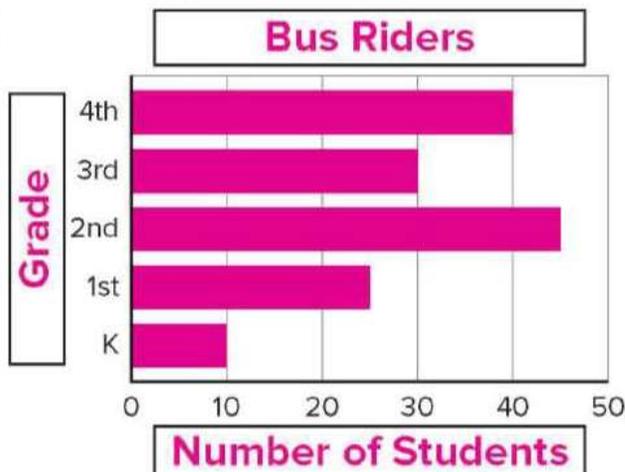A scaled bar graph uses intervals greater than 1.

Math is... **Thinking**

How can you change the scale and represent the same data?

Work Together

How can you display the data in a bar graph?

Bus Riders	
Grade	**Number of Students**
K	10
1st	25
2nd	45
3rd	30
4th	40

Bus Riders

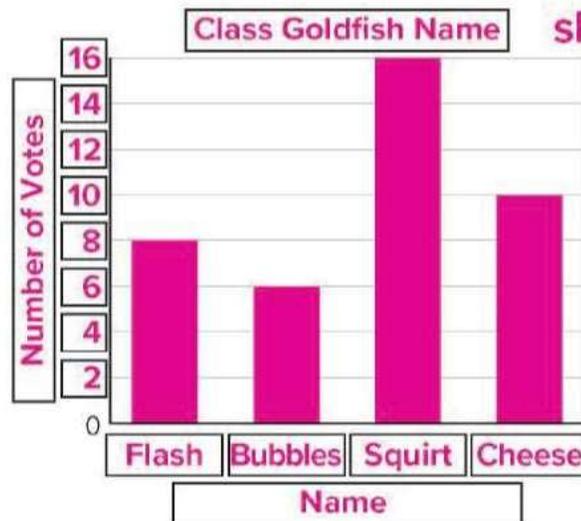# On My Own

Name _____

1. How can you display the data in a scaled bar graph?

Sample answer shown.

Class Goldfish Name	
Name	**Number of Votes**
Flash	8
Bubbles	6
Squirt	16
Cheese	10

Class Goldfish Name

a. How did you decide the scale of your graph?

Sample answer: The numbers are even so I knew I could make each interval represent 2 votes.

b. What is another scale you could use for your graph?

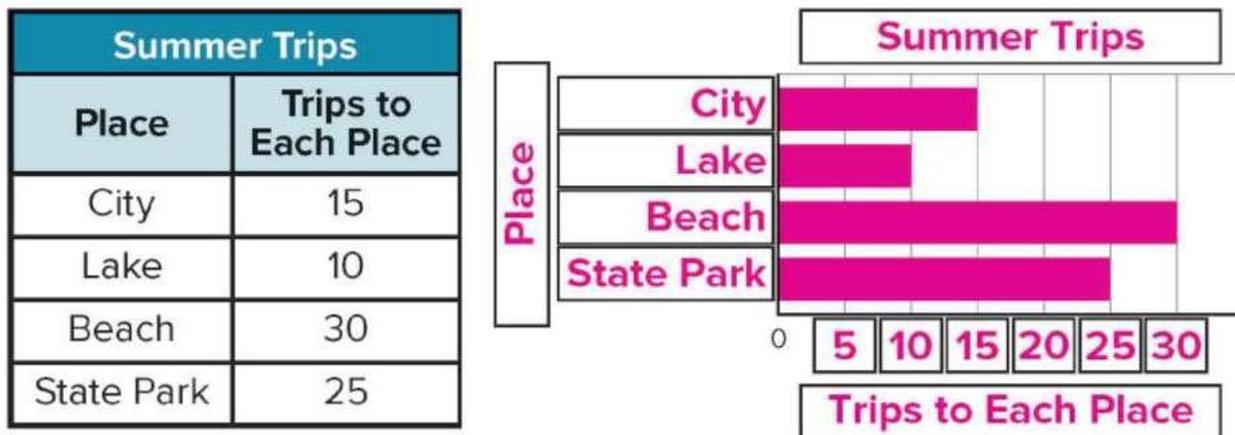**Sample answer: Each interval could represent 4.**

2. **Error Analysis** Cameron created a bar graph using the data in the table. How can you explain the error in the graph?

Sports Teams	
Team	**Number of Friends**
Soccer	5
Basketball	6
Swim	2

Sports Teams
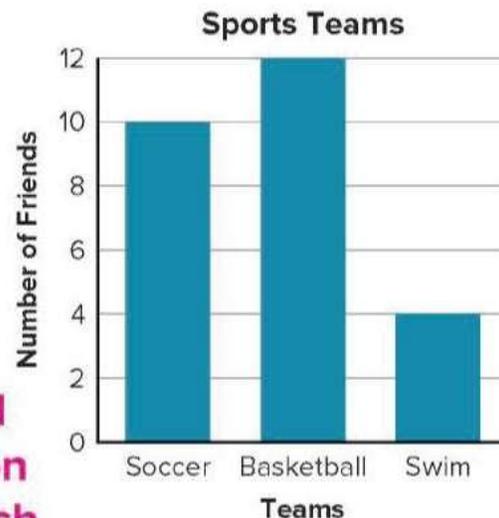
Sample answer: Each interval represents 2 friends. Cameron completed the graph as if each interval represents 1 friend.

3. How can you display the data in a scaled bar graph?

Summer Trips	
Place	**Trips to Each Place**
City	15
Lake	10
Beach	30
State Park	25

Summer Trips

Place

City

Lake

Beach

State Park

0   5 10 15 20 25 30

Trips to Each Place

4. Which parts of the graph did you need to complete before displaying the data with bars? Explain why these needed to be completed first.

Sample answer: I needed to create the scale and label the categories so I would know where to place the data or to which line to extend the bar.

5. How can you explain the difference between a scaled bar graph and a bar graph?

Sample answer: The intervals are greater than 1 on a scaled bar graph.

6. Extend Your Thinking Why might you choose to display a set of data in a bar graph instead of a picture graph? Explain your thinking. **Sample answer: Bar graphs can be easier to create and compare data. They can also represent greater numbers better than a picture graph.**

🔁 **Reflect**

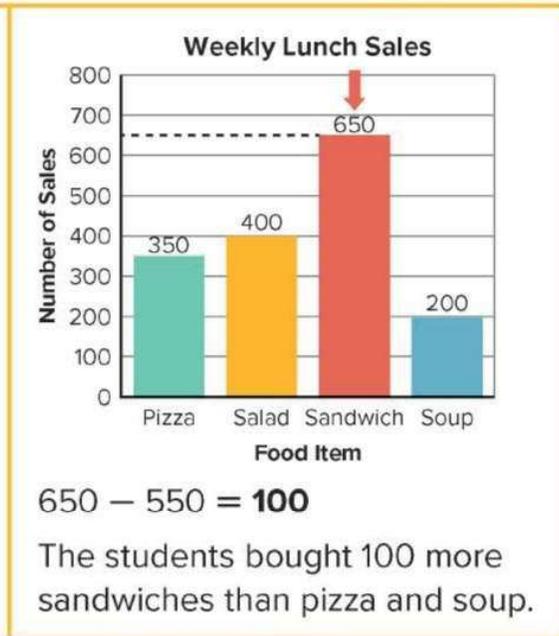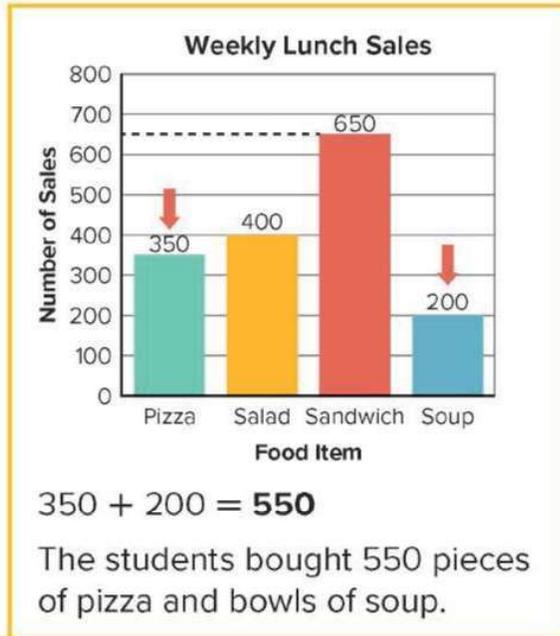How can you display data in a scaled bar graph?
Answers may vary.

Math is... **Mindset**

What helped you want to do your best work today?

Learn

Some students tracked the numbers and types of lunch items bought. They displayed the data in a bar graph.

MENU
Pizza
Salad
Sandwich
Soup

How many more sandwiches did students buy than pieces of pizza and bowls of soup?

Weekly Lunch Sales

$350 + 200 = \textbf{550}$

The students bought 550 pieces of pizza and bowls of soup.

Weekly Lunch Sales

$650 - 550 = \textbf{100}$

The students bought 100 more sandwiches than pizza and soup.

Solve problems with scaled graphs by making sense of the data and writing an equation to represent the problem.

Math is... Precision

How does the scale of the graph help you find the number of items sold?

🅠 Work Together

On Thursday, Sam spent 10 fewer minutes on homework than he did on Tuesday. How many pencils belong in the last row?
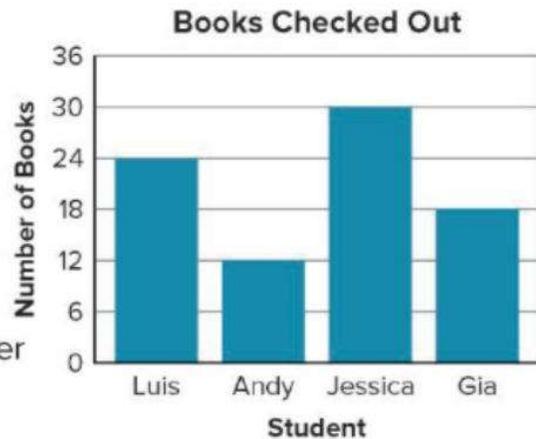
4 pencils

Time Spent on Homework

Monday	✏️✏️✏️✏️
Tuesday	✏️✏️✏️✏️✏️✏️
Wednesday	✏️✏️✏️✏️✏️
Thursday	

Key: ✏️ = 5 minutes

On My Own

Name _____

Use the bar graph to complete exercises 1 through 3.

Books Checked Out

1. How many more books did Jessica check out than Luis?

   6 books

2. What is the difference between the greatest number of books checked out and the fewest number of books checked out?

   18 books

3. The number of books Jessica checked out is the same as the total number of books checked out by which two students? Explain how you know.

   Andy and Gia; Sample answer: Jessica checked out 30 books. Andy checked out 12 books and Gia checked out 18 books. $12 + 18 = 30$

Use the picture graph to complete exercises 4 through 6.

4. How many fewer banana nut muffins sold than blueberry?

   12 muffins

5. How many more chocolate muffins sold than corn and blueberry muffins combined? Show your work.

   6 muffins;

   **Sample answer: $12 + 18 = 30$, $36 - 30 = 6$**

6. How can you compare the sales of blueberry muffins to corn and banana nut muffins combined? Explain. **They sold the same number. Sample answer: 18 blueberry muffins sold; $12 + 6 = 18$; 18 corn and banana nut muffins sold**

Use the bar graph to complete exercises 7 through 9.

7. **STEM Connection** Maya tracks the number of rock and mineral samples she finds at a dig site. How many fewer gypsum samples did she find than limestone samples?

25 samples;
Sample answer:
$30 - 5 = 25$

Samples Collected

Number of Samples

30	
25	
20	
15	
10	
5	
0	

Quartz Limestone Shale Gypsum

Sample Type
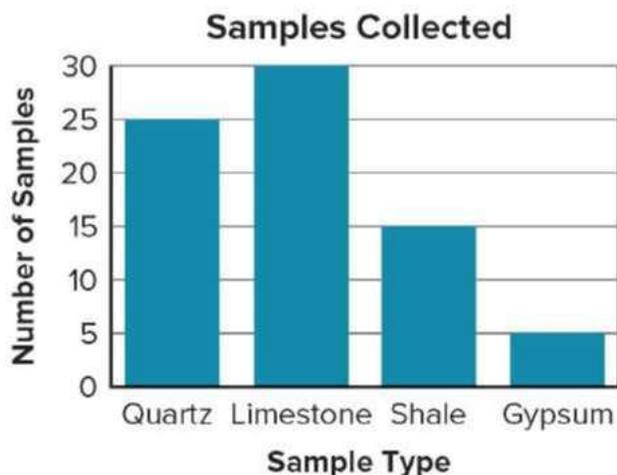
8. Which two samples combined equal the same amount as one single sample?

30 quartz and gypsum samples equal 30 limestone samples; Sample answer: $25 + 5 = 30$

9. **Extend Your Thinking** Maya visits a second dig site. She collects 5 fewer samples of each type. How many total samples does she collect at the second dig site?

55 samples; Sample answer: $4 \times 5 = 20$;
$25 + 30 + 15 + 5 = 75$; $75 - 20 = 55$

⟳ **Reflect**

How can you find the difference between two data points on a scaled graph?

Answers may vary.

Math is... Mindset

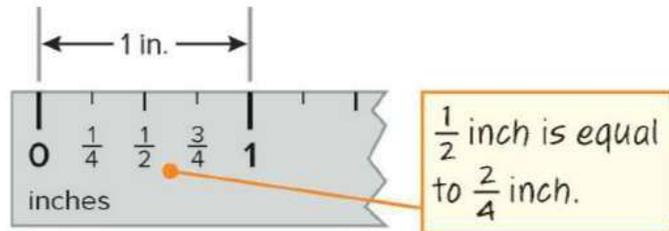How did a plan help you solve a problem today?

Learn

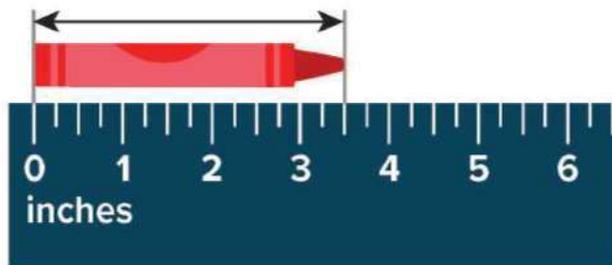Lola is measuring items around her classroom.

How can she determine the most precise measurement of each item?
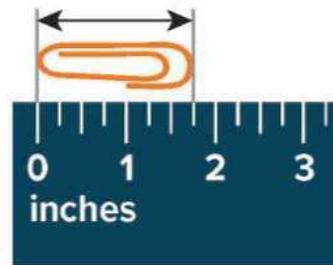
Use an inch **ruler** to measure length.

It is marked in halves and fourths, or quarters, of an inch.

$\frac{1}{2}$ inch is equal to $\frac{2}{4}$ inch.

Place one end of the object at the 0 mark. Then find the nearest half-inch or quarter-inch mark at the other end of the object.

$3\frac{1}{2}$ inches

$1\frac{3}{4}$ inches

You can measure an object to the nearest half inch or quarter inch to find the most precise measurement.
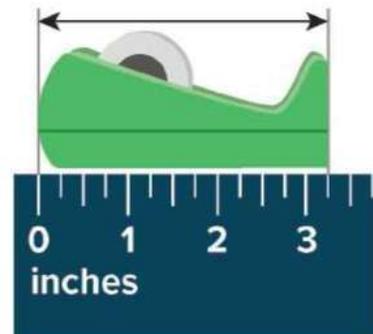
Math is... **Precision**

How can you decide which units on the ruler are a good choice for your measurement?

Work Together

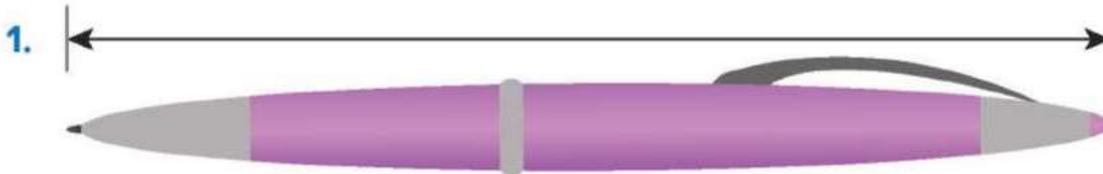What is the most precise measurement of the tape dispenser?
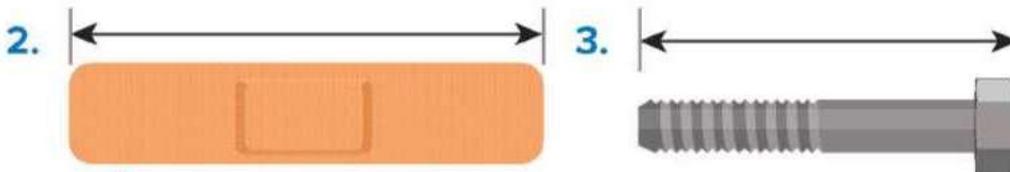
$3\frac{1}{4}$ **inches**

Name _____

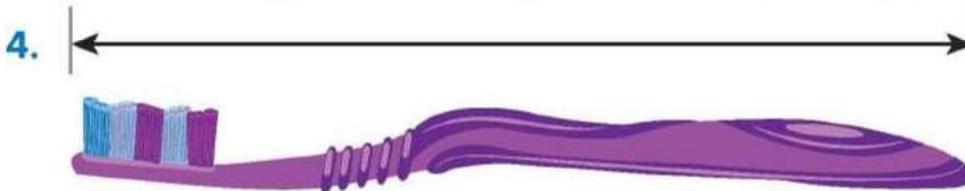**What is the length of each object to the nearest half inch?**

1.

$5\frac{1}{2}$ inches

2.

$2\frac{1}{2}$ inches

3.

2 inches

What is the length of each object to the nearest quarter inch?
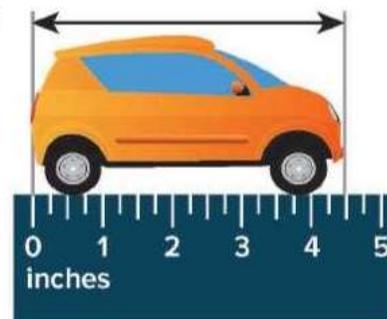
4.

$4\frac{3}{4}$ inches

5.

$2\frac{1}{4}$ inches

6.
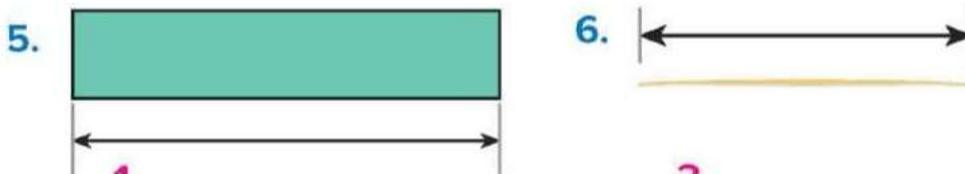
$1\frac{3}{4}$ inches

7. What is the most precise measurement of the toy car using the ruler in the picture?

$4\frac{1}{2}$ inches

0 1 2 3 4 5
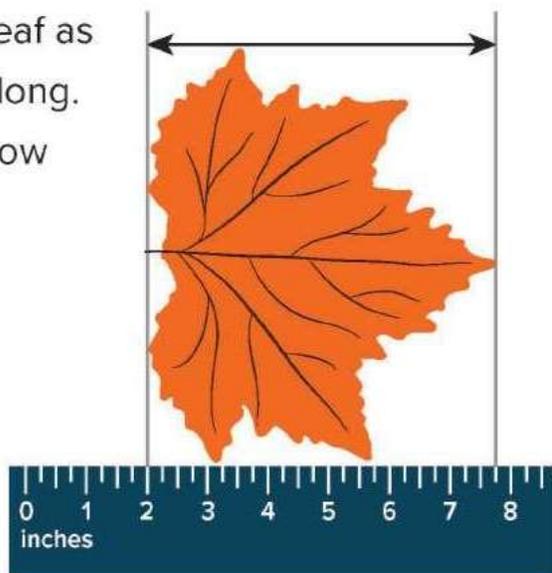inches

Use the image of the leaf and ruler for exercises 8 through 10.

8. **Error Analysis** Tyler measures the leaf as shown. He says the leaf is $7\frac{3}{4}$ inches long. How can you help Tyler understand how to measure the leaf?

   Sample answer: One end of the leaf isn't lined up at 0. He should move the leaf to 0 to measure correctly.

9. Is the length of the leaf more or less than $7\frac{3}{4}$ inches? Explain how you know.

   The leaf is less than $7\frac{3}{4}$ inches. Sample answer: The measurement $7\frac{3}{4}$ inches is too long because the leaf is lined up at 2 inches instead of 0.

10. **Extend Your Thinking** How can you determine about how many inches long the leaf is?

    Sample answer: The leaf starts at 2 inches and ends at about 8 inches. I can subtract 2 from 8 to find about how many inches long the leaf is.

🔄 Reflect

How can you measure an object to a half or a fourth of an inch?

Answers may vary.

Math is... **Mindset**

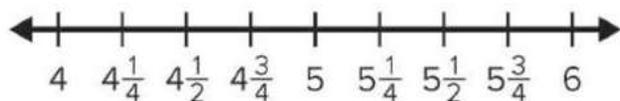How did having confidence in your work help you do your best today?

Learn

The table shows the length of 15 pencils.

How many pencils are longer than 5 inches?

Pencil Lengths (in.)				
$4\frac{1}{4}$	$5\frac{3}{4}$	$4\frac{1}{4}$	5	4
5	$4\frac{3}{4}$	$5\frac{3}{4}$	5	6
$4\frac{3}{4}$	5	$4\frac{3}{4}$	$4\frac{1}{2}$	$5\frac{1}{2}$

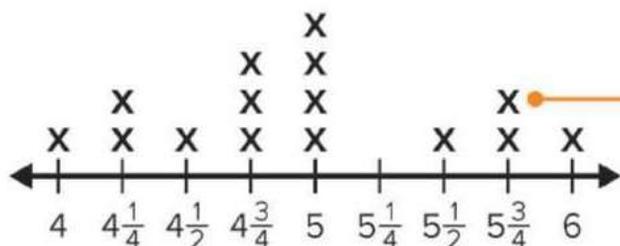You can use a **line plot.** A line plot displays data above a number line.

Label a number line with values from the data set.

$$4 \quad 4\frac{1}{4} \quad 4\frac{1}{2} \quad 4\frac{3}{4} \quad 5 \quad 5\frac{1}{4} \quad 5\frac{1}{2} \quad 5\frac{3}{4} \quad 6$$

Pencil Lengths (in.) ● —— Label the line plot.

Place one X above the measurement for each pencil length.

```
                    X
              X     X
        X     X     X                    X  ● —— 4 Xs to the right of 5.
  X     X  X  X  X        X     X     X
  |-----|--|--|--|--|-----|-----|-----|
  4   4¼ 4½ 4¾  5  5¼   5½   5¾    6
```

Pencil Lengths (in.)

Four pencils are longer than 5 inches.

Math is...   Modeling

How can a line plot help you understand a data set?

You can display measurement data in a line plot. Each X can represent one data point.

ⓠ Work Together

How many shoes were measured?
Which shoe length was most common?
Explain how you know.

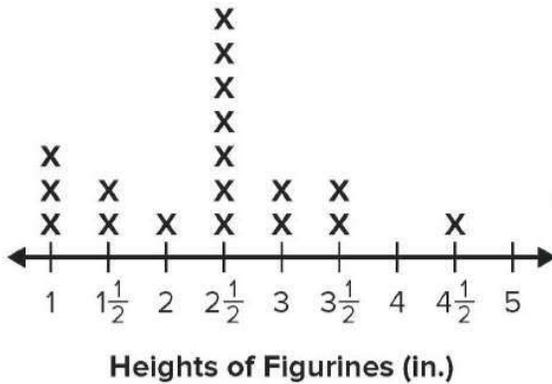**Sample answer: 10 shoes; $9\frac{1}{2}$ was the most common length because it has the most Xs.**

```
                    X
              X     X     X     X
        X     X     X     X     X
  |-----|-----|-----|-----|-----|
  8½    9    9½    10   10½
```
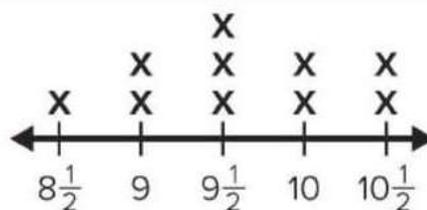
Shoe Lengths (in.)

On My Own

Name _____

Use the line plot to complete exercises 1 through 3.


Heights of Figurines (in.)

1. How many figurines are in the collection?

   18 figurines

2. Which height is most common?

   $2\frac{1}{2}$ inches

3. Which measurements were not the height of any figurines?

   4 and 5 inches

4. How many figurines are shorter than 2 inches?

   5 figurines

5. How many figurines are taller than 3 inches?

   3 figurines

Brody measures his crayons to the nearest half inch. He records the measurements in a table.

Crayon Lengths (in.)				
2	3	$1\frac{1}{2}$	3	$1\frac{1}{2}$
$3\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	3	2
2	$3\frac{1}{2}$	3	2	$2\frac{1}{2}$
3	$3\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{1}{2}$	3

6. How can you display the data in a line plot?
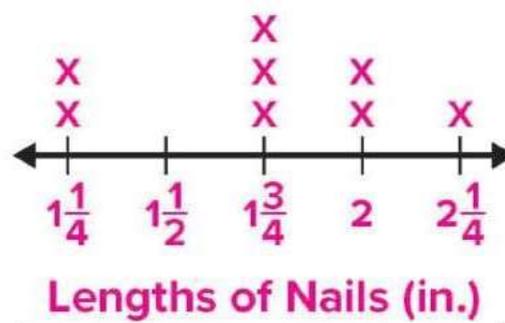

Lengths of Crayons (in.)
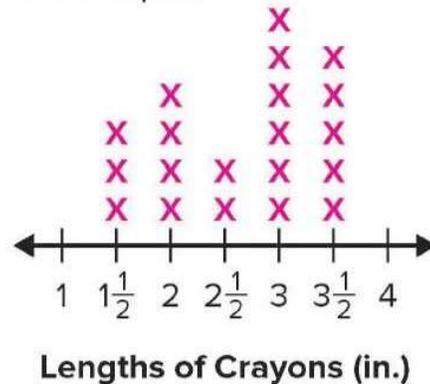
7. How many crayons are $2\frac{1}{2}$ inches long?

   2 crayons

8. How many more 3-inch crayons are there than $1\frac{1}{2}$-inch crayons?

   3 crayons

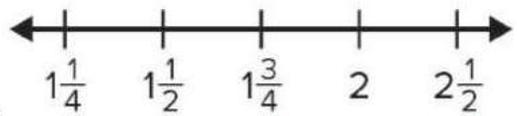9. How many crayons are shorter than 3 inches?

   9 crayons

10. What is the measurement of each nail to the nearest quarter inch? Record the data in the table and create a line plot.

$1\frac{1}{4}$

2

$1\frac{3}{4}$

$2\frac{1}{4}$

2

$1\frac{3}{4}$

$1\frac{1}{4}$

$1\frac{3}{4}$
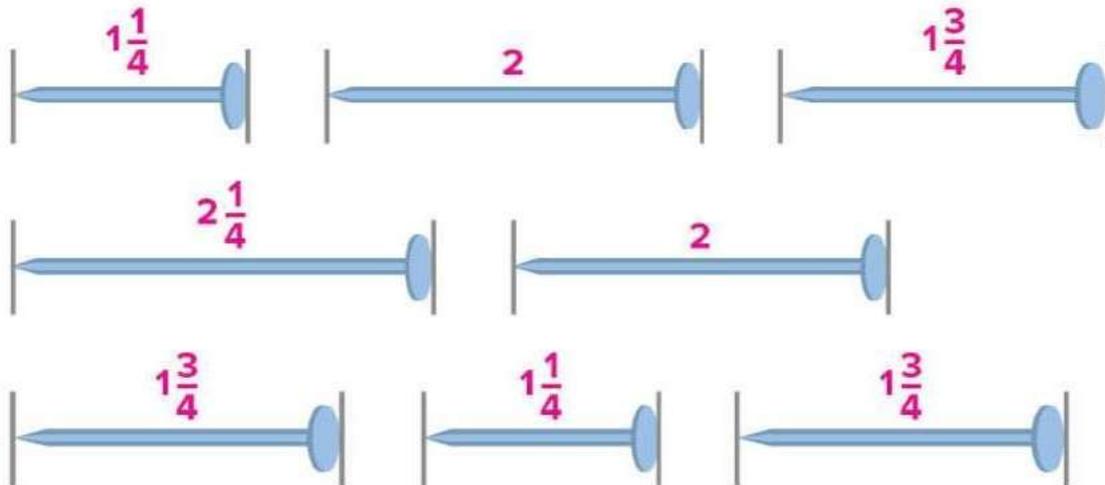
Lengths of Nails (in.)			
$1\frac{1}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	2
$2\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	2

```
                    X
         X          X          X
         X          X          X          X
  ←──────┼──────────┼──────────┼──────────┼──────────┼──────→
       1¼         1½         1¾          2         2¼
```

Lengths of Nails (in.)

11. Error Analysis Meg begins a line plot to record the lengths of the nails. How might you correct the number line? Explain your thinking. **Sample answer: Replace $2\frac{1}{2}$ with $2\frac{1}{4}$. The data shows fourths of an inch so each interval on the number line represents one-fourth inch.**

```
  ←──┼──────┼──────┼──────┼──────┼──→
    1¼     1½     1¾      2     2½
```

12. Extend Your Thinking How can showing measurement data on a line plot help someone understand the data?

Sample answer: A line plot helps you easily see which measurements occur the most and least.

⟳ **Reflect**

How can you explain how to create a line plot from length measurements?

Answers may vary.

Math is... Mindset

How did working as a team help you achieve your goal?