Name _____

Line Plots

Essential Question How can you make and interpret line plots with fractional data?

Common Core **Measurement and Data—4.MD.B.4**
Also 4.MD.A.2

MATHEMATICAL PRACTICES
MP4, MP5, MP7

Unlock the Problem

The data show the lengths of the buttons in Jen's collection. For an art project, she wants to know how many buttons are longer than $\frac{1}{4}$ inch.

You can use a line plot to solve the problem. A **line plot** is a graph that shows the frequency of data along a number line.

Length of Buttons in Jen's Collection (in inches)
$\frac{1}{4}, \frac{3}{4}, \frac{1}{4}, \frac{4}{4}, \frac{1}{4}, \frac{4}{4}$

Make a line plot to show the data.

Example 1

STEP 1 Order the data from least to greatest length and complete the tally table.

_____

Buttons in Jen's Collection	
Length (in inches)	Tally
$\frac{1}{4}$	
$\frac{3}{4}$	
$\frac{4}{4}$	

STEP 2 Label the fraction lengths on the number line below from the least value of the data to the greatest.

STEP 3 Plot an *X* above the number line for each data point. Write a title for the line plot.

_____ _____ _____ _____

_____

So, _____ buttons are longer than $\frac{1}{4}$ inch.

Math Talk MATHEMATICAL PRACTICES 4

Use Models Explain how you labeled the numbers on the number line in Step 2.

1. How many buttons are in Jen's collection? _____

2. What is the difference in length between the longest button and the shortest button in Jen's collection? _____

Think: To find the difference, subtract the numerators. The denominators stay the same.

Example 2

Some of the students in Ms. Lee's class walk to school. The data show the distances these students walk. What distance do most students walk?

Distance Students Walk to School (in miles)
$\frac{1}{2}, \frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{1}{4}, \frac{1}{2}, \frac{1}{2}$

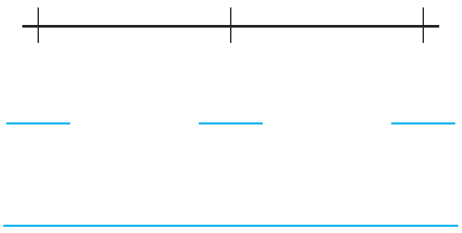
Make a line plot to show the data.

STEP 1 Order the data from least to greatest distance and complete the tally table.

Distance Students Walk to School	
Distance (in miles)	Tally

STEP 2 Label the fraction lengths on the number line below from the least value of the data to the greatest.

STEP 3 Plot an *X* above the number line for each data point. Write a title for the line plot.



So, most students walk _____.

3. How many more students walk $\frac{1}{2}$ mile than $\frac{1}{4}$ mile to school?

4. What is the difference between the longest distance and the shortest distance that students walk?

5. What if a new student joins Ms. Lee's class who walks $\frac{3}{4}$ mile to school? How would the line plot change? Explain.

Name _____

Share and Show

MATH BOARD

1. A food critic collected data on the lengths of time customers waited for their food. Order the data from least to greatest time. Make a tally table and a line plot to show the data.

Time Customers Waited for Food (in hours)
$\frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{1}{4}, \frac{1}{4}, \frac{1}{2}, 1$

Time Customers Waited for Food	
Time (in hours)	Tally

_____ _____ _____ _____

_____

Math Talk

MATHEMATICAL PRACTICES 4

Use Graphs Explain how the line plot helped you answer the question for Exercise 2.

Use your line plot for 2 and 3.

2. On how many customers did the food critic collect data? _____

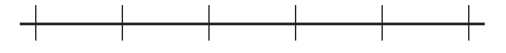
3. What is the difference between the longest time and the shortest time that customers waited? _____

On Your Own

4. MATHEMATICAL PRACTICE 4 **Use Models** The data show the lengths of the ribbons Mia used to wrap packages. Make a tally table and a line plot to show the data.

Ribbon Length Used to Wrap Packages (in yards)
$\frac{1}{6}, \frac{2}{6}, \frac{5}{6}, \frac{3}{6}, \frac{2}{6}, \frac{6}{6}, \frac{3}{6}, \frac{2}{6}$

Ribbon Used to Wrap Packages	
Length (in yards)	Tally



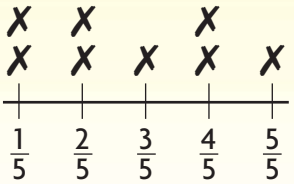
_____ _____ _____ _____ _____ _____

_____

5. What is the difference in length between the longest ribbon and the shortest ribbon Mia used? _____

Unlock the Problem Real World

6. GO DEEPER The line plot shows the distances the students in Mr. Boren's class ran at the track in miles. Altogether, did the students run more or less than 5 miles?



Distance Students Ran at the Track (in miles)

a. What are you asked to find? _____

_____

b. What information do you need to use? _____

_____

c. How will the line plot help you solve the problem? _____

_____

d. What operation will you use to solve the problem? _____

e. Show the steps to solve the problem.

_____

_____

f. Complete the sentences.

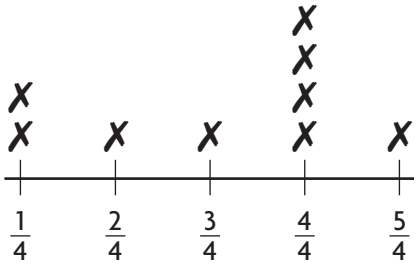
The students ran a total of _____ miles.

The distance is _____ than 5 miles. Altogether the students ran _____ than 5 miles.

7. THINK SMARTER Lena collects antique spoons. The line plot shows the lengths of the spoons in her collection. If she lines up all of her spoons in order of size, what is the size of the middle spoon? Explain.

_____

_____



Length of Spoons (in feet)

Personal Math Trainer

8. THINK SMARTER + A hiking group recorded the distances they hiked. Complete the line plot to show the data.

Distance Hiked (in miles)
$\frac{4}{8}, \frac{5}{8}, \frac{7}{8}, \frac{7}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{7}{8}, \frac{6}{8}$

_____ _____ _____ _____

Distance Hiked

Name _____

Line Plots

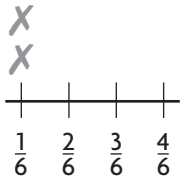
Common Core **COMMON CORE STANDARD—4.MD.B.4**
Represent and interpret data.

1. Some students compared the time they spend riding the school bus. Complete the tally table and line plot to show the data.

Time Spent on School Bus
(in hours)

$\frac{1}{6}, \frac{3}{6}, \frac{4}{6}, \frac{2}{6}, \frac{3}{6}, \frac{1}{6}, \frac{3}{6}, \frac{3}{6}$

Time Spent on School Bus	
Time (in hours)	Tally
$\frac{1}{6}$	
$\frac{2}{6}$	
$\frac{3}{6}$	
$\frac{4}{6}$	



Time Spent on School Bus (in hours)

Use your line plot for 2 and 3.

2. How many students compared times? _____

3. What is the difference between the longest time and shortest time students spent riding the bus? _____

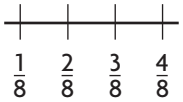
Problem Solving Real World

For 4, make a tally table on a separate sheet of paper. Make a line plot in the space below the problem.

4.

Milk Drunk at Lunch
(in quarts)

$\frac{1}{8}, \frac{2}{8}, \frac{2}{8}, \frac{4}{8}, \frac{1}{8}, \frac{3}{8}, \frac{4}{8}, \frac{2}{8}, \frac{3}{8}, \frac{2}{8}$



Milk Drunk at Lunch (in quarts)

5. WRITE Math Write a problem that can be solved using a line plot. Draw and label the line plot and solve the problem.

_____

_____

_____

Lesson Check (4.MD.B.4)

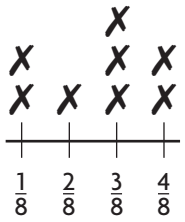
Use the line plot for 1 and 2.

1. How many students were reading during study time?

_____

2. What is the difference between the longest time and shortest time spent reading?

_____



Time Spent Reading During Study Time (in hours)

Spiral Review (4.NF.C.5, 4.MD.A.1)

3. Bridget is allowed to play on-line games for $\frac{75}{100}$ of an hour each day. Write this fraction as a decimal.

_____

4. Bobby's collection of sports cards has $\frac{3}{10}$ baseball cards and $\frac{39}{100}$ football cards. The rest are soccer cards. What fraction of Bobby's sports cards are baseball or football cards?

_____

5. Jeremy gives his horse 12 gallons of water each day. How many 1-quart pails of water is that?

_____

6. An iguana at a pet store is 5 feet long. Measurements for iguana cages are given in inches. How many inches long is the iguana?

_____