

X Marks the Length

Read and make line plots with fraction measurements.

GRADE 4 • 4.MD.B.4

CCSS.Math.Content.4.MD.B.4 "Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example..."

NAME _____

DATE _____

LINE PLOT CLUES

A line plot places one mark above each measurement. Here, a tick of 3 means $\frac{3}{8}$ inch; 4 means $\frac{4}{8}$ or $\frac{1}{2}$ inch. Stack repeated measurements. Add to combine lengths; subtract to compare them.

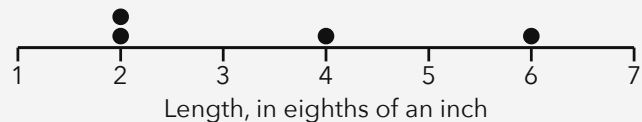
WORKED EXAMPLE

Use the strip-length plot. How much longer is the longest strip than the shortest?

1. The shortest strip is $\frac{2}{8}$ inch; the longest is $\frac{6}{8}$ inch.
2. Subtract: $\frac{6}{8} - \frac{2}{8} = \frac{4}{8} = \frac{1}{2}$.

Answer: $\frac{1}{2}$ inch longer

Example Strip Lengths



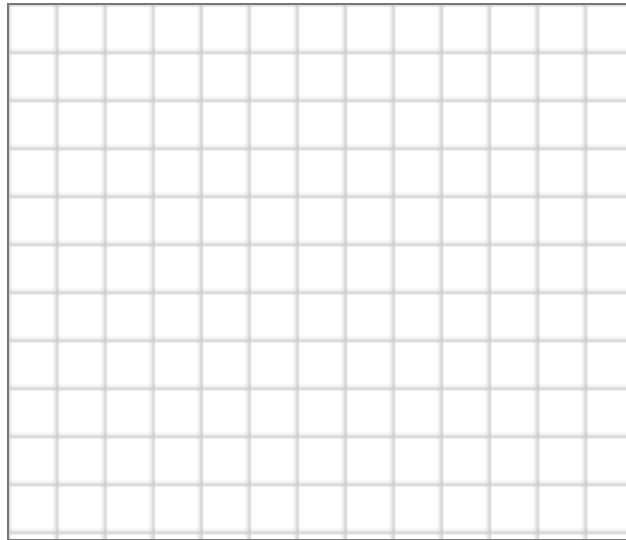
PRACTICE 4 problems

- 1** Paper strips measure $\frac{1}{8}$, $\frac{3}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$ inch. Make a line plot. Which length appears most often?



ANSWER _____

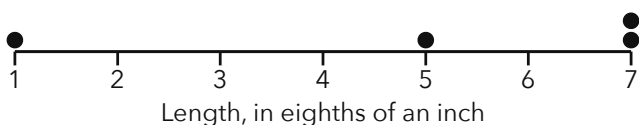
- 2** Ribbon pieces measure $\frac{1}{8}$, $\frac{3}{8}$, $\frac{3}{8}$, $\frac{3}{8}$, $\frac{5}{8}$ inch. Make a line plot. How many pieces are $\frac{3}{8}$ inch long?



ANSWER _____

- 3** Use the shell-length plot. Add the shortest length and longest length.

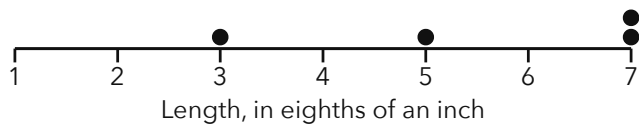
Shell Lengths



ANSWER _____

- 4** Use the bead-length plot. How much longer is the longest bead than the shortest?

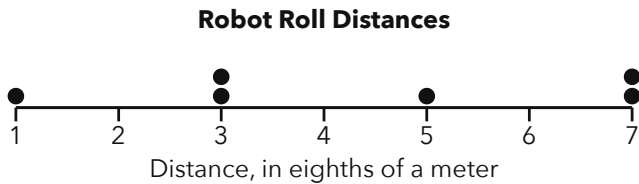
Bead Lengths



ANSWER _____

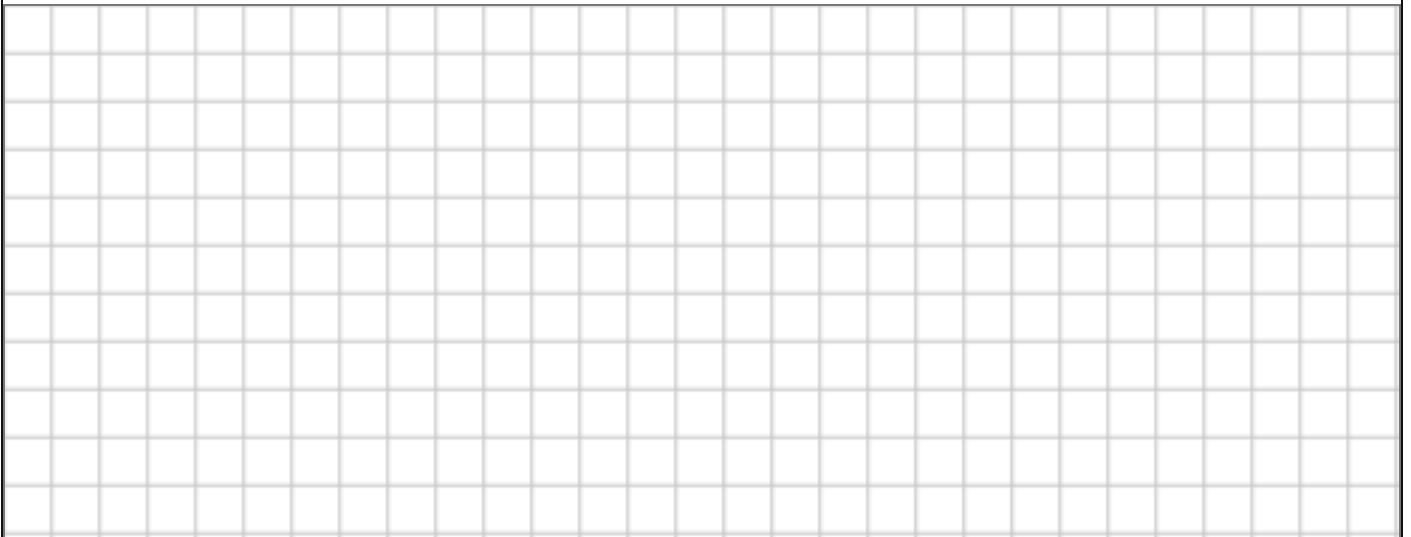
APPLY IT Show your work

- 1** At robotics club, students tested how far a tiny robot rolled. The line plot shows each distance in eighths of a meter. What is the total of the shortest roll and the longest roll?



ANSWER _____

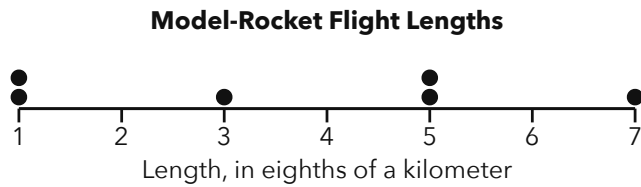
- 2** Ribbon lengths are $\frac{1}{8}$, $\frac{3}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$, $\frac{7}{8}$ inch. Make a line plot. Find the difference between the longest and shortest ribbons.



ANSWER _____

CHALLENGE One step up

The line plot shows the lengths of model-rocket flights in eighths of a kilometer. One new flight measures $\frac{3}{8}$ kilometer, and another new flight measures 1 kilometer. After adding both flights, what is the new difference between the longest and shortest flights? Explain how you know.



WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Paper strips measure $\frac{1}{8}$, $\frac{3}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$ inch. Make a line plot. Which length appears most often?	Plot counts: $\frac{1}{8}$: 1 X, $\frac{3}{8}$: 2 Xs, $\frac{5}{8}$: 1 X, $\frac{7}{8}$: 1 X. The most frequent length is $\frac{3}{8}$ inch.
2	Ribbon pieces measure $\frac{1}{8}$, $\frac{3}{8}$, $\frac{3}{8}$, $\frac{3}{8}$, $\frac{5}{8}$ inch. Make a line plot. How many pieces are $\frac{3}{8}$ inch long?	Plot counts: $\frac{1}{8}$: 1, $\frac{3}{8}$: 3, $\frac{5}{8}$: 1. Three pieces are $\frac{3}{8}$ inch long.
3	Use the shell-length plot. Add the shortest length and longest length.	1 inch
4	Use the bead-length plot. How much longer is the longest bead than the shortest?	$\frac{4}{8}$ inch, or $\frac{1}{2}$ inch

PART 2 • APPLY IT

1. **1 meter** The shortest roll is $\frac{1}{8}$ meter and the longest roll is $\frac{7}{8}$ meter. Add $\frac{1}{8} + \frac{7}{8} = \frac{8}{8} = 1$ meter.

2. **Line plot counts: $\frac{1}{8}$: 1 X, $\frac{3}{8}$: 2 Xs, $\frac{5}{8}$: 1 X, $\frac{7}{8}$: 2 Xs. The difference is $\frac{6}{8}$ inch, or $\frac{3}{4}$ inch.**

The shortest ribbon is $\frac{1}{8}$ inch and the longest is $\frac{7}{8}$ inch. Subtract $\frac{7}{8} - \frac{1}{8} = \frac{6}{8} = \frac{3}{4}$.

CHALLENGE

$\frac{7}{8}$ kilometer. The shortest flight stays $\frac{1}{8}$ kilometer, and the new longest flight is 1 kilometer, or $\frac{8}{8}$ kilometer. $\frac{8}{8} - \frac{1}{8} = \frac{7}{8}$.

Accept equivalent fractions, such as $\frac{4}{8}$ for $\frac{1}{2}$ and $\frac{6}{8}$ for $\frac{3}{4}$. For student-made line plots, accept X marks stacked above correctly labeled eighth-inch values.