

Data Dot Detectives

Collect measurements and build fractional and decimal line plots.

GRADE 5 • MA.5.DP.1.1

MA.5.DP.1.1 "Collect and represent numerical data, including fractional and decimal values, using tables, line graphs or line plots."

NAME _____

DATE _____

READ, REASON AND EXPLAIN

Each dot represents one measurement. Equal number intervals need equal spacing. Stack repeated values above the same position. Title the plot and label its scale and unit. Keep fractional inches and decimal centimeters in separate data sets.

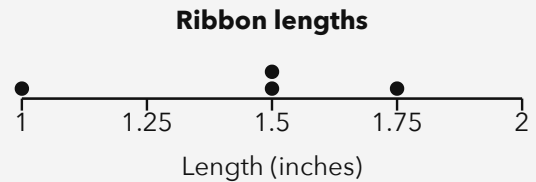
WORKED EXAMPLE

The plot shows four measured ribbon lengths. How is a repeated length represented?

1. Each dot is one ribbon.
2. Two ribbons measure $1\frac{1}{2}$ inches, so two dots are stacked there.

Answer: Repeated values stack above the same position.

Four dots represent four measurements.



PRACTICE 4 problems

Complete tasks in order: construct practice plots, collect real measurements, then represent your own data.

- 1** Five trial times, in minutes, are 0.8, 0.9, 0.8, 1.1 and 0.8. Make a line plot. Label all 13 ticks from 0 to 1.2 in equal 0.1-minute steps, include title and units, and use one dot per time.

Decimal trial times Title:

ANSWER _____

- 2** Five paper-strip lengths are $\frac{1}{2}$, $1\frac{1}{2}$, 1, $1\frac{1}{2}$ and 2 inches. Make a line plot. Label all 13 ticks from 0 to 6 inches in equal half-inch steps. Include title and units.

Fractional strip lengths Title:

ANSWER _____

- 3** Look at your plot for task 1. Why must the gap from 0.8 to 0.9 be the same as the gap from 1.0 to 1.1?

ANSWER _____

- 4** Check your plot for task 2 against its five measurements. Explain why counting only the occupied positions would give the wrong number of strips.

ANSWER _____

APPLY IT Show your work

- 1** Use an inch ruler. Choose four actual small classroom objects. Measure each width to the nearest quarter inch. Record object names and fractional widths in the table.

MY MEASURED WIDTHS

Object name	Width (inches)
_____	_____
_____	_____
_____	_____
_____	_____

ANSWER _____

- 2** Use a centimeter ruler marked in millimeters. Measure the same four widths to the nearest tenth of a centimeter. Record the same object names and decimal widths in this table.

MY MEASURED WIDTHS

Object name	Width (cm)
_____	_____
_____	_____
_____	_____
_____	_____

ANSWER _____

CHALLENGE One step up

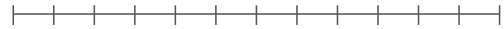
Use both tables you collected. Make one line plot for the fractional inch widths and one for the decimal centimeter widths. Choose equal intervals that cover your values; label each title, scale and unit. Plot all four measurements on each.

My fractional widths

Title: _____

My decimal widths

Title: _____



PRACTICE 3

Both gaps represent 0.1 minute, so they must have equal length.

PRACTICE 4

There are 5 strips but only 4 occupied positions. The 1 1/2-inch position has two dots. Count every dot.

APPLY IT 1

Answers vary. Four actual object names with widths to the nearest 1/4 inch, including mixed numbers when needed. Check against the real objects and inch-ruler marks. Do not supply invented measurements.

APPLY IT 2

Answers vary. Four actual decimal widths to the nearest 0.1 centimeter. Each millimeter is 0.1 centimeter. Check actual measurements and decimal notation; do not require converting the rounded inch measurements.

CHALLENGE

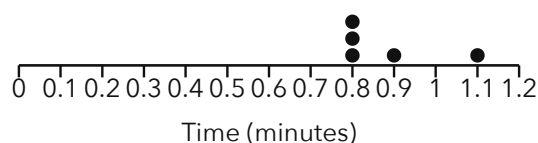
Answers vary with the actual measurements. Each plot must have exactly 4 dots in positions matching its own table. Repeated measurements stack; unused scale positions stay empty.

Provide four small objects per student or group and rulers marked in quarter inches and millimeters. Task 1 and task 2 use supplied practice data; tasks 5-7 require actual collection. Accept quarter-inch fractions or equivalent halves and whole/mixed numbers. Decimal widths are measured to tenths, within the hundredths limit. For actual plots, students choose their own suitable ranges; verify their data, not a fixed answer example. Fractions on the completed practice key may appear as equivalent decimals. Check every plotted value against the corresponding actual-data table, equal scale spacing, title and units. The two scales need not have the same range.

PRACTICE 1

0.8 has 3 dots; 0.9 has 1; 1.0 has 0; 1.1 has 1.

Trial times

**PRACTICE 2**

1/2: 1 dot; 1: 1; 1 1/2: 2; 2: 1.

Paper-strip lengths

