

MA.5.DP.1.1

Overarching Standard: MA.5.DP.1 Collect, represent, and interpret data and find the mean, mode, median or range of a data set.

Benchmark of Focus

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

Examples: Gloria is keeping track of her money every week. She starts with \$10.00, after one week she has \$7.50, after two weeks she has \$12.00 and after three weeks she has \$6.25. Represent the amount of money she has using a line graph.

Benchmark Clarifications

Clarification 1: Within this benchmark, the expectation is for an estimation of fractional and decimal heights on line graphs.

Clarification 2: Decimal values are limited to hundredths. Denominators are limited to 1, 2, 3 and 4. Fractions can be greater than one.

Related Benchmark/Horizontal Alignment

- MA.5.NSO.1.4
- MA.5.AR.1.2
- MA.5.GR.4.1/4.2

Vertical Alignment

Previous Benchmarks

MA.4.DP.1.1

Next Benchmarks

MA.6.DP.1.5

Terms from the K-12 Glossary

- Line Graphs
- Line Plots

Purpose and Instructional Strategies

The purpose of this benchmark is to collect and display authentic numerical data in tables, line graphs or line plots, including fractional and decimal values. Students have represented whole number and fractional values using tables, stem-and-leaf plots and line plots in Grade 4 (MA.4.DP.1.1). In Grade 6, this work will extend to box plots and histograms (MA.6.DP.1.5).

- Instruction with line graphs should develop the understanding that values in this graph often represent data that changes over time.
 - Instruction should include identifying the meaning of the points presented on the x -axis and y -axis with both axes being labeled correctly.
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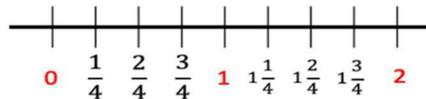
Common Misconceptions or Errors

- For line plots, students may misread a number line and have difficulty because they use whole-number names when counting fractional parts on a number line instead of the fraction name.

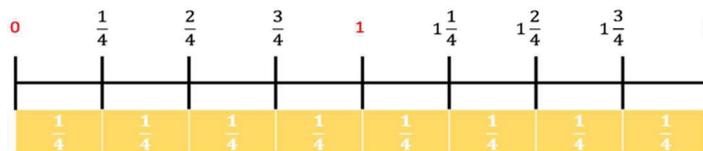
Strategies to Support Tiered Instruction

- Instruction includes opportunities to use concrete models and draw number lines to connect learning with fraction understanding. Students plot fourths on the number line, paying particular attention to what each tick mark and the “distance” between each tick mark represents.

- Example:



- For example, utilizing fraction strips or tiles, students will be able to connect fractional parts to the measurement on a number line.

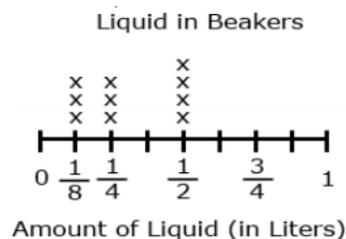


Questions to ask students:

- Use the following data to construct a line plot to represent the amount of liquid in beakers in liters:*

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

- Sample answer that indicates understanding: Students create a line plot, including a title and labels. All data is shown correctly, with an X on the line plot, ordering the fractions from least to greatest.
- Sample answer that indicates an incomplete understanding or a misconception: Students do not order the fractions correctly from least to greatest. Title and/or label is not shown.



Instructional Tasks

Instructional Task 1

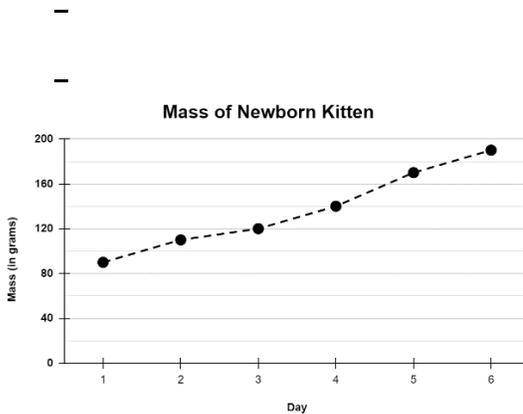
Claire studied the amount of water in different glasses. The data she collected is below. Use her data to create a line plot to show the amount of water in the glasses.

Amount of Water in a Glass (cups)									
$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

Instructional Items

Instructional Item 1

A line graph is shown.



Part A. What is the approximate change in the kitten's mass, in grams, between Days 3 and 4?

Part B. What is the approximate change in the kitten's mass, in grams, between Days 2 and 5?

Achievement Level Descriptors

Benchmark	Context	Assessment Limits
<p>MA.5.DP.1.1 Collect and represent numerical data, including fractional and decimal values, using tables, line graphs or line plots. Example: Gloria is keeping track of her money every week. She starts with \$10.00, after one week she has \$7.50, after two weeks she has \$12.00 and after three weeks she has \$6.25. Represent the amount of money she has using a line graph.</p> <p>Clarification 1: Within this benchmark, the expectation is for an estimation of fractional and decimal heights on line graphs.</p> <p>Clarification 2: Decimal values are limited to hundredths. Denominators are limited to 1, 2, 3 and 4. Fractions can be greater than one</p>	Both	<p>Items with numerical data represented in tables or on line plots must include at least one decimal value. Numerical data sets may be presented in set notation using braces. Items including decimals will not include fractions. Items including fractions will not include decimals.</p>

ALD 2	ALD 3	ALD 4	ALD 5
N/A	Collects and represents numerical data, including decimal values, using tables or line plots.	Collects and represents numerical data, including fractional and decimal values, using tables, line graphs, or line plots.	Collects and represents numerical data, including fractional and decimal values, using tables, line graphs, or line plots and justifies choice of data representation.

Additional Resources:

[CPALMS:](#)

Resources/Tasks to Support Your Child at Home:

[LearnZillion: Creating line plots using fractional measures](#)

[Khan Academy: Reading line graphs](#)