

Data Detectives

Use data displays to interpret mode, median and range.

GRADE 4 • MA.4.DP.1.2

MA.4.DP.1.2 "Determine the mode, median or range to interpret numerical data including fractional values, represented with tables, stem-and-leaf plots or line plots."

NAME _____

DATE _____

READ, REASON AND EXPLAIN

Mode means the most frequent value. A set can have one mode, several tied modes, or no mode when no value repeats. Order values to find the middle, or median. All median sets here have an odd number of values. Range is greatest minus least. Include the context and units.

WORKED EXAMPLE

The table records water volumes in three small cups. What volume occurs most often?

WATER IN SMALL CUPS

Trial	Volume (cups)
1	$\frac{1}{6}$
2	$\frac{2}{6}$
3	$\frac{2}{6}$

1. Read each cup volume.
2. The volume $\frac{2}{6}$ cup occurs twice; $\frac{1}{6}$ occurs once.

Answer: Mode: $\frac{2}{6}$ cup, or $\frac{1}{3}$ cup.

PRACTICE 4 problems

- 1** Five bead strings were measured. Find the mode and explain what it means here.

BEAD-STRING LENGTHS

Trial	Length (cm)
1	3
2	7
3	3
4	8
5	4

ANSWER _____

- 3** Find the range of toy-car travel times. What does it tell you?

TOY-CAR TRIALS

Trial	Time (seconds)
1	9
2	13
3	11
4	16
5	10

ANSWER _____

- 2** Find the median ribbon length. Show the lengths in order.

RIBBON LENGTHS

Trial	Length (m)
1	$\frac{1}{4}$
2	$\frac{3}{4}$
3	$\frac{1}{2}$
4	$1\frac{1}{4}$
5	$\frac{1}{2}$

ANSWER _____

- 4** Find the mode and range of the seedling heights. Include units.

SEEDLING HEIGHTS

Trial	Height (inches)
1	$2\frac{1}{2}$
2	3
3	$2\frac{1}{2}$
4	$3\frac{1}{2}$
5	4

ANSWER _____

APPLY IT Show your work

- 1** Eli says there can be only one most common ticket count. Use the table to decide whether he is right. Name every mode.

ARCADE TICKET COUNTS

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
12	17	12	15	17

ANSWER _____

- 2** Find the median robot-route time. Does this set have a mode? Explain.

ROBOT ROUTE TIMES (MINUTES)

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
$\frac{3}{4}$	$1\frac{1}{4}$	1	$1\frac{1}{2}$	$\frac{1}{2}$

ANSWER _____

CHALLENGE One step up

Find the median and range of five jump distances. Explain how you locate the median and what the range means.

FIVE JUMP DISTANCES

Trial	Distance (m)
1	$\frac{3}{4}$
2	$\frac{1}{2}$
3	$\frac{3}{4}$
4	$\frac{1}{4}$
5	1

WORK SPACE AND ANSWER

PRACTICE 1

Five bead strings were measured. Find the mode and explain what it means here.

3 centimeters; this length occurs most often.

PRACTICE 2

Find the median ribbon length. Show the lengths in order.

$\frac{1}{2}$ meter. Order: $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{4}$.

PRACTICE 3

Find the range of toy-car travel times. What does it tell you?

7 seconds; the longest time is 7 seconds more than the shortest.

PRACTICE 4

Find the mode and range of the seedling heights. Include units.

Mode: $2\frac{1}{2}$ inches. Range: $1\frac{1}{2}$ inches.

APPLY IT 1

Eli is not right. There are two modes: 12 and 17 tickets; each occurs twice.

The remaining ticket count, 15, appears only once.

APPLY IT 2

Median: 1 minute. No mode: every time occurs once.

Ordered: $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$; the third value is the median.

CHALLENGE

Median: $\frac{3}{4}$ meter. Range: $\frac{3}{4}$ meter. Order: $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{3}{4}$, 1; the third is the median.

The longest jump is $\frac{3}{4}$ meter longer than the shortest.

Accept equivalent fractions. Median tasks use five observations, so averaging two middle values is unnecessary. Include both 12 and 17 for the two-mode task; each is equally most frequent. For the no-mode task, every value occurs once. Require units and interpretations when requested.