

Evidence in Units

Collect measurements and observations that support a claim.

GRADE 7 • TEKS 7.1.E

7.1.E "collect quantitative data using the International System of Units (SI) and qualitative data as evidence;"

NAME _____

DATE _____

MEASURE AND DESCRIBE

Quantitative data use numbers and units. Use SI units such as meters, kilograms, and seconds, plus common metric units such as centimeters, grams, liters, milliliters, and degrees Celsius. Qualitative data use words to describe what you observe, such as color, texture, or smell.

WORKED EXAMPLE

A student measures a model bridge that is 0.42 m long. Record the length in centimeters.

- 1 m equals 100 cm.
- Move the decimal point two places right.
- Multiply 0.42 by 100: $0.42 \times 100 = 42$.
The length is 42 cm.

Answer: 42 cm

PRACTICE 6 problems

- 1** Choose the best SI unit for measuring the mass of a backpack: g or kg.

ANSWER _____

- 2** Convert 3.6 L to milliliters.

ANSWER _____

- 3** A student measures a snail trail that is 125 mm long and notes that it is shiny. Identify the quantitative data and the qualitative data.

ANSWER _____

- 4** Convert 0.75 m to centimeters.

ANSWER _____

- 5** A graduated cylinder contains 275 mL of water. Record this volume in liters.

ANSWER _____

- 6** For each of three ice cubes, a student records melting time in seconds and describes the cube's shape. Which entry is quantitative, and which entry is qualitative?

ANSWER _____

APPLY IT Show your work

- 1** Kai tests two water bottles after they sit outside for 30 minutes. Which bottle kept the water colder? Use the average temperature and one qualitative observation as evidence.

WATER BOTTLE TEST

Bottle	Trial 1 temperature	Trial 2 temperature	Trial 3 temperature	Outside observation
A	9 °C	10 °C	11 °C	dry
B	6 °C	7 °C	8 °C	wet

ANSWER _____

- 2** A student compares two basketballs during practice. Ball A bounces 74 cm, 78 cm, and 76 cm high. Ball B bounces 75 cm, 76 cm, and 75 cm high. The student notes that Ball A feels smooth and Ball B feels tacky. Which ball should the student choose for the most consistent bounce? Use the bounce range and the qualitative observation in your answer.

WORK SPACE

ANSWER _____

- 3** Collect your own data. Teacher supplies two safe, clean leaves labeled A and B, a metric ruler and a clear tabletop. Do not taste the leaves or remove leaves from a living plant. Lay each leaf flat and measure from the base of the leaf blade to its tip, excluding the stalk. Record each actual length in cm and convert it to m by dividing by 100. Record one visible qualitative feature for each, such as color, edge shape or overall shape. On extra paper make two rows labeled A/B with columns Length (cm), Length (m) and Visible feature. Compare the measured lengths (or report a tie) and cite the lengths plus one observed feature; do not invent measurements.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two plants receive different fertilizers for 7 days. Plant R is near a window, and Plant S is under a shelf. Does this evidence support the claim that Fertilizer S causes faster growth? Explain using the growth measurements, the leaf observations, and the flaw in the test.

PLANT FERTILIZER TEST

Plant	Fertilizer	Initial height	Final height	Leaf observation
R	R	12 cm	18 cm	green
S	S	10 cm	17 cm	darker green

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Choose the best SI unit for measuring the mass of a backpack: g or kg.	kg
2	Convert 3.6 L to milliliters.	3600 mL
3	A student measures a snail trail that is 125 mm long and notes that it is shiny. Identify the quantitative data and the qualitative data.	Quantitative: 125 mm long. Qualitative: shiny.
4	Convert 0.75 m to centimeters.	75 cm
5	A graduated cylinder contains 275 mL of water. Record this volume in liters.	0.275 L
6	For each of three ice cubes, a student records melting time in seconds and describes the cube's shape. Which entry is quantitative, and which entry is qualitative?	Quantitative: melting time in seconds. Qualitative: shape description.

PART 2 • APPLY IT

- Bottle B kept the water colder. Its average temperature was 7 °C, and its outside was wet.** Bottle A has an average temperature of 10 °C, while Bottle B has an average temperature of 7 °C. The wet outside is qualitative evidence from the test.
- Choose Ball B. Its bounce range is 1 cm, compared with Ball A's 4 cm range, and Ball B feels tacky.** Ball A's range is $78 - 74 = 4$ cm. Ball B's range is $76 - 75 = 1$ cm, so its bounces are more consistent.
- Answers depend on actual leaves. Both rows need a measured length, its correct conversion to meters, and a visible qualitative observation.** Observe ruler zero alignment with the leaf-blade base and reading at the tip. Require an actual record, not only a proposed measure. Example only if observed: A 8 cm = 0.08 m, green with a smooth edge; B 6 cm = 0.06 m, brown with a toothed edge. A is longer by 2 cm. Visible color or edge does not itself prove why the lengths differ.

CHALLENGE

No. Plant R grew 6 cm and Plant S grew 7 cm, and Plant S had darker green leaves, but the plants were in different locations. The different light conditions could have affected the results, so both fertilizers should be tested with plants in the same light conditions.

Accept equivalent decimal forms such as 0.275 L or 0.2750 L. For written responses, accept accurate claims that cite the requested quantitative data with units and the stated qualitative observation. For Apply 3, verify actual ruler use and two complete data rows. Use the student's observed leaves; accept accurate rounded ruler readings and honest equal-length results. Check cm-to-m conversions by division by 100 and distinguish numerical length from visible descriptive data. Extra paper provides the full data table and comparison.