

Evidence Lab Notes

Measure, convert, and use observations as evidence.

GRADE 8 • TEKS 8.1.E

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

NAME _____

DATE _____

NUMBERS AND OBSERVATIONS

Quantitative data uses numbers to report counts or measurements. Measurements can use SI or other units; use SI units and metric conversions here. Qualitative data describes qualities, such as a smooth surface. When converting units, keep the measurement's meaning the same.

WORKED EXAMPLE

A cart rolls 0.83 m. Record its distance in centimeters.

1. Use $1 \text{ m} = 100 \text{ cm}$.
2. Multiply 0.83 by 100.
3. Multiply 0.83 by 100: $0.83 \times 100 = 83$.
The distance is 83 cm.

Answer: 83 cm

PRACTICE 6 problems

- 1** A balance reading is 0.62 kg. Is this quantitative or qualitative data? Copy the measurement with its unit.

ANSWER _____

- 2** A student records, "The liquid is cloudy." Is this quantitative or qualitative data?

ANSWER _____

- 3** Convert 7.3 m to centimeters.

ANSWER _____

- 4** Convert 4,500 mg to grams.

ANSWER _____

- 5** A runner completes 360 m in 45 s. What is the runner's speed in m/s?

ANSWER _____

- 6** Two soil samples have masses of 1.8 kg and 1.25 kg. What is the difference in mass?

ANSWER _____

APPLY IT Show your work

- 1** At an esports club, Nia tests two reusable cold packs. She measures each pack's outer surface temperature and looks through its clear cover for ice inside. Which pack is better at staying cold? Give one quantitative and one qualitative piece of evidence from the table.

COLD PACK TEST: OUTER SURFACE TEMPERATURES

Cold pack	Start temperature (°C)	Temperature after 30 min (°C)	Observation after 30 min
A	6	11	Ice crystals visible
B	6	13	No ice visible

ANSWER _____

- 2** During a gaming-club fundraiser, Arlo times two phone chargers. Charger P reaches 50% charge in 75 min and feels warm. Charger Q reaches 50% charge in 90 min and feels cool. How many fewer seconds does P take? Then name the quantitative observation and the qualitative observation.

WORK SPACE

ANSWER _____

- Collect actual evidence. Teacher supplies a classroom balance or scale marked in grams and two safe, dry classroom blocks labeled A and B. Place the tool on a level surface and zero it as directed. Measure each block separately; wait for a stable reading and record its mass in g. Convert each mass to kg by dividing by 1000. Also record a visible qualitative feature of each block, such as color or shape. On extra paper make an A/B table with Mass (g), Mass (kg) and Visible feature. State which block is heavier, or report a tie, using your actual records; include a visible observation without claiming it caused the mass difference.
- 3**

WORK SPACE

ANSWER _____

CHALLENGE

One step up

A student tests two compost mixes for bean seedlings. Mix A plant heights are 18 cm, 20 cm, and 22 cm, and the leaves are dark green. Mix B plant heights are 16 cm, 20 cm, and 24 cm, and the leaves are light green with brown edges. Which claim is better supported: "Mix A makes plants taller" or "Mix A produces healthier-looking plants"? Calculate each average height and explain using both quantitative and qualitative evidence.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A balance reading is 0.62 kg. Is this quantitative or qualitative data? Copy the measurement with its unit.	Quantitative; 0.62 kg
2	A student records, "The liquid is cloudy." Is this quantitative or qualitative data?	Qualitative
3	Convert 7.3 m to centimeters.	730 cm
4	Convert 4,500 mg to grams.	4.5 g
5	A runner completes 360 m in 45 s. What is the runner's speed in m/s?	8 m/s
6	Two soil samples have masses of 1.8 kg and 1.25 kg. What is the difference in mass?	0.55 kg

PART 2 • APPLY IT

- Cold pack A. Its outer surface temperature increased 5°C, compared with 7°C for B, and A still has visible ice crystals inside.** Subtract the start temperature from the temperature after 30 minutes for each pack. Use the ice observation as qualitative evidence.
- 900 s; quantitative observation: Charger P takes 75 min and Charger Q takes 90 min; qualitative observation: P feels warm and Q feels cool.** Find the time difference, 90 min minus 75 min = 15 min. Convert 15 min to seconds by multiplying by 60.
- Results depend on the actual blocks. Each row requires measured mass in grams, the correct conversion to kilograms and an observed visible feature; comparison must match the measured masses.** Observe actual zeroing and separate stable scale readings. Example only if observed: A 20 g = 0.020 kg, blue rectangular block; B 30 g = 0.030 kg, red rectangular block. B is heavier by 10 g (0.010 kg). Do not prescribe these values or infer mass from color.

CHALLENGE

"Mix A produces healthier-looking plants" is better supported. Mix A average height is 20 cm, and Mix B average height is 20 cm, so neither mix is taller on average. Mix A has dark green leaves, while Mix B has light green leaves with brown edges.

Accept equivalent correct conversion work and any clear wording that identifies quantitative data as numerical counts or measurements (measurements have units). For the challenge, students must state that both average heights are 20 cm and use the leaf observations to support the healthier-looking claim. For Apply 3, require actual tool use and two numerical/qualitative records. Check $g \div 1000 = kg$, correct comparison and honest ties. Teacher supports scale precision/reading; extra paper provides the table and explanation. Visible appearance is qualitative evidence, not a cause of measured mass.