

Melt Time Lab

Match metric measurements and tools to a fair investigation.

PS.1.b.iii "planning and carrying out investigations take metric measurements using appropriate tools and technologies"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline every measurement unit, circle every measuring tool or technology, and number three actions that help Jordan collect reliable data. Your marks should show how a measurement plan uses suitable tools and units.

Testing Ice Melt Time

- ① Jordan planned an investigation about how the amount of water affects the time needed for an ice cube to melt. He chose three identical cups and placed one ice cube in each cup. Before adding ice, he measured 50 mL, 100 mL, or 150 mL of room-temperature water with a graduated cylinder. Milliliters were appropriate because he was measuring liquid volume. He labeled the cups by volume and recorded the planned amounts in a data table.
- ② To make the comparison fair, Jordan used cups of the same size, ice cubes from the same tray, and water from the same container. He set all cups on the same counter, away from direct sunlight. A timer on a tablet measured melting time in minutes. Every five minutes, he looked for the moment when no solid ice remained. He did not stir the water, because stirring could change the melting time. Only the water volume was purposely changed.
- ③ Jordan also checked the water temperature at the start with a digital thermometer, which displayed degrees Celsius. He placed the probe in the water without touching the cup's bottom or side, then waited until the display stopped changing before recording the value. For a thermometer with a liquid column, a scientist would view the scale straight on to avoid parallax. Jordan repeated each volume trial three times and calculated the average melting time. Repeated trials can make a result more dependable than a single trial.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What tool did Jordan use to measure the water, what unit did he use, and why was that unit suitable?

2 What variable did Jordan purposely change? Name two conditions he kept the same to make the comparison fair.

3 What technology measured melting time, and what unit did it measure?

4 Describe two steps Jordan used to get a reliable starting temperature with the digital thermometer.

3 YOUR TURN _____ Your own words

Plan three fair trials to investigate how water temperature affects the time for sugar to dissolve. Complete the table with a different temperature for each trial, a constant water volume, appropriate tools, and one condition you will keep the same.

TRIAL	WATER TEMPERATURE (°C)	WATER VOLUME (ML)	TOOLS FOR TEMPERATURE, VOLUME, AND TIME	CONDITION KEPT THE SAME

PART 1 • READ AND MARK

Underline every measurement unit, circle every measuring tool or technology, and number three actions that help Jordan collect reliable data. Your marks should show how a measurement plan uses suitable tools and units. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What tool did Jordan use to measure the water, what unit did he use, and why was that unit suitable?	He used a graduated cylinder and measured in milliliters, or mL. Milliliters are suitable for measuring liquid volume.
2	What variable did Jordan purposely change? Name two conditions he kept the same to make the comparison fair.	He changed the water volume. He kept conditions such as cup size, ice-cube source, water source, counter location, and no stirring the same.
3	What technology measured melting time, and what unit did it measure?	A timer on a tablet measured melting time in minutes.
4	Describe two steps Jordan used to get a reliable starting temperature with the digital thermometer.	He kept the probe from touching the cup's bottom or side and waited until the display stopped changing before recording the temperature.

PART 3 • YOUR TURN (SAMPLE ANSWER)

TRIAL	WATER TEMPERATURE (°C)	WATER VOLUME (ML)	TOOLS FOR TEMPERATURE, VOLUME, AND TIME	CONDITION KEPT THE SAME
1	10 °C	100 mL	digital thermometer, graduated cylinder, tablet timer	5 g of sugar
2	25 °C	100 mL	digital thermometer, graduated cylinder, tablet timer	5 g of sugar
3	40 °C	100 mL	digital thermometer, graduated cylinder, tablet timer	5 g of sugar

Accept equivalent correct tools and fair-control conditions from the passage. For the open task, accept any three different Celsius temperatures, a constant metric water volume, suitable tools, and a reasonable condition held constant.