

Grade 9 Chemistry Start Diagnostic

Evidence, measurement, and mathematical readiness

Name: _____

Date: _____

Purpose: This is a starting-point check, not a chemistry grade. Show what you know; leave a note beside any item you have not learned yet.

Time: 20–25 minutes. **Tools:** calculator optional. Always write units with a measurement.

1. A student writes, “The liquid turned cloudy.” Is this an observation or an inference? [1 pts]

2. Which statement is an inference rather than a direct observation? [1 pts]

(a) The digital scale read 18.4 g.

(b) Bubbles appeared.

(c) A gas was produced.

(d) The cup felt warm.

3. A runner travels 2.50 km. Convert the distance to meters. [1 pts]

4. A sample has a mass of 18.0 g and a volume of 6.0 mL. Calculate its density. [2 pts]

5. A table lists plant heights after seven days. Which column is the dependent variable? [1 pts]

Pot label	Hours of light per day	Height after 7 days (cm)
A	2	4.1
B	6	7.8
C	10	10.2

6. In the same study, name one condition that should be held constant. [1 pts]

7. Four measurements of the same length are 12.1, 12.2, 12.1, and 12.2 cm. Find the mean. [2 pts]

8. A graph has time (s) on the horizontal axis and temperature ($^{\circ}\text{C}$) on the vertical axis. Which statement is supported by a line that rises from 20 to 35 $^{\circ}\text{C}$? [1 pts]

(a) Time decreased.

- (b) Temperature increased.
- (c) Mass increased.
- (d) The substance must have reacted.

9. Write 0.00450 in scientific notation.

[1 pts]

10. A recipe calls for 3 cups of water for 2 batches. How many cups are needed for 5 batches if the ratio stays the same?

[2 pts]

11. A drawing uses dots to represent particles in a liquid. Give one useful thing the drawing can show and one thing it may leave out.

[2 pts]

12. Plan a fair comparison to test whether water temperature changes how long a sugar cube takes to dissolve. Name the changed variable, the measured variable, and two conditions to keep the same.

[4 pts]

13. A measurement tool has marks every 1 mL. Which value is the most defensible reading?

[1 pts]

- (a) 18 mL
- (b) 18.0 mL
- (c) 18.000 mL
- (d) 18.376 mL

Reflection: One skill I feel ready to use is _____.