IGCSE Physics Worksheet — Temperature and Thermometers

Reading Passage

Temperature is a measure of the average kinetic energy of particles in a substance. When particles move faster, the temperature increases. When they move slower, the temperature decreases.

Thermometers are instruments used to measure temperature. There are several types:

Liquid-in-glass Thermometers: These contain a liquid (usually mercury or alcohol) that expands when heated. As the temperature rises, the liquid moves up the narrow tube. The scale beside the tube shows the temperature in degrees Celsius (°C).

Digital Thermometers: These use sensors to detect temperature and display the reading on a screen. They are fast, accurate, and commonly used in medical and laboratory settings.

Fixed Points: Two important reference points are: 0°C — the freezing point of water; 100°C — the boiling point of water. Thermometers are calibrated using these fixed points to ensure accuracy.

Multiple Choice Questions

1. Temperature measures:
A. The total energy of a substance
B. The average kinetic energy of particles
C. The number of particles
D. The size of particles

2. A liquid-in-glass thermometer works by:
A. Melting the liquid
B. Compressing the liquid
C. Expanding the liquid with heat
D. Freezing the liquid

3. The boiling point of water is:
A. 0°C
B. 37°C
C. 50°C
D. 100°C

4. Digital thermometers are preferred in hospitals because they:
A. Are cheaper
B. Use mercury
C. Are fast and accurate
D. Have no scale

5. The freezing point of water is:
A. 100°C
B. 0°C
C. –10°C
D. 37°C

Structured Questions

6. Explain how a liquid-in-glass thermometer measures temperature.

7. Describe the difference between a digital thermometer and a liquid-in-glass thermometer.

8. Why are 0°C and 100°C used as fixed points in thermometer calibration?

9. A thermometer shows 37.0°C. What does this temperature represent in a medical context?

10. Why does the liquid in a thermometer rise when heated?

Teacher-Only Answer Key

MCQ Answers: 1. B 2. C 3. D 4. C 5. B

Structured Answers:

6. A liquid-in-glass thermometer contains a liquid that expands when heated. As temperature increases, the liquid rises in the tube. The height of the liquid corresponds to a temperature value on the scale.

7. A digital thermometer uses sensors and displays the temperature electronically. A liquid-in-glass thermometer uses expanding liquid and a physical scale. Digital thermometers are faster and more precise.

8. 0°C and 100°C are the freezing and boiling points of water. They are used as standard reference points to calibrate thermometers accurately.

9. 37.0°C is the normal human body temperature. In medicine, this indicates a healthy, stable condition.

10. When heated, the particles in the liquid gain kinetic energy and move apart. This causes the liquid to expand and rise in the tube.