

# Multiple-choice test

## Block 2: Supplement

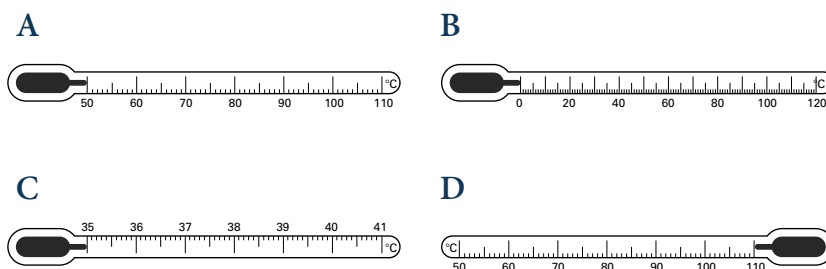
Click on the correct answer to each question.

- 1 A gas exerts pressure on the walls of its container. Which is the correct explanation for this?
  - A Gas molecules are very small and fast-moving.
  - B The gas molecules move more slowly after colliding with the walls of the container.
  - C The molecules of a gas are closer together at higher pressure.
  - D The momentum of a gas molecule changes when it strikes the walls of the container.
- 2 When observed through a microscope, smoke particles in air can be seen moving about randomly. Which is the correct explanation for this?
  - A The microscope makes the smoke particles look bigger.
  - B The molecules of air are smaller than the smoke particles.
  - C Collisions with air molecules cause the smoke particles to move.
  - D The smoke particles can move freely in between the molecules of the air.
- 3 Which of the following will **not** increase the rate at which a liquid evaporates?
  - A increase its temperature
  - B increase its surface area
  - C increase its volume
  - D blow a draught over its surface
- 4 When the pressure  $p$  of a gas is changed at constant temperature, its volume  $V$  also changes. Which of the following statements is correct?
  - A  $pV = \text{constant}$
  - B  $\frac{p}{V} = \text{constant}$
  - C  $p = \text{constant} \times V$
  - D  $V = \text{constant} \times p$

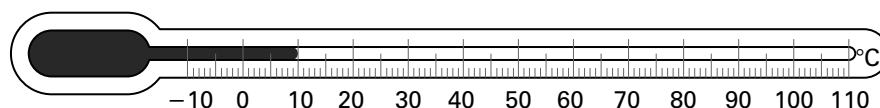
- 5 A cylinder contains  $50 \text{ dm}^3$  of methane gas at a pressure of  $120 \text{ kPa}$ . The gas is compressed to a volume of  $10 \text{ dm}^3$  at constant temperature. What is its new pressure, in  $\text{kPa}$ ?

- A  $12 \text{ kPa}$
- B  $24 \text{ kPa}$
- C  $240 \text{ kPa}$
- D  $600 \text{ kPa}$

- 6 Which of these liquid-in-glass thermometers has the greatest range?

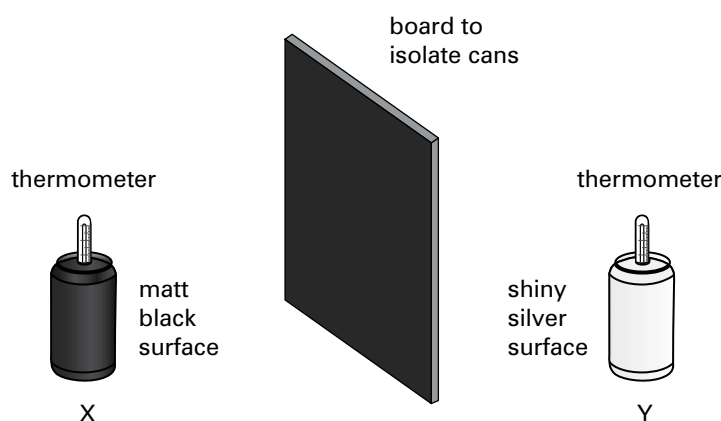


- 7 The picture shows a liquid-in-glass thermometer. How could its sensitivity be increased?



- A Make the tube longer.
  - B Make the scale markings closer together.
  - C Calibrate it more carefully.
  - D Make the tube narrower.
- 8 Which of the following correctly states the meaning of the specific heat capacity of a solid substance?
- A The energy required to raise the temperature of  $1 \text{ kg}$  of the substance to  $1^\circ\text{C}$ .
  - B The energy required to raise the temperature of a piece of the solid by  $1^\circ\text{C}$ .
  - C The energy required to raise the melting point of the substance by  $1^\circ\text{C}$ .
  - D The energy required to raise the temperature of  $1 \text{ kg}$  of the substance by  $1^\circ\text{C}$ .
- 9 A student heats  $2.0 \text{ kg}$  of water from  $20^\circ\text{C}$  to its boiling point. Which of the following shows correctly how the student should calculate the energy supplied? (Specific heat capacity of water =  $4200 \text{ J}/(\text{kg}^\circ\text{C})$ .)
- A  $\text{energy} = 2.0 \times 4200 \times (100 + 20)$
  - B  $\text{energy} = 2.0 \times 4200 \times (100 - 20)$
  - C  $\text{energy} = \frac{4200 \times (100 - 20)}{2.0}$
  - D  $\text{energy} = \frac{2.0 \times (100 - 20)}{4200}$

- 10 The specific latent heat of vaporisation of water is 330 kJ/kg. How much energy must be supplied to boil off 3.0 kg of water at 100°C?
- A 110 kJ  
B 990 kJ  
C 11 000 kJ  
D 99 000 kJ
- 11 Metals are better conductors of heat than most other materials. Which is the correct reason for this?
- A The atoms of a metal are free to move through the material, carrying energy with them.  
B Metals contain free electrons, which can move through the material, carrying energy with them.  
C Metals have a lower specific heat capacity than other materials, so they require less energy to raise their temperature.  
D Metals have shiny surfaces, so they lose less energy by radiation to their surroundings.
- 12 The picture shows an experiment to investigate the cooling of two cans, X and Y, which have been filled with equal volumes of water at 90°C.



Which of the following statements is correct?

- A Can X cools more quickly than can Y, because a matt black surface conducts heat better than a shiny silver surface.  
B Can X cools more quickly than can Y, because a matt black surface radiates heat better than a shiny silver surface.  
C Can Y cools more quickly than can X, because a shiny silver surface conducts heat better than a matt black surface.  
D Can Y cools more quickly than can X, because a shiny silver surface radiates heat better than a matt black surface.