

MARK SCHEME

GCSE

PHYSICS

AQA - COMBINED SCIENCE

P3 - TEST 3

PARTICLE MODEL OF MATTER

Intermediate

Mark schemes

- 1.** (a) any **two** from:
- water evaporates
accept steam / water vapour for water molecules
accept water turns to steam
 - water molecules / particles go into the air
 - mirror (surface) is cooler than (damp) air
accept the mirror / surface / glass is cold
 - water molecules / particles that hit the mirror lose energy
accept water molecules / particles that hit the mirror cool down
 - cooler air cannot hold as many water molecules / particles
- (causes) condensation (on the mirror)
accept steam changes back to water (on the mirror)
- or**
particles move closer together
- (b) mirror (surface) is warm
mirror is heated is insufficient
- (rate of) condensation reduced
accept no condensation (happens)
- 2.** (a) **Level 3:** The method would lead to the production of a valid outcome. All key steps are identified and logically sequenced.
- Level 2:** The method would not necessarily lead to a valid outcome. Most steps are identified, but the method is not fully logically sequenced.
- Level 1:** The method would not lead to a valid outcome. Some relevant steps are identified, but links are not made clear.
- No relevant content**

2

1

1

1

[5]

5-6

3-4

1-2

0

Indicative content

- measure mass
- use a top pan balance or scales

- part fill a measuring cylinder with water
- measure initial volume
- place object in water
- measure final volume
- volume of object = final volume – initial volume

- fill a displacement / eureka can with water
- water level with spout
- place object in water
- collect displaced water
- measuring cylinder used to determine volume of displaced water

- use of:
$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

(b) all y-axis values correct (minimum of 3)

allow 1 mark for two correct values

2

all bars drawn to the correct height

allow 1 mark for two correct bars

allow $\pm \frac{1}{2}$ small square

2

(c) $\frac{(1120 - 960)}{2}$

ignore + and / or – signs

1

= 80 (kg/m³)

an answer of 160 scores 1 mark

1

an answer of 80 scores 2 marks

[12]

3.

(a) (similarity) same size / shape particles

1

(difference) further apart / fewer in same area

allow none / not many touching

1

- (b) any **two** from:
- no movement shown
 - atoms / molecules / ions / particles are not solid spheres
 - no forces between the spheres
 - only 2D

2

- (c) • different forces between particles
allow substances have different types of bond
- (so) different amounts of energy required (to break forces)

1

1

- (d) high(er) pressure (within fire extinguisher)

1

- (e) liquid to gas

1

- (f) (change from solid to liquid) 80 seconds

and

(change from liquid to gas) takes 550 seconds

1

(therefore) takes longer so more (thermal) energy is supplied (to change state)

1

- (g) $1\,695\,000 = m \times 2.260 \times 10^6$

1

$$m = \frac{1\,695\,000}{2.260 \times 10^6}$$

1

0.75

an answer of 0.75 scores 3 marks

allow conversion of kJ to J

1

[13]