

Q1. (2018)

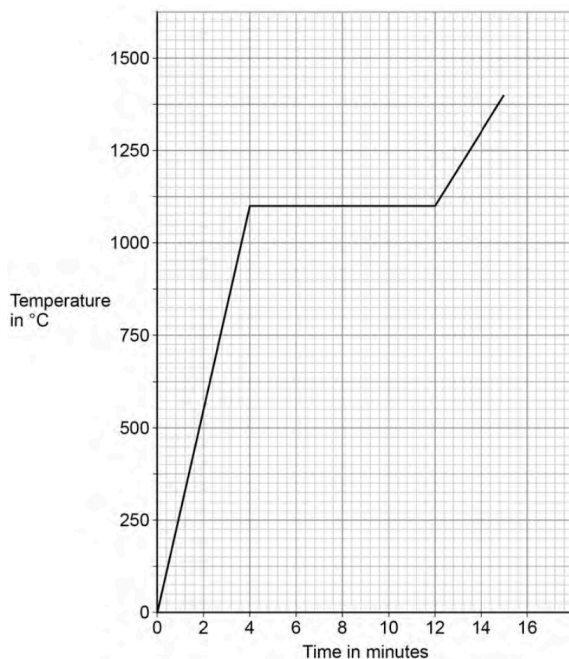
0 4 . 6 Describe how the movement of the copper particles in the wire changes when copper melts.

[2 marks]

Q2. (2019)

Figure 5 shows how the temperature of a small sample of gold changes as it is heated from a solid to a liquid.

Figure 5



a)

0 3 . 4 What is the melting point of the gold?

[1 mark]

Melting point = _____ °C

b)

0 3 . 5 How many minutes did it take for all of the gold in the sample to change from solid to liquid?

[1 mark]

Time taken = _____ minutes

c)

0 3 . 6 What does the gradient of the graph in Figure 5 represent?

[1 mark]

Tick (✓) **one** box.

The internal energy of the gold

☐

The rate of change of temperature of the gold

☐

The specific heat capacity of the gold

☐

Q3. (2019)

0 7

A scientist cooled the air inside a container.

The temperature of the air changed from 20 °C to 0 °C

The volume of the container of air stayed the same.

The air contained water that froze at 0 °C

The change in internal energy of the water as it froze was 0.70 kJ

The specific latent heat of fusion of water is 330 kJ/kg

a)

0 7 . 3

The air also contained oxygen, nitrogen and carbon dioxide.

Oxygen boils at –183 °C and freezes at –218 °C

Nitrogen boils at –195 °C and freezes at –210 °C

Carbon dioxide sublimates at –78 °C

The scientist continued to cool the air to a temperature of –190 °C

What is the state of each substance at –190 °C?

[2 marks]

Tick (✓) **one** box for **each** row of the table.

Substance	Solid	Liquid	Gas
Oxygen			
Nitrogen			
Carbon dioxide			

b)

0 7 . 4

The air also contained a small amount of argon.

As the temperature of the air decreased from 20 °C to –190 °C the argon changed from a gas to a liquid to a solid.

Explain the changes in the arrangement and movement of the particles of the argon as the temperature of the air decreased.

[6 marks]

Q4. (2020)

0 4

A scientist had a balloon which was filled with air.

The temperature of the air was 19 °C

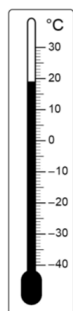
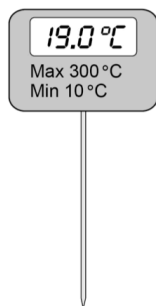
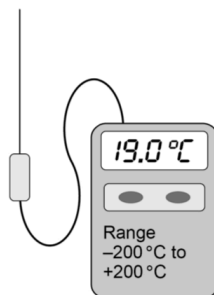
The scientist dipped the balloon into liquid nitrogen.

The temperature of the liquid nitrogen was –196 °C

a)

0 4 . 2 Which thermometer could be used to measure the temperature of the liquid nitrogen? [1 mark]

Tick (✓) **one** box.


☐

☐

☐

b)

0 4 . 5 The air in the balloon had a mass of 0.00320 kg
 The temperature of the air in the balloon decreased by 215 °C
 The change in thermal energy of the air in the balloon was 860 J
 Calculate the specific heat capacity of the air in the balloon.
 Use the Physics Equations Sheet.

[3 marks]

c)

0 4 . 6 The liquid nitrogen boiled.
 What happens to the temperature of nitrogen as it boils? [1 mark]
 Tick (✓) **one** box.

Temperature decreases ☐

Temperature increases ☐

Temperature stays the same ☐

d)

The scientist recorded measurements to calculate the specific latent heat of vaporisation of nitrogen.

0 4 . 7 What is meant by vaporisation? [1 mark]
 Tick (✓) **one** box.

A change of state from liquid to gas ☐

A change of state from solid to gas ☐

A change of state from solid to liquid ☐

e)

0 4 . 8

The mass of nitrogen that vaporised was 0.0072 kg

1440 J of energy was transferred to the nitrogen as it vaporised.

Calculate the specific latent heat of vaporisation of nitrogen.

Use the Physics Equations Sheet.

[3 marks]

Q5. (2022)

0 6 . 7

Some chips were put in the deep fryer.

In the deep fryer, water in the chips underwent a physical change and became steam.

Why is this a physical change?

[1 mark]Tick (✓) **one** box.

All water can change to steam.

☐

No chemicals are involved when water changes to steam.

☐

The change from water to steam can be detected visually.

☐

The water will recover its original properties if the steam is cooled.

☐

Q6. (2023)

0 3 . 2

The internal energy of the steel increases as the steel is heated.

What is meant by 'internal energy of the steel'?

[1 mark]Tick (✓) **one** box.

The change in energy of the steel particles as the steel melts.

☐

The energy added to the steel particles as they are heated.

☐

The total kinetic energy and potential energy of the steel particles.

☐

Q7. (2023)

0 3 . 3

Solid steel cannot be poured.

Which statement about the particles in a solid gives the reason why?

[1 mark]Tick (✓) **one** box.

The number of particles always stays the same.

☐

The particles are close together.

☐

The particles are in fixed positions.

☐

The particles have a fixed size.

☐

Q8. (2023)

0 3 . 4 Complete the sentence.

Choose the answer from the box.

[1 mark]

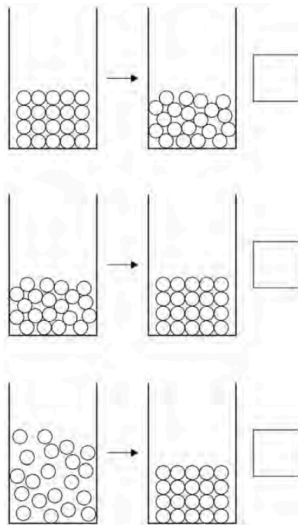
decreases	stays the same	increases
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As the piece of solid steel melts, the mass of the steel _____.

Q9. (2023)

0 3 . 5 Which diagram shows how the arrangement of particles changes when a solid melts and becomes a liquid?

[1 mark]

Tick (✓) **one** box.

Q10. (2023)

0 3 . 7 Complete the sentence.

Choose the answer from the box.

[1 mark]

chemical	permanent	physical
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Melting is an example of a _____ change.