

Q1. (2019)

0 7

A scientist cooled the air inside a container.

0 7 . 1

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

The volume of the container of air stayed the same.

Explain how the motion of the air molecules caused the pressure in the container to change as the temperature decreased.

[3 marks]

Q2. (2020)

0 4

A scientist had a balloon which was filled with air.

0 4 . 1

Which statement describes how air particles move?

[1 mark]

Tick (✓) **one** box.

At random speeds in random directions

☐

At random speeds in the same direction

☐

At the same speed in random directions

☐

At the same speed in the same direction

☐

Q3. (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

0 4 . 4

When the balloon was put into liquid nitrogen the temperature of the air in the balloon decreased.

Complete the sentences.

Choose answers from the box.

Each answer may be used once, more than once or not at all.

[2 marks]

decreased

stayed the same

increased

As the air in the balloon cooled down, the speed of the particles

_____. This is because the kinetic energy of the

particles _____.

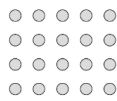
Q4. (2021)

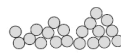
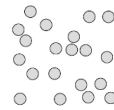
Pumice is a type of rock that has holes in it. The holes contain air.

0 1 . 8 Which diagram shows the arrangement of particles in air?

[1 mark]

Tick (✓) **one** box.


☐

☐

☐

☐

Q5. (2024)

0 5

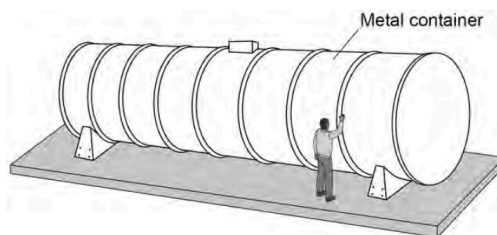
Data-storage computers get very hot.

Scientists investigated using the sea to cool data-storage computers.

The computers were set up inside a large metal container.

Figure 8 shows the metal container before it was lowered into the sea.

Figure 8



a)

0 5 . 1

Why is the container made of metal?

[1 mark]

Tick (✓) **one** box.

Metal has a high thermal conductivity.

☐

Metal is a good thermal insulator.

☐

Metal is a poor conductor of thermal energy.

☐

b)

0 5 . 2 The walls of the container are solid.

Figure 9 shows an arrangement of six particles in a solid.

Figure 9



The air inside the container is a gas.

Draw an arrangement of six particles in a gas in the box below.

[1 mark]



c)

0 5 . 3 How does the air in the container exert pressure on the container?

[1 mark]

Tick (✓) **one** box.

Air particles absorb energy from the container.

☐

Air particles collide with the walls of the container.

☐

Air particles expand to fill the container.

☐

d)

0 5 . 4 As the container is lowered into the sea, the temperature of the air in the container decreases.

Complete the sentence.

Choose the answer from the box.

[1 mark]

decreases

stays the same

increases

When the temperature of the air in the container decreases, the average speed of the air particles _____.

e)

0 5 . 5 After the temperature of the air in the container had decreased, the computers were switched on.

The computers caused the temperature of the air to then increase.

Describe how the air pressure in the container changed as the temperature decreased and then increased.

[2 marks]