

**Easter HW 1 Combined science - Physics (Higher and Foundation )**

**Physics Paper 1**

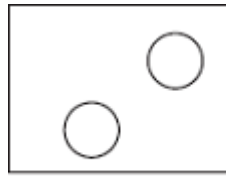
**Topic P3 Particle Model**

**6.3.1 Changes of state and the particle model**

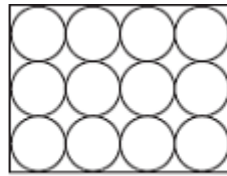
**You must complete this homework on Lined/ plain A4 paper and bring it in to school on 19/04/22**

**Q1.**

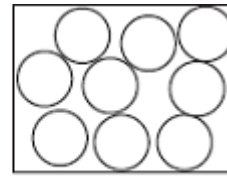
- (a) The diagrams, **X**, **Y** and **Z**, show how the particles are arranged in the three states of matter.



**X**



**Y**



**Z**

- (i) Which **one** of the diagrams, **X**, **Y** or **Z**, shows the arrangement of particles in a liquid?

Write the correct answer in the box.

(1)

- (ii) Which **one** of the diagrams, **X**, **Y** or **Z**, shows the arrangement of particles in a gas?

Write the correct answer in the box.

(1)

- (b) Draw a ring around the correct answer in each box to complete each sentence.

- (i) In a gas, the particles are

<p>vibrating in fixed positions. moving randomly. not moving.</p>
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(1)

- (ii) In a solid, the forces between the particles are

<p>stronger than equal to weaker than</p>	the
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forces between the particles in a liquid.

(1)

- (c) The picture shows a puddle of water in a road, after a rain shower.



- (i) During the day, the puddle of water dries up and disappears. This happens

because the water particles move from the puddle into the air.

What process causes water particles to move from the puddle into the air?

Draw a ring around the correct answer.

**condensation**      **evaporation**      **radiation**

(1)

- (ii) Describe **one** change in the weather which would cause the puddle of water to dry up faster.

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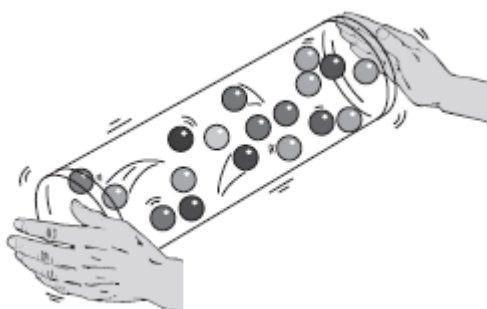
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(1)

(Total 6 marks)

## Q2.

A student shakes a tube containing small balls to model the movement of particles in a gas.



- (a) Why is this a good model for the movement of particles in a gas?

Tick (✓) **two** boxes.

The balls move slowly.

The balls are far apart from each other.

The balls are different colours.

The balls move randomly.

(2)

- (b) For a given material, in which state of matter:  
are the particles in a regular arrangement?



change as the temperature decreased.

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(3)

(b) 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

Calculate the mass of ice produced.

Use the Physics Equations Sheet.

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Mass of ice = \_\_\_\_\_ kg

(3)

(c) 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?

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

Substance	Solid	Liquid	Gas
Oxygen			
Nitrogen			
Carbon			

