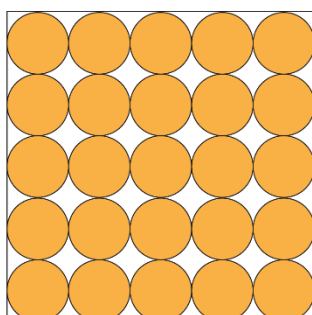
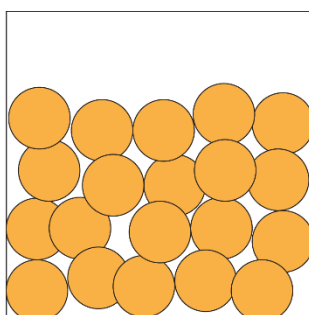


## Particle diagrams

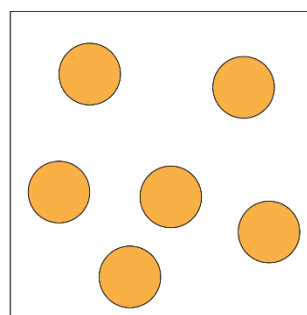
- 1 These 2D diagrams represent the particles in a solid, a liquid and a gas.



**solid**



**liquid**



**gas**

- (a) The particles in the diagrams are represented by small circles. Depending on the type of substance, what could the particles in the diagrams be representing?

Circle the correct answers.

*Hint: There is more than one correct answer.*

- A** atoms
- B** electrons
- C** ions
- D** molecules

**(3 marks)**

- (b) Complete the table by ticking the boxes to show the position of the particles in a solid, liquid or gas. One has been done for you.

The particles are:	Solid	Liquid	Gas
in a fixed position	✓		
free to move			
in a regular pattern			
in an irregular arrangement			

**(4 marks)**

- 2 (a) Name the changes of state using these words:

boiling

melting

freezing

condensing

Starting phase	Final phase	Name of change
solid	liquid	
liquid	gas	
gas	liquid	
liquid	solid	

(4 marks)

- (b) State how the **energy** of the particles change in each of the following state changes:

i. solid to liquid?

\_\_\_\_\_ (1 mark)

ii. liquid to gas?

\_\_\_\_\_ (1 mark)

- (c) State how the **movement** of the particles change in each of the following state changes:

i. solid to liquid?

\_\_\_\_\_ (1 mark)

ii. liquid to gas?

\_\_\_\_\_ (1 mark)

- (d) Which statement correctly explains why the changes in **question 2(a)** are physical changes?

Circle the correct answer.

- A** New substances are made.
- B** The electrons have been rearranged.
- C** The products have different chemical formulas to the reactants.
- D** No new substances are made.

(1 mark)

- (e) Which of the following factors stays the same during a change of state?

Circle the correct answer.

- A** the arrangement of particles
- B** the chemical formulae of the particles
- C** the movement of the particles
- D** the spaces between the particles

(1 mark)

- 3** The table shows the melting points of three metals.

Metal	Melting point/°C
aluminium	660
copper	1085
lead	328

- (a) Which metal has the strongest forces between the particles?

\_\_\_\_\_ (1 mark)

- (b) Explain your answer to **question 3(a)**.

\_\_\_\_\_ (1 mark)

(c) Draw a particle diagram to represent the physical state of lead at 400°C.

(1 mark)

(d) What is the difference between the forces of attraction between particles in solids, liquids and gases?

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(3 marks)

[Total: 23 marks]



Which question(s) did you get wrong? Why?

What will you do next time you're asked a similar question?