

Due Date:	Friday, 5th November 2021
Student Number:	
Name:	

Y10 T2 W1 C1 - Particles

Visit the BBC Bitesize link: <https://www.bbc.co.uk/bitesize/guides/z3gwdx5/revision/1>

Question	Answer
What is a particle?	A particle is a tiny amount of matter.
Describe the arrangement and movement of particles in a solid.	In a solid the particles are arranged regularly and they vibrate about fixed positions.
Describe the arrangement and movement of particles in a liquid.	In a liquid the particles are arranged randomly and they move around each other.
Describe the arrangement and movement of particles in a gas.	In a gas the particles are arranged randomly and they move quickly in all directions.
What is a chemical change?	A chemical change is a change that produces one or more new substances. Many chemical changes are irreversible.
Give two examples of chemical changes.	Two examples of chemical changes are cooking eggs and an acid reacting with an alkali to create a salt and water.
What is a physical change?	A physical change is a change that when no new substance is made. Physical changes are usual a change of state.
Give two examples of physical changes.	Freezing juice to make an ice lolly and dissolving sugar in water.
What types of forces are between particles?	Electrostatic forces of attraction.
What are the limitations of the particle model?	The model does not take into account the forces between particles, the size of particles and the space between particles.

Look, Cover, Write, Check

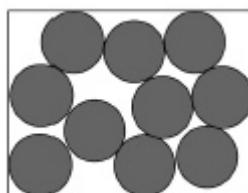
Question	Answer
Describe the arrangement and movement of particles in a solid.	
What is a chemical change?	
Give two examples of physical changes.	
Give two examples of chemical changes.	
What is a physical change?	
What types of forces are between particles?	
What is a particle?	
Describe the arrangement and movement of particles in a liquid.	
What are the limitations of the particle model?	
Describe the arrangement and movement of particles in a gas.	

Look, Cover, Write, Check

Question	Answer
What is a particle?	
Describe the arrangement and movement of particles in a solid.	
	In a liquid the particles are arranged randomly and they move around each other.
Describe the arrangement and movement of particles in a gas.	
	A chemical change is a change that produces one or more new substances. Many chemical changes are irreversible.
	Two examples of chemical changes are cooking eggs and an acid reacting with an alkali to create a salt and water.
What is a physical change?	
Give two examples of physical changes.	
	The forces between particles are electrostatic forces of attraction.
What are the limitations of the particle model?	

Exam Question:

Figure 1 shows a model of the particles in a liquid.



- (a) Give **one** similarity and **one** difference you would see in **Figure 1** if it showed the same substance as a gas.

Similarity _____

Difference _____

(2)

- (b) Describe **two** limitations of the model shown in **Figure 1**.

1. _____

2. _____

(2)

Due Date:	Friday, 12th November 2021
Student Number:	
Name:	

Y10 T2 W2 P1 - Pressure

Visit the BBC Bitesize link: <https://www.bbc.co.uk/bitesize/guides/z2cmsg/revision/1>

Question	Answer
Describe the arrangement and motion of particles in a solid.	The particles have a regular, tightly packed arrangement. They are in fixed positions so can only vibrate.
Describe the arrangement and motion of particles in a liquid.	The particles have an random, tightly packed arrangement. The particles can move randomly while still touching.
Describe the arrangement and motion of particles in a gas.	The particles have an random arrangement with large spaces between particles. The move freely and randomly.
What causes gas pressure?	The collision of gas particles with the container walls which exerts a force.
Explain how an increase in temperature effects gas pressure.	Particles increase in kinetic. This causes more frequent collisions with the container walls so pressure increases.
Other than temperature, how else can gas pressure be increased?	If the volume of the container decreases or the concentration of particles increases.
What is the equation linking pressure and area?	$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$
What are the units of measure for pressure?	Pascals (Pa)
Why do containers explode?	If the pressure inside is greater than the pressure outside and the container is no longer able to withstand the force .
In which direction do particles exert a force on the container?	The force will be perpendicular to the container wall.

Look, Cover, Write, Check

Question	Answer
What are the units of measure for pressure?	
In which direction do particles exert a force on the container?	
What is the equation linking pressure and area?	
Explain how an increase in temperature effects gas pressure.	
Describe the arrangement and motion of particles in a gas.	
Describe the arrangement and motion of particles in a solid.	
Why do containers explode?	
What causes gas pressure?	
Other than temperature, how else can gas pressure be increased?	
Describe the arrangement and motion of particles in a liquid.	

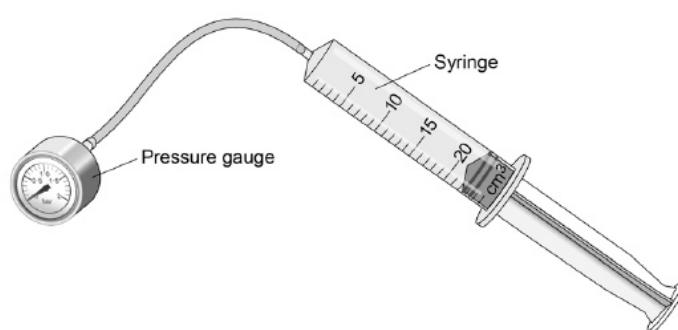
Look, Cover, Write, Check

Question	Answer
What is the equation linking pressure and area	
	The force will be perpendicular to the container wall.
	The higher the temperature the more kinetic energy the particles have. This causes more frequent collisions with the container walls so pressure increases.
Describe the arrangement and motion of particles in a solid.	
	Gas pressure will increase if the volume of the container decreases or the concentration of particles increases.
What causes gas pressure?	
Why do containers explode?	
Describe the arrangement and motion of particles in a gas.	
	The particles have an irregular, tightly packed arrangement. The particles can move randomly while still touching.
	Pascals (Pa)

Exam Question:

Explain why the pressure in the gas increases as the gas is compressed.

(4)



What is the resolution of the syringe?

_____ cm³

(1)

Due Date:	Friday, 19th November 2021
Student Number:	
Name:	

Y10 T2 W3 P1 – History of the Atom

Visit the BBC Bitesize link: <https://www.bbc.co.uk/bitesize/guides/z2csmg/revision/1>

Question	Answer
What is Dalton's model of the atom?	Atoms are solid sphere. Each different element will have a different sized sphere.
What did JJ Thomson discover?	The electron
What is JJ Thomson's model of the atom?	Atoms are positively charged matter with negative electrons evenly spread.
What did Rutherford discover?	A small, positively charged nucleus.
What experiment did Rutherford carry out to make his discovery?	Rutherford fired alpha particles at a thin sheet of gold foil.
How did most alpha particles behave? What did this show?	Most alpha particles passed straight through which shows the atom is mostly empty space.
How did some alpha particles behave? What did this show?	Some alpha particles were reflected. This showed there was a small, dense nucleus.
What is Rutherford's model of the atom?	The atom is mostly empty space with a small, dense nucleus at the centre. Electrons have random orbits.
What is Bohr's model of the atom?	Bohr discovered electron shells and stated electrons orbit the nucleus at fixed distances.
Why have our ideas about the atom changed over time?	As technology has developed it has allowed us to gain extra evidence.

Look, Cover, Write, Check

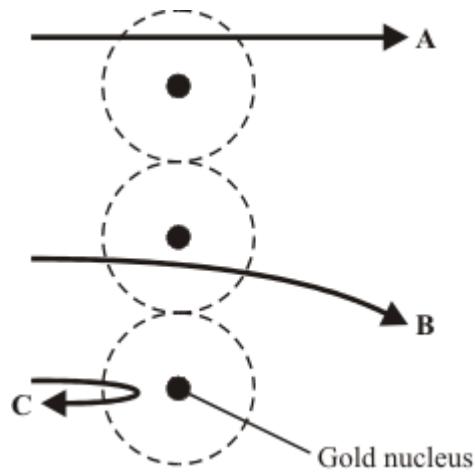
Question	Answer
What is Dalton's model of the atom?	
What is JJ Thomson's model of the atom?	
What did JJ Thomson discover?	
What is Rutherford's model of the atom?	
What did Rutherford discover?	
What experiment did Rutherford carry out to make his discovery?	
How did most alpha particles behave? What did this show?	
How did some alpha particles behave? What did this show?	
What is Bohr's model of the atom?	
Why have our ideas about the atom changed over time?	

Look, Cover, Write, Check

Question	Answer
	As technology has developed it has allowed us to gain extra evidence.
What is Bohr's model of the atom?	
	The atom is mostly empty space with a small, dense nucleus at the centre. Electrons have random orbits.
What did Rutherford discover?	
	Rutherford fired alpha particles at a thin sheet of gold foil.
How did most alpha particles behave? What did this show?	
How did some alpha particles behave? What did this show?	
	Atoms are positively charged matter with negative electrons evenly spread.
What did JJ Thomson discover?	
	Atoms are solid sphere. Each different element will have a different sized sphere.

Exam Question:

In the early part of the 20th century some scientists investigated the paths taken by positively charged alpha particles into and out of a very thin piece of gold foil. The diagram shows the paths of three alpha particles.



Explain the different paths **A**, **B** and **C** of the alpha particles.

Due Date:	Friday, 26th November 2021
Student Number:	
Name:	

Y10 T2 W4 B2 - Diffusion and Gas Exchange

Visit the BBC Bitesize link: www.bbc.co.uk/bitesize/guides/zwkn7p3/revision/1

Question	Answer
Define 'diffusion'	The net movement of particles from a region of high concentration to a region of low concentration.
What 4 factors affect the rate of diffusion?	- Temperature - Concentration gradient - Surface area: volume ratio - Diffusion distance
What is meant by the term 'concentration gradient'?	The difference in concentration between two areas.
How can you increase the rate of diffusion?	Increase temperature; increase concentration gradient; increase surface area: volume ratio; decrease the diffusion distance.
How can you decrease the rate of diffusion?	Decrease temperature; decrease concentration gradient; decrease surface area: volume ratio; increase the diffusion distance.
Where does diffusion occur in living organisms?	Gas exchange between the lungs and blood; gas exchange between the blood and cells; gas exchange in and out of the stomata.
How is the alveoli adapted for gas exchange?	Thin walls, large surface area, good blood supply
How does breathing allow oxygen to diffuse into the blood?	Breathing allows large amounts of oxygen to enter the lungs. This creates a high concentration gradient between the alveoli and the blood, allowing oxygen to enter the blood by diffusion.

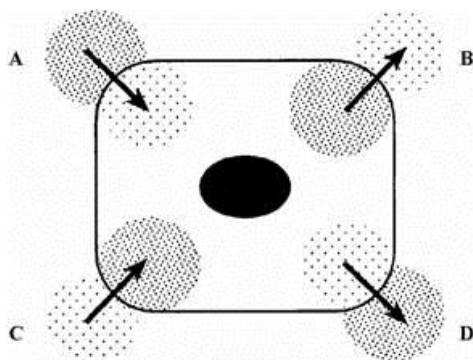
Look, Cover, Write, Check

Question	Answer
What is meant by the term 'concentration gradient'?	
What 4 factors affect the rate of diffusion?	
Define 'diffusion'	
How can you increase the rate of diffusion?	
How is the alveoli adapted for gas exchange?	
How does breathing allow oxygen to diffuse into the blood?	
How can you decrease the rate of diffusion?	
Where does diffusion occur in living organisms?	

Look, Cover, Write, Check

Question	Answer
What is meant by the term 'concentration gradient'?	
	Increase temperature; increase concentration gradient; increase surface area: volume ratio; decrease the diffusion distance.
Define 'diffusion'	
What 4 factors affect the rate of diffusion?	
Where does diffusion occur in living organisms?	
How does breathing allow oxygen to diffuse into the blood?	
	Decrease temperature; decrease concentration gradient; decrease surface area: volume ratio; increase the diffusion distance.
How is the alveoli adapted for gas exchange?	

Exam Question: The diagram shows four ways in which molecules may move into and out of a cell. The dots show the concentration of molecules.



The cell is respiring aerobically.

Which arrow, **A**, **B**, **C** or **D** represents:

- (i) movement of oxygen molecules; _____
- (ii) movement of carbon dioxide molecules? _____ (2)
- (c) Name the process by which these gases move into and out of the cell.
_____ (1)

Due Date:	Friday, 3rd December 2021
Student Number:	
Name:	

Y10 T2 W5 B2 – Plant Transport Vessels

Visit the BBC Bitesize link: www.bbc.co.uk/bitesize/guides/zqgtw6f/revision/3

Question	Answer
Define 'vessel'	A tube responsible for transporting substances.
What 2 vessels transport substances around the plant?	Xylem and phloem
Where are the xylem and phloem found?	They run from the root, up the stem to the leaves of the plant.
What does the xylem transport?	Water and mineral ions.
What does the phloem transport?	Sugars e.g. sucrose.
Define 'translocation'	The movement of sugars up and down the plant (in the phloem).
Describe the structure of the xylem.	Hollow tube made of dead cells . Lignin in the walls for strength.
Describe the structure of the phloem.	Tube made of live cells with sieve plates . Has companion cells which provide energy for the phloem to transport the sugars.
How does water enter the plant?	Absorbed into root hair cell by osmosis.
How do mineral ions enter the plant?	Absorbed into root hair cell by active transport.
How are sugars made in the plant?	By photosynthesis which happens in the chloroplasts.

Look, Cover, Write, Check

Question	Answer
Define 'translocation'	
What 2 vessels transport substances around the plant?	
How do mineral ions enter the plant?	
How does water enter the plant?	
What does the phloem transport?	
Describe the structure of the phloem.	
Describe the structure of the xylem.	
What does the xylem transport?	
Define 'vessel'	
Where are the xylem and phloem found?	
How are sugars made in the plant?	

Look, Cover, Write, Check

Question	Answer
	A tube responsible for transporting substances.
	Absorbed into root hair cell by osmosis.
	Absorbed into root hair cell by active transport.
What 2 vessels transport substances around the plant?	
What does the xylem transport?	
What does the phloem transport?	
	The movement of sugars up and down the plant (in the phloem).
Describe the structure of the xylem.	
Describe the structure of the phloem.	
Where are the xylem and phloem found?	
How are sugars made in the plant?	

Exam Question:

Q1. The diagram below shows a cross-section from the root of a plant. The transport tissues are labelled.

- (a) (i) What is tissue **A**?

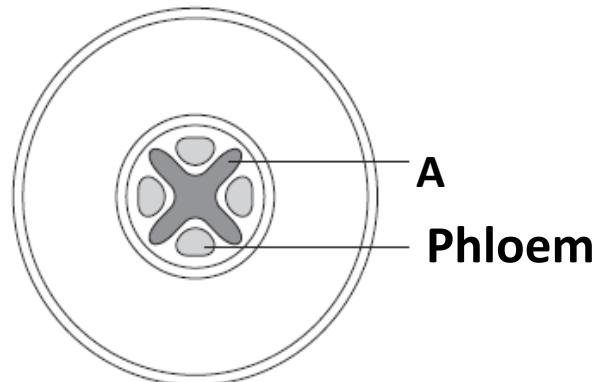
Draw a ring around the correct answer.

cuticle

epidermis

xylem

(1)



- (ii) Name **two** substances transported by tissue **A**.

1. _____

2. _____ (2)

- (b) The phloem is involved in a process called translocation.

What is translocation?

_____ (1)

Due Date:	Friday, 10th December 2021
Student Number:	
Name:	

Y10 T2 W6 C2 – Separating Techniques

Visit the BBC Bitesize link: <https://www.bbc.co.uk/bitesize/guides/z2cmsg/revision/1>

Question	Answer
Define pure.	A substance containing only one type of element or compound.
What is melting point used for?	To measure the purity of a substance.
What is relative formula mass?	The total mass of all of the elements in a compound.
What is empirical formula?	The simplest whole number ratio of elements in a compound.
What is an alloy?	A mixture of two or more elements, where at least one is a metal.
What is filtration?	A separation technique used to separate an insoluble solid from a liquid.
What is crystallisation?	A separation technique used to separate a soluble solid from a solution.
What is simple distillation?	A separation technique used to separate a mixture of solutions with two different boiling points.
What is fractional distillation?	A separation technique to separate a mixture of substances with different boiling points.
What is chromatography?	A separation technique used to separate mixtures of soluble substances, usually inks or colourings.

Look, Cover, Write, Check

Question	Answer
What is an alloy?	
What is crystallisation?	
What is fractional distillation?	
What is simple distillation?	
What is melting point used for?	
What is relative formula mass?	
Define pure.	
What is empirical formula?	
What is chromatography?	
What is filtration?	

Look, Cover, Write, Check

Question	Answer
Define pure.	
What is melting point used for?	
	The total mass of all of the elements in a compound.
What is empirical formula?	The simplest whole number ratio of elements in a compound.
	A mixture of two or more elements, where at least one is a metal.
What is filtration?	
What is crystallisation?	
	A separation technique used to separate a mixture of solutions with two different boiling points.
What is fractional distillation?	
	A separation technique used to separate mixtures of soluble substances, usually inks or colourings.

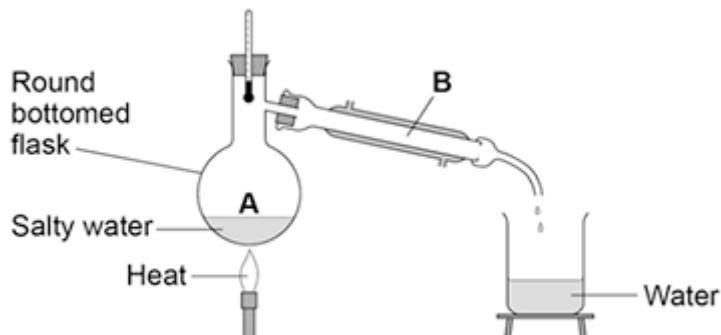
Exam Question:

Rock salt is a mixture of sand and salt.

Salt dissolves in water. Sand does **not** dissolve in water.

Some students separated rock salt.

A student removed water from salty water using the apparatus in the figure below.



Describe how this technique works by referring to the processes at **A** and **B**.

(2)

Due Date:	Friday, 17th December 2021
Student Number:	
Name:	

Y10 T2 W7 C2 – Giant Covalent Structures

Watch the Youtube Video: www.youtube.com/watch?v=tGH0mXCcEFU

Question	Answer
Define a ‘covalent bond’.	A shared pair of electrons between 2 non-metal atoms.
Give an example of a giant covalent structure.	Diamond, graphite and silicon dioxide.
Why do giant covalent structures have a high melting and boiling point?	They have lots of covalent bonds, therefore lots of energy is required to break these covalent bonds.
Define ‘allotrope’	Different structural forms of the same element in the same physical state.
Name 2 allotropes of carbon.	Diamond and graphite.
State some properties of graphite.	Soft and slippery; good conductor of heat and electricity; high melting and boiling point.
State some uses of graphite	Pencils; lubricant; electrodes in batteries and electrolysis.
Describe the bonding in graphite.	Each carbon atom is covalently bonded to 3 other carbon atoms, forming hexagons. The sheets of carbons are arranged in layers. There are delocalised electrons between the layers that allow the layers to slide over each other.
State some properties of diamond.	Very hard; shiny; does not conduct heat or electricity; high melting and boiling point.
State some uses of diamond	Jewellery; cutting tools.
Describe the bonding in diamond.	Each carbon atom is covalently bonded to 4 other carbon atoms. This forms a tetrahedral structure with no weak points.

Look, Cover, Write, Check

Question	Answer
Define an ‘allotrope’	
Name 2 allotropes of carbon.	
Give an example of a giant covalent structure.	
Define a ‘covalent bond’.	
Why do giant covalent structures have a high melting and boiling point?	
State some properties of graphite.	
State some properties of diamond.	
Describe the bonding in graphite.	
Describe the bonding in diamond.	
State some uses of graphite.	
State some uses of diamond	

Look, Cover, Write, Check

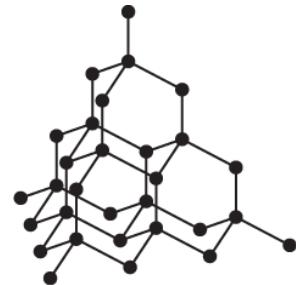
Question	Answer
	A shared pair of electrons between 2 non-metal atoms.
Give an example of a giant covalent structure.	
Why do giant covalent structures have a high melting and boiling point?	
	Different structural forms of the same element in the same physical state.
Name 2 allotropes of carbon.	
	Soft and slippery; good conductor of heat and electricity; high melting and boiling point.
State some uses of graphite.	
Describe the bonding in graphite.	
	Very hard; shiny; does not conduct heat or electricity; high melting and boiling point
State some uses of diamond	
Describe the bonding in diamond.	

Exam Questions:

Q1. Diamond is a form of carbon.

It has a giant molecular structure.

Write about **four** of the physical properties of diamond and explain, in terms of properties, why diamond is used in cutting tools.



[4]

Q2. Graphite can conduct electricity, however diamond cannot. Explain why this is.

[2]