



GRADE 8
NATURAL SCIENCE

TEXTBOOK
&
QUESTIONS AND TESTS

Christa van Wyk

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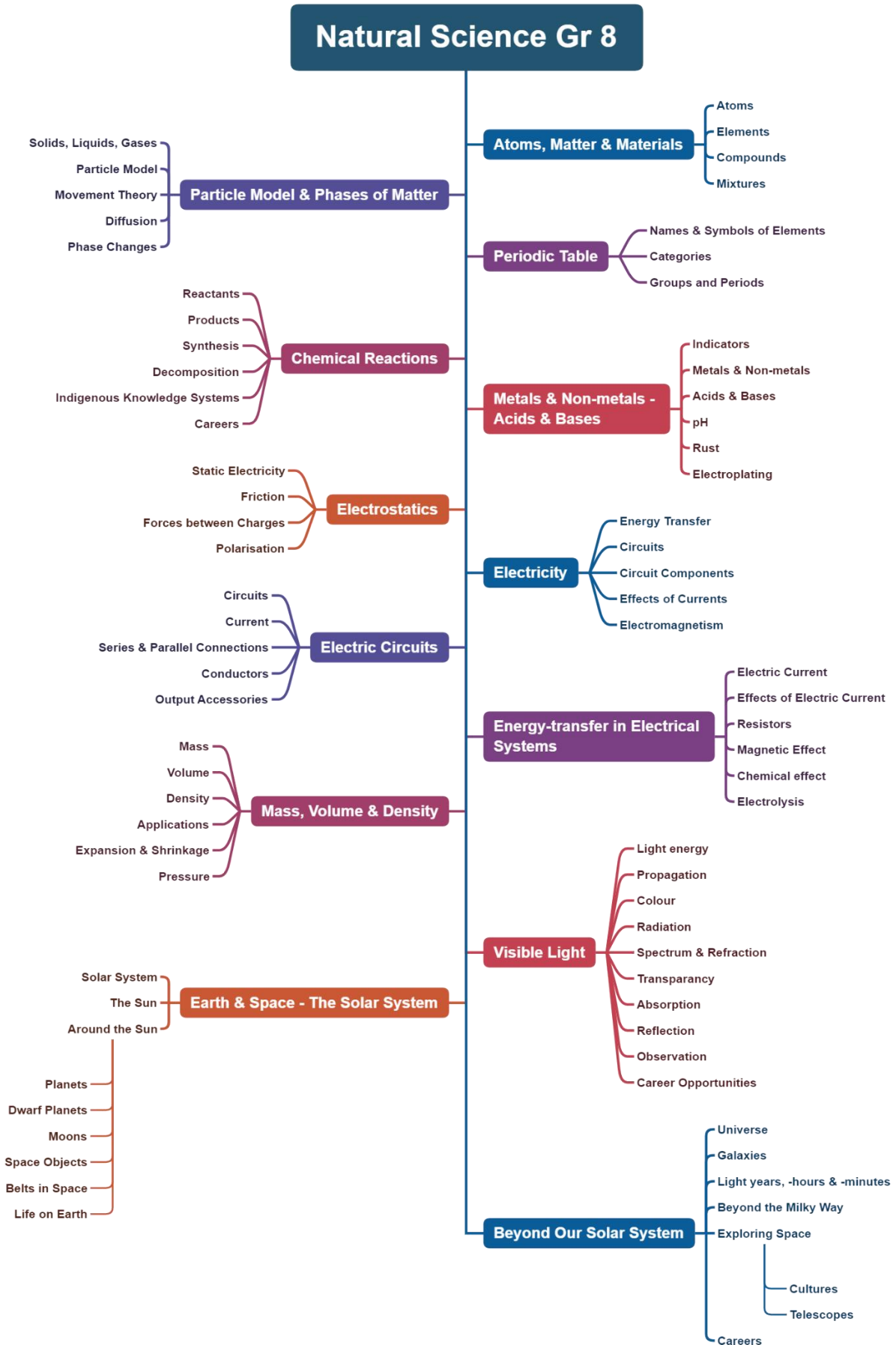
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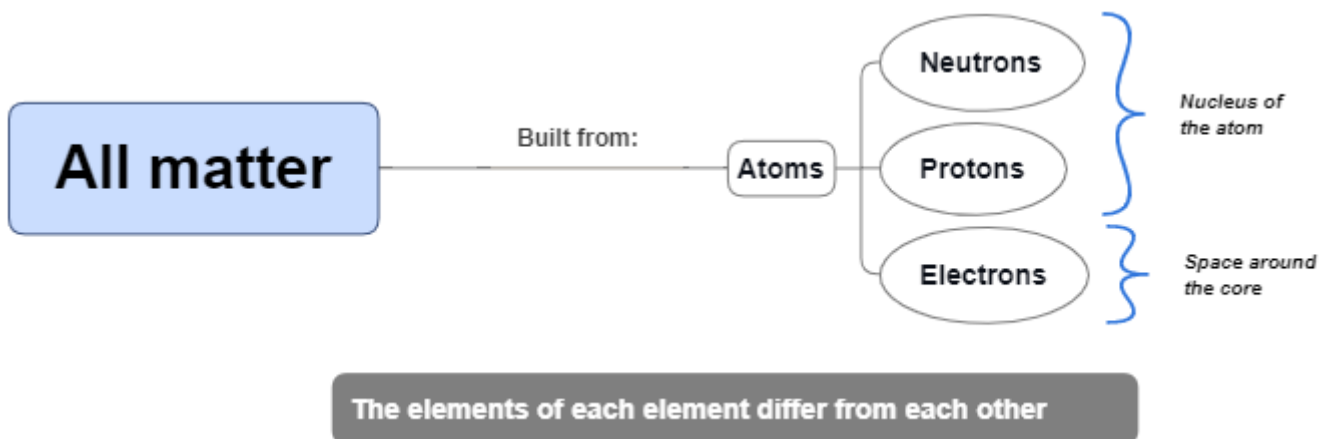
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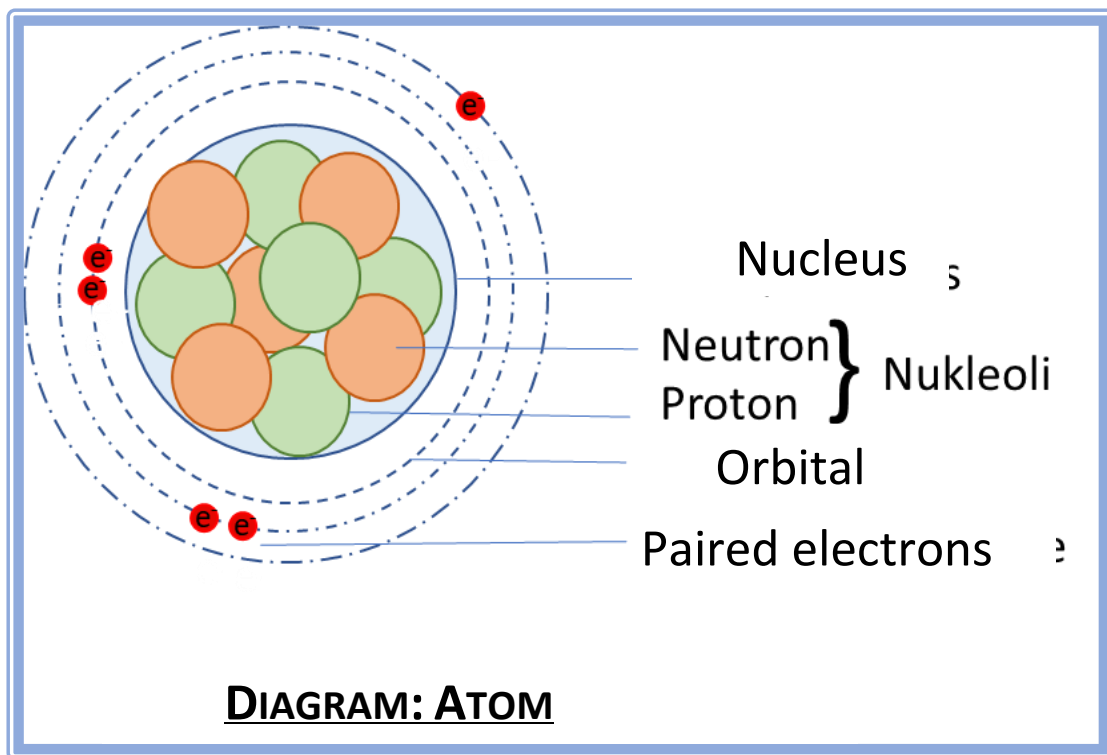
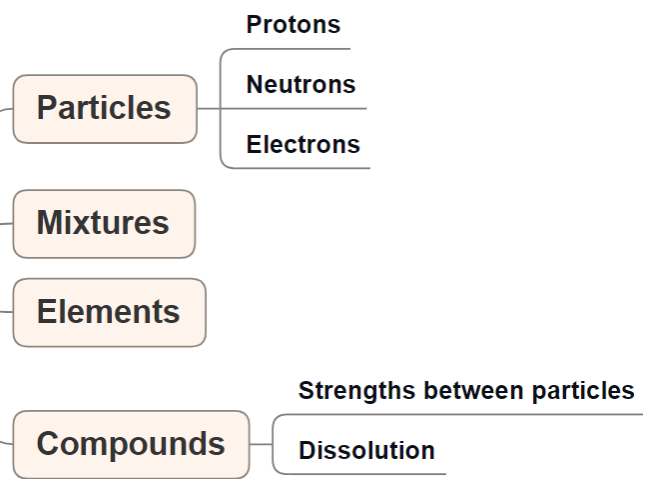
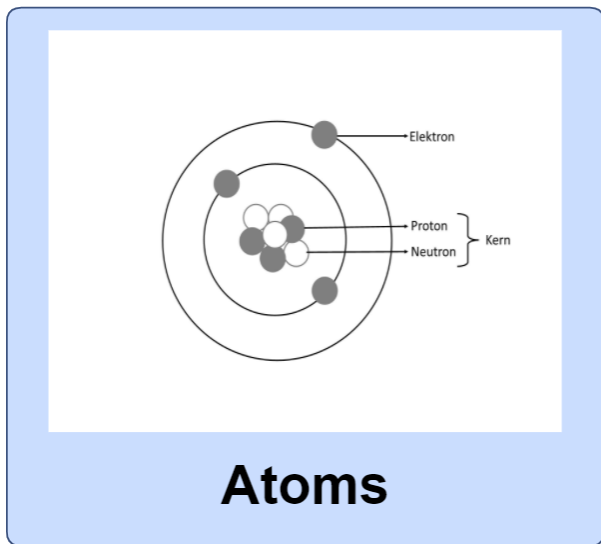
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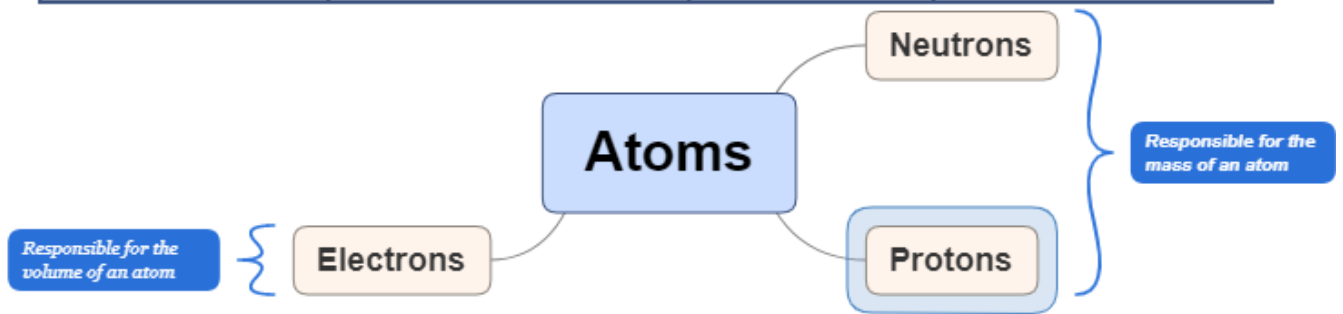
1. ATOMS, MATTER & MATERIALS

Matter and Materials	
	Atoms
Atoms	These are the smallest parts that matter consists of
Elements	An element is a substance that cannot be broken down by any chemical reaction into two or more different substances
Neutrons	A neutron is electrically neutral particles found in the core (nucleus) of an atom
Protons	A proton is a positively charged particle that is found in the nucleus of an atom
Electrons	Electrons are negative particles that normally move in spherical energy levels around the nucleus
Diatoms	Elements that occur in pairs of two atoms of the same substance
Electrolysis	An electric current is sent through a solution which then breaks down the dissolved compounds
Compounds	Two or more atoms of different substances that chemically bind to one molecule

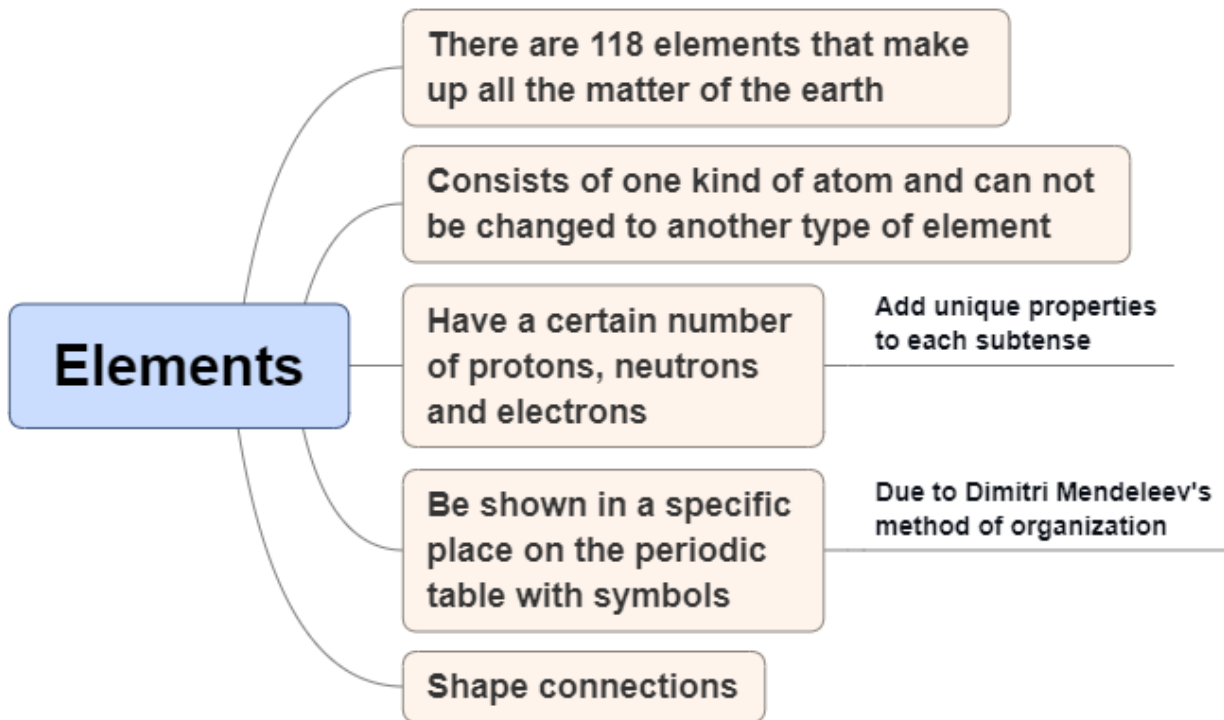




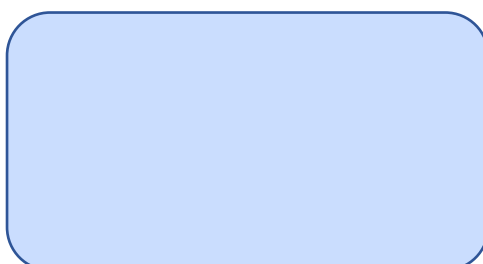
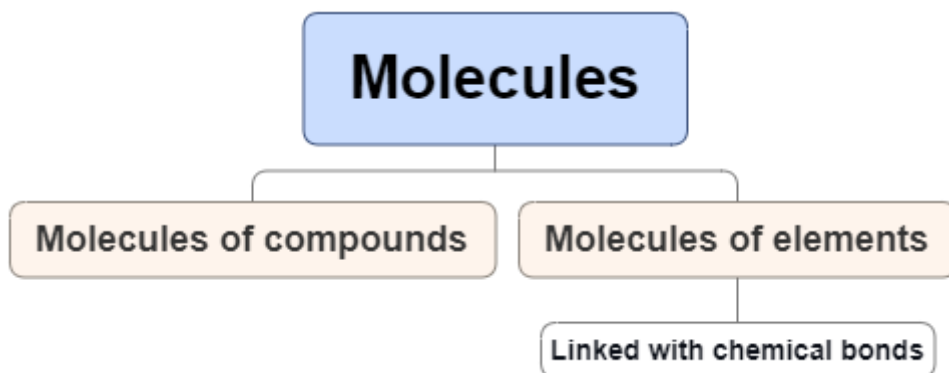
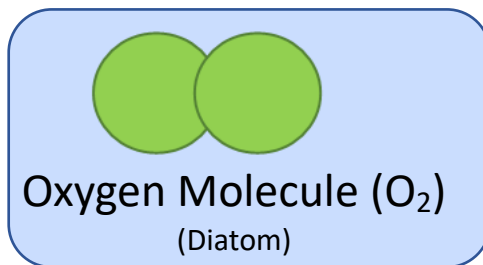
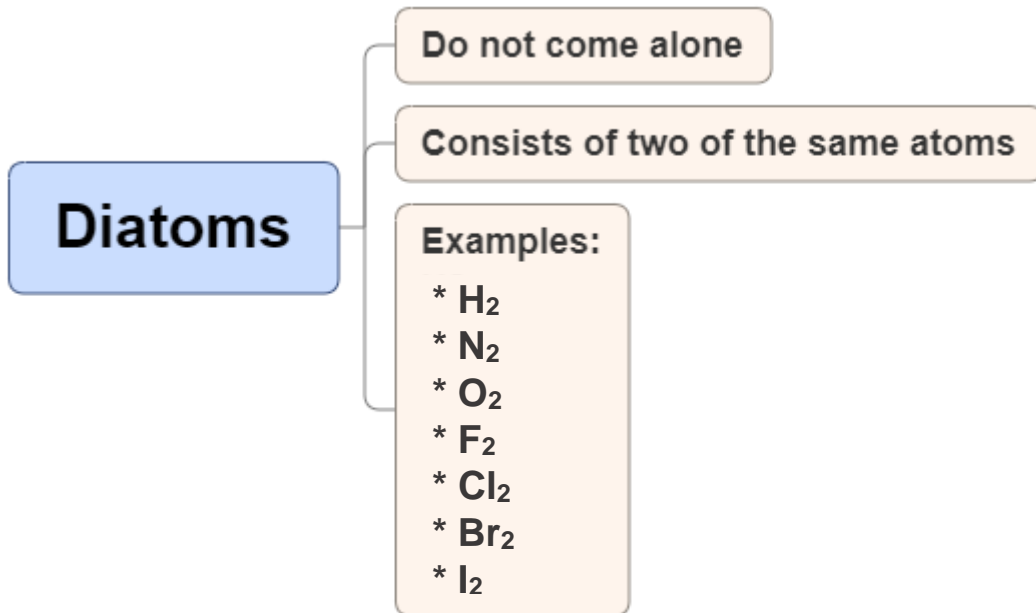
Atoms			
	Neutron	Proton	Electron
Charge	Without charge (neutral)	Positive charge	Negative charge
Where found	Core	Core	Space around the core



Atoms are neutral because the number of electrons equals the number of protons

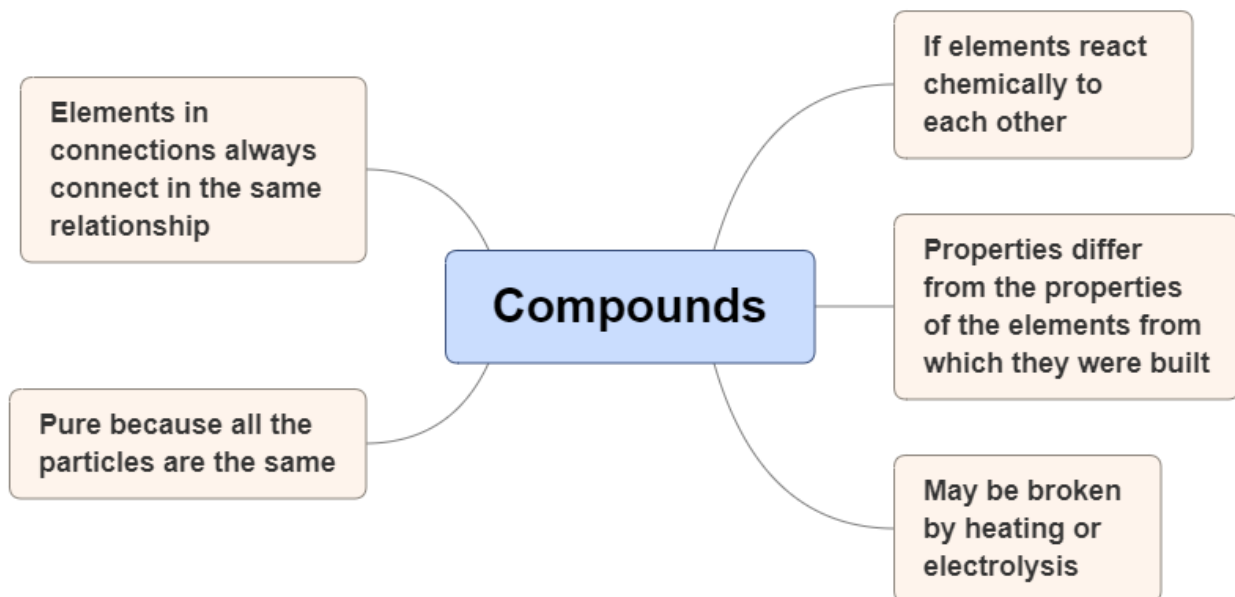
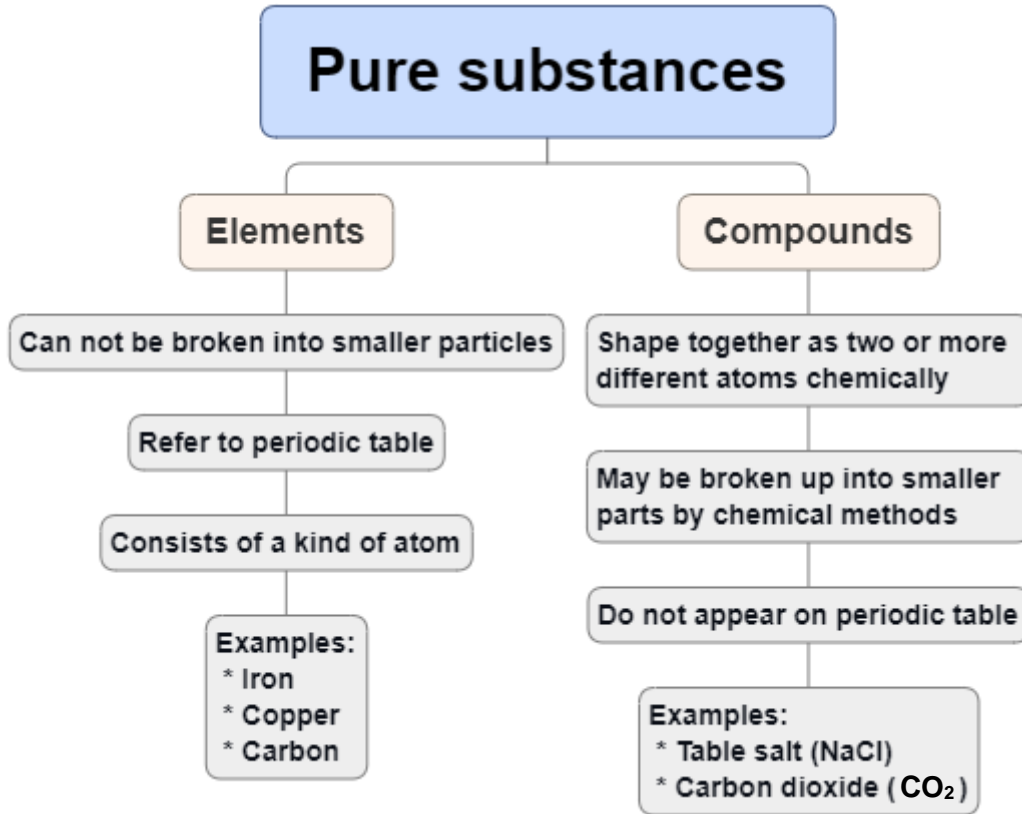


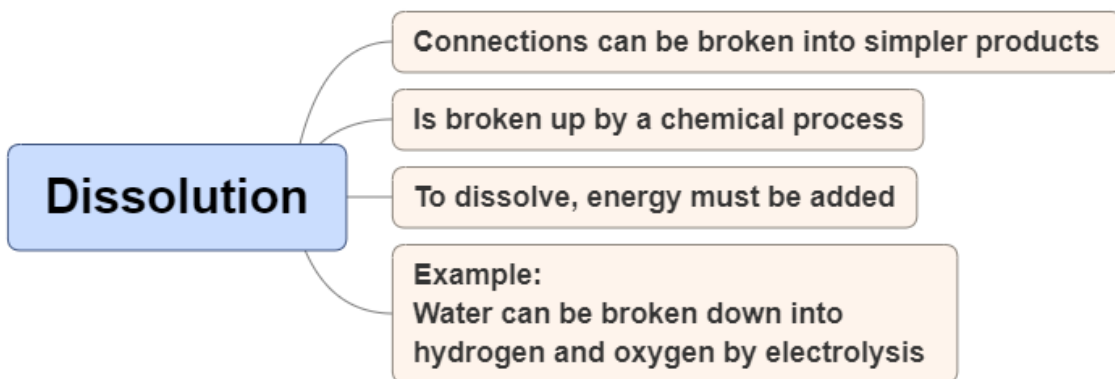
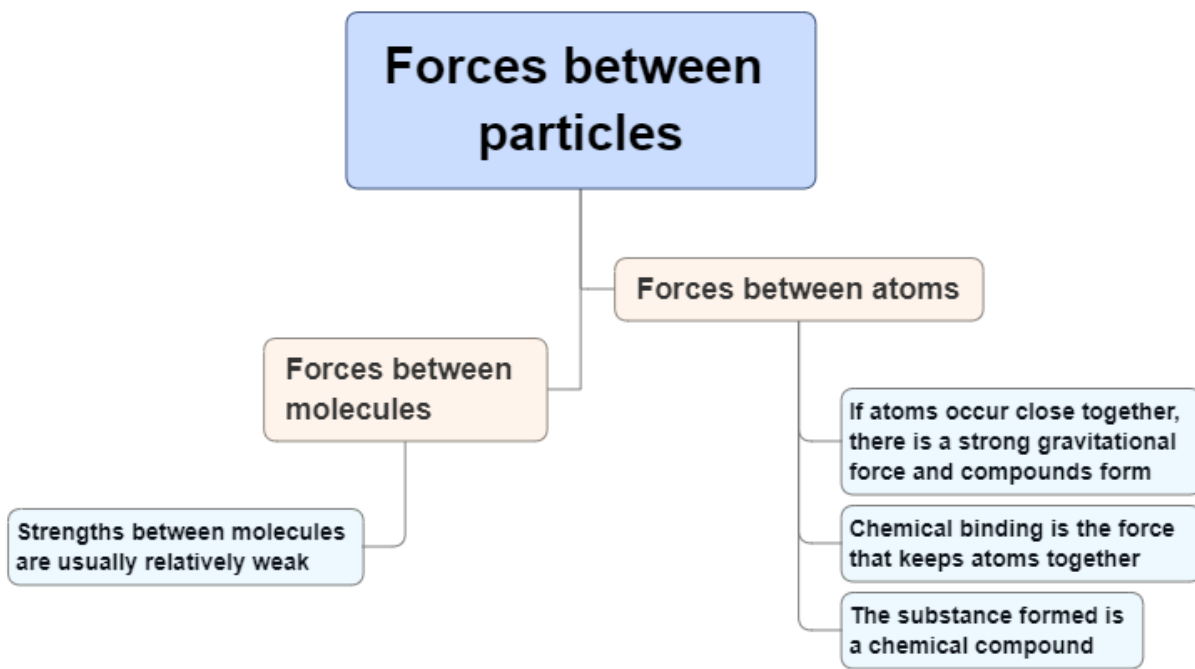
Examples of elements are carbon and oxygen.





Water Molecule (H₂O)





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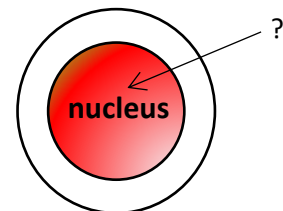
1 ATOMS TEST:

CHOOSE A, B, C OR D ONLY:

QUESTION 1:

1.1 Which particles move around the part shown?

- A. Atoms.
- B. Protons.
- C. Electrons.
- D. Neutrons.



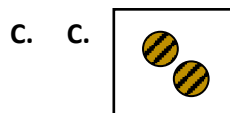
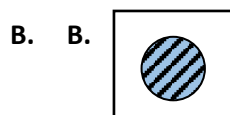
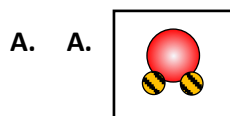
(2)

1.2 Which substance is a diatomic element?

- A. Fluoride
- B. Magnesium.
- C. Iodine
- D. A and C.

(2)

1.3 Which diagram represents a connection?



- D. D. None of the above.

(2)

1.4 Which option is an example of a mixture?

- A. Smoke coming from a factory.
- B. Magnesium.
- C. Table salt.
- D. Carbon dioxide.

(2)

1.5 'n Proton is:

- A. Positively charged and occurs in the energy levels
- B. Positively charged and occurs in the nucleus of the atom
- C. Positively charged and occurs outside the core

D. Negatively charged and is on the energy levels. (2)

[10]

QUESTION 2:

2.1 Which particles are found in the nucleus of an atom? (2)

2.2 How many of the particles are present in the nucleus of the carbon atom? (2)

2.3 Which particles occur around the nucleus? (1)

[5]

QUESTION 3:

3.1 Define the term compound. (2)

3.2 Draw a diagram of an example of a compound and indicate with labels the following:

- The molecule.
- The nucleus of each atom. (3)

3.3 Tabulate the difference between elements and compounds and also give an example of each. (4)

[9]

2 MATTER & MATERIAL QUESTIONS:

QUESTION 1:

- 1.1 Give the definition of atoms. (2)
- 1.2 Give the definition of matter. (2)
- 1.3 Name THREE subatomic particles that make up atoms. (3)
- 1.4 Which charge has the following:
 - 1.4.1 Neutrons.
 - 1.4.2 Protons.
 - 1.4.3 Electrons. (3)
- 1.5 Draw an atom and add captions to your sketch. (4)
- 1.6 What are nucleons? (2)
- 1.7 Does a proton or electron have the largest mass? (1)
- 1.8 Which part of an atom is constantly moving? (1)
- 1.9 Why do protons and electrons attract each other? (1)
- 1.10 Does an atom have an electric charge? Why not? (2)
- 1.11 What is responsible for the mass of an atom? (1)
- 1.12 What is responsible for the volume of an atom? (1)

[23]

QUESTION 2:

Give one word for the following:

- 2.1 Everything that possesses mass and occupies space.
- 2.2 The smallest particle of an element that still possesses the properties of the element.
- 2.3 Particles with a positive charge.
- 2.4 Particles found around the nucleus.
- 2.5 Particles found in the nucleus.
- 2.6 The smallest unit of 'n' element that still possesses the properties of the element.
- 2.7 Particles responsible for the mass of the nucleus.
- 2.8 A substance made up of one kind of atom ('n' Term - not 'n' example).
- 2.9 A subatomic particle in the nucleus of the atom with 'n' positive charge.
- 2.10 A subatomic particle that has virtually no mass.
- 2.11 The three-dimensional space of an atom created by moving electrons.
- 2.12 The type of electrons that lose or gain ions. (12 x 1)

[12]

QUESTION 3:

What is a diatomic molecule? Give **FIVE** examples. (6)

[6]

QUESTION 4:

One-word terms: Give ONE word for each of the following descriptions.

- 4.1 The smallest particles of 'n' element. (2)
- 4.2 The type of electrons that lose or gain ions. (2)
- 4.3 The type of energy that all particles possess, and which then gives them motion. (2)

- 4.4 It takes up mass and space. (2)
 4.5 The smallest building block of matter. (2)
[10]

QUESTION 5:

True or False - Enter the correct statement if the statement is false.

- 5.1 Molecules consist of atoms of the same or different elements that attract and stick to each other.
 5.2 Matter consists of atoms, ions and molecules and the particles are visible.
 5.3 There is really nothing in the spaces between the matter particles.
 5.4 There are attractive and repulsive forces between matter particles.
 5.5 A subatomic particle with the same mass as that of a proton's symbol is e^- .
 5.6 The nucleons are all the particles in an atom that possess mass.
 5.7 The symbol for 'n neutron is n^+ .
 5.8 Ions are atoms that have gained or lost valence electrons. (8 x 1)
[8]

QUESTION 6:

Pair the correct answer with the statements:

	Column A	Column B
6.1	The unit in which the size of atoms is measured.	A. Molecules.
6.2	The small particles that make up water.	B. A subatomic particle with a negative charge.
6.3	Electron.	C. Picometer.
6.4	Atomic nucleus.	D. An atom that has lost or gained an electron.
6.5	Electron cloud.	E. 6Protons & electrons.
6.6	It determines the volume of an atom.	F. Millimetre.
6.7	Nucleons.	G. A subatomic particle with a positive charge.
6.8	Valence electrons.	H. Consists of several energy levels.
6.9	Proton.	I. Electrons in the outer energy level.
6.10	Neutron.	J. A subatomic particle with the same mass as a proton.
6.11	Ions.	K. Electron cloud.

(11 x 2)

[22]

QUESTION 7:

Define the following:

- 7.1 Electron.
 7.2 Nucleons.
 7.3 Element.
 7.4 Proton.
 7.5 Neutron. (5 x 2)
[10]

3 PARTICLE MODEL AND PHASES OF MATTER QUESTIONS:

QUESTION 1:

Give ONE word for each of the following descriptions:

- 1.1 A specific temperature at which a liquid change into a gas.
- 1.2 Pollen grains on water constantly move jerkily around.
- 1.3 Small particles in water.
- 1.4 Ice turns into water.
- 1.5 Steam turns into water.
- 1.6 Everything that possesses mass and occupies space.

(6 x 1)

[6]

QUESTION 2:

Read the following statements. Indicate whether the statement is true (T) or false (F). If it is false, replace the underlined word with another word next to "correction" so that the statement will be true.

2.1.1 In the spaces between matter particles there is air. T / F

2.1.2 One word correction: _____

2.2.1 Phase change is a physical change. T / F

2.2.2 One-word correction: _____

2.3.1 Alcohol molecules are smaller than water particles. T / F

2.3.2 One-word correction: _____

2.4.1 All matter particles possess kinetic energy. T / F

2.4.2 One-word correction: _____

2.5.1 Dry ice can melt. T / F

2.5.2 One-word correction: _____

(5 x 2)

[10]

QUESTION 3:

Choose the correct choice from group B that matches the number in group A.

3.1	H ₂ O (s).	A	Water.
3.2	H ₂ O (l).	B	Bunsen Gas burner.
3.3	H ₂ O (g).	C	Ice.
3.4	Gas burner.	D	Steam.

(4 X 1)

[4]

QUESTION 4:

Complete the following sentences and answer the Questions:

- 4.1 A gas can be compressed because... (2)
- 4.2 If gas particles are forced too close to each other,... (2)
- 4.3 It is very difficult to force water particles apart because... (2)
- 4.4 It is not possible to compress water, because... (2)
- 4.5 Water and ice are visible because... (2)
- 4.6 Is air compressible? (2)
- 4.7 Describe the space between solids and say whether it is compressible. Motivate your answer. (4)

[16]

QUESTION 5:

- 5.1 Write down the particle model of matter. (5)
- 5.2 What do the particles of the particle model represent? (2)
- 5.3 What is in the spaces between air molecules? (1)
- 5.4 Name FOUR phases of matter. (4)
- 5.5 Give the definition of diffusion. (3)
- 5.6 Does diffusion occur faster in water than in steam? Explain. (3)
- 5.7 Explain the changes that occur when ice is heated until it forms gas. (5)

[23]

QUESTION 6:

- 6.1 Define freeze.
- 6.2 Define the cooking process.
- 6.3 What is phase change?
- 6.4 Define sublimation.
- 6.5 What is deposition?
- 6.6 What is deposition?
- 6.7 Give an example of a substance that undergoes sublimation. (7 x 2)

[14]

QUESTION 7:

- 7.1 Name TWO substances that are gas at room temperature. (2)
- 7.2 Name TWO substances that are liquid at room temperature. (2)
- 7.3 Name TWO substances that are 'n solids at room temperature. (2)
- 7.4 Name FIVE properties of a solid. (5)
- 7.5 Name FIVE properties of a liquid. (5)
- 7.6 Name FIVE properties of a gas. (5)

[21]

QUESTION 8:

- 8.1 What is the Test for Oxygen? (1)
- 8.2 Name THREE properties of a mixture. (3)
- 8.3 What can a mixture consist of? (1)

8.4 Give the definition of a pure substance and give an example. (2)

8.5 What is an impure substance? Give an example. (2)

[9]

QUESTION 9:

9.1 An experiment was done where ice was heated and then turned into water and later into gas.

Draw the phase change and also name the type of change between each phase. (5)

9.2 Why are ice and water visible but not gas? (2)

9.3 If one were to put a piece of potassium permanganate in the water, would the crystal disappear over time? If so, why? (2)

9.4 Potassium permanganate crystals consist of: atoms or molecules or ions (choose one). (1)

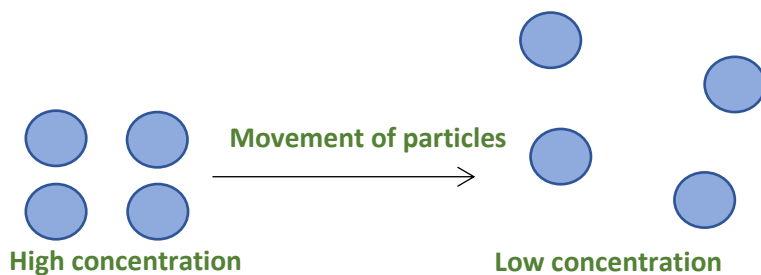
[10]

4 PARTICLE MODEL AND PHASES OF MATTER TEST:

QUESTION 1:

CHOOSE A, B, C OR D ONLY

1.1 What process is represented here of particles in a liquid?

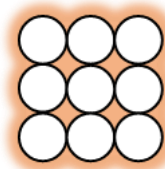


- A. Melting.
- B. Diffusion.
- C. Evaporation.
- D. Condensation.

(2)

1.2 What is the state of matter and how do the particles move?

- A. Liquid, and particles collide violently.
- B. Solid, and particles vibrate.
- C. Gas and particles do not collide at all.
- D. None of the above.



(2)

1.3 Three diagrams are presented. The mass of the first diagram's particles is $2x$ versus V . volume V . The mass of the second diagram is half of the first diagram versus n volume V . The mass of the third diagram is half the mass of the second diagram versus n volume V . Which diagram is density $(0.5x) / V$?

- A. Diagram 1
- B. Diagram 2
- C. Diagram 3
- D. None of the above.

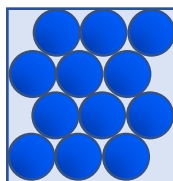


Diagram 1

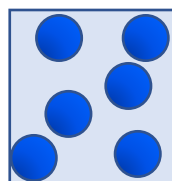


Diagram 2

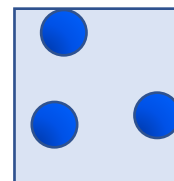
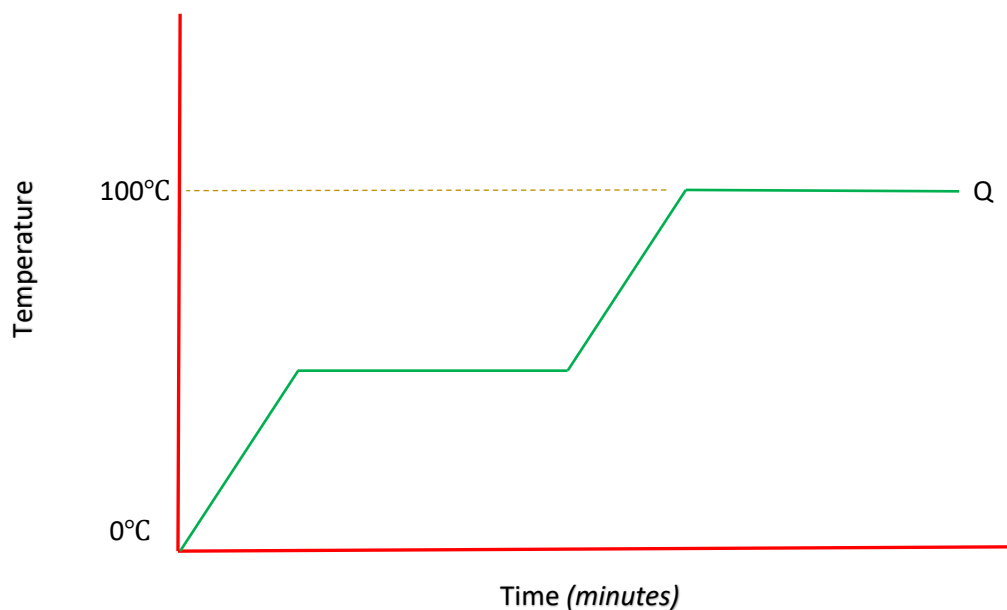


Diagram 3

(2)

1.4 Which phase of water is represented by Point Q?



- A. Gas Phase.
 - B. Solid.
 - C. Liquid.
 - D. None of the above
- (2)

1.5 n Certain dust expands. The number of particles is the number of particle x. What is the number of particles after expansion?

- A. x.
 - B. 2x.
 - C. 3x.
 - D. 4x.
- (2)

[10]

QUESTION 2:

2.1 Classify the following substances as solid, liquid or gas.

2.1.1 A toothbrush.

2.1.2 Oxygen (at room temperature).

2.1.3 Table salt.

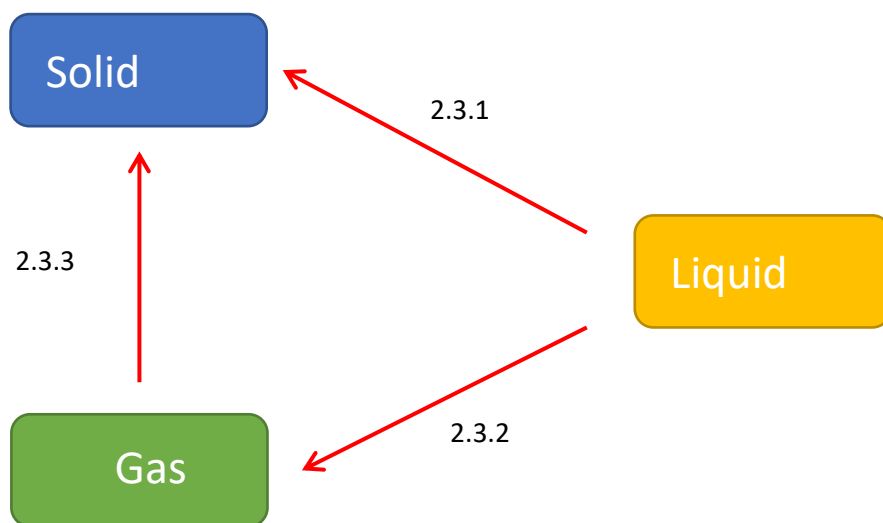
2.1.4 Carbon dioxide.

(4)

2.2 Which density of substances will be the smallest?

(2)

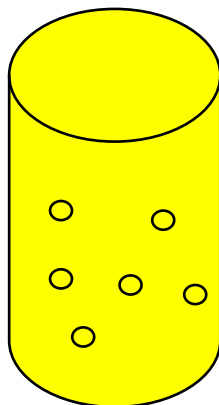
2.3 Complete the following by indicating only the phase change on the arrows.



(3)
[9]

QUESTION 3:

- 3.1 Tabulate the differences of the three phases and also the type of forces between the particles. (5)
- 3.2 Consider the following container full of particles. Gas is now pumped into the container describing what happens to the number of particles and the pressure in the container.



(3)
[8]