GRADE 8

NATURAL SCIENCE

MEMORANDUM

FOR NATURAL SCIENCE: QUESTIONS & TESTS

Christa van Wyk

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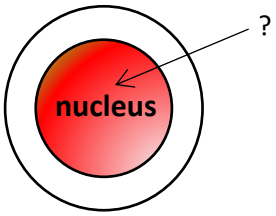
1 ATOMS TEST:

CHOOSE A, B, C OR D ONLY:

QUESTION 1:

1.1 Which particles move around the part shown?

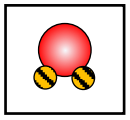


A. Atoms.
B. Protons.
C. Electrons.
D. Neutrons. (2)

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?

A. 

B. 

C. 

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. Protons & 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_2O (s).	A Water.
3.2	H_2O (l).	B Bunsen Gas burner.
3.3	H_2O (g).	C Ice.
3.4	Gas burner.	D Steam.

[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)

INDEX:

1 ATOMS TEST:

QUESTION 1:

1.1 C.
1.2 D.
1.3 A.
1.4 A.
1.5 B. (2 x 5)

[10]

Question 2:

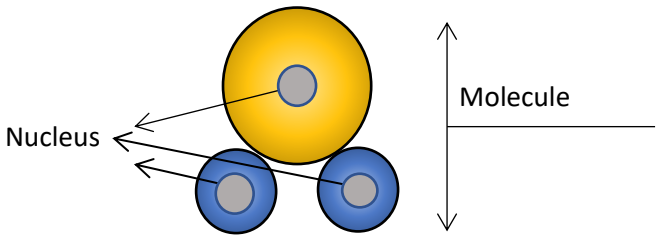
2.1 The nucleus of any atom consists of positively charged protons and neutral neutrons. (2)
2.2 6 protons and 6 neutrons. (2)
2.3 Electrons. (1)

[5]

QUESTION 3:

3.1 A compound is a substance that forms when two or more different atoms bond chemically with each other. (2)

3.2



(3)

3.3

Element	Compound
Cannot be chemically broken down	Can be chemically broken down
E.g. Copper	E.g. Ammonia

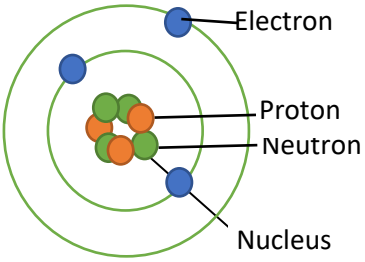
(4)

[9]

2 MATTER AND MATERIALS QUESTIONS:

QUESTION 1:

1.1. Smallest particles that possess mass (2)
1.2. It is a substance that occupies space and mass (2)
1.3. Electrons. proton and neutrons (3)
1.4.1. Neutral (1)
1.4.2. Positive (1)
1.4.3. Negative (1)
1.5. The sketch of an atom



(4)

1.6 It is the particles in the nucleus that consist of protons and neutrons. (2)
1.7 Proton (1)
1.8 Electrons (1)
1.9 They have opposite electrostatic charges. That's why they attract each other. (1)
1.10 A atom has a neutral charge, because there is equal amount of proton (positive charge) and electrons (Negative charge) (2)
1.11 The mass is determined by the number of protons and neutrons (Nucleons) (1)
1.12 The electrons are responsible for the volume of an atom. (1)

[23]

QUESTION 2:

2.1. Matter
2.2. Atom
2.3. Protons
2.4. Nucleons
2.5. Neutrons & Protons
2.6. Atom
2.7. Protons & Nucleons
2.8. Element
2.9. Proton
2.10. Electron
2.11. Volume
2.12. Valens electrons (12 x1)

[12]

QUESTION 3:

A diatomic molecule is a molecule that consists of two atoms of the same element.
Examples are O_2, N_2, H_2, F_2, Cl_2, Br_2 (6)

[6]

QUESTION 4:

4.1. Atom (2)
4.2. Valence electrons (2)
4.3. Kinetic energy (2)
4.4. Matter (2)
4.5. Atom (2)

[10]

QUESTION 5:

5.1. True
5.2. False. Matter consists of atoms, ions and molecules and the particles are invisible.
5.3. True.
5.4. True.
5.5. False. 'n Subatomic particle with the same mass as that of 'n proton's symbol is n.
5.6. True.
5.7. True.
5.8. True. (8 x 1)

[8]

QUESTION 6:

6.1. C
6.2. A
6.3. B
6.4. E
6.5. H
6.6. K
6.7. E
6.8. I
6.9. G
6.10. J
6.11. D (11 x 2)

[22]

QUESTION 7

7.1. An electron has a negative charge and occurs in an electron cloud around the nucleus which determines the volume of an atom.
7.2. Nucleons are the proton and neutrons that are found in the nucleus.
7.3. An element is a substance with specific properties.
7.4. A proton is a particle that occurs in the nucleus of an atom and has a positive charge.
7.5. A neutron is a particle that occurs in the nucleus of an atom and has no charge.

(5 x 2)

[10]

3 PARTICLE MODEL AND PHASES OF MATTER QUESTIONS:

QUESTION 1:

1.1. Boiling point.
1.2. Brownian movement.
1.3. Molecules.
1.4. Melting point.
1.5. Condensation.
1.6. Matter. (6 x 1)

[6]

QUESTION 2:

2.1.1. False.
2.1.2. Spaces.

2.2.1. False.
2.2.2. Chemical.

2.3.1. False.
2.3.2. Larger.

2.4.1. True.
2.4.2. ---

2.5.1. False.
2.5.2. Sublimate. (5 x 2)

[10]

QUESTION 3:

3.1. C.
3.2. A.
3.3. D.
3.4. B. (4 x 1)

[4]

QUESTION 4:

4.1. there are spaces between molecules. (2)
4.2. the temperature increases. (2)
4.3. there is cohesion between the molecules (Polar) (2)
4.4. the molecules are already near to each other. (2)
4.5. the molecules are near to each other. (2)
4.6. Yes. (2)
4.7. The molecules of a solid is packed in a roster with many small spaces between the molecules. The molecules have fixed places and do not move from these positions. Therefore, a solid is not compressible. (4)

[16]

QUESTION 5:

5.1. Particle is in constant motion. Particles of gas constantly collide with each other and against the walls of the container. The kinetic energy of the particles is directly proportional to the temperature. There are spaces between the particles. There are attractive and repulsive forces. (5)

5.2. Molecules and atoms (2)

5.3. Vacuum (Nothing) (1)

5.4. Solids, liquids, gases and plasma. (4)

5.5. It is the distribution of particles in space until the particles are evenly distributed throughout space. (3)

5.6. No, the further apart the particles are, e.g. in a gas, the faster the diffusion will be completed. (3)

5.7. Ice is heated to all the particles the temperature of 0ºC and liquefied to water. The temperature of the water rises until it reaches 100ºC. The water particle now has enough energy to evaporate from the water until all that has been converted to gas. (5)

[23]

QUESTION 6:

6.1. This is when a liquid changes to a solid. (2)

6.2. This is when a liquid changes to a gas. (2)

6.3. This is when substances change from one phase to another phase. (2)

6.4. This is when a substance of a solid changes directly into a gas. (2)

6.5. Deposition is condensation - where a gas changes to a liquid. (2)

6.6. Naphthalene. (2)

[12]

QUESTION 7:

7.1. Oxygen and nitrogen. (2)

7.2. Mercury, water. (2)

7.3. Ice, diamond. (2)

7.4. • It is made up of particles
• The particles vibrate in the same place all the time.
• There are strong attractive forces between the particles.
• The particles are arranged in a crystal lattice and have a fixed location and have their own shape.
• There are empty spaces between the particles. (5)

7.5. ◦ It is made up of particles.
◦ The particles move all the time.
◦ There are strong attractive forces between the particles but also repulsive forces.
◦ The particles are more dispersed than in a gas and take the shape of the container in which they are.
◦ There are empty spaces between the particles . (5)

7.6. □ It is made up of particles.
□ The particles move quickly and collide with each other and against the edge of their container

in which it is.

□ There are attractive forces between the particles but also strong repulsive forces.
□ The particles are far apart and take the shape of the container in which they are.
□ There are empty spaces between the particles. (5)

[21]

QUESTION 8:

8.1 Insert a glowing wood splinter into a test tube with oxygen. The wood splinter will ignite. (1)

8.2 • It consists of atoms or molecules of different substances.
• It consists of two or more substances that are mixed.
• The substances must be in the same phase. (3)

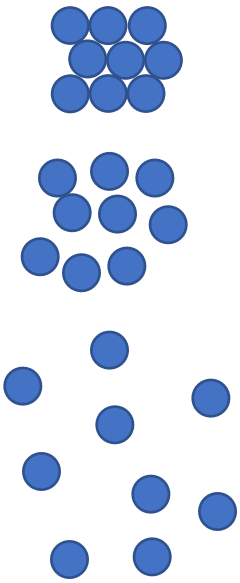
8.3 Salt and sugar. (1)

8.4 A pure substance is a substance that consists of the atoms of the same element, e.g. diamond. (2)

8.5 An impure substance will consist of atoms of different elements. Water. (2)

[9]

QUESTION 9:



SOLID

Melt

↓

LIQUID

Evaporate

↓

GAS

(5)

9.2 Ice is visible because many of the particles are arranged very close to each other and a solid substance will be seen. In gases the small particles are very far apart and move very fast, so you will not be able to see the water vapor in the air. (2)

9.3 Yes, the crystal disappears. As the crystal dissolves, the particles of the potassium permanganate disperse through those due to diffusion. (2)

9.4 Molecules. (1)

[10]

4 PARTICLE MODEL AND PHASES OF MATTER TEST:

Question 1:

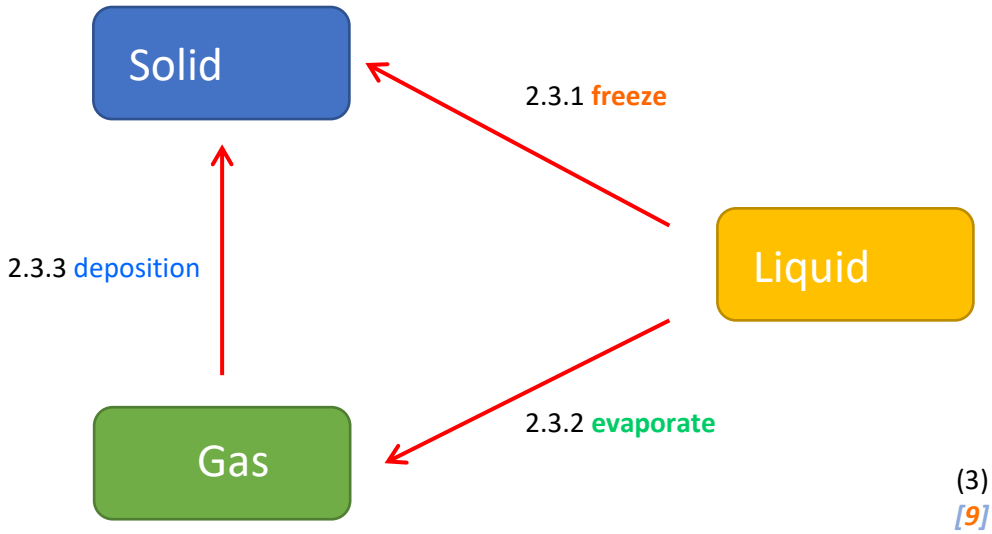
1.1 B.
1.2 B.
1.3 C.
1.4 A.
1.5 A. (5 x 2)
[10]

QUESTION 2:

2.1.1 Solid.
2.1.2 Gas.
2.1.3 Solid.
2.1.4 Gas. (4)

2.2 Oxygen and carbon dioxide. (2)

2.3



(3)
[9]

Question 3:

3.1

Phase	Differences	Intermolecular Forces
Solid.	Orderly arrangement of particles.	Strong attraction forces.
Liquid.	Particles loosely arranged.	Weaker attraction forces.
Gas.	No order in the arrangement of the particles.	Very weak attraction forces.

(5)

3.2 When the gas is pumped into the container the number of gas particles increases and so also the collisions increase per unit time and the pressure increases. (3)

[8]

5 CHEMICAL REACTIONS QUESTIONS:

QUESTION 1:

1.1 Oxidation.
1.2 Acid.
1.3 CO_2. (3 x 1)

QUESTION 2:

2.1 BA.
2.2 AB.
2.3 BC.
2.4 AD. (4 x 1)
[4]

QUESTION 3:

3.1 No not under normal circumstances. (Yes – in nuclear reactions). (1)
3.2 It is a compound of two or more atoms of one or more elements. (2)
3.3 It is a molecule consisting of 2 atoms of the same element. (2)
3.4 H_2, N_2, O_2, F_2, Br_2, $C\ell_2$, I_2. (7)
3.5 CO_2, H_2O, NO_2. (3)
3.6 This is the process where electricity is used to break down a molecule into simpler molecules or atoms.
(2)
3.7 A molecule consisting of atoms of one element. (1)
[18]

QUESTION 5:

4.1.1 False.
4.1.2 Empty spaces. (2)

4.2.1 False.
4.2.2 Less. (2)

4.3.1 False.
4.3.2 Nitrate. (2)

4.4.1 False.
4.4.2 Metals. (2)

4.5.1 True.
4.5.2 - (2)
[10]