Grade 9
Natural Science

Textbook
&
Tests
&
Worksheets

Christa van Wyk

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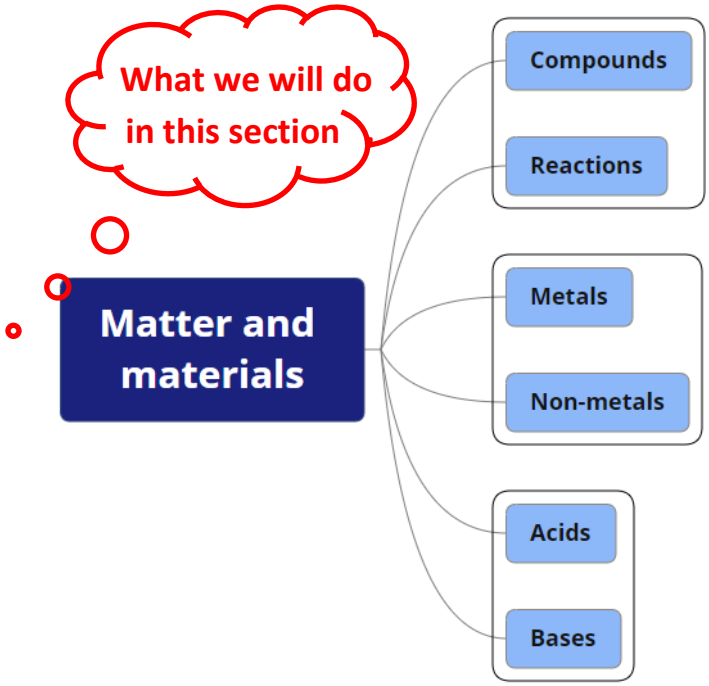
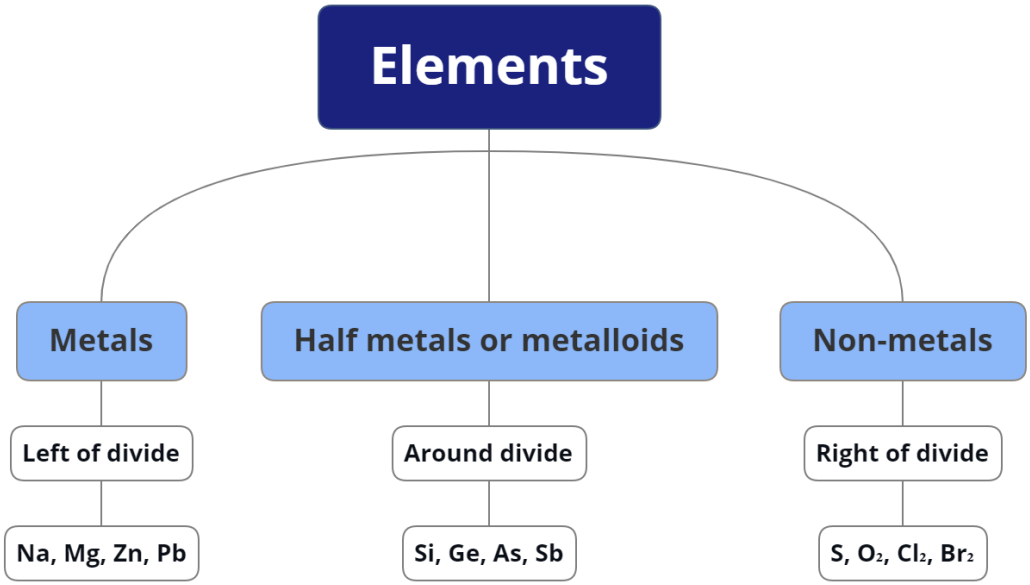
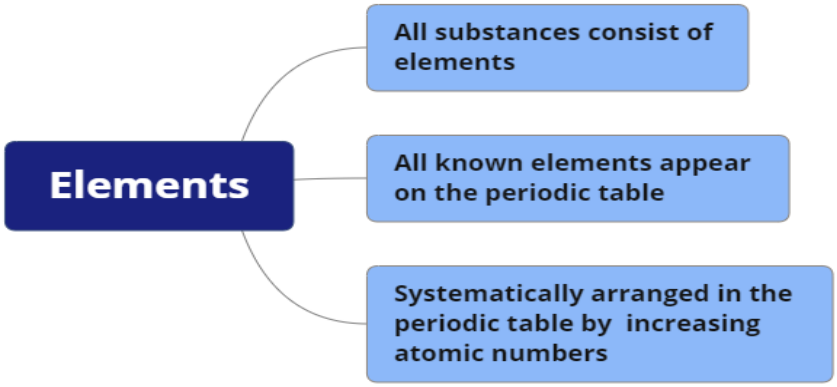
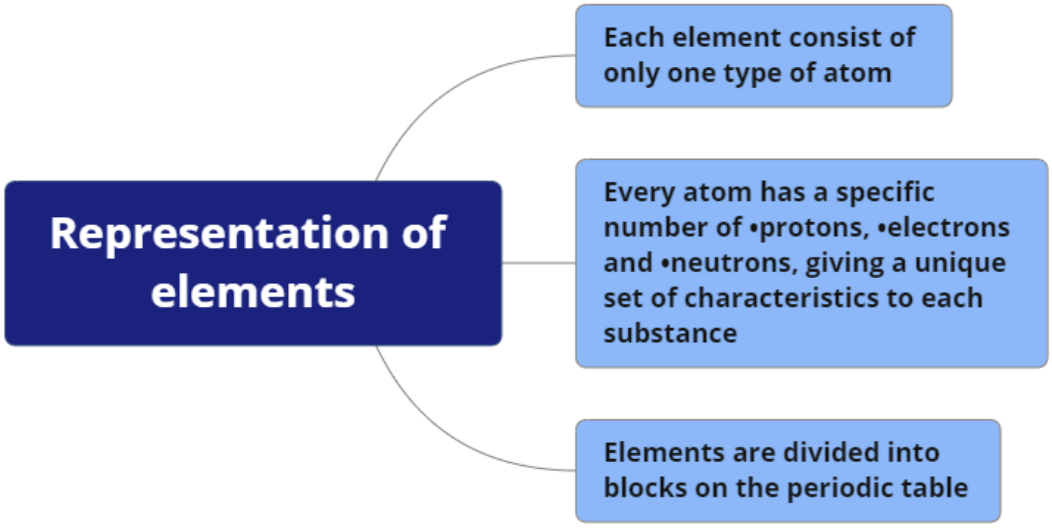
1 COMPOUNDS AND CHEMICAL REACTIONS:

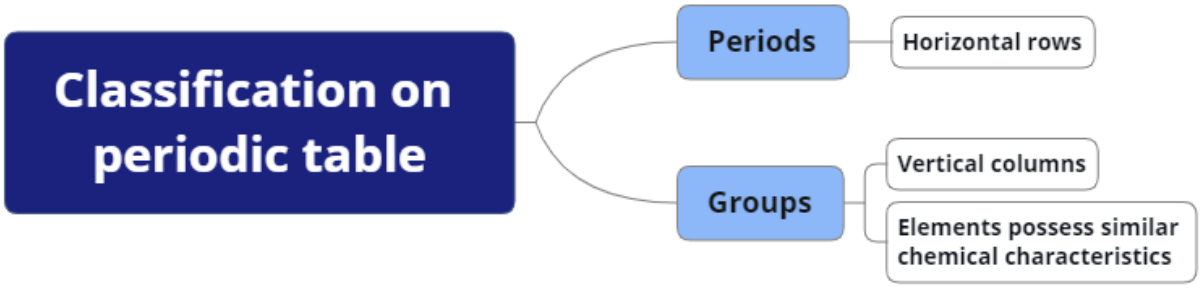


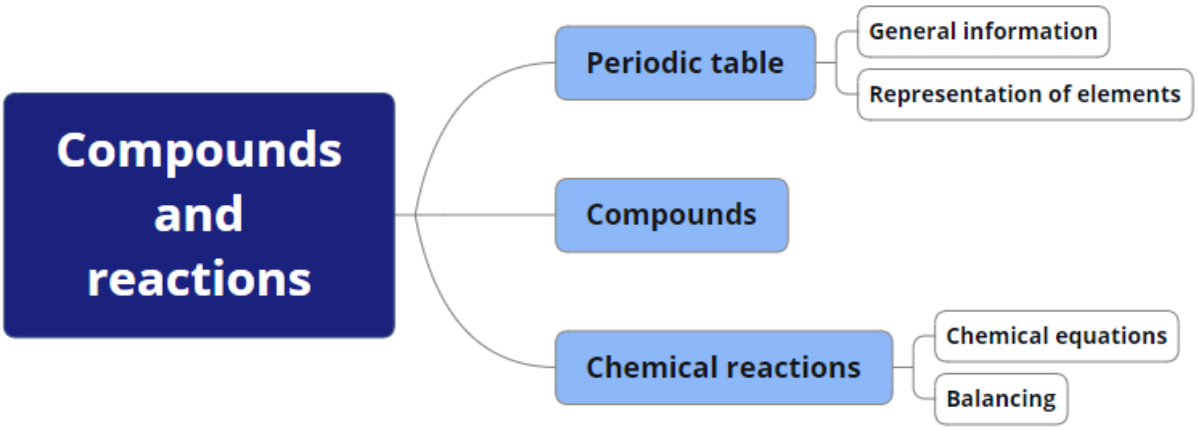
Matter and materials	
	Compound and reactions
Diatoms	Atoms that occur in nature as a diatomic molecule and not only as a single atom
Chemical reaction	Process during which one set of chemical substances change into a new set of chemical substances with their own new characteristics

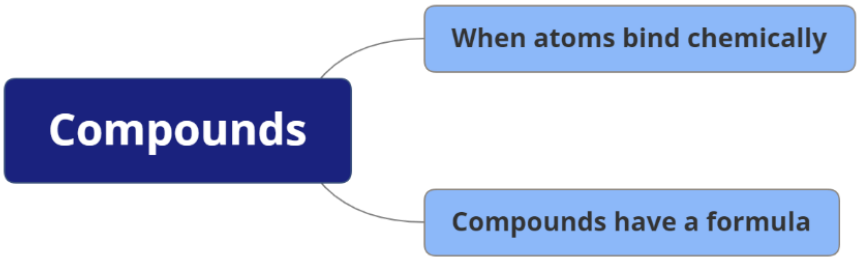

Elements
Metals
Half metals or metalloids
Non-metals
Left of divide
Around divide
Right of divide
Na, Mg, Zn, Pb
Si, Ge, As, Sb
S, O2, Cl2, Br2

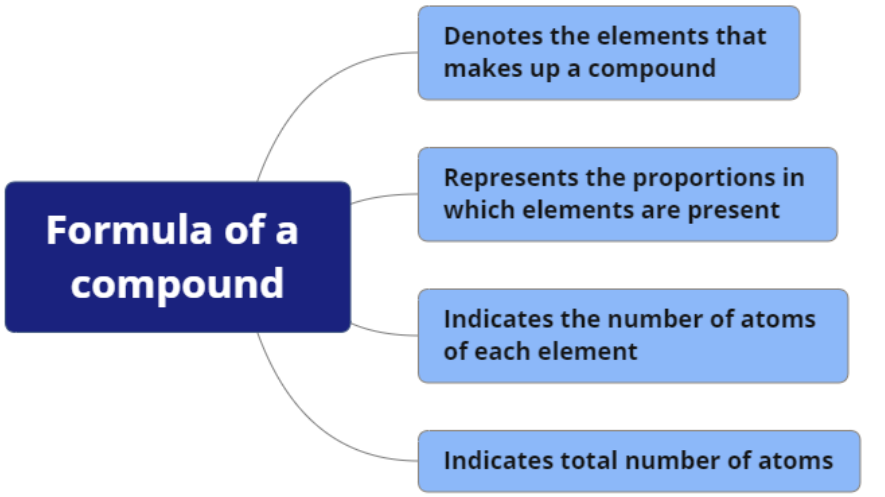

Elements
All substances consist of elements
All known elements appear on the periodic table
Systematically arranged in the periodic table by increasing atomic numbers

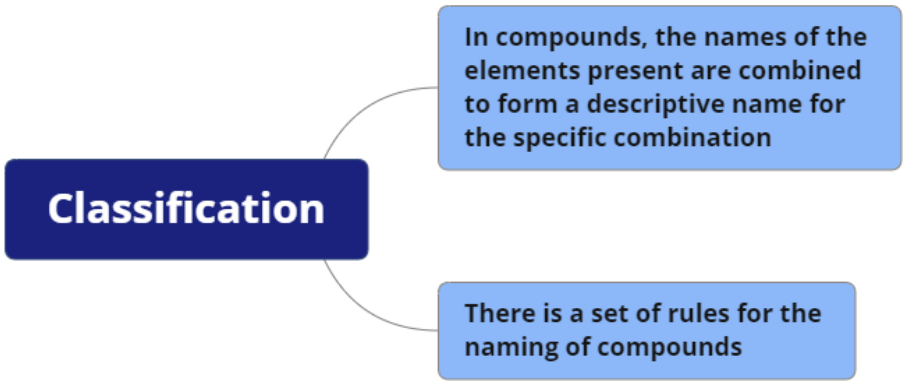

Representation of elements
Each element consist of only one type of atom
Every atom has a specific number of •protons, •electrons and •neutrons, giving a unique set of characteristics to each substance
Elements are divided into blocks on the periodic table

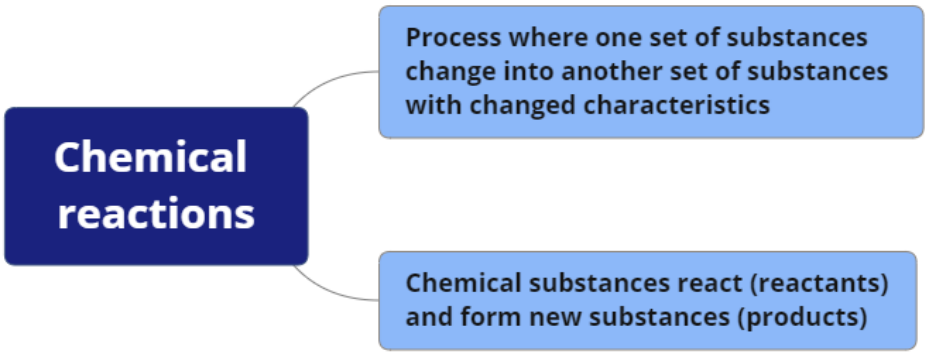

Classification on periodic table
Periods
Horizontal rows
Groups
Vertical columns
Elements possess similar chemical characteristics


Compounds and reactions
Periodic table
General information
Representation of elements
Compounds
Chemical reactions
Chemical equations
Balancing


Compounds
When atoms bind chemically
Compounds have a formula

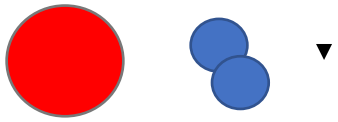
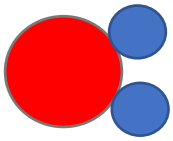

Formula of a compound
Denotes the elements that makes up a compound
Represents the proportions in which elements are present
Indicates the number of atoms of each element
Indicates total number of atoms


Classification
In compounds, the names of the elements present are combined to form a descriptive name for the specific combination
There is a set of rules for the naming of compounds

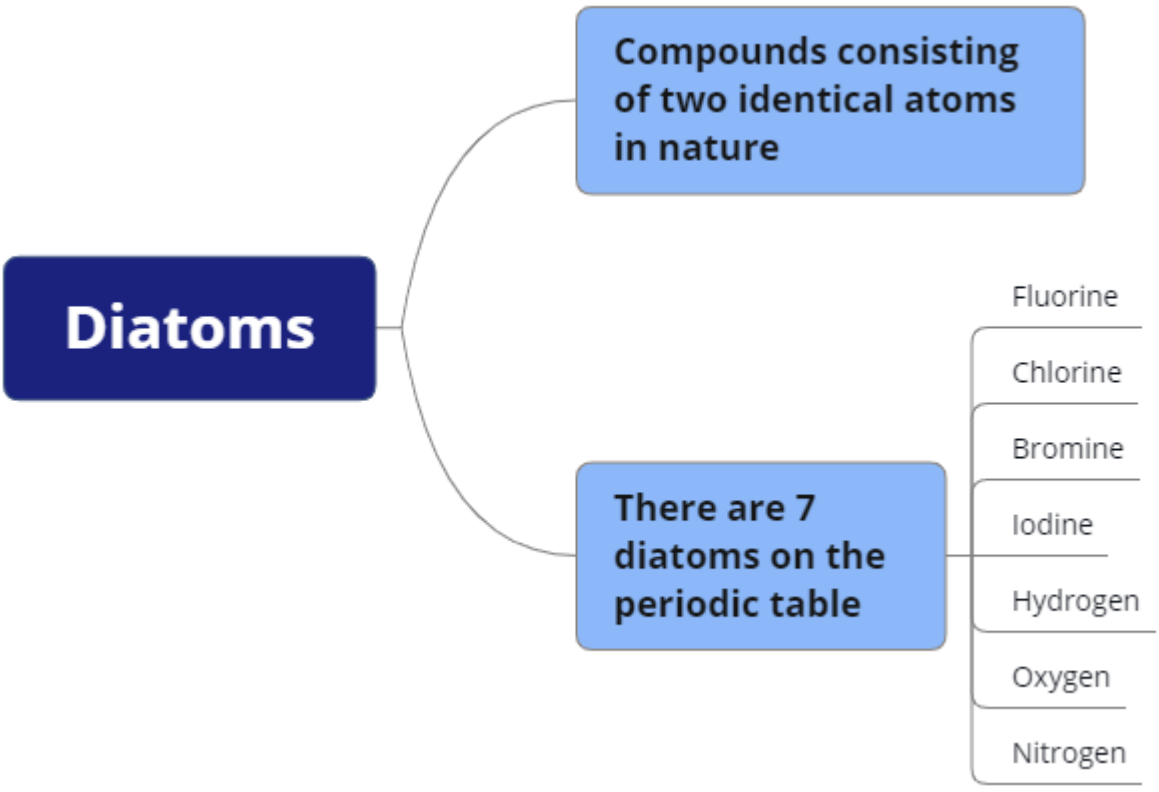

Chemical reactions
Process where one set of substances change into another set of substances with changed characteristics
Chemical substances react (reactants) and form new substances (products)

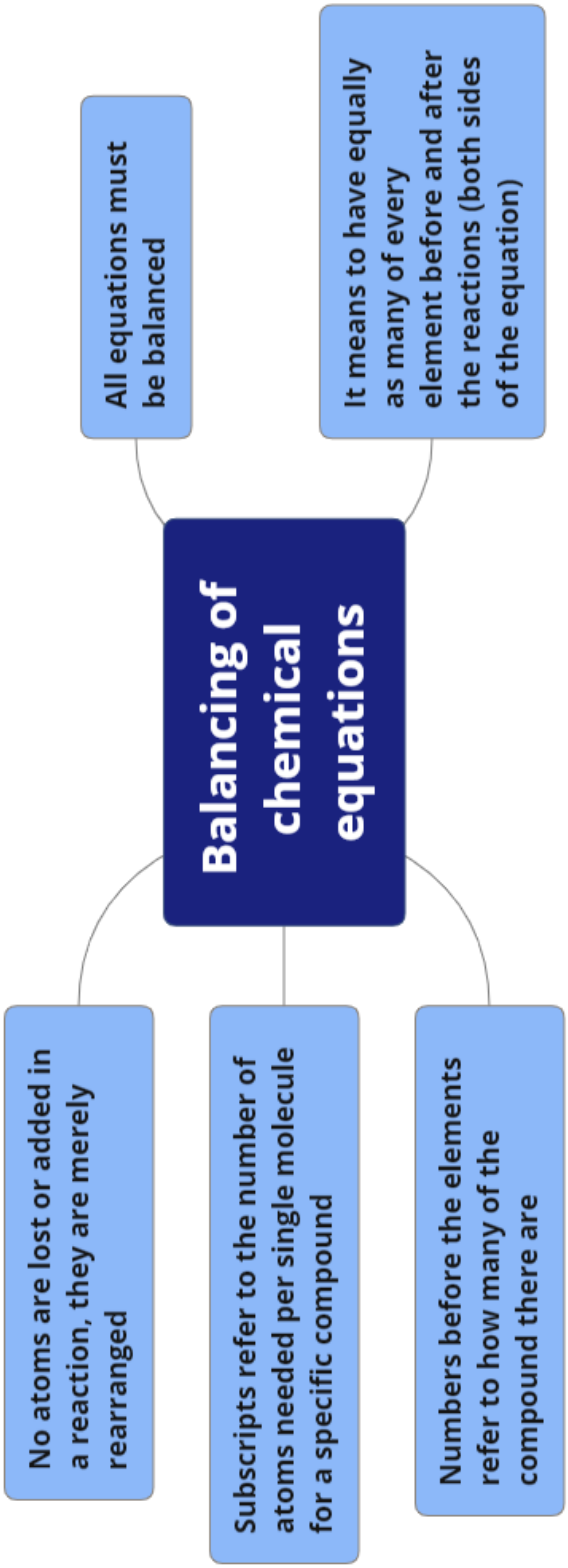
Common names for known compounds		
	Chemical name	Common name
H_2O	Hydrogen oxide	Water
NH_3	Hydrogen nitrite	Ammonia
HCl	Hydrogen chloride	Hydrochloric acid or pool acid
H_2SO_4	Hydrogen sulphate	Sulphuric acid or pool acid
HNO_3	Hydrogen nitrate	Nitric acid
H_2CO_3	Hydrogen carbonate	Carbonic acid
NaCl	Sodium chloride	Table salt
NaOH	Sodium hydroxide	Caustic soda
$NaHCO_3$	Sodium hydrogen carbonate or Sodium bicarbonate	Baking soda
Na_2CO_3	Sodium carbonate	Washing soda
KNO_3	Potassium nitrate	Salpeter
KOH	Potassium hydroxide	Caustic soda
$CaCO_3$	Calcium carbonate	Marble
$CaSO_4$	Calcium sulphate	Gypsum/ plaster
CO_2	Carbon dioxide	Carbon dioxide (gas)
$MgSO_4$	Magnesium sulphate	Epsom salt
$CuSO_4$	Copper sulphate	Blue vitriol
CH_4	Methane	Natural gas

REACTIONS CAN BE REPRESENTED AS FOLLOWS:

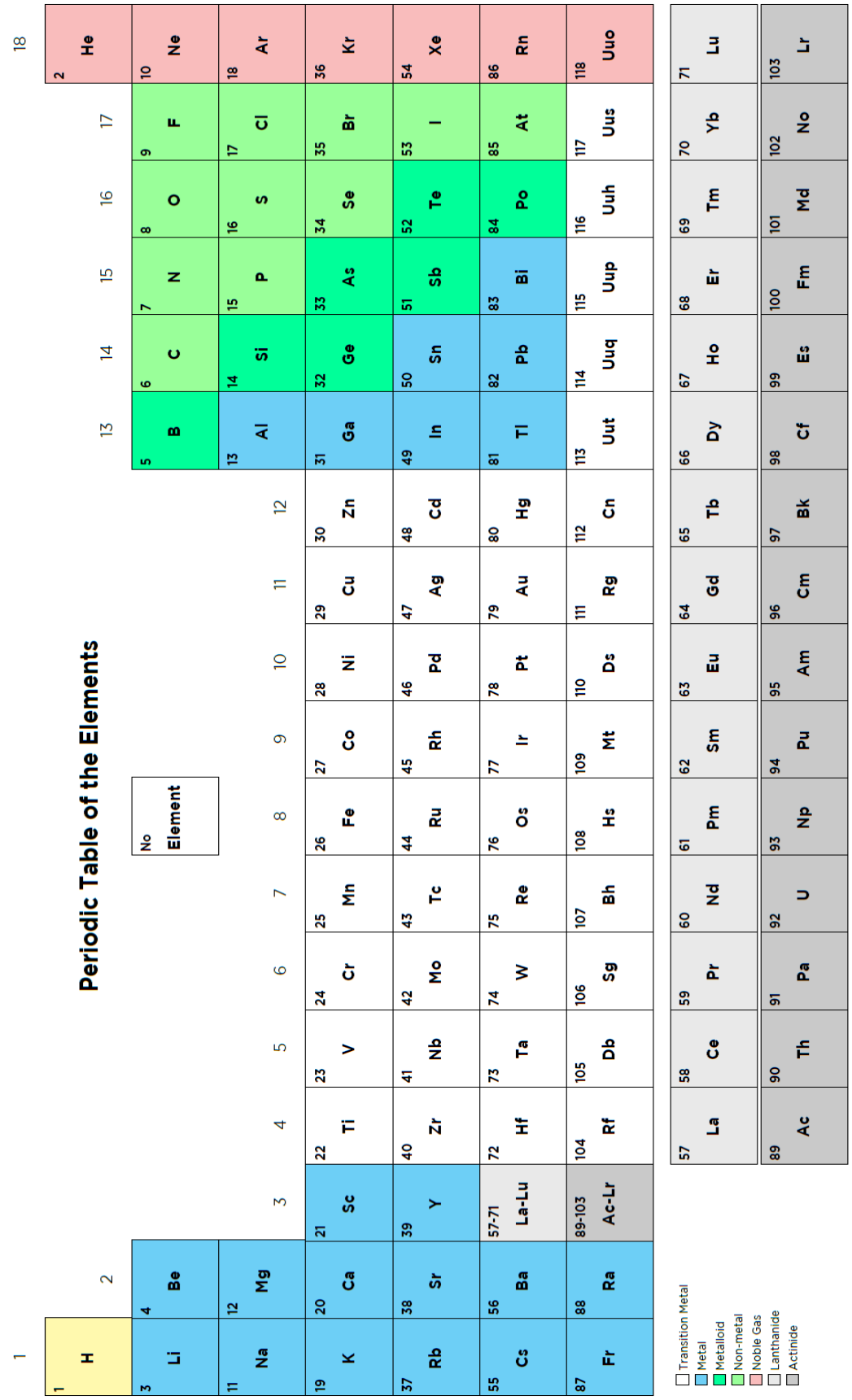
	Reactants (carbon and oxygen)	Products (carbon dioxide)
Symbols	C + O_2 →	CO_2
Microscopic		

Transition process is indicated by →.

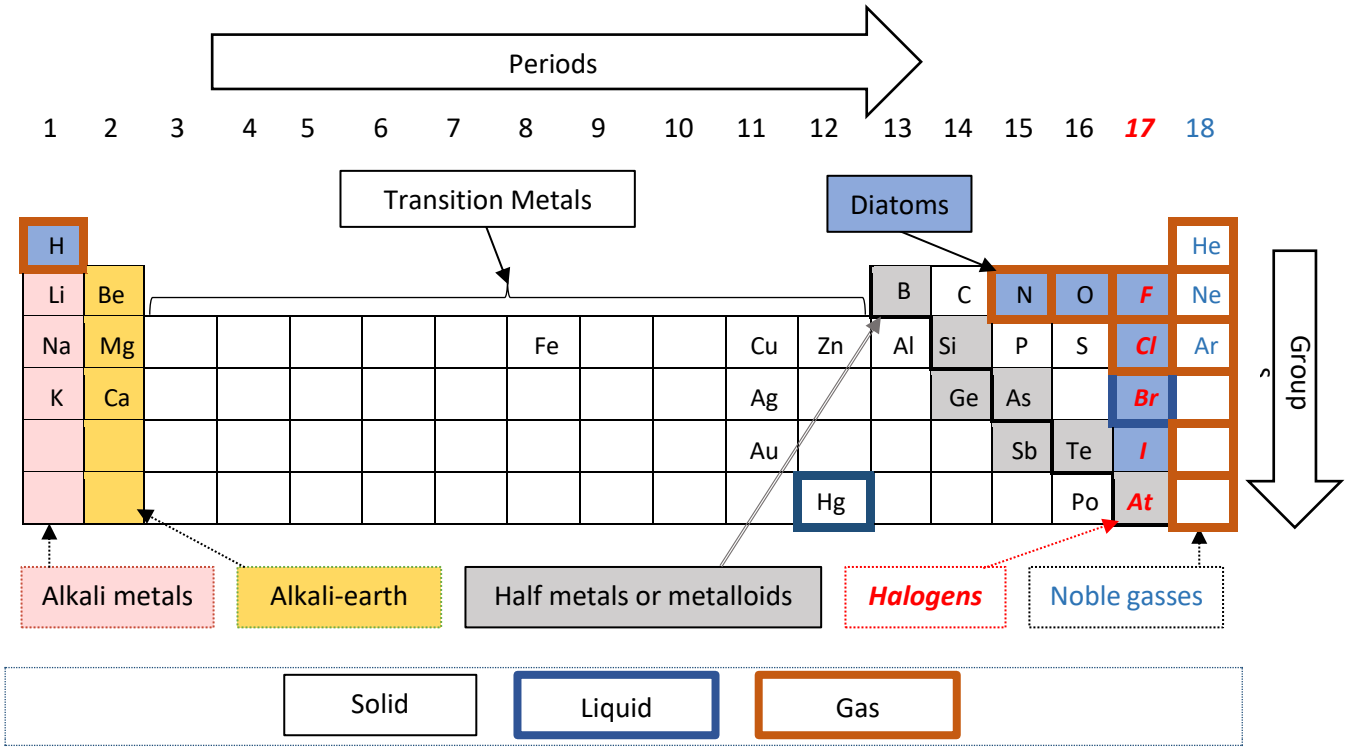



Balancing of chemical equations
All equations must be balanced
It means to have equally as many of every element before and after the reactions (both sides of the equation)
No atoms are lost or added in a reaction, they are merely rearranged
Subscripts refer to the number of atoms needed per single molecule for a specific compound
Numbers before the elements refer to how many of the compound there are

2 PERIODIC TABLE



Grade 9_A-NS_Explore_Siyavula English Teacher's guide. https://wcedeportal.co.za/eresource/44996



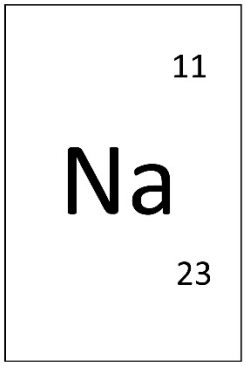
Group Names

Group	Name
1	Alkali metals
2	Alkali-earth metals
3-16	Transition metals
17	Halogens
18	Noble gasses

The relationship in which atoms bond, depends on its valency

Group	Valency
1	1
2	2
13	3
14	4
15	5 or 3
16	2
17	1
18	0

Each item on the periodic table looks as follows:



Deduction from this example:

- Element: Sodium.
- Altogether there are 23 protons and neutrons in the nucleus (nucleons).
- There are 11 protons.
- Neutrons: 23-11= 12
- If the atom is neutral, there are 11 electrons.
- Sodium is the 11th element on the periodic table.

Rules for naming:

Description	Example
Elements with the smallest group number is the first part of the name.	$NaCl$ = Sodium chloride
Certain substances have common names.	H_2O =Hydrogen oxide / Water HCl =Hydrochloride / Hydrochloric acid H_2O = Hydrogen Oxide / **Water** HCl = Hydrogen Chloride / **Hydrochloric Acid** / **Swimming Pool Acid**
Compounds that have shared group elements have parts of their corresponding names.	Na_2SO_4 = Sodium sulphate $CaSO_4$ = Calcium Sulphate
Some compounds can bind with more than one oxygen.	CO = Carbon monoxide CO_2 = Carbon dioxide SO_3 = Sulphur Trioxide

Element names often change when it is at the end of a compound:

Element:	Changes to:
Oxygen	oxide
Sulphur	sulphide
Chlorine	chloride
Iodine	iodine
Fluoride	fluoride
Bromine	bromide

Designation with more than one oxygen compound

Monoxide	One oxygen atom
Dioxide	Two oxygen atoms
Trioxide	Three oxygen atoms

Common compounds in reactions (polyatomic ions):

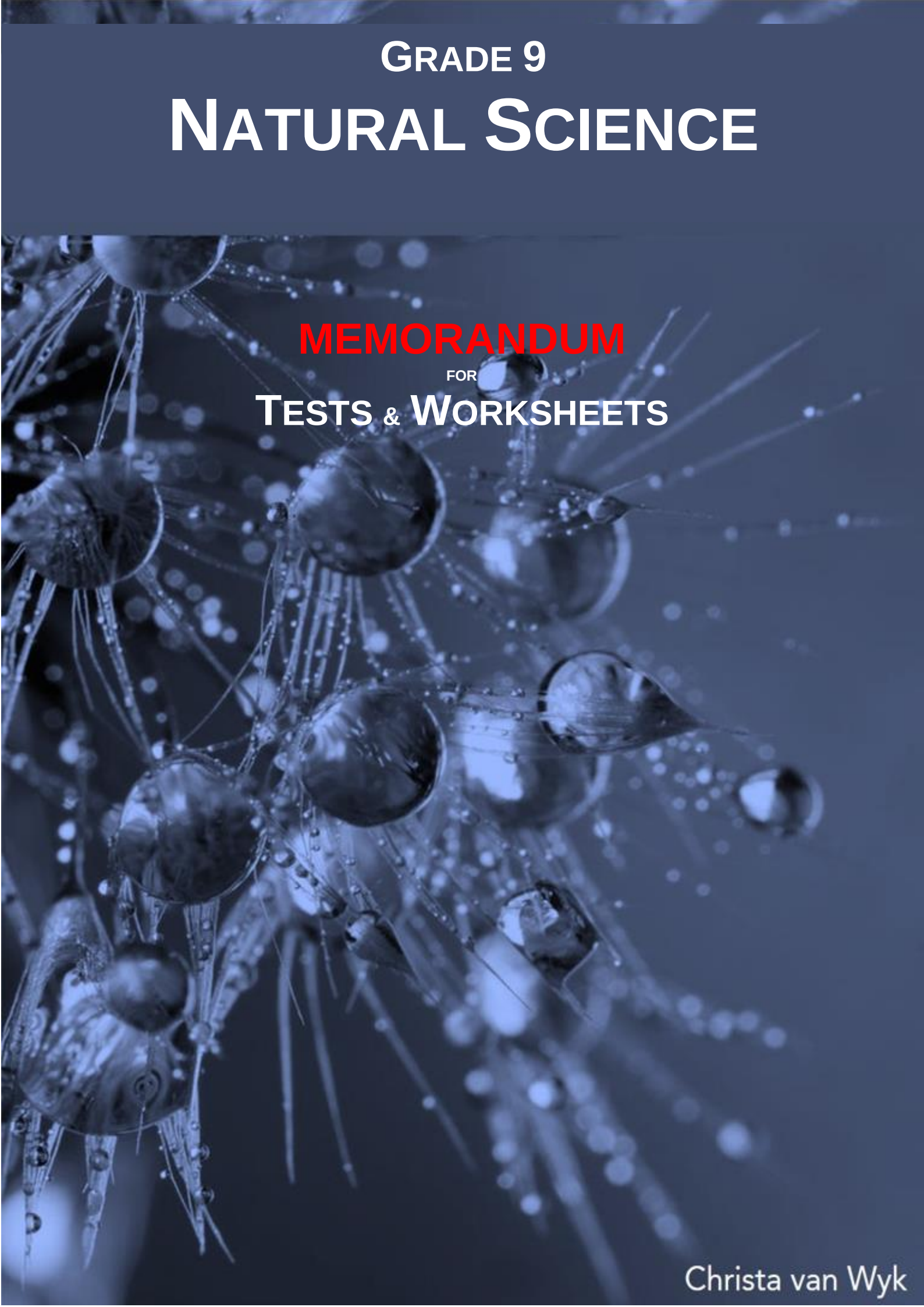
OH^-	Hydroxide
NO_3^-	Nitrate
SO_4^{2-}	Sulphate
CO_3^{2-}	Carbonate
PO_4^{3-}	Phosphate
SO_3^{2-}	Sulphite

Positive and Negative Ions:

Negative Ions					
1- Symbol	**Valency 1 Name**	**2- Symbol**	**Valency 2 Name**	**3- Symbol**	**Valency 3 Name**
F^{1-}	Fluoride	O^{2-}	Oxide	N^{3-}	Nitride
Cl^{1-}	Chloride	S^{2-}	Sulphide	PO_4^{3-}	Phosphate
Br^{1-}	Bromide	CO_3^{2-}	Carbonate		
I^{1-}	Iodide	SO_4^{2-}	Sulphate		
OH^{1-}	Hydroxide	SO_3^{2-}	Sulphite		
NO_3^{1-}	Nitrate	CrO_4^{2-}	Chromate		
NO_2^{1-}	Nitrite	$Cr_2O_7^{2-}$	Dichromate		
HCO_3^{1-}	Hydrogen Carbonate	MnO_4^{2-}	Manganate		
HSO_4^{1}	Hydrogen sulphate				
ClO_3^{1-}	Chlorate				
MnO_4^{1-}	Permanganate				
IO_3^{1-}	Iodate				
CH_3COO^{1-}	Ethanoate (acetate)				
Positive Ions					

1+ Symbol	Valency 1 Name	2+ Symbol	Valency 2 Name	3+ Symbol	Valency 3 Name
H^+	Hydrogen	Be^{2+}	Beryllium	Al^{3+}	Aluminium
Li^+	Lithium	Mg^{2+}	Magnesium	Fe^{3+}	Iron (III)
Na^+	Sodium	Ca^{2+}	Calcium	Cr^{3+}	Chromium (III)
K^+	Potassium	Ba^{2+}	Barium		
Ag^+	Silver	Sn^{2+}	Tin (II)		
Hg^+	Mercury (I)	Pb^{2+}	Lead (II)		
Cu^+	Copper (I)	Zn^{2+}	Zinc		
NH_4^+	Ammonium	Fe^{2+}	Iron (II)		
H_3O^+	Hydronium	Hg^{2+}	Mercury (II)		
		Mn^{2+}	Manganese		
		Ni^{2+}	Nickel		
		Cd^{2+}	Cadmium		
		Cr^{2+}	Chromium(II)		
		Cu^{2+}	Copper (II)		

GRADE 9
NATURAL SCIENCE



MEMORANDUM
FOR
TESTS & WORKSHEETS

Christa van Wyk

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1 CHEMICAL REACTIONS AND CHEMICAL EQUATIONS – WORKSHEET 1 MEMORANDUM:

QUESTION 1:

Name the elements and the number of atoms in the following equations:

1.1. 2 Elements - Nitrogen and Hydrogen. (✓✓)
3 N (nitrogen) atoms, 12 H (hydrogen) atoms. (✓✓) (4)

1.2. 4 $CuSO_4$ 3 Elements – Carbon (Cu), Sulphur (S) and Oxygen (O), (✓✓✓)
3 Copper atoms (Cu), 4 Sulphur atoms (S), 16 Oxygen atoms (O). (✓✓✓) (6)

QUESTION 2:

Give the chemical formula for the following compounds:

2.1 $HC\ell$ (✓✓) (2)

2.2 $K(CO_3)_2$ (✓✓) (2)

2.3 $Ca(OH)_2$ (✓✓) (2)

2.4 $NaC\ell$ (✓✓) (2)

QUESTION 3:

3.1 Yellow. (✓) (1)
3.2 Non-metal. (✓) (1)
3.3 Is in group 6 on the right side of the periodic table, does not have a gloss. (✓✓) (2)
3.4 Liquid. (✓) (1)
3.5 Sulphur oxide. (✓) (1)

(Explanation: When sulphur burns in pure oxygen, it forms sulphur dioxide, SO_2. Sulphur dioxide produces sulfuric acid, H_2SO_3 when it dissolves in water. The balanced chemical equation for this reaction is: SO_2 (g) + H_2O (l) → H_2SO_3 (liquid). unstable H_2SO_3 will react further and change to H_2SO_4).

3.6 An indicator is a chemical substance that changes colour when it comes into contact with an acid or an alkali. (✓✓) (2)

3.7 Any one of the following:

• Universal indicator	Red/orange/yellow in acid	**or**: Blue/purple/violet in alkali	
• Red or blue litmus paper	Red in acid	**or**: Blue in alkali.	
• Bromothymol blue	Yellow in acid	**or**: Blue in alkali.	
• Phenolphthalein	Colourless in acid	**or**: Pink in base. (✓✓)	(2)

QUESTION 4:

4.1 $N_2 + O_2 \rightarrow 2NO$ (✓✓) (2)

4.2 $Mg + 2HCl \rightarrow H_2 + MgCl_2$ (✓✓) (2)

4.3 $CaCO_3 + 2\ HNO_3 \rightarrow Ca(NO_3)_2 + H_2O + CO_2$ (✓✓) (2)

4.4 $P_2O_5 + 3H_2O \rightarrow 2H_3PO_4$ (✓✓) (2)

2 CHEMICAL NAMES, FORMULAS AND EQUATIONS – WORKSHEET MEMORANDUM:

QUESTION 1:

1.1 Carbon (✓)
1.2 Oxygen (✓)
1.3 Nitrogen (✓)
1.4 Sodium (✓)
1.5 Sulphur (✓)
1.6 Chlorine (✓)
1.7 Phosphorus (✓)
1.8 Calcium (✓)
1.9 Copper (✓)
1.10 Zinc (✓)
1.11 Silver (✓)
1.12 Lead (✓)
1.13 Mercury (✓)
1.14 Tin (✓)
1.15 Uranium (✓) (15)

QUESTION 2:

2.1 He (✓)
2.2 Mg (✓)
2.3 Al (✓)
2.4 Be (✓)
2.5 Au (✓)
2.6 Fe (✓)
2.7 Br (✓)
2.8 Li (✓)
2.9 K (✓)
2.10 Sn (✓)
2.11 C (✓)
2.12 P (✓) (12)

QUESTION 3:

1.1 3 Copper, 3 Sulphur, 12 Oxygen. (✓✓✓) (3)
1.2 2 Hydrogen, 2 Nitrogen, 6 Oxygen. (✓✓✓) (3)

QUESTION 4:

4.1 NH_3 (✓✓) (2)
4.2 HCl (✓✓) (2)
4.3 $CaCO_3$ (✓✓) (2)
4.4 $NaOH$ (✓✓) (2)

QUESTION 5:

5.1.1 $P_2O_5 + 3H_2O \rightarrow 2H_3PO_4$ (✓✓) (2)
5.1.2 $Mg + 2HCl \rightarrow H_2 + MgCl_2$ (✓✓) (2)
5.1.3 $CaCO_3 + 2HCl \rightarrow CO_2 + CaCl_2 + H_2O$ (✓✓) (2)
5.1.4 $N_2 + 3H_2 \rightarrow 2NH_3$ (✓✓) (2)

5.2.1 B (✓✓) (2)
5.2.2 D (✓✓) (2)

5.2.3 B (✓✓) (2)

QUESTION 6:

6.1.1 Copper sulphate. (✓) (1)
6.1.2 Copper + Sulphur + Oxygen. (✓✓✓) (3)

6.2.1 Potassium permanganate. MnO_4 (✓✓✓) (3)
6.2.2 Sodium oxide. Na_2O (✓✓✓) (3)
6.2.3 Sulfuric acid. H_2SO_4 (✓✓✓) (3)

QUESTION 7:

7.1.1 $2Na + 2H_2O \rightarrow 2NaOH + H_2$ (✓✓✓✓) (4)

7.1.2 $CaCO_3 + 2HCl \rightarrow CO_2 + CaCl_2 + H_2O$ (✓✓✓✓) (4)

7.1.3 $2Na + 2H_2O \rightarrow 2NaOH + H_2$ (✓✓✓✓) (4)

7.1.4 $Mg + 2HCl \rightarrow H_2MgCl_2$ (✓✓✓✓) (4)

7.1.5 $2Mg + O_2 \rightarrow 2MgO$ (✓✓✓✓) (4)

7.1.6 $2Ca + O_2 \rightarrow 2CaO$ (✓✓✓✓) (4)

7.1.7 $H_2 + I_2 \rightarrow 2HI$ (✓✓✓✓) (4)

7.2.1 $3Fe + 2O_2 \rightarrow Fe_3O_4$ (✓✓✓) (3)

7.2.2 $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$ (✓✓✓✓) (4)

7.2.3 $Al_2O_3 + 3H_2SO_4 \rightarrow Al_2(SO_4)_3 + 2H_2O$ (✓✓✓✓) (4)

7.2.4 $2NaNO_3 \rightarrow 2NaNO_2 + O_2$ (✓✓✓) (3)

7.2.5 $2KClO_3 \rightarrow 2KCl + 3O_2$ (✓✓✓)
(3)

7.2.6 $2Cu(NO_3)_2 \rightarrow 2CuO + 4NO_2 + O_2$ (✓✓✓✓) (4)

7.2.7 $Al_2O_3 + 3H_2SO_4 \rightarrow Al_2(SO_4)_3 + 3H_2O$ (✓✓✓✓)
(4)

QUESTION 8:

8.1.1 A glowing splinter (match) ignites. (✓) (1)
8.1.2 Clear lime water becomes milky. (✓) (1)

8.2.1 B (✓✓) (2)
8.2.2 D (✓✓) (2)

8.3.1 HCl (✓) (1)

8.3.2 $NaOH$ (✓) (1)

8.3.3 HNO_3 (✓) (1)

8.4.1 Ferric Oxide. (✓) (1)

8.4.2 Iron and Oxygen. (✓✓) (2)

8.5.1 $2Cu + Cl_2 \rightarrow 2CuCl$ (✓✓) (2)

8.5.2 $Mg + 2HCl \rightarrow MgCl_2 + H_2$ (✓✓) (2)

8.5.3 $2Na + 2H_2O \rightarrow 2NaOH + H_2$ (✓✓) (2)

QUESTION 9:

9.1 $FeS + 2HCl \rightarrow FeCl_2 + H_2S$ (✓✓) (2)

9.2 $N_2 + 3H_2 \rightarrow 2NH_3$ (✓✓) (2)

9.3 $2KClO_3 \rightarrow 2KCl + 3O_2$ (✓✓) (2)

9.4 $2HgO \rightarrow 2Hg + O_2$ (✓✓) (2)

9.5 $Mg + 2HCl \rightarrow MgCl_2 + H_2$ (✓✓) (2)

9.6 $4Li + O_2 \rightarrow 2Li2O$ (✓✓) (2)

9.7 $2H_2 + O_2 \rightarrow 2H_2O$ (✓✓) (2)

9.8 $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$ (✓✓) (2)

9.9 $Zn + 2HCl \rightarrow ZnCl_2 + H_2$ (✓✓) (2)

9.10 $C_3H_8 + 5O_2 \rightarrow 3O_2 + 4H_2O$ (✓✓) (2)

9.11 $2Cu + Cl_2 \rightarrow 2CuCl$ (✓✓) (2)

9.12 $2Na + 2H_2O \rightarrow 2NaOH + H_2$ (✓✓) (2)

9.13 $P_2O_5 + 3H_2O \rightarrow 2H_3PO_4$ (✓✓) (2)

9.14 $CaCO_3 + 2HCl \rightarrow CO_2 + CaCl_2 + H_2O$ (✓✓) (2)

QUESTION 10:

10.1.1 $KMnO_4$ (✓) (1)

10.1.2 $NaOH$ (✓) (1)

10.1.2 NH_4Cl (✓) (1)

10.2.1 Nitric Acid. (✓) (1)

10.2.2 Hydrogen+ Nitrogen + Oxygen. (✓✓✓) (3)

10.2.3 $1H + 1N + 3O$ = five atoms. (✓) (1)

10.3.1 $2Cu + Cl_2 \rightarrow 2CuCl$ (✓✓) (2)

10.3.2 $Mg + 2HCl \rightarrow MgCl_2 + H_2$ (✓✓) (2)

10.3.3 $2Na + 2H2O \rightarrow 2NaOH + H_2$ (✓✓) (2)

QUESTION 11:

11.1 D (✓✓) (2)
11.2 D (✓✓) (2)
11.3 C (✓✓) (2)
11.4 D (✓✓) (2)

QUESTION 12:

12.1.1 Ca (✓) (1)
12.1.2 Na (✓) (1)
12.1.3 P (✓) (1)
12.1.4 Hg (✓) (1)

12.2.1 CO_2 (✓✓) (2)
12.2.2 $KMnO_4$ (✓✓) (2)
12.2.3 HCl (✓✓) (2)
12.2.4 $CaCO_3$ (✓✓) (2)

12.3.1 Potassium, Nitrogen, Oxygen. (✓✓✓) (3)
12.3.2 Copper, sulphur, oxygen. (✓✓✓) (3)

QUESTION 13:

13.1 A formula consists of the symbols of the elements that appear in the compound. (✓✓) (2)

13.2.1 $FeS + 2HCl \rightarrow FeCl_2 + H_2S$ (✓✓) (2)

13.2.2 $2KClO_3 \rightarrow 2KCl + 3O_2$ (✓✓) (2)

13.2.3 $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$ (✓✓) (2)

13.2.4 $2Na + 2H_2O \rightarrow 2NaOH + H_2$ (✓✓) (2)

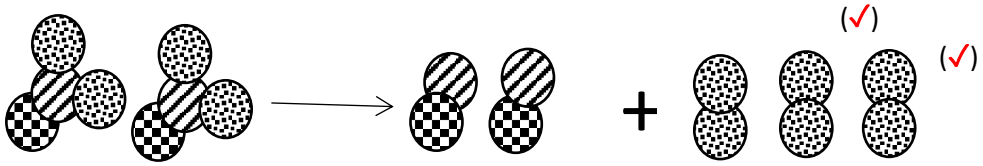
3 COMPOUNDS AND CHEMICAL REACTIONS – TEST 1 MEMORANDUM:

QUESTION 1:

1.1 B (✓✓)
1.2 B (✓✓)
1.3 C (✓✓)
1.4 C (✓✓)
1.5 A (✓✓) (10)

QUESTION 2:

2.1 (✓)



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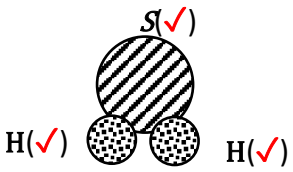
2.2. KCl and O_2. (✓✓) (2)
2.3. Potassium, Chlorine, Oxygen. (✓✓✓) (3)
2.4. 2 atoms. (✓) (1)

QUESTION 3:

3.1.1. Hydrogen as a reactant. (✓✓) (2)
3.1.2. Hydrogen sulphide as a product. (✓✓) (2)
3.2. To the left of the arrow, hydrogen is represented as diatomic and to the right of the arrow, hydrogen is in a compound, so hydrogen is part of the molecule. (✓✓) (2)
3.3. Compound. (✓) (1)
3.4.



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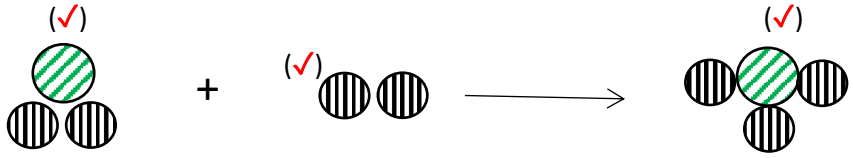
4 COMPOUNDS AND CHEMICAL REACTIONS – TEST 2 MEMORANDUM:

QUESTION 1:

1.1 B (✓✓)
1.2 A (✓✓)
1.3 A (✓✓)
1.4 D (✓✓)
1.5 C (✓✓) (10)

QUESTION 2:

2.1. A diatomic element is a compound that consists of two identical atoms (✓) O_2 . (✓) (2)
2.2. Rust: Fe_2O_3(✓) (1)
2.3. $4Fe$(✓) + $3O_2$(✓) → $2\ Fe_2O_3$(✓) (3)
2.4.



QUESTION 3:

3.1. 2. (✓) (1)
3.2. 2. (✓) (1)
3.3. Hydrogen (✓) and Bromine. (✓) (2)
3.4. 2. (✓) (1)

5 ELEMENTS, IONS, AND CHEMICALS – WORKSHEET MEMORANDUM:

QUESTION 1:

1.1 *He* (✓)
1.2 *Al* (✓)
1.3 *Au* (✓)
1.4 *Br* (✓)
1.5 *K* (✓)
1.6 *Mg* (✓)
1.7 *Be* (✓)
1.8 *Fe* (✓)
1.9 *Li* (✓)
1.10 *Sn* (✓) (10)

QUESTION 2:

2.1. Carbon. (✓)
2.2. Nitrogen. (✓)
2.3. Sulphur. (✓)
2.4. Phosphorus. (✓)
2.5. Copper. (✓)
2.6. Silver. (✓)
2.7. Mercury. (✓)
2.8. Uranium. (✓)
2.9. Oxygen. (✓)
2.10. Sodium. (✓)
2.11. Chlorine. (✓)
2.12. Calcium. (✓)
2.13. Zinc. (✓)
2.14. Tin. (✓)
2.15. Lead. (✓) (15)

QUESTION 3:

3.1 Ion: It is an atom of an element that has too many or too few electrons. (✓) (1)
3.2 Cation: It's an ion that has too few electrons. (✓) (1)

QUESTION 4:

4.1 NH_3 (✓) (1)
4.2 *HCl* (✓) (1)
4.3 $CaCO_3$ (✓) (1)
4.4 *NaOH* (✓) (1)

QUESTION 5:

5.1 D (✓✓) (2)
5.2 B (✓✓) (2)

QUESTION 6:

6.1.1 Ca (✓) (1)
6.1.2 Na (✓) (1)
6.1.3 P (✓) (1)
6.1.4 Hg (✓) (1)

6.2.1 CO_2 (✓) (1)
6.2.2 $KMNO_3$ (✓) (1)
6.2.3 $HC\ell$ (✓) (1)
6.2.4 $CaCO_3$ (✓) (1)

QUESTION 7:

7.1 Sodium sulphide. (✓) (1)
7.2 Magnesium chloride. (✓) (1)
7.3 Molecules of calcium carbonate. (✓) (1)
7.4 Silver nitrate. (✓) (1)
7.5 Sulfuric acid. (✓) (1)

QUESTION 8:

8.1 MgF_2 (✓) (1)
8.2 $A\ell Cl_3$ (✓) (1)
8.3 $A\ell_2S_3$ (✓) (1)
8.4 $(NH_4)_2CO_3$ (✓) (1)

QUESTION 9:

$$4CaCO_3$$

9.1.1 4(1+1+3) = 20 atoms. (✓✓) (2)
9.1.2 4 Ca+ ions. (✓✓) (2)
9.1.3 4 CO32 ions. (✓✓) (2)
9.1.4 Carbonate ion. (✓) (1)

$$3(NH_4)_2SO_4$$

9.2.1 3(2(1+4) +1+4) = 3(15) = 45 atoms. (✓✓) (2)
9.2.2 6 NH_4^+ ions. (✓✓) (2)
9.2.3 3 SO_4^{2-} ions. (✓✓) (2)
9.2.4 Ammonium ion. (✓) (1)

6 PERIODIC TABLE AND CHEMICAL FORMULAS – TEST MEMORANDUM:

QUESTION 1:

1.1 An element consists of one type of atom. (✓)
1.2 A bond is formed when atoms chemically join. (✓)
1.3 Substances on the right side of the periodic table. (✓)
1.4 The elements on the left side of the table, mainly in group 1 and 2. (✓)
1.5 The names of chemicals that contain the names of the elements that make up the chemical bond. (✓)
1.6 Something that occurs regularly. (✓) (6)

QUESTION 2:

2.1 Calcium carbonate. (✓✓)
2.2 Sodium chloride. (✓✓)
2.3 Hydrogen nitrate. (✓✓) (6)

QUESTION 3:

3.1 Nitric acid. (✓)
3.2 Sulfuric acid. (✓)
3.3 Potash. (✓)
3.4 Baking Soda. (✓) (4)

QUESTION 4:

4.1 Alkali metals. (✓)
4.2 Alkali earth metals. (✓)
4.3 Halogens. (✓)
4.4 Noble gases. (✓) (4)

QUESTION 5:

5.1 Atomic number. (✓)
5.2 Mass number. (✓)
5.3 Element. (✓)
5.4 11. (✓)
5.5 11. (✓)
5.6 12. (✓) (6)

7 METALS AND NON-METALS – WORKSHEET MEMORANDUM:

QUESTION 1:

1.1 B (✓✓) (2)
1.2 C (✓✓) (2)
1.3 C (✓✓) (2)
1.4 C (✓✓) (2)
1.5 B (✓✓) (2)
1.6 D (✓✓) (2)

QUESTION 2:

2.1 D (✓✓) (2)
2.2 C (✓✓) (2)
2.3 A (✓✓) (2)
2.4 B (✓✓) (2)
2.5 E (✓✓) (2)

QUESTION 3:

3.1 Blue (✓) (1)
3.2 Yellow (✓) (1)
3.3 Green (✓) (1)

QUESTION 4:

4.1 A measure of how acidic or alkaline a substance is. (✓) (1)
4.2 A pH of less than 7 is an acid (✓), while a pH of more than 7 is alkaline (✓) and a pH of 7 is neutral. (✓) (3)
4.3 Universal indicator. (✓) (1)
4.4 A chemical substance that changes colour when it comes into contact with acid or alkali.
4.5

(✓)			(✓)				(✓)			(✓)				(✓)	
Strong Acid			Weak Acid				Neutral			Weak Base		Strong Base			
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Red			Orange		Yellow		Green		Blue		Purple			Violet	(5)

QUESTION 5:

5.1 Metal oxide. (✓) (1)
5.2 Corrosion. (✓) (1)
5.3 This weakens the material. (✓) (1)
5.4 Whether there are salts in water (✓). The pH of the solution (✓), the purity of the metal (✓) and number of ions (✓) in contact with the metal. (4)
5.5 Painting (✓), electroplating (✓) and galvanizing. (✓) (3)

QUESTION 6:

6.1 Electroplating. (✓) (1)
6.2 Electrolysis. (✓) (1)
6.3 Neutralization reaction. (✓) (1)

QUESTION 7:

7.1 Dull(✓) and brittle. (✓) (2)
7.2 Non-metal oxide. (✓) (1)

QUESTION 8:

8.1 A splinter of wood that merely glows(✓) will catch fire(✓) in the presence of oxygen (2)
8.2 Lime water (✓) will become milky if carbon dioxide(✓) is bubbled through it. (2)

QUESTION 9:

9.1 The oxidation (✓) of a compound by heat. (✓) (2)
9.2 XO. (✓) (1)
9.3 Non-metals. (✓) (1)
9.4 Insoluble. (✓) The solution remains neutral so only the water's pH was measured. (✓) (2)
9.5 Soluble. (✓) The solution becomes acidic and the pH of the water and the non-metal is measured. (✓) (2)

8 METALS AND NON-METALS – TEST MEMORANDUM:

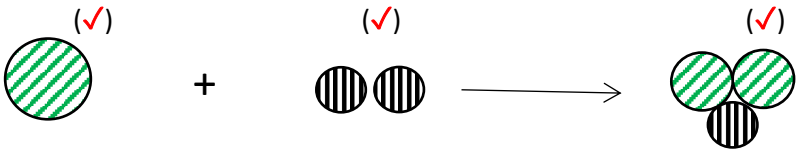
QUESTION 1:

1.1 B (✓✓)✓) (2)
1.2 B (✓✓) (2)
1.3 B (✓✓) (2)
1.4 B (✓✓) (2)
1.5 B (✓✓) (2)

QUESTION 2:

2.1.2 K_2O (✓) (1)
2.1.2 Metaaloksied (✓) (1)

2.2



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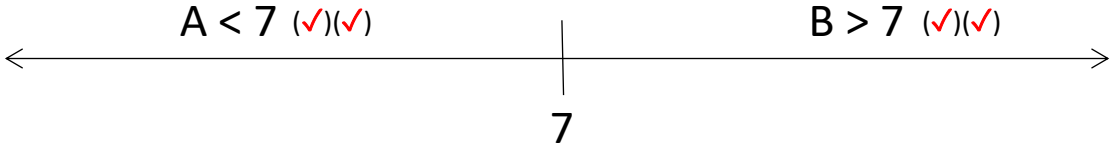
2. 2.3 KOH (✓) + HCl (✓) ⟶ KCl (✓) + H_2O (✓)

(4)

QUESTION 3:

1.1 Chemical substance that changes colour (✓) when it comes into contact with an acid or an alkali. (✓) (2)
1.2.1 Red (✓)
1.2.2 Blue (✓)
1.2.3 Red (✓) (3)

1.3



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