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PLANNER & TRACKER FOR RECOVERY ANNUAL TEACHING PLAN (ATP)

2021 - 2023

NATURAL SCIENCES

GRADE 9 TERM 2

Helping teachers and learners to catch up with learning losses, master new content and acquire skills for the future.

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REPUBLIC OF SOUTH AFRICA

NATIONAL EDUCATION COLLABORATION TRUST

Read to Lead
A Reading Nation is a Leading Nation

2030 NDP

- Please note that a Natural Sciences structured learning programme that includes daily lesson plans and classroom resources is available for download from www.nect.org.za
- This is a zero-rated website, so there are no data costs for downloads.
- This document can be used independently of the structured learning programme.

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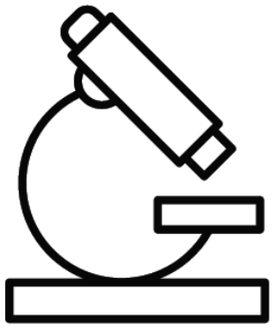
Natural Sciences



Grade 9 Term 2

2021 - 2023

Table of Contents

Introduction

Dear Natural Sciences Teachers,

The COVID-19 Pandemic has left us with an enormous challenge in education. As we return to 'normal schooling', we all have to work smarter and harder to ensure that our system recovers.

This document is designed to help you achieve this. By systematically working through this plan, we are confident that you can address the loss of teaching and learning time, and bring your learners to the level where they need to be in terms of NS.

We thank you in advance for the commitment, dedication and hard work that is required of you.

You are truly building our nation.

With very best wishes for the term ahead,

The DBE / NECT Recovery ATP Trackers Team

Overview

Please continue to keep the following key principles in mind throughout the recovery journey:

- The development of **Science Process Skills** is key to the teaching and learning of the subject. Focussing on these skills is critical.

- Learners should be given as many opportunities as possible to **write regularly and read for meaning, in Natural Science,** in order to develop **language skills** as well. Due to learning losses, as a result of the Covid pandemic, it is the responsibility of every educator to develop these literacy skills.

- It is very important to give learners a sense of **how science applies to their daily lives**, and of **the value that science adds to their lives**. Hold a brief discussion on this point when introducing a new topic, and invite learners to contribute their ideas on the uses and value that this topic has.

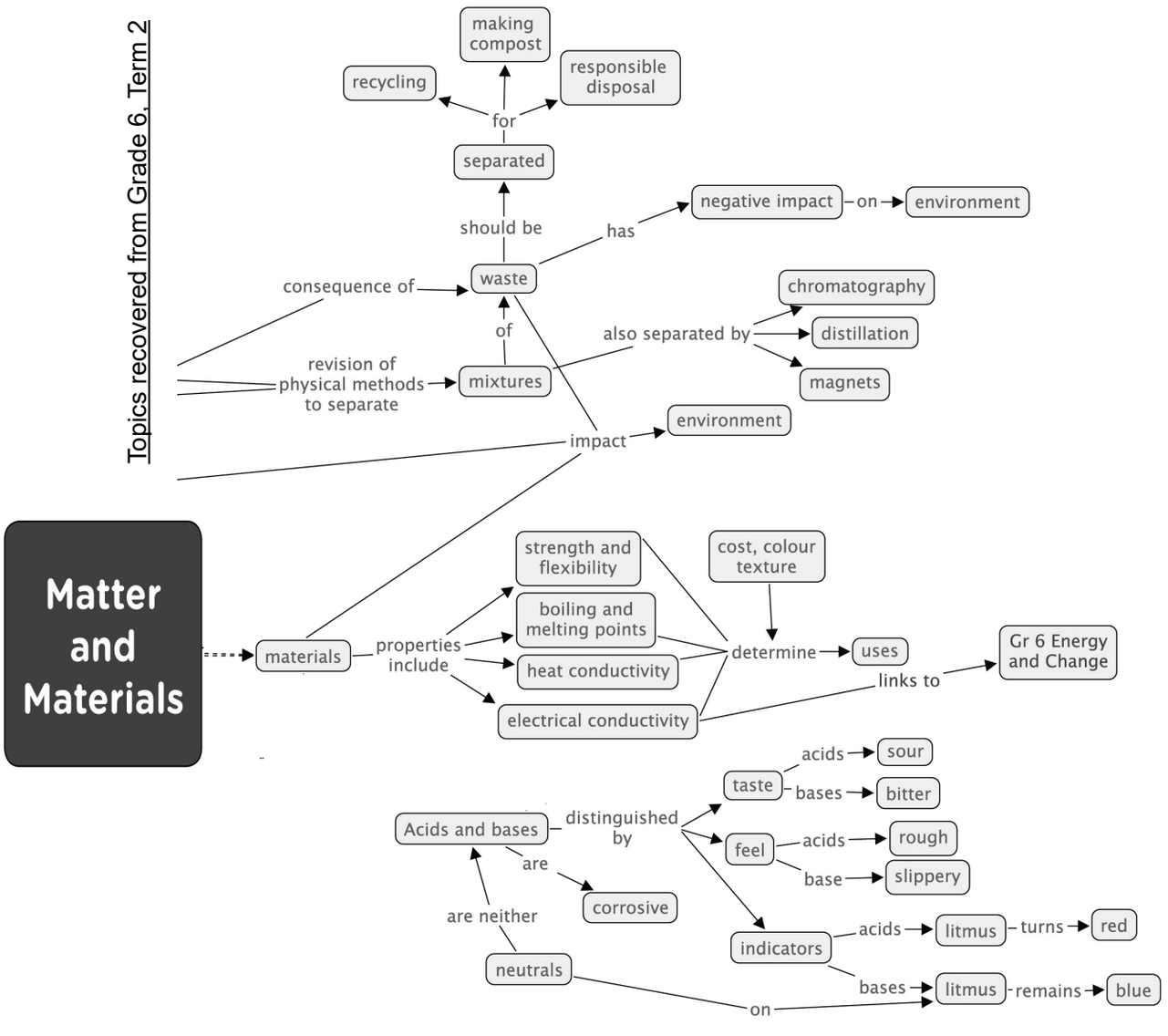
- At the end of every topic, come back to the topic overview, and **reflect on what has been learnt and taught**. In particular, it is important to note your challenges and ideas for future improvement, so that you can improve your teaching the next year.

- At the core of all scientific activities is the need to **ask questions**. These questions help us seek answers through observation and experimental design. The results of these questions should raise more questions. It is this natural curiosity that all teachers, and especially science teachers, should be encouraging in their classrooms. **Encourage curiosity** and **questions that investigate, inquire and probe.**

- **Build a solid conceptual foundation** for learners. A **conceptual chain** for the phase is provided at the start of this document. It is important for all NS teachers to work cohesively to ensure that learners are equipped with a solid understanding of the required concepts, by the time they leave the phase.

- Using the **CONCEPTUAL CHAIN** provided, **work together** as a department to:
  a. Check that all **concepts for the phase are covered** in your school's recovery plan.
  b. **Check for overlaps** across the grades.
  c. **Identify the weak links in the conceptual chain** - points where learners struggle and may be the source of misconceptions or common errors.
  d. Decide how to **emphasise critical concepts from previous grades** especially where topics have moved from a different grade in the revised ATP.

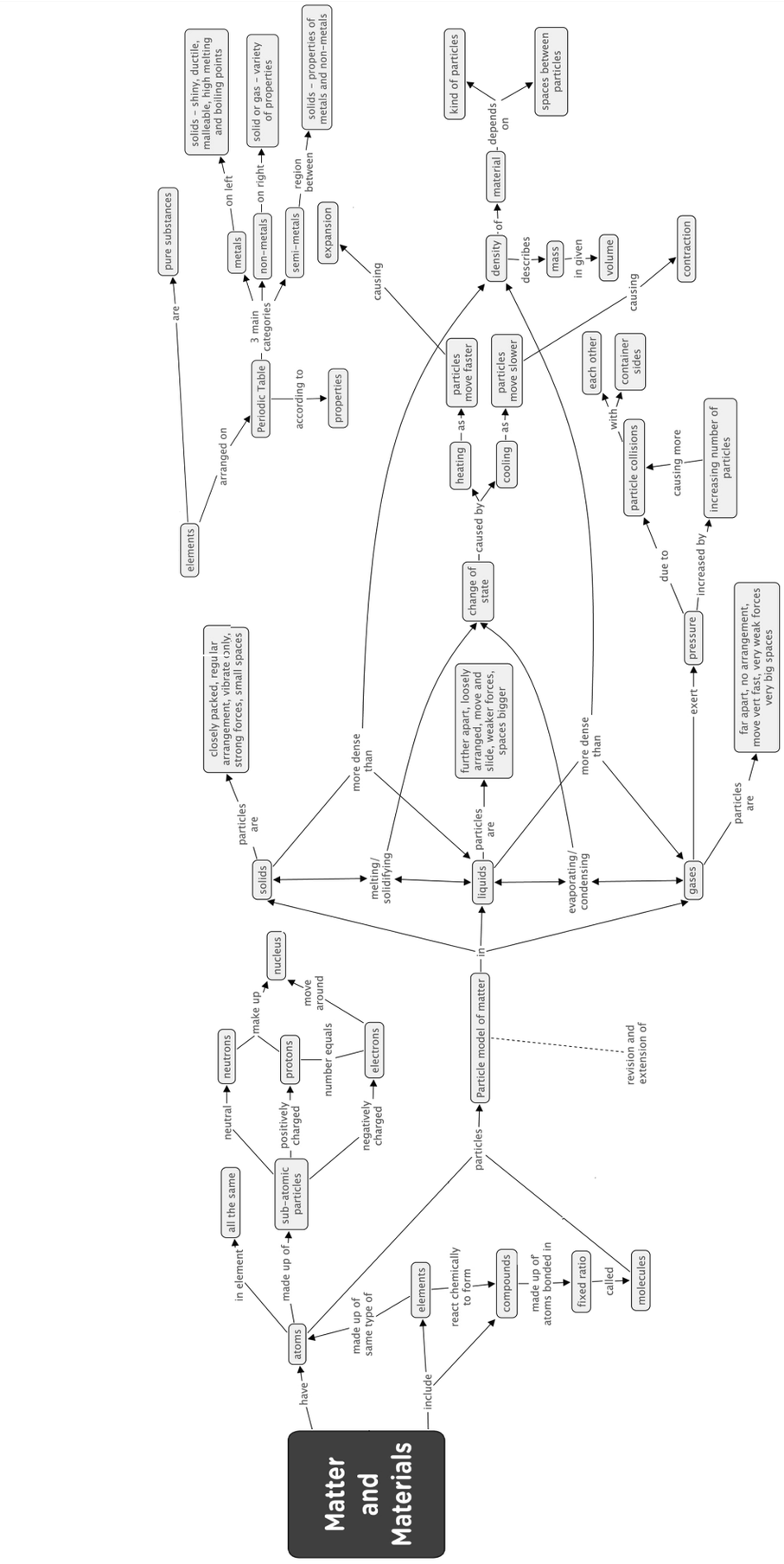
Gr 7



*The concept maps in this section have been adapted from **Thunderbolt Kids resources** published by **Siyavula.***

Gr 8

Topic recovered from Grade 7, Term 2



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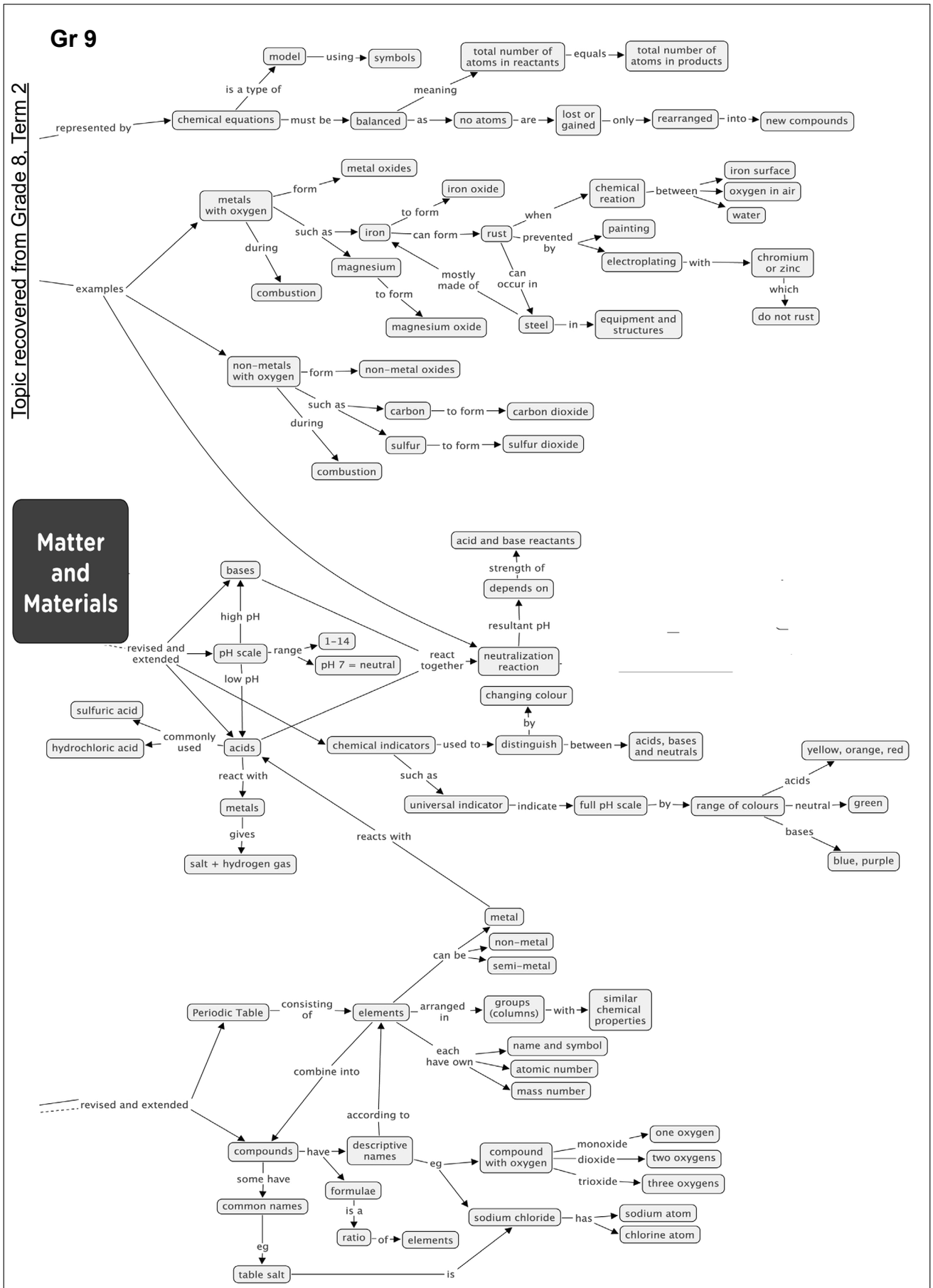


*The concept maps in this section have been adapted from **Thunderbolt Kids resources** published by **Siyavula.***

Amendments to the Annual Teaching Plan

The Recovery ATP for Natural Sciences has the same content as in CAPS, however, this content has been arranged as follows for Grade 9 Term 2:

One **topic from Grade 8** has been **included/recovered**

1. **Chemical reactions** **(1 week)**

Some topics **remain**

2. **Compounds** **(1 week)**
3. **Chemical reactions** **(1 week)**
4. **Reactions of Metals + O2** **(1,5 weeks)**
5. **Reactions of Non-Metals + O2** **(1 week)**
6. **Acids and bases and pH value** **(1 week)**
7. **Reactions of acids with bases Part I and II** **(1,5 weeks)**

Some topics have been **removed completely**

Reactions of acids with bases Part III

Reactions of acids with metals

Directions on how to cover all required topics are provided in the Tracker that follows.

Amendments To The Programme Of Assessment

- The Programme of Assessment is aligned to the *Revised Section 4 of CAPS.*
- Both formal and informal assessment should continue as normal.
- Recording of the informal assessment is left to the discretion of the teacher.
- The 2022 formal assessment tasks for Grade 9 are as follows:

	TERM 1	TERM 2	Term 4	TERM 4
Practical Task/Investigation/Projects	20 marks	20 marks	30 marks	-
Test	70 marks	100 marks	70 marks	100 marks

Sample Assessment Tasks and Memoranda / Rubrics for Grade 9 Term 2 are included in this document.

ATP / NECT Lesson Plan / Textbook Alignment: Grade 9 Term 2

Notes:

- **Column 1** shows the **time allocation** per topic.
- **Column 2** shows the **Recovery ATP requirements** for Grade 9 Term 2.
- **Column 3** explains any **changes** that have been made to the teaching plan.
- **Column 4** shows **where in the NECT lesson plans** this is covered.
- **Column 5** shows **where in the approved textbooks** this is covered.
- Finally, if, for any reason, the **Term 2 teaching time** for NS **is reduced,** please ensure that the **KEY CONCEPTS** listed below each table are thoroughly covered.

Key To Approved Textbook Abbreviations:	
SbS	Step-by-Step Natural Sciences Grade 9 Van Schaik
SFA	Solutions for All Natural Sciences Grade 9 MacMillan
SO	Spot On Natural Sciences Grade 9 Pearson
TC	Top Class Natural Sciences Grade 9 Shuter and Shooter
VA	Via Afrika Natural Sciences Grade 9 Via Afrika
PLAT	Platinum Natural Sciences Grade 9 Maskew Miller Longman
OX	Oxford Successful Natural Sciences Grade 9 Oxford University Press
PEL	Pelican Natural Sciences Grade 9 Global MBD Africa
SIBB	Sasol Inzalo Bk B Natural Sciences Grade 9 Sasol

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Week 1 1 week	Compounds 1. The periodic table 2. Names of compounds		***Gr 9 Term 2 Lesson Plans*** Lesson 1A: Revise concepts from Grade 8 Lesson 1B: The periodic table of the elements Lesson 1C: Names of compounds	SFA Gr9	97 – 108	
				VA Gr9	76 – 77	
				OX Gr9	72 - 75	
				SO Gr9	57 – 61	
				PLAT Gr9	75 -	
				TC Gr9	85 – 99	
				SbS Gr9	102 - 114	
				PEL Gr9	106 - 110	
				SIBB Gr9	146 - 165	

Scaling down

If the Term 2 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

Compounds

- A compound is made up of 2 or more different elements chemically bonded together. An element is made up of atoms of the same kind.
- A pure substance consists of only one type of material. Elements and compounds are pure substances.
- The Periodic Table is a classification system for elements. Copper, gold and oxygen are examples of elements.
- Elements are classified into metals, non-metals and semi-metals. Each element has a name, a chemical symbol, an atomic number and a mass number on the periodic table. Metals are found in the middle and on the left-hand side of the table. Non-metals are found in the middle and right-hand side of the table. Semi-metals are found in a zigzag line between the metals and non-metals.
- Many compounds are named according to their elements. The formula of the compound indicates the symbols of the elements in the compound and the ratio of the number of atoms of each element. E.g. the formula for water = H_2O. Ratio of 2 hydrogen atoms to one oxygen atom.

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Week 2 1 week	Chemical reactions 1. Reactants and products	This topic has been recovered from Grade 8	***Gr 8 Term 2 Lesson Plans*** Lesson 8A: Reactants and products Lesson 8B: Mechanisms of chemical reactions Lesson 8C: Applications of chemical reactions	SNS Gr8	86 – 95	
				TC Gr8	92 – 98	
				VA Gr8	88 – 93	
				SFA Gr8	112 – 122	
				SO Gr8	84 – 95	
				PLAT Gr8	110 – 120	
				SbS Gr8	72 – 75	
				NS Gr8	101 – 116	
				SIBB Gr8	113; 196 - 216	

If the Term 2 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

Chemical reactions

- A chemical change occurs when materials react to form a new material with different properties to the original materials.
- During a chemical reaction, substances react to form new substances with different chemical properties.
- The reactants are the substances that are mixed together and cause a chemical reaction and are then changed. After chemical reactions, the new substance that is produced are called the products.
- Reactants and products have different chemical properties. Chemical reactions are represented by chemical equations. Reactants Products
- Signs that indicate a chemical reaction – colour change, fizzing, gain or release of energy.
- Atoms are joined together in a chemical reaction with a force called a chemical bond. Atoms are conserved in in a chemical reaction. They are not created or destroyed – they are just rearranged. Reactants react with each other, bonds are broken and new bonds are forms.
- Energy, like heat or electrical are needed to break bonds of the reactants.
- A neutralisation reaction is when an acid and a base neutralise each other.
- A fermentation reaction is when a reaction between sugar and yeast produces alcohol and carbon dioxide.
- A combustion reaction is when a fuel burns in oxygen. A combustion releases a lot of energy and the products are always water and carbon dioxide.

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Week 3 1 week	Chemical reactions 1. Chemical equations to represent reactions 2. Balanced equations		***Gr 9 Term 2 Lesson Plans*** Lesson 2A: Chemical equations to represent reactions Lesson 2B: Balanced equations Lesson 2C: Balancing equations	SbS Gr9	115 – 116	
				SFA Gr9	112 – 120	
				SO Gr9	62 – 66	
				TC Gr9	91 – 95	
				VA Gr9	80 – 83	
				PLAT Gr9	75 - 83	
				OX Gr9	64 – 79	
				PEL Gr9	115 – 122	
				SIBB Gr9	172 – 191	

If the Term 2 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

Chemical reactions

- A chemical reaction is when 2 or more substances react to form new substances. The reactants are the substances that react and the new substances that are made are called products.
- The subscript number indicates the number of atoms of an element in a compound. No atoms are lost or gained in a chemical reaction. They are just rearranged. This is called the Law of Conservation of Matter.
- In an equation, the reactants are written on the left-hand side of the arrow and the products are written on the right-hand side.
- e.g. $CU + Cl_2 \longrightarrow CuCl_2$. A chemical equation must be balanced – the total number and type of atoms in the reactants are the same as in the products.

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Weeks 4 – 5 1,5 weeks	Reactions of metals with Oxygen 1. The general reaction of metals with oxygen 2. Reaction of iron with oxygen 3. Reaction of magnesium with oxygen 4. Formation of rust 5. Ways to prevent rusting		***Gr 9 Term 2 Lesson Plans*** Lesson 3A: General reaction of metals with oxygen Lesson 3B: The reaction of iron with oxygen Lesson 3C: The reaction of magnesium with oxygen Lesson 4A: The formation of rust	SbS Gr9	117 – 119	
				SFA Gr9	122 – 128	
				SO Gr9	68 – 71	
				TC Gr9	96 – 100	
				VA Gr9	84 – 89	
				PLAT Gr9	89 -	
				OX Gr9	80 – 85	
				PEL Gr9	131 – 136	
				SIBB Gr9	194 – 208	

If the Term 2 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

Reactions of metals with oxygen

- Metal is a material that conducts electricity and is malleable and shiny. Oxygen is colourless and odourless. About 21% of the atmosphere is oxygen.
- Some metals react with oxygen during combustion (burning). Combustion produces heat and light.
- When a substance reacts with oxygen, the reaction is oxidation. When a metal is oxidised, a new compound called an oxide is formed.
- When iron is burned in air (oxygen), the reaction forms iron oxide as a product. Iron + oxygen $\longrightarrow$ iron oxide
- When magnesium is burned in air (oxygen), the reaction forms magnesium oxide (white powder). Magnesium + oxygen $\longrightarrow$ magnesium oxide.
- Rusting is a slow chemical reaction of iron metal with oxygen and water, forming a complex compound. Part of the compound is iron oxide (Fe_2O_3).
- Rust is a form of corrosion. We can prevent rust by painting or electroplating a product which contains iron.

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Week 5 - 6 1 week	Reactions of non-metals with oxygen 1. The general reaction of non- 2. metals with oxygen 3. Reaction of carbon with oxygen 4. Reaction of sulphur with oxygen		***Gr 9 Term 2 Lesson Plans*** Lesson 4B: The general reaction of non-metals with oxygen Lesson 4C: The reaction of carbon with oxygen Lesson 5A: The reaction of sulphur with oxygen	SbS Gr9	117	
				SFA Gr9	131	
				SO Gr9	67	
				TC Gr9	102	
				VA Gr9	84	
				PLAT Gr9	89	
				OX Gr9	86	
				PEL Gr9	140	
				SIBB Gr9	212	

If the Term 2 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

Reactions of non-metals with oxygen

- When non-metals react with oxygen, the product is a non-metal oxide. The reactants are non-metal and oxygen. The reaction is oxidation.
- Some non-metals combust (burn) more easily in the presence of oxygen. Non-metal + oxygen $\longrightarrow$ non-metal oxide
- When carbon is burnt in oxygen, carbon dioxide is produced. The reactants are carbon and oxygen. The product is carbon dioxide.
- When carbon is burned it burns with an orange glow – e.g. charcoal and coal briquettes. Carbon dioxide turns clear limewater milky.
- When sulphur is burnt in oxygen, sulphur dioxide is produced. The reactants are sulphur and oxygen. The product is sulphur dioxide.
- When sulphur is burnt it burns with a bright blue flame. It is a whitish gas. Acid rain contains carbon dioxide and sulphur dioxide

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Weeks 6 – 7 1 weeks	Acids and bases and pH value 1. The concept of pH value		***Gr 9 Term 2 Lesson Plans*** Lesson 5B: Introducing acids, bases and pH Lesson 5C: pH indicators Lesson 6A: Universal indicators	SbS Gr9	127	
				SFA Gr9	137	
				SO Gr9	75	
				TC Gr9	106	
				VA Gr9	93	
				PLAT Gr9	99	
				OX Gr9	88	
				PEL Gr9	149	
				SIBB Gr9	224	

If the Term 2 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

Acids, bases and pH value

- pH is a measure of how acidic or basic a substance is. pH is a number between 0 and 14.
- An acid is a substance with a pH between 0 and 7. Acids taste sour and feel rough.
- A base is a substance with a pH between 7 and 14. Bases taste bitter and feel slippery.
- Some acids and bases are dangerous.
- An indicator is a dye that turns a different colour in acids, bases or neutral substances. Red cabbage water can be used as a pH indicator.
- Red cabbage water turns reddish-pink in acid, purple in a neutral substance and bluish-green in a base.
- A universal indicator is a pH indicator made up of different substances on a strip, so that it shows colour changes across the whole pH range.

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NOTES	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS		DATE COMPLETED
Week 7 - 8 1,5 weeks	Reactions of acids with bases Parts I and II 1. Neutralisation and pH 2. The general reaction of an acid with a metal oxide 3. Applications		***Gr 9 Term 2 Lesson Plans*** Lesson 6B: Neutralisation and pH Lesson 6C: Investigating neutralisation Lesson 7A: The general reaction of an acid with a metal oxide Lesson 7B: Applications of reactions of acids with bases	SbS Gr9	129	
				SFA Gr9	137	
				SO Gr9	75 - 83	
				TC Gr9	112	
				VA Gr9	96 - 99	
				PLAT Gr9	109	
				OX Gr9	92	
				PEL Gr9	160 - 171	
				SIBB Gr9	242	

If the Term 2 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

Reactions of acids with bases

- A neutral substance has a pH value of 7.
- Neutralisation reaction is a chemical reaction where a base and an acid react to produce a salt and water.
- A base reacts with an acid to make it less acidic/neutral. An acid reacts with a base to make it less basic/neutral.
- When a base is added to an acid, the pH increases. When an acid is added to a base, the pH decreases. To form a neutral solution, the correct quantity and strength of an acid and base must be mixed together.
- An example of neutralisation is salt and water: hydrochloric acid + sodium hydroxide $\longrightarrow$ sodium chloride + water
- $HCl + NaOH \longrightarrow NaCl + H_2O$
- A metal oxide is a compound formed when a metal reacts with oxygen. When a metal oxide reacts with an acid, the products are salt and water.
- A salt is a compound made up of a metal and a non-metal: acid + metal oxide $\longrightarrow$ salt + water
- Acid rain is a weak acid that sometimes forms in the atmosphere. It is formed when non-metals like carbon and sulphur react with oxygen to form sulphur dioxide and carbon dioxide which dissolve in rain water.
- Acid rain can corrode buildings, structures like bridges, historical landmarks and statues. Acid rain threatens the habitat of some species.
- Acid rain changes the pH of soil – this affects agriculture and forestry. It causes rivers and ground water to become acidic.

Below is a sample assessment test and memorandum. Please feel free to use this task as is, or to adapt for your context. It is important to ensure that learners are only assessed on work that has been taught.

Natural Sciences
Grade 9
Practical task
Term 2
20 Marks

Time allocation:

NOTES TO THE TEACHER

1. This practical activity will be completed as part of Section E of lesson 1C.
2. This practical will take place during the lesson after the teaching component in Section D, “Accessing Information”.
3. The first 20 minutes will be used to teach section D and prepare learners for the practical task.
4. The next 40 minutes will be used to complete the practical activity as outlined in Section E.
5. The instructions and content of the practical task should be written on the chalkboard for the learners.
6. This task will be done in groups of 6.
7. The learners will need access to the poster for Term 2: “The Periodic Table of the Elements” for this activity.
8. Each group will need the following in order to complete the practical:
   - clay/ plasticine/ dough/ (preferably in a variety of colours)
   - matches/ toothpicks/ straws/ small thin lengths of stick
   - tinfoil (optional)
   - paper scraps for labels
   - tape for sticking
   - prestik (optional)
   - round seeds and/or beads in different colours (optional)
   - pens or markers
9. Ensure that you have all the materials ready and prepared for the learners before the lesson begins.
10. The memorandum for assessing the practical task is provided.
11. The learners should complete the drawings with a sharp pencil and the written answers should be completed in pen.

1. This activity will be done in groups.
2. To do this activity, each group will need the following:
   - clay/ plasticine/ dough/ (preferably in a variety of colours)
   - matches/ toothpicks/ straws/ small thin lengths of stick
   - tinfoil (optional)
   - paper scraps for labels
   - tape for sticking
   - prestik (optional)
   - round seeds and/or beads in different colours (optional)
   - pens or markers
3. Ensure you have these materials prepared for each group before the lesson starts.
4. Tell the learners that in this lesson they are going to be constructing models of chemical compounds.
5. Divide the learners into groups of six.
6. Write the following onto the chalkboard (always try to do this before the lesson starts):

PRACTICAL TASK

1. This practical task will be done in groups of 6.
2. Each group will be looking at three chemical compounds.
3. Each person in the group must participate in the planning and construction of the models.
4. Only one set of models will need to be handed in by each group, but each learner must complete the written tasks in their workbooks for further assessment.
5. Each group will need the following materials and equipment to do the investigation:
   - clay/ plasticine/ dough/ (preferably in a variety of colours)
   - matches/ toothpicks/ straws/ small thin lengths of stick
   - tinfoil (optional)
   - paper scraps for labels
   - tape for sticking
   - prestik (optional)
   - round seeds and/or beads in different colours (optional)
   - pens or markers
6. You will need to refer to “The Periodic Table of the Elements” to complete this task.

7. Read through the practical task with the learners.
8. Tell the learners that today they are going to be constructing three different models of compound substances.
9. Remind the learners that a compond substance is a substance that is made up of two or more elements that are chemically bonded together.
10. Have each group collect the equipment they will need (as listed on the board) for the task.
11. Write the following “Investigation method” onto the chalkboard:

Task 1 **(6 marks)**

1a Using the Periodic Table name the two elements in the compound NaCl.

1b What is the name of this compound?

1c What is the ratio of the elements in this compound?

1d Draw a basic representation of the compound with labels.

1e Using the materials you have available, construct a 3-dimensional model of this compound.

1f Label the elements on the model.

12. Read through the task with the learners.
13. Remind the learners that a 3-dimensional object is an object that can be seen from all sides.
14. Tell the learners they will need to be creative when making the model.
15. Explain that they will have to look carefully at the materials they have and discuss as a group what will be suitable for constructing the model.
16. Ask them if they have any questions.
17. Tell the learners they have 10 minutes to complete this task.
18. Supervise the learners whilst they complete the task and answer any questions that they may have.
19. After 10 minutes call the learners back to attention.
20. Tell the learners that they are now going to work together as a group to complete task 2.
21. The following will need to be written on the chalkboard:

Task 2 **(7 marks)**

2a. Using the Periodic Table name the two elements in the compound $CaBr_2$.

2b. What is the name of this compound?

2c. What is the ratio of the elements in this compound?

2d. Draw a basic representation of the compound with labels.

2f. Using the materials you have available, construct a 3-dimensional model of this compound.

2g. Label the elements on the model.

22. Read through task 2 with the learners.
23. Ask them if they have any questions.
24. Tell the learners they have 10 minutes to complete task 2 and to answer the questions in their workbooks.
25. Supervise the learners whilst they complete the task and answer any questions they may have.
26. After 10 minutes call the learners back to attention.
27. Tell the learners that they are now going to work together, as a group, to complete task 3.
28. The following will need to be written on the chalkboard:.

Task 3 **(7 marks)**

3a. Using the Periodic Table name the three elements in the compound Na_2CO_3.

3b. What is the name of this compound?

3c. What is the ratio of the elements in this compound?

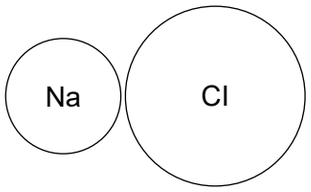
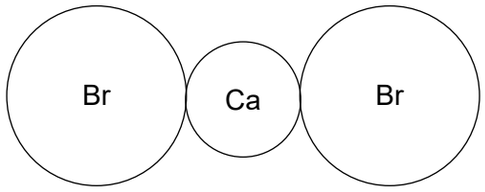
3d. Draw a basic representation of the compound with labels.

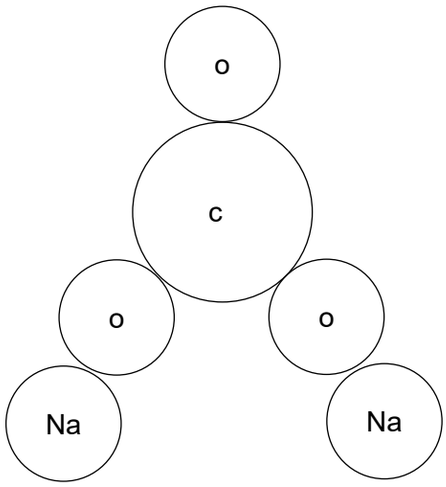
3e. Using the materials you have available, construct a 3-dimensional model of this compound.

3f. Label the elements on the model.

29. Read through the method with the learners.
30. Ask them if they have any questions.
31. Tell the learners they have 15 minutes to complete this task.
32. Supervise the learners whilst they complete the task and answer any questions they may have.
33. After 15 minutes call the learners back to attention.
34. Ensure that learners have remembered to put their names on their models.
35. Have learners hand in their models and workbooks.
36. Learners must then tidy up practical activity areas and hand back equipment.

Natural Sciences
Grade 9
Practical Task
Memorandum
Term 2
20 Marks

Topic	Task	Expected answer / outcome	Marks
	1		
Compounds	1a..	sodium ✓ chlorine ✓	1
Compounds	1b..	Sodium Chloride ✓	1
Compounds	1c..	1 : 1 ✓	1
Compounds	1d..	✓ 	1
Compounds	1e..	A suitable 3-D model as per the diagram has been made ✓	1
Compounds	1f..	The labels are correct as per the diagram ✓	1
	2		
Compounds	2a.	calcium ✓ bromine ✓	1
Compounds	2b.	Calcium bromide ✓	1
Compounds	2c.	1 : 2 ✓	1
Compounds	2d.	✓ 	1
Compounds	2e.	A suitable 3-D model as per the diagram has been made✓	2
Compounds	2f.	The labels are correct as per the diagram✓	1

	3		
Compounds	3a.	sodium✓ carbon ✓ oxygen ✓	1
Compounds	3b.	Sodium carbonate ✓	1
Compounds	3c.	2 : 1 : 3 ✓	1
Compounds	3d.	✓ 	1
Compounds	3e.	A suitable 3-D model as per the diagram has been made ✓	2
Compounds	3f.	The labels are correct as per the diagram ✓	1
			TOTAL: 20

Below is a sample test and memorandum. Please feel free to use this task as is, or to adapt for your context. It is important to ensure that learners are only assessed on work that has been taught.

Natural Sciences
Grade 9
Term 2
Test
100 Marks
120 Minutes

NOTES TO THE TEACHER

If possible, photocopy this test for each learner. If this is not possible, write the test on the chalkboard.

INSTRUCTIONS TO THE LEARNERS

1. Answer all questions in blue or black ink.
2. Read each question carefully before answering it.
3. Pay attention to the mark allocations.
4. Plan your time carefully.
5. Write your answers in the spaces provided.
6. Write neatly.

PRACTICE QUESTION

e.g. Which one of these happens when humans put food into their mouths?

A. absorption
B. ingestion
C. digestion
D. excretion

You have answered correctly if you have circled (B)

Grade 9 Natural Sciences Term 2 Assessment

PART 1: Life and Living

QUESTION 1: MULTIPLE CHOICE **[3]**

Read each question and circle the letter that shows the correct answer.

1a. Which one of these is NOT an animal cell?

A. Red blood cell.
B. White blood cell.
C. Palisade cell.
D. Sperm cell

1b. Which of these statements is FALSE?

A. Plants are producers because they make their own food.
B. The process of making their own food is called photosynthesis.
C. Photosynthesis takes place in the nucleus.
D. Some plants can store the food they make underground.

1c. Which of these statements is TRUE?

A. Arteries are blood vessels that transport blood away from the heart.
B. Veins are blood vessels that transport blood away from the heart..
C. Capillaries carry sperm cells.
D. The oesophagus carries air to the lungs.

Question 2: Match the columns **[4]**

Instructions:

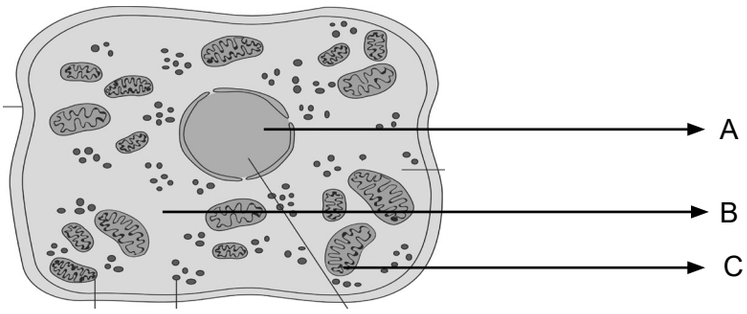
- Match the sentences in COLUMN A with the words in COLUMN B.
- Draw a line to join the sentence in COLUMN A with the correct word in COLUMN B. Do this as shown in the example below.

COLUMN A	
example	Waste matter from ingested food.
2a.	Tube which carries the female egg to the uterus.
2b.	Bag made of skin that holds testes outside the body.
2c..	Hollow cavity inside a female in which the baby develops during pregnancy.
2d..	Fatty substance found in animal-based foods..

COLUMN B
A. Uterus
B. Oviduct
C. Cholesterol
D. Scrotum
E. Faeces

Question 3 **[8]**

Look at the diagram of the cell below:



(Note to teacher: Copy this picture or use Term 1 Resource 1 with the labels covered.)

3a. Is this cell a plant or animal cell? _____

3b. Give a reason from what you can see in the diagram to explain your answer.

_____

_____

3c. What part of the cell is labelled A?

_____

3d. What function does part A have in the cell?

_____

_____

3e. What part of the cell is labelled B?

_____

3f. What function does part B have in the cell?

_____

3g. What part of the cell is labelled C?

_____

3h. What function does part C have in the cell?

_____

Question 4 **[5]**

The statements below all refer to the plant cell.

Write the word that is being described in the sentence.
Only write the answer.

4a. The jelly-like liquid in cells where reactions take place.

_____

4b. Structure that is green in colour which uses energy from the Sun to produce food.

_____

4c. Structure that controls all the activities of the cell.

_____

4d. Large bubble pumped full of water to make the cell firm.

_____

4e. Thin layer on outside that makes the plant cell strong and firm.

_____

_____

Question 5 **[10]**

Using what you have learnt and the words in the box below, explain what you understand about the processes of the digestive system, from ingestion to egestion.

Ingestion, molecules, bloodstream, oesophagus, intestines, stomach, digestion, nutrients, gastric juices, liver, egestion, faeces, anus, waste, muscles, saliva, chewing, absorption, mouth, teeth, peristalsis, enzymes, rectum

Question 6 **[10]**

"The Respiratory System functions to supply oxygen to the body and remove carbon dioxide."

Answer the following questions using examples from the passage:

6a. Explain what happens during breathing.

_____

_____

6b. Which gasses are exchanged and where does this take place?

_____

_____

6c. Define respiration:

_____

6d. Write down a word equation for respiration:

_____

6e. What are the two products of respiration?

_____

_____

6f. Explain where the glucose that is needed for respiration comes from in the blood stream.

_____

6g. Explain what you understand by diffusion of gases and how this helps in respiration.

_____

_____

_____

_____

6h. Where in the cells does respiration take place?

_____

Question 7 **[6]**

Read the following statement:

"Puberty is the time of your life when the sexual organs mature for reproduction."

7a. These changes are caused by hormones. Which gland is responsible for releasing these hormones?

_____

7b. Where is this gland located?

_____

7c. What is the function of hormones in the body?

_____

7d. Which hormone is released from the testes in males?

_____

7e. Which hormone is released from the ovaries in females?

_____

7f. Explain the difference between the menstrual cycle and menstruation.

_____

_____

Question 8 **[4]**

State whether the following statements are True or False:

8a. Condoms can be used more than once. _____

8b. Condoms prevent pregnancy every time. _____

8c. Condoms may help prevent the spread of STDs._____

8d. During pregnancy it is safe to drink alcohol. _____

8e. Pregnant girls who use drugs may be affecting their unborn baby._____

8f. 40 weeks is considered a full-term pregnancy._____

8g. Fertilization of the female egg happens during first 5 days of a regular menstrual cycle._____

8h. The urethra can carry semen and urine at the same time. _____

PART 2 : Matter and Materials

QUESTION 9: MULTIPLE CHOICE **[4]**

Read each question and circle the letter that shows the correct answer.

9a. Which one of these is NOT an element on the Periodic Table?

A. CO_2
B. Xe
C. OD.
D. Ar

9b. Which of these statements is TRUE?

A. An element is the basic unit of a chemical element.
B. An element is made up of atoms of the same kind.
C. A pure substance consists of many different elements, chemically bonded together.
D. Compounds are not pure substances.

9c. Which of these statements is FALSE?

A. An element is a pure substance that cannot be broken down any further.
B. The elements are classified into two group; metals and non-metals.
C. Copper and oxygen are examples of elements.
D. All the elements are listed on the Periodic Table

9d. What is the ratio of the elements Calcium and Bromine in Calcium Bromide ($CaBr_2$)

A. 1 : 1.
B. 2 : 1
C. 1 : 2
D. 2 : 2

Question 10: Match the columns **[4]**

Instructions:

- Match the sentences in COLUMN A with the words in COLUMN B.
- Draw a line to join the sentence in COLUMN A with the correct word in COLUMN B. Do this as shown in the example below.

COLUMN A		COLUMN B
example	Basic unit of a chemical element.	A. Electron
10a.	Neutral sub-atomic particle.	B. Neutron
10b.	Negatively charged sub-atomic particle.	C. Particle
10c.	Positively charged sub-atomic particle.	D. Proton
10d.	Minute portion of matter.	E. Atom

Question 11 **[4]**

Look at the following element at it appears on the Periodic Table:

6
C
Carbon
12,011

11a. What is the name of this element? _____

11b. What is the symbol for this element? _____

11c. What does the number "12,011" refer to? _____

11d. What does the number"6" refer to? _____

11e. What does this number tell us about the nucleus of the carbon atom?

_____

11f. Is Carbon an element or a compound?

_____

11g. Explain your answer, giving two reasons.

_____

_____

Question 12 **[3]**

Complete the following sentences using the words in the box below:

oxygen, sodium, hydrogen, water, two, chemically bonded, three, chlorine

"Many compounds are named according to their elements."

12a. If the compound name ends in "ide" (example: Copper oxide) there are _____ elements in the compound.

12b. If the compound ends in "ate" (example: Calcium carbonate) there are _____ elements in the compound, one of which is _____.

12c. The common name for H_2O is: _____.

12d. The formula for ammonia (NH_3) tell us there is one nitrogen atom and three _____ atoms in Ammonia.

12e. Compounds are made of elements that are _____.

12f. The common name for the compound NaCl is table salt. What elements are found in table salt? _____

Question 13 **[3]**

Write the word that is being described in the sentence.
Only write the answer.

13a. A process that occurs when two or more substances react to form new substances.

_____

13b. The substances that react in a chemical reaction.

_____

13c. Substances that are made as a result of a chemical reaction.

_____

13d. The law that explains that atoms are not lost or gained during a chemical reaction.

_____

13e. Molecule composed of only two atoms.

_____

13f. Process where a metal is damaged or weakened by a chemical reaction.

_____

Question 14 **[3]**

State whether the following sentences are True or False:

14a . Not all chemical equations must be balanced. _____

14b. In a balanced equation, the total number and type of atoms in the reactants are the same as in the products. _____

14c. You can change the composition of a molecule or atom in order to balance an equation. _____

14d. You can change the number of molecules or atoms to balance an equation. _____

14e. $4Fe + 3O_2 \rightarrow 2Fe_2O_3$ is a balanced equation. _____

Question 15 **[3]**

Complete and balance the following reactions:

15a. $H_2P + O_2 \rightarrow$ _____

15b. $HCl + Mg \rightarrow$ _____

15c. $S + O_2 \rightarrow$ _____

Question 16 **[6]**

" Some metals react when exposed to oxygen."

16a. When a substance reacts with oxygen, the reaction is called _____.

16b. Some metals burn in the presence of oxygen. This process is called _____

16c. When a metal is burned in air, the metal reacts with the oxygen in the air and a _____ is formed.

16d. Complete the following table:

Reactants	**Metal oxide formed**
	Sodium oxide
Calcium and oxygen	

16e. Write the reaction equation (using chemical symbols) for the oxidation of calcium and oxygen: _____

Question 17 **[5]**

" Rusting is the slow chemical reaction of iron metal with oxygen and water."

17a. Explain what happens, chemically, when iron reacts with water and oxygen.

_____

_____

17b. What is the chemical symbol for iron oxide? _____

17c. Name two ways to prevent rusting of metal or iron objects.

_____

Question 18 **[7]**

Define the following:

18a. pH measure:_____

18b. An acid:_____

18c. A base: _____

18d. What is the pH value of a neutral substance?_____

18e. What happens to the pH level when you add an acid to a base?

_____

_____

When sulfur dioxide combines with moisture in the air it forms an acid.

18e. What do we commonly call this acid?_____

18f. List 2 effects this acid has on the environment.

_____

_____

_____

_____

Question 19 **[4]**

Draw a model of each of the following molecules:

19a. sulphur trioxide molecule

19b. carbon dioxide molecule

Question 20 **[4]**

Complete the following table:

Chemical symbol on Periodic Table	Name
N	
	Sodium
Fe	
Mg	

TOTAL: 100

Natural Sciences
Grade 9
Term 2
Test
Memorandum
100 Marks

CAPS Topic	Questions	Expected answer(s)	Marks
PART 1: Life and Living			
	1		
Cells as the basic units of life	1a.	C ✓	1
Cells as the basic units of life	1b.	C ✓	1
Systems in the human body	1c.	B ✓	1
	2		
Human reproduction	2a.	B ✓	1
Human reproduction	2b.	D ✓	1
Human reproduction	2c.	A ✓	1
Human reproduction	2d.	C✓	1
	3		
Cells as basic units of life	3a	Animal cell ✓	1
Cells as basic units of life	3b.	Answers will vary ✓	1
Cells as basic units of life	3c.	Nucleus ✓	1
Cells as basic units of life	3d.	Controls all activities inside the cell ✓	1
Cells as basic units of life	3e.	Cytoplasm ✓	1
Cells as basic units of life	3f.	Where all reactions in the cell take place ✓	1
Cells as basic units of life	3g.	Mitochondria ✓	1
Cells as basic units of life	3h.	Creates energy for the cell/ respiration ✓	1
	4		
Cells as basic units of life	4a.	cytoplasm ✓	1
Cells as basic units of life	4b.	chloroplast ✓	1
Cells as basic units of life	4c.	nucleus ✓	1
Cells as basic units of life	4d.	vacuole ✓	1
Cells as basic units of life	4e.	cell wall ✓	1

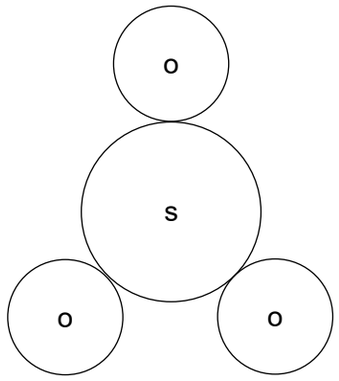
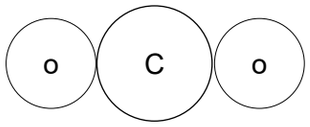
	5		
Digestive system	5.	(Any 10) ✓✓✓✓✓✓✓✓✓✓ • When you eat you put food in you mouth. This is called ingestion. • Saliva in the mouth helps break the food down chemically. • The teeth break up the food and the tongue assists in swallowing, • This is mechanical digestion. • The food then moves down the oesophagus • to the stomach. • The liver assists in digestion by producing liquid to break down fats. • The oesophagus moves the food by process of peristalsis. • In the stomach the food is broken down by enzymes • and hydrochloric acid. • This chemical digestion makes the food easier to absorb. • Digestion is necessary so that the nutrients can be absorbed by the bloodstream. • The food then moves into the small intestine • and then the large intestine. • Nutrients are absorbed by the body in the intestines. • These nutrients are needed for respiration. • Waste (or faeces) is stored in the rectum. • Egestion occurs when waste is pushed out of the rectum.	10

	6		
Circulatory and respiratory systems	6a.	During breathing air is taken in through the mouth and nose (inhalation) into the lungs and then air is breathed out of the nose and mouth (exhalation).✓	1
Circulatory and respiratory systems	6b.	Oxygen and carbon dioxide are exchanged. This takes place in the alveoli which are in the lungs.✓	1
Circulatory and respiratory systems	6c.	Respiration is when oxygen is used to change sugars into energy.✓	1
Circulatory and respiratory systems	6d.	oxygen + glucose → energy + carbon dioxide + water✓	1
Circulatory and respiratory systems	6e.	Carbon dioxide Water✓	1
Circulatory and respiratory systems	6f.	Digested food✓	1
Circulatory and respiratory systems	6g.	✓✓✓ • Diffusion is the movement of gases from a high concentration to a low concentration. • Oxygen moves from the alveoli into the blood capillary because of diffusion. • The concentration of oxygen is high in the alveoli because the person has just inhaled. • The oxygen will move into the blood capillary where there is now a low concentration of oxygen but a high concentration of carbon dioxide. • The carbon dioxide will move in the opposite direction. • The carbon dioxide will move from the blood capillaries to the alveoli where there is now a low concentration of carbon dioxide. • The carbon dioxide will now be exhaled.	3
Circulatory and respiratory systems	6h.	In the mitochondria of the cells	1

	7		
Human reproduction	7a.	Pituitary gland✓	1
Human reproduction	7b.	The brain✓	1
Human reproduction	7c.	Hormones are chemical substances that are released that affect the activity of another part of the body.✓	1
Human reproduction	7d.	They become extinct✓	1
Human reproduction	7e.	Testosterone✓	1
Human reproduction	7f.	Menstrual cycle: a 28-day cycle to prepare the uterus for a possible pregnancy. Menstruation: Breakdown of the uterus during the menstrual cycle, known as the "period".✓	1
	8		
	8a.	False ✓	½
	8b.	False ✓	½
	8c.	True ✓	½
	8d.	False ✓	½
	8e.	True ✓	½
	8f.	True ✓	½
	8g.	False ✓	½
	8h.	False ✓	½

PART 2 : Matter and Materials			
	9		
Compounds	9a.	A ✓	1
Compounds	9b.	B ✓	1
Compounds	9c.	B ✓	1
Compounds	9d.	C ✓	1
	10		
Compounds	10a.	B ✓	1
Compounds	10b.	A ✓	1
Compounds	10c.	D ✓	1
Compounds	10d.	C✓	1
	11		
Compounds	11a	Carbon✓	½
Compounds	11b.	C✓	½
Compounds	11c.	Atomic mass✓	½
Compounds	11d.	Atomic number ✓	½
Compounds	11e.	This number tells us how many protons are in the nucleus✓	½
Compounds	11f.	Element✓	½
Compounds	11g.	An element is made up of atoms of the same kind. Carbon is not bonded to any other element✓	1
	12		
Compounds	12a.	two✓	½
Compounds	12b.	three✓ oxygen✓	½
Compounds	12c.	water✓	½
Compounds	12d.	hydrogen✓	½
Compounds	12e.	chemically bonded✓	½
Compounds	12f.	sodium✓ chlorine✓	½
	13		
Chemical reactions	13a.	chemical reaction✓	½
Chemical reactions	13b.	reactants✓	½
Chemical reactions	13c.	products✓	½
Chemical reactions	13d.	Law of Conservation of Matter✓	½
Chemical reactions	13e.	diatomic molecule✓	½
Chemical reactions	13f.	corrosion✓	½

	14		
Chemical reactions	14a.	False✓	½
Chemical reactions	14b.	True✓	½
Chemical reactions	14c.	False✓	½
Chemical reactions	14d.	True✓	½
Chemical reactions	14e.	True✓	1
	15		
Compounds	15a.	$H_2P + O_2 \rightarrow P + H_2O$ ✓	1
Compounds	15b.	$HCl + Mg \rightarrow MgCl + H_2$ ✓	1
Compounds	15c.	$S + O_2 \rightarrow SO_2$ ✓	1
	16		
Reaction of metals with oxygen	16a.	oxidation✓	1
Reaction of metals with oxygen	16b.	combustion✓	1
Reaction of metals with oxygen	16c.	metal oxide ✓	1
Reaction of metals with oxygen	16d.	Reactant: Metal oxide sodium and oxygen: sodium oxide✓ calcium and oxygen: calcium oxide✓	2
Reaction of metals with oxygen	16e.	$Cu + O \rightarrow CuO$✓	1
	17		
Reaction of metals with oxygen	17a.	When iron reacts with water and oxygen it forms iron hydroxide. When the iron hydroxide dries out the water evaporates, and iron oxide is formed. Iron oxide corrodes the metal in the form of rust.✓✓	2
Reaction of metals with oxygen	17b.	Fe_2O_3✓	1
Reaction of metals with oxygen	17c.	Electroplating✓ Painting✓	2
	18		
Acids, bases and pH value	18a.	pH is a measure of how acidic or basic a substance is.✓	½
Acids, bases and pH value	18b.	An acid is a substance with a pH value between 0 and 7.✓	½
Acids, bases and pH value	18c.	A base is a substance with a pH value between 7 and 14.✓	½
Acids, bases and pH value	18d.	7✓	½

<table>
<tr><td>Reaction of acids with bases</td><td>18e.</td><td>The pH decreases ✓</td><td>1</td></tr>
<tr><td>Reaction of acids with bases</td><td>18f.</td><td>Acid rain✓</td><td>1</td></tr>
<tr><td>Reaction of acids with bases</td><td>18g.</td><td>• Damages buildings/statues/ bridges/ man-made structures ✓
• Makes water / soil acidic ✓
• Kills fish / plants ✓</td><td>3</td></tr>
<tr><td></td><td>19</td><td></td><td></td></tr>
<tr><td>Compounds</td><td>19a.</td><td>✓✓  </td><td>2</td></tr>
<tr><td>Compounds</td><td>19b.</td><td>✓✓  </td><td>2</td></tr>
<tr><td></td><td>20</td><td></td><td></td></tr>
<tr><td>Compounds</td><td>20</td><td>✓✓✓✓
<table><tr><td>Symbol</td><td>Name</td></tr><tr><td></td><td></td></tr><tr><td>N</td><td>Nitrogen</td></tr><tr><td>Na</td><td>Sodium</td></tr><tr><td>Fe</td><td>Iron</td></tr><tr><td>Mg</td><td>Magnesium</td></tr></table></td><td>4</td></tr>
<tr><td colspan="4">TOTAL: 100</td></tr>
</table>