

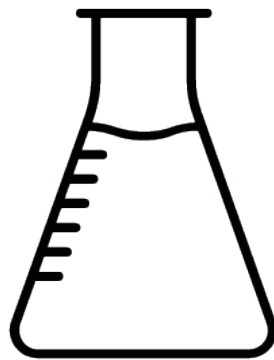


basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA



Planner & Tracker for Recovery ATP

Natural Sciences & Technology



Grade 6 Term 3

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Introduction

Dear Natural Sciences & Technology 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 & Tech.

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,

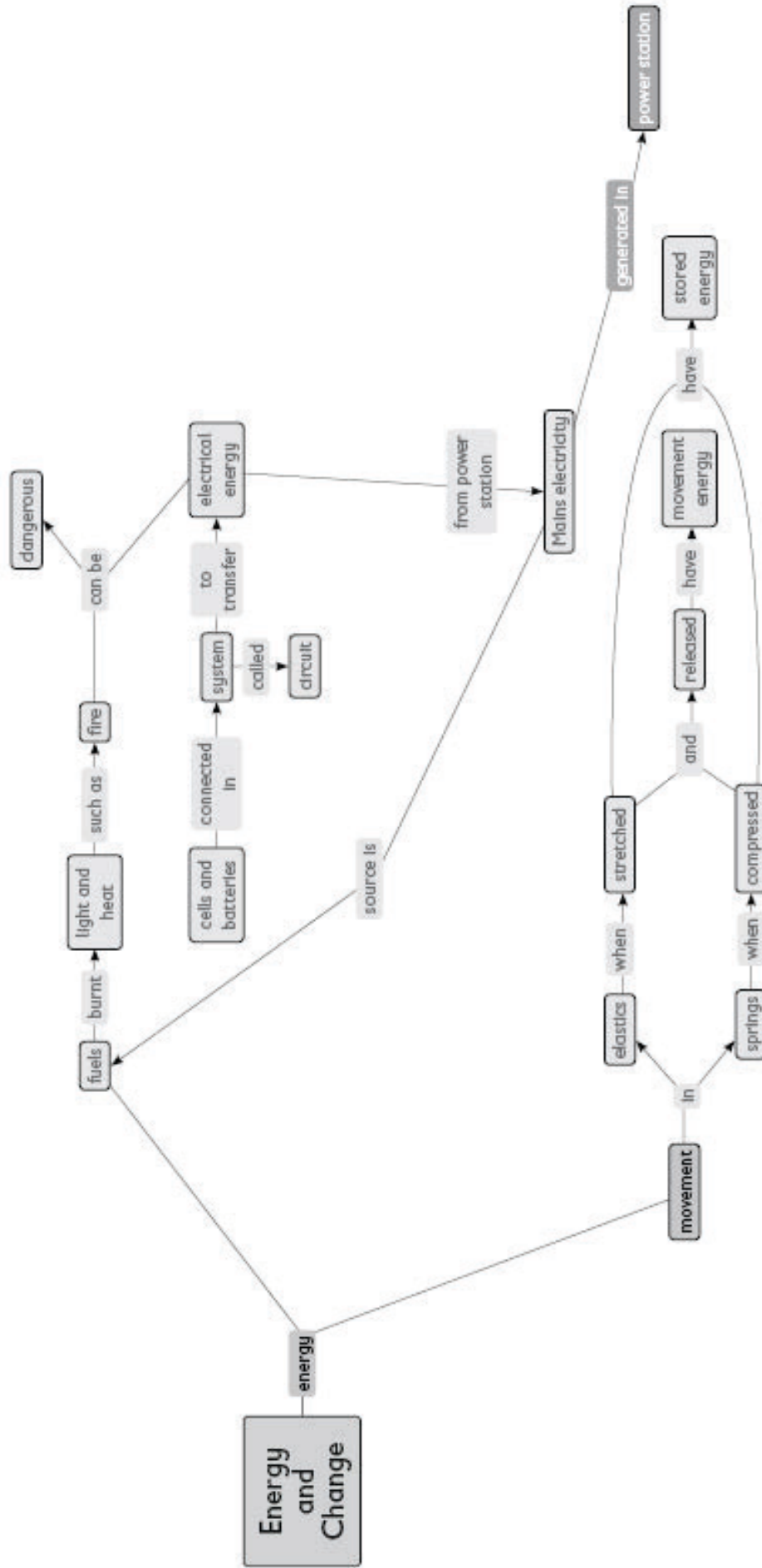
The DBE / NECT Recovery ATP Trackers Team

Overview

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

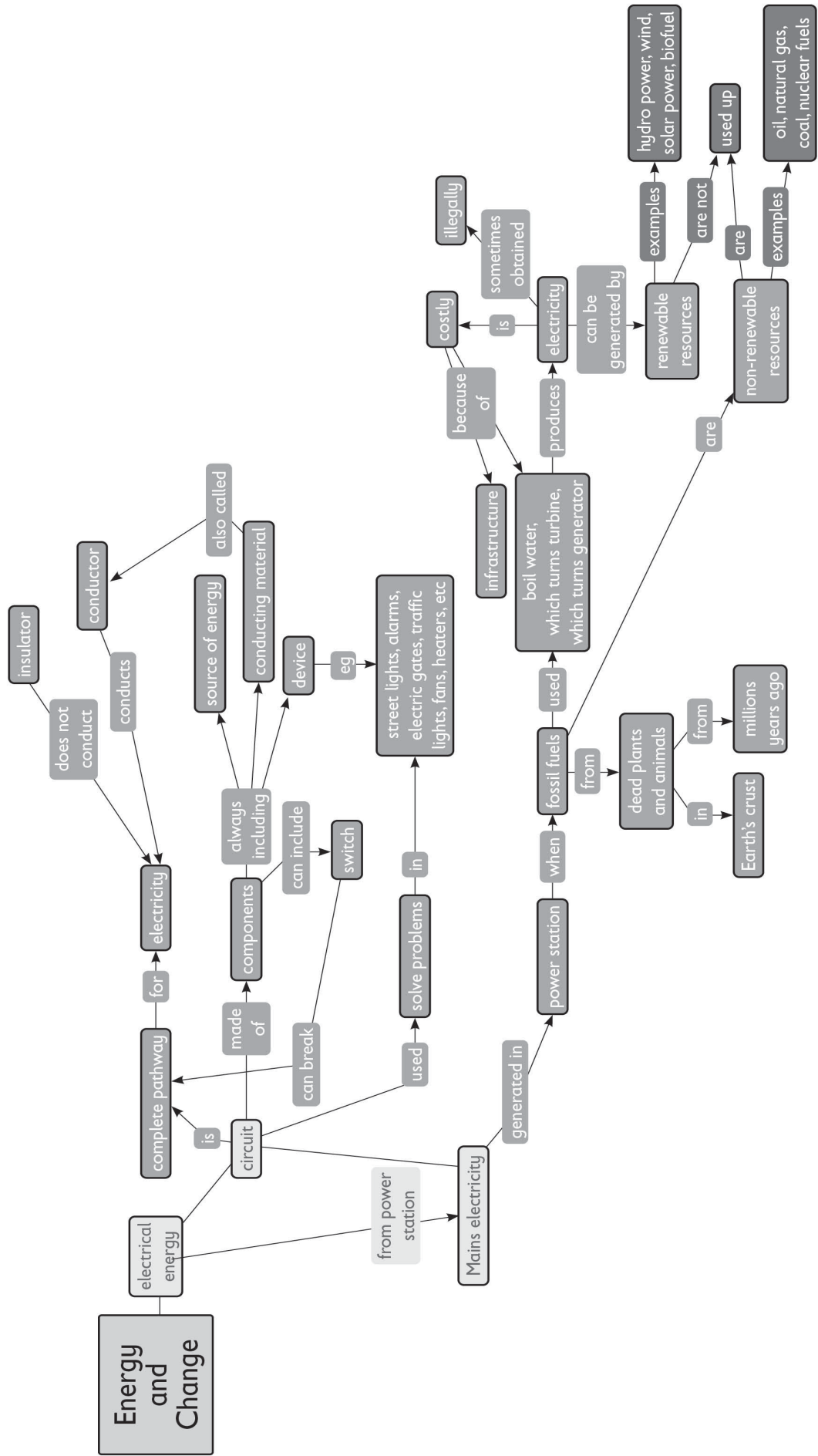
- The development of **Science Process Skills** is key to the teaching and learning of the subject. Focussing on these skills is critical.
- Learners should be given as many opportunities as possible to **write regularly and read for meaning** in Natural Science and Technology, in order to develop **language 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 & Tech 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.

Energy and Change Concept Map
Grade 5



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

Energy and Change Concept Map
Grade 6



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 & Technology has the same content as in CAPS. It is important to note that all the topics for Gr6 Term 3, NS and Tech remain as per CAPS (Grade 6). Therefore, there is no change to the topics and time allocation.

- **All topics remain the same:**

1. Electric Circuits (2,5 weeks)
2. Electrical conductors & insulators (2 weeks)
3. Systems to solve problems (2,5 weeks)
4. Mains electricity (3 weeks)

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 2021 formal assessment tasks for Grade 6 are as follows:

	TERM 1	TERM 2	TERM 3	TERM 4
Practical Task/Investigation	20 marks	20 marks	20 marks	-
Test	40 marks	60 marks	40 marks	60 marks

Sample Assessment Tasks and Memoranda / Rubrics for Grade 6 Term 3 are included in this document.

Notes:

- **Column 1** shows the **time allocation** per topic.
- **Column 2** shows the **Recovery ATP requirements** for Grade 6 Term 3.
- **Column 3** shows **where in the NECT lesson plans** this is covered.
- **Column 4** shows **where in the approved textbooks** this is covered.
- Finally, if, for any reason, the **Term 3 teaching time** for NS & Tech **is reduced**, please ensure that the **KEY CONCEPTS** listed below each table are thoroughly covered.

Key To Approved Textbook Abbreviations:

S&M	Study & Master Natural Science and Technology Grade 6 Cambridge University Press
VIVA	Viva Natural Sciences and Technology Grade 6 Vivlia
PLAT	Platinum Natural Sciences and Technology Grade 6 Maskew Miller Longman
SFA	Solutions for All Natural Sciences and Technology Grade 6 MacMillan
DbD	Day by Day Natural Sciences and Technology Grade 6 Maskew Miller Longman
OX	Oxford Successful Natural Sciences and Technology Grade 6 Oxford University Press
SO	Spot On Natural Sciences and Technology Grade 6 Pearson
TC	Top Class Natural Sciences and Technology Grade 6 Shuter and Shooter
SIBB	Sasol Inzalo Bk B Natural Sciences and Technology Grade 6 Sasol

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Weeks 1, 2 & 3 6.5 hours	Electric Circuits 1. A simple circuit 2. Circuit diagrams	Gr6 Term 3 Lesson Plans Lesson 1A: A system for transferring energy Lesson 1B: Circuits have 3 components Lesson 1C: A circuit is a pathway Lesson 2A: Make a circuit with a switch Lesson 2B: Circuit symbols Lesson 2C: Drawing circuit diagrams	S&M Gr 6 98 – 103 VIVA Gr 6 112 – 114 PLAT Gr 6 114 – 123 SFA Gr 6 187 – 195 DbD Gr 6 - 121 OX Gr 6 87 – 92 SO Gr 6 53 – 57 TC Gr 6 93 – 98 SIBB Gr 6 6 - 24	

Scaling down

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key content and concepts:

Electric Circuits

- A circuit is a system for transferring energy
- A circuit is a pathway for electricity with 3 important components – an energy source (input), conducting materials (wires), devices like motors that change electricity to useful energy (output)
- Identify symbols used in circuit diagrams

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Weeks 3 - 5 6 hours	Electrical conductors and Insulators 1. Conductors 2. Insulators	Gr6 Term 3 <u>Lesson Plans</u> Lesson 3A: Some materials conduct electricity Lesson 3B: Test materials for conductivity Lesson 3C: Some materials are insulators Lesson 4A: Test materials for insulation Lesson 4B: Uses of insulators	S&M Gr 6 104 – 108 VIVA Gr 6 117 – 122 PLAT Gr 6 126 – 133 SFA Gr 6 203 - 206 DbD Gr 6 125 – 127 OX Gr 6 93 – 97 SO Gr 6 59 – 60 TC Gr 6 101 – 105 SIBB Gr 6 32 - 39	

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Electrical conductors and insulators

- Most metals conduct electricity - Conductors
- Most non-metals do not conduct electricity - Insulators
- Identify when insulators are used – e.g. around wires

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Week 5 - 7 7 hours	Systems to solve problems 1. Using electric circuits	<p><u>Grade 6 Term 3 Lesson Plans</u></p> <p>Lesson 4C: Circuits as solutions</p> <p>Lesson 5A: Investigate circuits</p> <p>Lesson 5B: Design a circuit</p> <p>Lesson 5C: Make a circuit</p> <p>Lesson 6A: Evaluate your design</p> <p>Lesson 6B: Present your design</p>	<p>S&M Gr 6 109 – 115</p> <p>VIVA Gr 6 124 – 138</p> <p>PLAT Gr 6 137 – 145</p> <p>SFA Gr 6 213 – 230</p> <p>DbD Gr 6 130 – 133</p> <p>OX Gr 6 98 - 101</p> <p>SO Gr 6 61 – 63</p> <p>TC Gr 6 106 – 111</p> <p>SIBB Gr 6 44 - 51</p>	

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Systems to solve problems

- How electric circuits can be useful for street lights, alarms, electric gates
- How electric circuits can be useful for models and toys
- Investigate and design a circuit to solve a problem

TIME ALLOCATION	DBE RECOVERY ATP REQUIREMENTS	NECT LESSON PLANS: LESSONS	APPROVED TEXTBOOKS	DATE COMPLETED
Week 8 - 10 9 hours	Mains Electricity 1. Fossil fuels & electricity 2. Cost of electricity 3. Renewable ways to generate electricity	Grade 6 Term 3 Lesson Plans Lesson 6C: How fossil fuels were formed Lesson 7A: Oil & natural gas and their uses Lesson 7B: Formation of fossil fuels Lesson 7C: Coal power station Lesson 8A: Fossil fuels are non-renewable resources Lesson 8B: Electricity is costly Lesson 8C: Examine labels of electrical appliances Lesson 9A: Illegal connections Lesson 9B: Renewable ways to generate electricity Lesson 9C: Comparing renewable energies	S&M Gr 6 116 – 132 VIVA Gr 6 139 – 149 PLAT Gr 6 148 – 161 SFA Gr 6 232 – 248 DbD Gr 6 138 – 145 OX Gr 6 102 – 112 SO Gr 6 66 – 75 TC Gr 6 112 -120 SIBB Gr 6 56 - 78	

If the Term 3 teaching time is reduced, ensure that learners have a thorough understanding of the following key concepts:

Mains Electricity

- Understanding non-renewable and renewable sources of energy
- The high cost of electricity
- Saving electricity
- The dangers of illegal connections
- Renewable ways to generate electricity

Grade 6 Natural Sciences & Technology Term 3 Assessment

Below is a set of sample assessment tasks and memoranda. Please feel free to use these tasks 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 & Technology

Grade 6

Practical Task

Term 3

Time: 40 minutes

(15 minutes preparation, 25 minutes task time)

Marks: 20

NOTES TO THE TEACHER

1. This practical activity will be completed as part of Section E of lesson 4A.
2. This practical will take place during the lesson after the teaching component in Section D, "Accessing Information".
3. The first 15 minutes will be used to teach section D and prepare learners for the practical task.
4. The next 25 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. The memo for assessing the practical task is provided.
7. This will be a demonstration lesson unless there is enough equipment available for group work.
8. The following equipment will need to be collected before the lesson:
 - a circuit with a lightbulb (see Section D of Lesson 3B on instructions on how to make a circuit)
 - a coke can
 - an eraser
 - a plastic pen
 - a metal cup or kettle
 - a glass cup or bowl
 - a stick
 - a coin
 - tinfoil
9. Ensure you have these materials prepared for each group before the lesson starts.

10. Tell the learners that they are going to be doing an investigation where they will be exploring the conductivity of electricity.
11. If you are doing group work, divide the learners into groups so that each group will have access to the required materials.
12. If you are doing a demonstration, make sure all the learners can see the demonstration.
13. Write the following onto the chalkboard (always try to do this before the lesson starts):

PRACTICAL TASK

1. We are going to be exploring the conductivity of materials using a circuit.
2. We are going to test various materials to see if they are conductors or insulators of electricity.
3. Each test will start with a prediction and then we will test the materials to see if they are conductors or insulators of electricity.

14. Read through the practical task with the learners.
15. Remind the learners that conductors of electricity allow electricity to pass through them.
16. Remind learners that insulators do not allow electricity to pass through them.
17. Show the learners the lightbulb circuit and ask them to identify the:
 - battery/ies
 - cell holder
 - wire

TASK 1: (8 MARKS)

- 1a. Draw a diagram of the open circuit that you have been shown.
 - Use the correct circuit symbols
 - Use a sharp pencil
- 1b. Why do you think the lightbulb is not lighting up? Explain in detail.
- 1c. How do you think we could get the lightbulb to light up? Explain in detail.

Grade 6 Natural Sciences & Technology Term 3 Assessment

18. Read through task 1 with the learners.
19. Ask them if they have any questions.
20. Tell the learners they have 5 minutes to complete this task.
21. Supervise the learners whilst they complete the task and answer any questions they may have.
22. After 5 minutes call the learners back to attention.
23. Tell the learners that they are now going to complete task 2.
24. The following will need to be written on the chalkboard:

TASK 2: (3 MARKS)

- The aim of this experiment is to see which materials are conductors of electricity and which are insulators.

Draw the following table in your workbook:

Item to be tested	Predict: Conductor/ Insulator	Test result: Conductor/ Insulator	Was my prediction correct?
Coke can			
Eraser			
Plastic pen			
Metal cup/kettle			
Glass			
Stick			
Coin			
Tinfoil			
Wire coat hanger			

25. Give the learners 2 minutes to draw the table into their workbooks.
26. Show the learners all the items that are going to be tested.
27. Tell the learners that they now need to predict if the item will conduct or insulate electricity.
28. Tell them to write 'conductor' or 'insulator' in the first column, next to the item we are going to test.
29. Ask them if they have any questions.
30. Tell the learners they have 2 minutes to complete this task.
31. Supervise the learners whilst they complete the task and answer any questions they may have.
32. After 2 minutes call the learners back to attention.
33. Tell the learners that they are now going to observe the testing of their predictions.
34. Ensure that all the learners can see the test.
35. Remind the learners that if the lightbulb switches on, the electricity is flowing through and that item is a conductor of electricity.
36. If the lightbulb does not switch on, the electricity is not flowing through, and the item is an insulator.
37. Demonstrate the closing of the circuit using the items one-by-one by touching the wires on either end of the object.
38. Tell learners to record the test result: 'conductor' or 'insulator' in the second column.
39. Tell the learners to mark off in the third column if their predictions were correct or incorrect.
40. After the demonstration, the following will need to be written on the chalkboard:

TASK 3: (9 MARKS)

Looking at the table you completed whilst observing the experiment, answer the following questions:

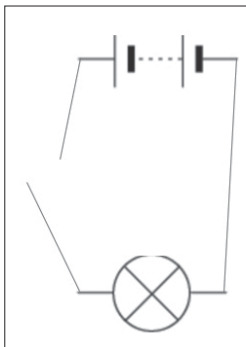
- 3a. What do you observe about most of the materials that are conductors of electricity?
- 3b. Which material did you not know was an insulator?
- 3c. Which material did you not know was a conductor?
- 3d. Give 2 reasons why it is important to know if materials are conductors or insulators?
- 3e. Why are the wires of the circuit wrapped in plastic?
- 3f. Name two dangers that you can think of that could be caused by electricity.
- 3g. What should electricians wear to protect themselves when working with electricity?

Grade 6 Natural Sciences & Technology Term 3 Assessment

41. Read through task 3 with the learners.
42. Ask them if they have any questions.
43. Tell the learners they have 10 minutes to complete task 3 in their workbooks.
44. Supervise the learners whilst they complete the task and answer any questions they may have.
45. After 10 minutes call the learners back to attention.

**Practical Task
Memorandum**

(See section E of lesson 4A for instructions and questions)

CAPS Topic	Task	Expected answer/outcome	Marks
	1		
Energy and electricity	1a		4
Energy and electricity	1b	The circuit is not closed, ✓ and electricity cannot flow from the battery to the lightbulb. ✓	2
Energy and electricity	1c	Join the wires to close the circuit ✓ so that the electricity can flow. ✓	2
	2		
Energy and electricity	2	(Note: The learner must make both a prediction in column one ✓ and checked the answer during the test in column two. ✓The last column must also be completed ✓This is completed on the table).	3
	3		
Energy and electricity	3a	Most seem to be made of metals. ✓	1
Energy and electricity	3b	Answers will vary. ✓	1
Energy and electricity	3c	Answers will vary. ✓	1
Energy and electricity	3d	<ul style="list-style-type: none"> • To make full use of their useful properties. ✓ • To avoid dangerous use of materials. ✓ 	2
Energy and electricity	3e	<ul style="list-style-type: none"> • To insulate the electricity. ✓ 	1
Energy and electricity	3f	<ul style="list-style-type: none"> • Shock and/or electrocution ✓ • Fire hazard ✓ 	2
Energy and electricity	3g	Rubber soled shoes or rubber gloves ✓	1
			TOTAL 20

Test

40 Marks

90 Minutes

NOTE 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

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

1. Which of the following is an example of a conductor of electricity?
 - a. glass
 - b. copper wire
 - c. plastic
 - d. rubber

You have answered correctly if you have circled **(b)**

QUESTION 1: MULTIPLE CHOICE

[4]





1a. Which one of these is NOT an example of a fossil fuel?

- a. oil
- b. coal
- c. natural gas
- d. electricity

1b. Which one of these statements is FALSE?

- a. A fan uses a motor to change electrical energy into movement energy.
- b. A doorbell uses a buzzer to change electrical energy into sound energy.
- c. A torch uses a battery to change electrical energy into light energy.
- d. A stove uses a heating element to change electrical energy into heat energy.

1c. In circuitry, which of the following is the symbol for a lightbulb?

- a. 
- b. 
- c. 
- d. 

1d. Which one of these statements is NOT TRUE about Evaluation in the process of design and manufacturing?

- a. Evaluation is a process to check what went well and where we could improve.
- b. Evaluation is the last step in the process.
- c. Evaluation means to look at the end product and the way in which we worked.
- d. A checklist is one way to evaluate a product.

QUESTION 2:

[6]

Write one word that means the same as the sentence:

2a. Material that does not allow electricity to pass through it.

2b. The metal wires inside a light bulb.

2c. A machine for making power in which a wheel with blades is made to turn by flowing water, steam, gas, air or other fluid.

2d. A resource that once used up cannot be replaced.

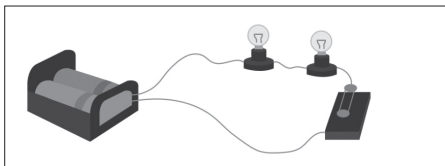
2e. The type of energy we get from the sun.

2f. The most used energy fuel in the world.

QUESTION 3

[11]

Look at the following illustration of a two bulb circuit:



3a. Draw a circuit diagram of this illustration.

- Use a sharp pencil and a ruler.
- Use the correct symbols for the components.
- Give the circuit a title or heading.

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3b. Give 3 examples of systems that use electric circuits.

3c. Give 2 reasons why is it important to observe safe work practices when working with electricity.

QUESTION 4

[8]

4a. Give 2 reasons why electricity is expensive.

4b. Electrical power is measured in units called _____.

4c. Explain why a fridge uses less electricity than a toaster.

4d. How does earth leakage protect us from accidental contact with live electricity?

QUESTION 5

[13]

5a. Give two examples of **renewable** energy.

5b. Give two examples of **non-renewable** energy

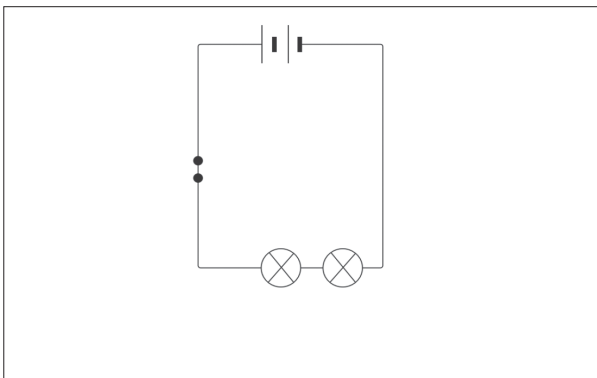
5c. Give 2 advantages and 2 disadvantages of using **renewable** energy in South Africa.

5d. Explain why using coal to generate electricity is not a good long-term solution for South Africa or the rest of the planet. Give three reasons for your answer.

5e. Which form of renewable energy do you think is most suitable for South Africa? Give a reason for your answer.

TOTAL 40

**Term 3
Test
Memorandum**

CAPS Topic	Questions	Expected answer(s)	Marks
	1		
Mains electricity	1a	D ✓	1
Systems to solve problems	1b	C ✓	1
Electric circuits	1c	A ✓	1
Systems to solve problems	1d	B ✓	1
	2.		
Electrical conductors and insulators	2a	insulator ✓	1
Electrical conductors and insulators	2b	filament ✓	1
Mains electricity	2c	turbine ✓	1
Mains electricity	2d	non-renewable ✓	1
Mains electricity	2e	Solar ✓	1
Mains electricity	2f	Oil ✓	1
	3.		
Electrical circuits	3a	 <p>e.g. A two bulb circuit or A closed circuit</p> <p>Allocate marks as follows:</p> <ul style="list-style-type: none"> • Symbols are correct ✓ ✓ ✓ • Symbols are in correct order ✓ • Lines are straight and correct ✓ • A suitable label has been given ✓ 	<p>3</p> <p>1</p> <p>1</p> <p>1</p>

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Systems to solve problems	3b	Any 3 systems that show understanding ✓ ✓ ✓ e.g. street lights, traffic lights, alarms, fans etc.	3
	3c	Any 2 reasons ✓ ✓ e.g. to avoid injury, avoid electrocution, avoid causing an electrical fire etc.	2
4			
Mains electricity	4a	(Any 2 reasons – as detailed below) ✓ ✓ <ul style="list-style-type: none"> • A large infrastructure is needed • Power stations are very expensive to build and/or maintain • It is expensive to make and distribute electricity • Coal needs to be mined and transported to the power stations 	2
Mains electricity	4b	watts ✓	1
Mains electricity	4c	A toaster needs heat to toast the bread. ✓ Heat needs much more energy, than a fridge ✓	2
Mains electricity	4d	It switches off the main electricity switch if we accidentally come into contact with live electricity ✓	1
5			
Mains electricity	5a	(Any two) ✓ ✓ <ul style="list-style-type: none"> • Hydroelectricity • Wind turbines • Solar panels • Landfill gas 	2
Mains electricity	5b	(Any two) ✓ ✓ <ul style="list-style-type: none"> • Oil • Coal • Natural gas 	2

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Mains electricity	5c	<p>(Any 2 advantages and 2 disadvantages)</p> <p>Advantages: ✓ ✓</p> <ul style="list-style-type: none"> • Resource will always be there/energy will not run out • The resource is free • Renewable energy does not cause pollution <p>Disadvantages: ✓ ✓</p> <ul style="list-style-type: none"> • Bad weather, droughts, lack of wind can affect the use of this energy • Infrastructure required to capture the energy are expensive, e.g. solar panels, turbines, wind farms 	4
Mains electricity	5d	<p>Any three ✓ ✓ ✓</p> <ul style="list-style-type: none"> • It is a non-renewable energy source • It is a major cause of air pollution • The infrastructure to mine, transport and convert coal to electricity is expensive • Coal shortages are responsible for load shedding 	3
Mains electricity	5e	<p>Answers will vary, e.g. hydro power, solar power, etc. ✓ Reason must match the choice ✓</p>	2
TOTAL 40			