



Province of the
EASTERN CAPE
EDUCATION

SENIOR PHASE

GRADE 9

NOVEMBER 2014

**NATURAL SCIENCES
MEMORANDUM**

MARKS: 100

This memorandum consists of 9 pages.

INSTRUCTIONS AND INFORMATION

1. Mark allocation in this paper is based on the level of answers required from learners.
2. Some expected answers have various or multiple answers. Only the required number of answers or facts will be considered.
3. Where applicable, an answer that has more than one mark or point, marks can be deducted where there are missing facts.

SECTION A

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

NO.	EXPECTED ANSWER	LETTER	MARK
1.1	Gravitational force	B	✓ (1)
1.2	volt	B	✓ (1)
1.3	uranium	B	✓ (1)
1.4	electricity	C	✓ (1)
1.5	globe	A	✓ (1)
1.6	the lithosphere, atmosphere and hydrosphere.	A	✓ (1)
1.7	Hydrogen	B	✓ (1)
1.8	Ozone layer	C	✓ (1)
1.9	black hole	B	✓ (1)
1.10	Helium	D	✓ (1)

[10]

QUESTION 2: MISSING WORDS

NO.	EXPECTED ANSWER	MARK
2.1	Newtons	✓ (1)
2.2	Sir Isaac Newton	✓ (1)
2.3	Tension force	✓ (1)
2.4	Frictional force	✓ (1)
2.5	Gravitational force	✓ (1)

(5 x 1)

[5]

QUESTION 3: MATCHING ITEMS

NO.	EXPECTED ANSWER	LETTER	MARK
3.1	Is a conducting material selected to control the current or to provide the useful energy transfer.	C	✓ (1)
3.2	Use wind energy to generate electricity.	A	✓ (1)
3.3	Use falling water to turn turbine blades.	E	✓ (1)
3.4	An industrial facility to generate power.	B	✓ (1)
3.5	The layer of air around the earth.	D	✓ (1)

(5 x 1)

[5]**TOTAL SECTION A: 20**




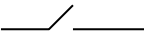

SECTION B: ENERGY AND CHANGE

QUESTION 4: MAGNETIC FORCES AND ELECTROSTATIC FORCE

NO.	EXPECTED ANSWERS		MARK
4.1	MAGNETIC SUBSTANCES:	NON-MAGNETIC:	✓ ✓ (2)
	Iron Steel	Plastic Paper	
4.2	The earth, just like a bar magnet, has a north pole and south pole.		✓✓ (2)
4.3	Loss or gain of electrons.		✓ (1)
4.4	Metals: <ul style="list-style-type: none"> • Can be attracted by a magnet. • Good conductors of heat. • Ductile and malleable. • Have a ring sound and they are shiny. (Any two of the above)		✓✓ (2)
	Non-metals: <ul style="list-style-type: none"> • Can be used as insulators. • Break easily. • Have different colours. • Cannot be attracted by a magnet. (Any two of the above)		✓✓ (2)
4.5	<ul style="list-style-type: none"> • In painting cars (spray painting). • In photocopying machines. • In micro-waves (Any two related and correct answers.)		✓✓ (2)

[11]

QUESTION 5: ELECTRIC CIRCUITS

NO.	EXPECTED ANSWERS		MARK
5.1	5.1.1	Cell 	✓ (1)
	5.1.2	Connector 	✓ (1)
	5.1.3	Light bulb 	✓ (1)
	5.1.4	Switch 	✓ (1)
	5.1.5	Battery 	✓ (1)
5.2	5.2.1	Circuit B, because it is a closed circuit and connectors or wires are all connected to the cell.	✓✓ (2)
	5.2.2	<ul style="list-style-type: none"> • Circuit A has one light bulb, while circuit B has two light bulbs. • Circuit A has a battery (3 cells), while circuit B has one cell. • Circuit A has an open switch, while circuit B has a closed switch. • Circuit A has a single light bulb connected in series, while circuit B has two light bulbs connected in parallel. • In circuit A an electric wire is not connected to a negative terminal of a battery, while in circuit B all electric wires are connected. (Any two of the above)	✓✓ (2)
	5.2.3	<ul style="list-style-type: none"> • The material of which the conductor is made. Different materials offer different degrees of resistance to the passing of the current. • The length of the conductor. The longer the conductor, the greater is the resistance. • The thickness of the conductor. The thicker the conductor the smaller the resistance. • The temperature of the conductor. The higher the temperature, the greater is the resistance. 	✓✓ ✓✓ ✓✓ ✓✓ (8)

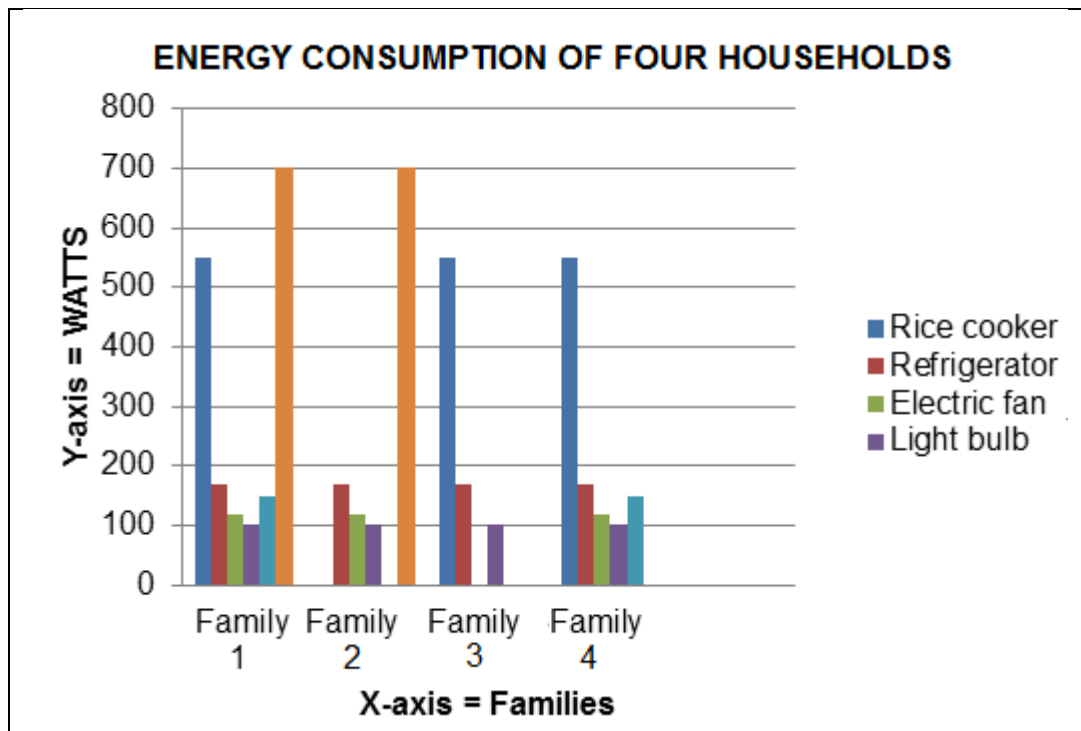
[17]

QUESTION 6: PRACTICAL INVESTIGATION TASK – ENERGY CONSUMPTION

NO.	EXPECTED ANSWERS	MARK
6.1	The scientific aim is to investigate the energy consumption in four different households or to investigate the use of electricity in four different households.	✓
		(1)
6.2	Family 2: Refrigerator (170 W) + Electric fan (120 W) + Light Bulb (100 W) + TV (700 W) = 1 090 W= 1,09 kW Family 3: Rice cooker (550 W) + Refrigerator(170 W) + Light Bulb (100 W) = 820 W = 0,82 kW <i>(1 mark for addition, 1 mark for the total and 1 mark for the conversion to kW.)</i>	✓✓✓
		(3)
		✓✓✓ (3)
6.3	Family 1 will pay the highest electricity bill because they are using more appliances compared to the other families.	✓✓
		(2)
6.4	Learners will need to show the following in their bar graph: <ul style="list-style-type: none"> • The heading • Y-axis showing the units (watts) of the appliances used in each family. • X-axis showing the families and their appliances. • Different keys or colours for electrical appliances (with the same key or same colour for each appliance in all families). • Correct measurements or units in the Y-axis. • Correct key of the graph. • The graph should be neat and clearly drawn. 	✓ ✓ ✓ ✓ ✓ ✓
		(7)

[16]

6.4 THE BAR GRAPH PRESENTATION



TOTAL SECTION B: 44

SECTION C: PLANET EARTH AND BEYOND**QUESTION 7: THE EARTH AS A SYSTEM**

NO.	EXPECTED ANSWERS	MARK	
7.1	X = The core Y = The crust Z = The mantle	✓ ✓ ✓	(3)
7.2	<ul style="list-style-type: none"> Lithosphere: The outer rockiest part of the earth (or the hard part of the earth with soil and rocks). Atmosphere: the layer of the air around the earth. Hydrosphere: the water bodies on the earth (oceans, rivers, dams etc.). Biosphere: the part of the earth where life exists (where animals and plants exist). 	✓ ✓ ✓ ✓	(4)
7.3	<ul style="list-style-type: none"> Igneous rock Sedimentary rock Metamorphic rock 	✓ ✓ ✓	(3)

[10]

QUESTION 8: MINING OF MINERAL RESOURCES IN SOUTH AFRICA

NO.	EXPECTED ANSWERS	MARK	
8.1	8.1.1 Gold – Au	✓	(1)
	8.1.2 Iron – Fe	✓	(1)
	8.1.3 Aluminium – Al	✓	(1)
	8.1.4 Copper – Cu	✓	(1)
	8.1.5 Lead – Pb	✓	(1)
8.2	Minerals are used to make: <ul style="list-style-type: none"> Jewellery Tools Weapons Machinery and decorations (Any three of these and other related answers)	✓ ✓ ✓	(3)
8.3	<ul style="list-style-type: none"> Surface mining Strip mining Underground mining Solution mining (Any two will be correct)	✓ ✓	(2)

8.4	<ul style="list-style-type: none"> Concentration of ores: Refers to getting rid of as much unwanted rocky material as possible before the ore is converted into a metal. Froth Floatation: Is a process by which ore is concentrated and treated with substances that bind metal particles with them. Reduction of metal oxide to metal: Refers to the removal of oxygen from the ores by chemical reaction. 	✓✓✓	(3)				
8.5	<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">CARBON DIOXIDE</th> <th style="width: 50%;">OXYGEN</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> It is composed of one carbon atom and two oxygen atoms. Carbon dioxide does not support combustion. </td> <td> <ul style="list-style-type: none"> Oxygen is composed of two oxygen atoms, hence it is a diatomic molecule (O₂). Oxygen supports combustion. </td> </tr> </tbody> </table>	CARBON DIOXIDE	OXYGEN	<ul style="list-style-type: none"> It is composed of one carbon atom and two oxygen atoms. Carbon dioxide does not support combustion. 	<ul style="list-style-type: none"> Oxygen is composed of two oxygen atoms, hence it is a diatomic molecule (O₂). Oxygen supports combustion. 	✓✓ ✓✓	(4)
CARBON DIOXIDE	OXYGEN						
<ul style="list-style-type: none"> It is composed of one carbon atom and two oxygen atoms. Carbon dioxide does not support combustion. 	<ul style="list-style-type: none"> Oxygen is composed of two oxygen atoms, hence it is a diatomic molecule (O₂). Oxygen supports combustion. 						

[17]

QUESTION 9: PRODUCTION OF MINERALS IN SOUTH AFRICA

NO.	EXPECTED ANSWERS	MARK	
9.1	9.1.1 In 1970	✓✓	(2)
	9.1.2 1000 – 200 = 800 tons more in 1970.	✓✓	(2)
	9.1.3 <ul style="list-style-type: none"> Mining increases job opportunities. Mining activities can make the country’s economy grow. Mining can bring business opportunities from other countries. (Any three related answers.)	✓ ✓ ✓	(3)
	9.1.4 <ul style="list-style-type: none"> Mining leads to loss of farming and wild life environments. Processing the gold ore leaves solid waste behind. Mining activities often encroach on protected areas. Mining threatens biodiversity in the operational areas. Mining can result in acid formation and global warming. Mining leads to the creation of mine dumps that damage Places with high tourist or cultural heritage value. (Any two related answers.)	✓ ✓	(2)

[9]

TOTAL SECTION C: 36
GRAND TOTAL: 100