Natural Sciences and Technology · Grade 6

Memorandum · Term 3–4

TOTAL 87 MARKS

Marking guidelines

1. Award the full mark for a correct answer, even if the learner words it differently.
2. Accept any scientifically correct answer, including one not given in the memorandum.
3. Where a question asks for two or more items, award one mark per correct item.
4. For diagrams, award the mark if the label points at the correct part, even with a spelling error.
5. Do not deduct marks for spelling unless the word takes on a different scientific meaning.

Question	Answer	Marks	Marking note
QUESTION 1 · Multiple choice questions · 6 marks			
1.1	b. Mercury	**1**	
1.2	a. Natural gas	**1**	
1.3	a. a complete, unbroken path for electricity	**1**	
1.4	a. 24 hours	**1**	
1.5	b. Jupiter	**1**	
1.6	a. Pluto	**1**	
QUESTION 2 · Short questions · 9 marks			
2.1	a. The geyser (1) and the iron (1). b. Both are heating appliances: they change electricity into heat (1). c. The cellphone charger (1).	**4**	*Learners need not know how W is measured (CAPS note).*
2.2	a. solar system; b. day; c. moon (accept satellite / natural satellite)	**3**	*1 mark each. Also accept b. 'daylight'.*
2.3	Solar panels change sunlight into electricity (1); a solar water heater only uses sunlight to heat water and makes no electricity (1).	**2**	*1 mark each.*

Question	Answer	Marks	Marking note
QUESTION 3 · Electric circuits · 10 marks			
3.1	1 mark: correct cell symbol (long and short line). 1 mark: correct bulb symbol and closed-switch symbol. 1 mark: wires drawn as straight lines forming one complete, closed loop.	**3**	
3.2	Steel nail = Yes; Chalk = No; Cardboard = No	**3**	*1 mark each.*
3.3	Steel is a metal and a conductor, so electricity can flow through it and the circuit is complete (1). Cardboard is an insulator (non-conductor), so the circuit stays broken and no electricity flows (1).	**2**	*Accept both 'insulator' and 'non-conductor'.*
3.4	Any two: you can switch the device on and off without taking the circuit apart; it saves the energy in the cell (the cell lasts longer) because the device is off when it is not needed; it is safer, because the circuit can be broken quickly.	**2**	*1 mark each.*
QUESTION 4 · Fossil fuels and electricity · 8 marks			
4.1	Plants (trees, ferns) died millions of years ago, often in swamps (1); they were buried under layers of mud and sand (1); over millions of years the weight (pressure) and heat of the layers changed them into coal (1); coal takes millions of years to form, so once we have used it, it cannot be replaced (1).	**4**	*1 mark each.*
4.2	a. TV, substation, power lines (pylons), power station, coal, Sun. Accept substation and power lines in either order. b. Plants that lived long ago used sunlight to make food; their energy was stored in the coal that formed from them (1).	**4**	*a. 3 marks = all correct; 2 = one item out of place; 1 = two items out of place; 0 = more. b. 1 mark.*
QUESTION 5 · The Solar System · 11 marks			
5.1	Mercury, Venus, Earth, Mars. 3 = all four in the correct order; 2 = all four, but two swapped; 1 = two or three correct; 0 = otherwise.	**3**	
5.2	There is almost no oxygen to breathe (1); it is far too cold and there is no liquid water on the surface (1).	**2**	
5.3	A star makes its own light through reactions inside it (1); a planet makes no light and we see it because it reflects the Sun's light (1).	**2**	

Question	Answer	Marks	Marking note
5.4	Jupiter is much further from the Sun, so its orbit is far longer (1), and it also moves more slowly along that orbit (1).	**2**	
5.5	Any two: what the surface looks like; whether there is water or ice; what the atmosphere is made of; how hot or cold it is; whether there are moons.	**2**	
QUESTION 6 · The Moon · 6 marks			
6.1	a. About 28 days (about a month). b. About 28 days (about a month). c. The Sun.	**3**	*1 mark each. Accept 27 to 29$\frac{1}{2}$ days for a and b.*
6.2	Craters; mountains (the lighter areas); flat plains (the darker areas, also called seas or maria).	**3**	*1 mark each.*
QUESTION 7 · Exploring space · 9 marks			
7.1	a. Light (1). b. Any two: no bright city lights, so the sky is dark; clear, dry air with few clouds; it is high up, above dust and haze.	**3**	*1 mark each.*
7.2	a. To grip on loose sand and rocks so that the rover does not slip or get stuck (1). b. To send pictures and information to Earth and to receive instructions from Earth (communication) (1). c. No people have gone to Mars yet; Mars rovers are robots controlled from Earth (1).	**3**	*1 mark each.*
7.3	Any two: the planets are not all the same size (Jupiter is much bigger than Earth); they should be spread out at different distances from the Sun; each planet should be on its own orbit around the Sun.	**2**	*1 mark each. Do not give a mark for 'the Sun must be in the centre' (given in 2.2a).*
7.4	Mercury or Venus.	**1**	
QUESTION 8 · Electricity from a power station · 10 marks			
8.1	a. steam; b. turbine; c. generator	**3**	*1 mark each.*
8.2	Any three: coal mines; trains or trucks to transport the coal; power stations; pylons and power lines (cables); substations; wiring, meter boxes and plugs in homes.	**3**	*1 mark each.*

Question	Answer	Marks	Marking note
8.3	Advantage (1), any one: water is renewable; no coal is burnt, so the air is not polluted; it is cheap to run once built. Disadvantage (1), any one: South Africa is a dry country with few big rivers; in a drought there is too little water; building a dam is very expensive and floods land.	**2**	
8.4	Any two: a power station burns a huge amount of coal every day; coal is heavy and expensive to transport over long distances; it saves trains, trucks and roads, so the electricity costs less.	**2**	*1 mark each.*
QUESTION 9 · Technology: design a model rover · 10 marks			
9.1	Wheels: bottle tops (1). Axles: kebab sticks (1); also accept 'kebab sticks inside straws'.	**2**	
9.2	Any three: it must roll at least 1 m after the ramp; it must carry the matchbox on top; it may use only the listed materials; the wheels must turn freely and stay on; it must be strong enough not to break.	**3**	*1 mark each.*
9.3	Let the rover roll down the same ramp from the same starting point without pushing it (1); measure how far it rolls past the bottom of the ramp and check that it is at least 1 m (1).	**2**	
9.4	1 mark for a clear sketch with wheels joined by axles under the box. 2 marks for labels: four correct = 2; two or three correct = 1.	**3**	
QUESTION 10 · Circuits that solve problems · 8 marks			
10.1	Traffic light = light; Electric fan = movement; Fire alarm = sound	**3**	*1 mark each.*
10.2	The person's weight pushes the two metal parts of the switch together, so the switch closes (1); the circuit is now complete (1); electricity flows through the buzzer (bell), which makes a sound (1).	**3**	
10.3	Any two: street lights; electric gates; heaters; lifts; pedestrian-crossing buttons; school bells; security lights.	**2**	*1 mark each. Do not accept traffic lights, fans, fire alarms or burglar alarms.*

Total **87 marks**



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