



Province of the
EASTERN CAPE
EDUCATION

**SENIOR
PHASE**

GRADE 9

NOVEMBER 2011

**TECHNOLOGY
MAKING GUIDELINE**

MARKS: 100

This memorandum consists of 8 pages.

INSTRUCTIONS AND INFORMATION

1. Learners answer all the questions from SECTIONS A, B, C, D and E.
2. Sketches must be clear, neat and done in pencil.

ALLOCATION OF MARKS

SECTION A	MULTIPLE-CHOICE QUESTIONS	
	QUESTION 1	[10]
SECTION B	STRUCTURES	
	QUESTION 2	[15]
SECTION C	PROCESSING	
	QUESTION 3	[15]
SECTION D	SYSTEMS AND CONTROL (Mechanical Systems)	
	QUESTION 4	[30]
SECTION E	SYSTEMS AND CONTROL (Electrical Systems)	
	QUESTION 5	(5)
	QUESTION 6	(25)
		[30]

SECTION A: MULTIPLE-CHOICE QUESTIONS**QUESTION 1**

- 1.1 B ✓
 1.2 A ✓
 1.3 C ✓
 1.4 A ✓
 1.5 D ✓
 1.6 B ✓
 1.7 B ✓
 1.8 B ✓
 1.9 B ✓
 1.10 C ✓

(10 x 1) [10]

TOTAL SECTION A: 10**SECTION B: STRUCTURES****QUESTION 2****2.1 2.1.1 Reasons for building a bridge:**

- Spanning a gap. ✓
- Shortening the distance to be travelled. ✓
- Providing access to remote areas. ✓
- Being able to cross rivers, seas, etc. ✓
- Providing access for vehicles. ✓
- Saving time and money ✓

(Any 2) (2)

- 2.1.2 Positive effect is that distance between places is shortened and distance is straight. ✓
 Negative effect is that the natural environment is damaged through the construction of a bridge. ✓ (2)

- 2.1.3
- Wood ✓
 - Rope ✓
 - Stone ✓
 - Iron ✓
 - Concrete ✓
 - Cables etc. ✓

(Any 2) (2)

2.2

Picture	Property
A	Tensile strength ✓
B	Toughness ✓
C	Conductivity ✓
D	Malleability ✓
E	Compressive strength ✓

(5)

- 2.3 A – Dynamic ✓
 B – Static ✓
 C – Dynamic ✓
 D – Dynamic ✓ (4)

TOTAL SECTION B: 15

SECTION C: PROCESSING

QUESTION 3

3.1

COLUMN A		COLUMN B	
3.1.1	Irradiation	D	✓
3.1.2	Refrigeration	C	✓
3.1.3	UHT – Ultra Heat Treatment	E	✓
3.1.4	Drying	B	✓
3.1.5	Pickling	A	✓

(5)

- 3.2 3.2.1
- Oil ✓
 - Paint ✓
 - Varnish ✓
 - Lacquer ✓
 - Wax ✓
 - Polish ✓
- (Any 4) (4)

- 3.3 The symbol means that the object that it is on can be recycled. ✓
 It can be found on milk, water bottles, juice, cosmetics, shampoo etc. ✓
 (Answers referring to plastic bottles or plastic bags are correct.) (2)

- 3.4 3.4.1 It is because of chemicals added to food such as colourants, artificial flavourings and artificial preservatives. ✓ (1)

- 3.4.2 By removing colourants, artificial flavourings and artificial preservatives in food. P ✓ (1)

- 3.4.3
- Restlessness ✓
 - Rash on the skin
 - Difficulty to concentrate
 - Air passages swell which causes difficulty in breathing.
- (Any 1) (1)

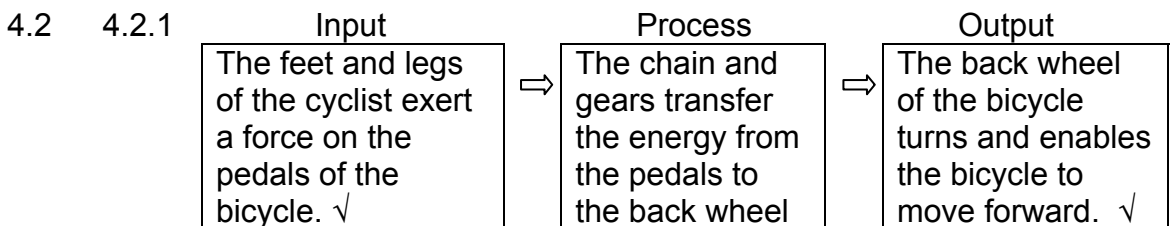
- 3.4.4 By comparing food labels of different brands of the same foods. ✓ (1)

TOTAL SECTION C: 15

SECTION D: SYSTEMS AND CONTROL (Mechanical Systems)

4.1	Name of object	Benefit to people	Mechanical or electrical
(a)	Bicycle gear system	Makes cycling easier ✓	Mechanical ✓
(b)	A torch	Allows us to see in the dark ✓	Electrical ✓
(c)	A hand-driven gear winch	Makes lifting loads easier. ✓	Mechanical ✓
(d)	A radio	Allows people to hear music, news, commentary etc. ✓	Electrical ✓
(e)	A jackhammer	Allows construction workers to demolish hard surfaces ✓	Mechanical ✓
(f)	A hand-driven hydraulic car jack	Lifts a car when a person needs to change a tyre. ✓	Mechanical ✓

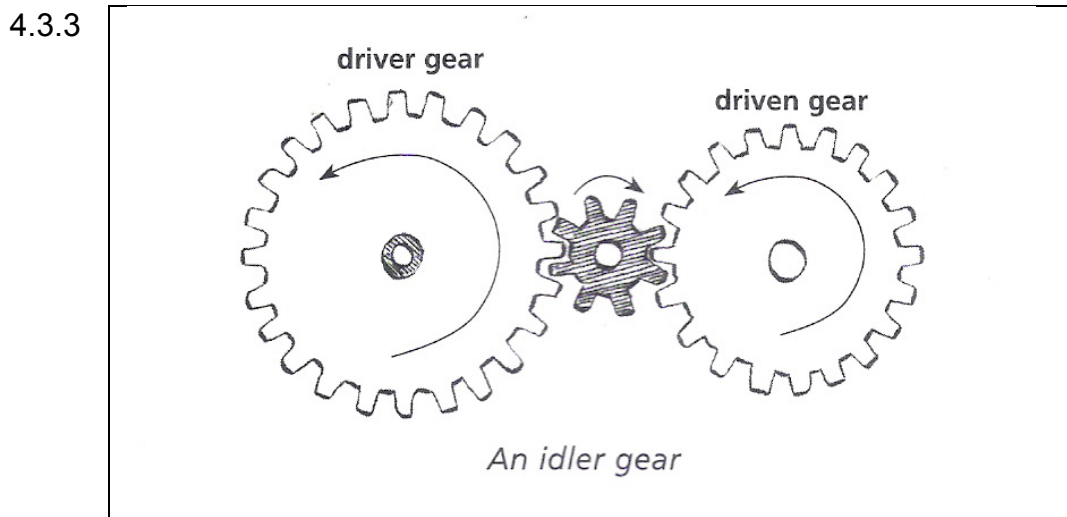
(12)



(2)

4.3 4.3.1 A gear is a wheel with teeth on its edge. ✓ (1)

4.3.2 By using a third gear called an idler gear. ✓ (1)



Driver gear label = ✓
 Driven gear label = ✓
 Idler gear label = ✓
 Direction arrow = ✓

(4)

- 4.4 4.4.1 (B is larger than A and outputs less revolutions per minute and is slower. C is smaller, therefore revolutions per minute will increase and rotation will be faster.)

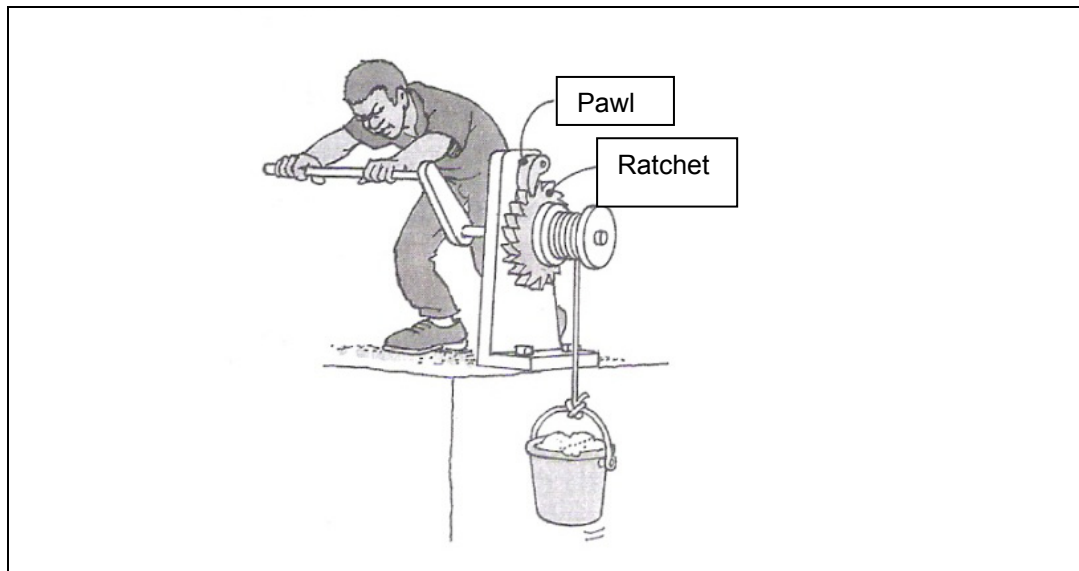
Learners now find the revolutions per minute at C.

$$\frac{60}{10} \sqrt{\frac{B}{C}} = 6 \sqrt{\quad}$$

$$20 \text{ revolutions} \times 6 \sqrt{\quad} = 120 \text{ revolutions at C}$$

(5)

4.5



- 4.5.1 A = Ratchet $\sqrt{\quad}$
B = Pawl $\sqrt{\quad}$

(2)

- 4.5.2 The purpose of the one way valve is to allow the flow of liquid or gas in one direction only. $\sqrt{\quad}$

(1)

- 4.5.3 (a) Cleats –
 - Are used to hold ropes of sails on yachts. $\sqrt{\quad}$
 - On the mast of a boat, blinds etc.

(1)

- (b) One way valve –
 - Tube in a bicycle tyre $\sqrt{\quad}$
 - Hydraulic car jacks

(1)

TOTAL SECTION D: 30

SECTION E: SYSTEMS AND CONTROL (Electrical Systems)**QUESTION 5**

- 5.1 5.1.1 A light-dependant resistor (LDR) is used. ✓ (1)
- 5.1.2 The resistance increases when it gets dark. ✓ (1)
- 5.1.3 The safety lamp turns on because when it gets dark, the signal to the transistor becomes high. ✓ The transistor turns on the flow of current which turns on the safety lamp. ✓ (2)
- 5.1.4 The transistor is used as the automatic switch to turn the safety lamp on. ✓ (1)
- [5]**

QUESTION 6

- 6.1 6.1.1 **Resistor 1**
 green in the 1st band = 5 ✓
 orange in the 2nd band = 3 ✓
 red in the 3rd band = 00 ✓
 = 5 300 Ω
 (one mark for 5, one mark for 3 and one mark for 00) (3)
- 6.1.2 **Resistor 2**
 Yellow in the 1st band = 4 ✓
 Green in the 2nd band = 5 ✓
 Orange in the 3rd band = 000 ✓
 = 45 000 Ω
 (one mark for 4, one mark for 5 and one mark for 000) (3)
- 6.1.3 Gold = +- 5% ✓ (1)
- 6.1.4 (a) 1st band 4 = Yellow ✓
 2nd band 7 = Violet ✓
 3rd band 0 = Brown ✓
- (b) 1st band 1 = Brown ✓
 2nd band 5 = Green ✓
 3rd band 00 = Red ✓
- (c) 1st band 8 = Grey ✓
 2nd band 9 = White ✓
 3rd band 000 = Orange ✓ (9)

- 6.2 6.2.1 Motor B. ✓ Lower resistance means higher current, ✓ which means the motor is stronger (has higher torque). ✓ (3)
- 6.3 6.3.1 To store electrical charge in a controlled manner and release it when needed. ✓
- 6.3.2 • The size of the plates. ✓
• The distance between the plates. ✓
• The type of dielectric used. ✓ (3)
- 6.4 • Intercoms ✓
• Warning signals in control rooms. ✓
• Warning devices in cars, doorbells and computer games. ✓
 (Any 2 of the above and other acceptable answers.) (2)

TOTAL SECTION E: 30

GRAND TOTAL: 100