



Subject: Grade 8 Technology
Topic: Technology: Term 2 - Exam 1
Total: 113 Marks

Name: _____
Date: _____

This text refers to question: 1, 2, 3

The Health and Environmental Impact of Plastic Waste in South Africa

1. Approximately 2% of general waste in South Africa is plastic and mostly ends up in landfills. However, the excess of landfill spaces is becoming a major problem. As a result of the types and quantities of harmful compounds present in landfills, as well as their potential for leaching (leaking or soaking) into soil and groundwater, there is growing public health and environmental concern about landfill effects.
2. Government and other stakeholders worldwide aim to minimise the quantity of waste that is land-filled, but this has been difficult to achieve because approximately 90% of South Africa's municipal waste is still land-filled compared to 20%, 37% and 60% in Germany, France and England, respectively.
3. Plastics, are organic chemicals made up of large molecules primarily made from synthetic oil derivatives, and many additives added to the raw material.
4. The plastic materials manufacturing sector is booming, particularly packaging; while only a fraction of its waste is recycled, another fraction is destroyed, and the larger part continues to pollute the environment.
5. However plastic is destroyed or disposed of, it poses a serious challenge in both the short term and the long term to humans and their natural environment if the process is not efficiently managed.
6. South Africa ranks in the top 20 coastal nations globally in terms of the quantity of mismanaged plastic waste, and is a substantial contributor to the pollution of marine life by plastics.
7. Twenty-first century human behaviour continues to escalate activities that result in environmental damage. This calls for environmentally friendly solutions, such as waste recycling and handling, to deal with the increased amount of waste, especially plastics.

Adapted from an Article published online in January 2022 titled "The Health and Environmental Impact of Plastic Waste Disposal in South African Townships: A Review".

Question 1: Text Input

3 marks

South Africa has a long coastline and plastic pollution has a negative impact on ... life in the oceans.

Give your answer as **one word** only.



Question 2: Please Fill In The Blanks

6 marks

Refer to paragraph one to answer this question.

Ninety percent of general waste in (1) ends up in landfills, whereas in (2) 60% of waste ends up in landfills and only 20% in (3) .

Possible Answers: France | South Africa | United States | Germany | England

1	
3	

2	
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Question 3: Please Fill In The Blanks

6 marks

Landfills take up large areas of (1) and harmful compounds from these landfills (2) into the soil and water. This is a worldwide health and (3) concern.

Possible Answers: environmental | ocean | atmosphere | leach | land | flow

1	
3	

2	
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Question 4: Multiple Choice

4 marks

Select the **MOST CORRECT** statement about **columns**.

- | | |
|----------|---|
| A | Columns are only used in certain specialised projects in the construction industry. |
| B | Columns are always under tension from the load they carry. |
| C | Columns are only used horizontally in structures. |
| D | Columns are compressed by the load they carry. |

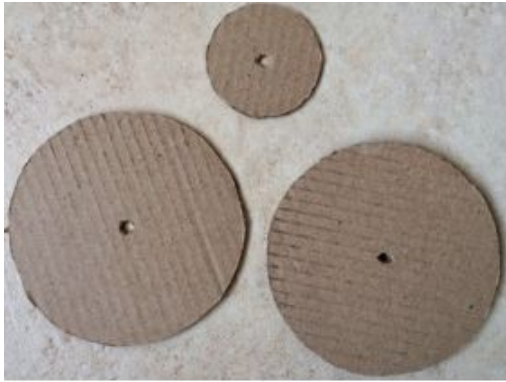
Question 5: Text Input

3 marks

What is the mechanical advantage if a system has an effort force of 400N and a load force of 200N?

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This image refers to question: 6



Step 1: Cut 2 bigger circles and a slightly smaller circle from corrugated cardboard. Make a hole in the centre of every cardboard circle.

MAKING A PULLEY WHEEL.



Step 2 : Sandwich the smaller circle in-between the two larger cardboard circles with glue. Pass a pencil (any axle) through the hole so that the pulley wheel rotates freely.

Question 6: Multiple Choice

4 marks

What is the function of the small centre wheel flanked by the two larger outer wheels?

- | | |
|----------|---|
| A | The small wheel forms a groove to guide the cable or rope of the pulley system. |
| B | The small wheel makes the two larger wheels spin faster. |
| C | The larger wheels form a protection for the small wheel. |
| D | The larger wheels are like gears for the smaller wheel. |

This image refers to question: 7



Question 7: Multiple Choice

4 marks

We use pliers like these to work with wires in Technology. What class of lever are pliers?

- | | |
|----------|----------------------|
| A | first class |
| B | second class |
| C | third class |
| D | They are not levers. |

This image refers to question: 8



Question 8: Text Input

3 marks

Provide a name for the type of structural failure shown in this image.

Note: Your answer must be one word only.

This image refers to question: 9



Question 9: Please Fill In The Blanks

6 marks

This image shows an example of a metal (1) . This L shape is called an (2) iron and is used for (3) bracing and triangulation in large structures.

Possible Answers: cross | side | part | angle | section

1	
3	

2	
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Question 10: Text Input

3 marks

A three dimensional drawing used by an architect or engineer to depict the structure or building at an angle of 30 degrees is called an (...) projection.

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Question 11: True/False

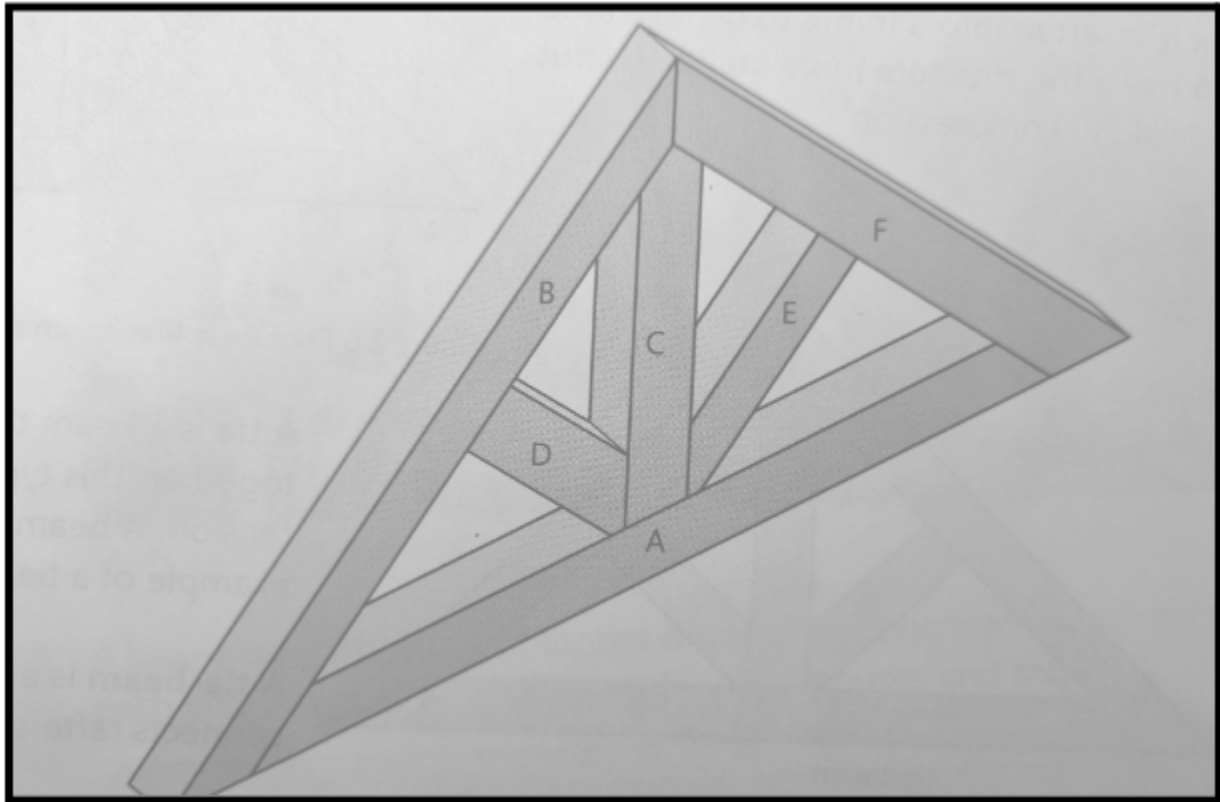
2 marks

All mechanisms are based on 6 simple machines: **the wheel, the pulley, the wedge, the lever, the screw and the inclined plane.**

TRUE

FALSE

This image refers to question: 12, 13



Question 12: Text Input

3 marks

Is the part labelled **C** in this image a **king post** or a **queen post**?

Answer with TWO WORDS only.

Question 13: Please Fill In The Blanks

6 marks

In this drawing of a roof truss, **part A** is called a (1) , **part E** is a (2) and **part F** is called a (3) .

Possible Answers: tie-beam | king post | rafter | attic post | strut | principal rafter

1	
3	

2	
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This text refers to question: 14, 15, 16**Negatives of Technology in Our Lives**

Adapted from an article by Christine Romans

As much as we appreciate technology for the convenience it brought to our lives, several aspects of it have impacted our society negatively in more ways than one.

1. Technology Causes Health Problems.

As technology advances, we are connected now more than ever, and it has become a huge part of our lives. That's why it's possible for technology to impact our physical health negatively. These physical health problems can be severe. Apart from creating unhealthy sleeping patterns, electronic devices can cause digital eye strain, poor posture, and increased inactivity, leading to health problems like obesity. Nevertheless, you can avoid most of them by creating healthy tech habits instead of bad ones. Taking regular breaks from these devices can help you avoid these health problems.

2. Technology Creates Job Insecurity

Job loss and downsizing are two significant adverse effects of technology. Because of advances in the tech field such as AI integration, automating and accomplishing tasks have become easy. Many low-skilled employees, like factory workers and cashiers, will be replaced. Machines can now carry out tasks that only humans could do so far, which creates a massive shortage of jobs.

3. Tech Products Lack Longevity

Technology grows incredibly quickly, so the digital devices and gadgets that we use have a short lifespan and become outdated in a matter of months. Since these devices are so important in our daily lives, we need to maintain and upgrade them regularly or they become outdated and pushed aside by newer, more advanced versions. This can lead to unnecessary e-waste. Instead of throwing your older devices away or tossing them in the cupboard, you can resell the items or recycle the parts.

4. Technology Spawns Misinformation and Fake News

The spread of misinformation and fake news online is nothing new. In fact, it has been going on for many years. However, with all the developments that happen so frequently in technology, it has become harder to define what's true and what's not. Since so many people cannot tell what information is factual and what isn't, it creates a lot of skepticism and misunderstanding about important topics. This can be especially harmful when it comes to political issues and trusting the media.

5. In conclusion:

Overall, technology is amazing, and it has changed the world for the better, from improving our daily lives to building better businesses. The majority of the adverse effects of technology stem from its misuse. The

way we choose to utilise technology can help or harm ourselves and others. Instead of blaming the tool, we need to use technology in a healthy, more disciplined way. By doing this, technology can continue to benefit our lives.

Adapted from: <https://www.makeuseof.com/effects-of-technology-on-life/>

Question 14: Please Fill In The Blanks

6 marks

Modern technological devices are continually being (1) which results in previous models becoming (2) and then they are (3).

Possible Answers: discarded | decomposed | decreased | upgraded | outdated | automated

1	
3	

2	
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Question 15: True/False

2 marks

According to this article, using technology can cause health problems such as obesity.

TRUE

FALSE

Question 16: True/False

2 marks

Technology is not the problem, it is the way we use technology that makes it harmful.

TRUE

FALSE

Question 17: Text Input

3 marks

Calculate the gear ratio if the driver gear has **30 teeth** and the driven gear has **90 teeth**.

Note: Write your answer as a simplified ratio.

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Question 18: Text Input

3 marks

Due to advances made in technological processes, the amount of greenhouses gases being emitted is reduced and this will hopefully lead to less ... warming.

Give your answer as **one word** only.

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Question 19: Multiple Choice

4 marks

Which of these facts about **reinforcing materials** is **correct**?

- | | |
|----------|---|
| A | Concrete is reinforced with wooden rebars to make it last longer. |
| B | Structures are reinforced to ensure they are aesthetically pleasing. |
| C | The reason why materials used in large structures must be reinforced, is that there are static and dynamic forces acting on the structures. |
| D | The number of layers glued together in a plywood panel depends on the availability of wood. |

Question 20: True/False

2 marks

You must present the mine headgear model and tender to the mining company during the **investigation** stage of the design process.

TRUE	FALSE
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Question 21: Please Fill In The Blanks

6 marks

An engineer designing a structure must consider three important things to prevent structural failure: the weight of the (1) itself, the weight of the (2) it will carry and the force of the (3) passing through the area.

Possible Answers: wind | structure | rain | load | force | features

1		2	
3			

Question 22: Text Input

3 marks

Two gears meshed together are called ... gears.

Use ONE word to complete the sentence.

Question 23: Text Input

3 marks

A shelf in your kitchen or bedroom that needs to carry a heavy load should rather be made from plywood to help it resist the ... force.

(One word answer)

This image refers to question: 24



Question 24: True/False

2 marks

This bridge has been photographed from beneath the deck. It is a beam and column bridge.

TRUE

FALSE

Question 25: Please Fill In The Blanks

6 marks

Thin plastic shopping bags are banned in South Africa as we cannot (1) the bags because they break easily. Legislation was introduced to ensure that shopping bags are thicker as they can then be used again. We can also (2) the thicker plastic bags which are then broken down into pellets to make other plastic products. If alternative bags made from material or paper are used, then this will (3) the amount of plastic bags being used and thrown away.

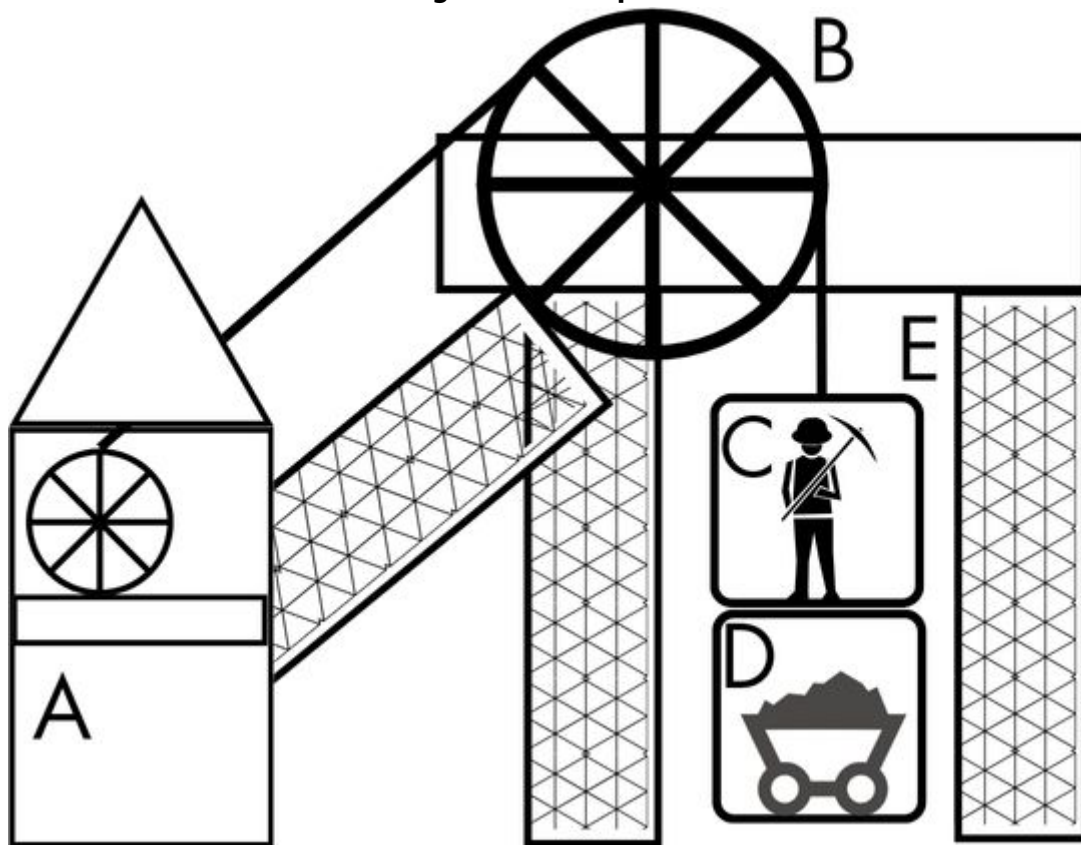
Possible Answers: reduce | recycle | reclaim | repair | reuse

1

2

3

This image refers to question: 26



Question 26: Multiple Choice

4 marks

Which part of the mining headgear tower carries the load and people?

A] Winch house B] Sheave Wheel C] Passenger Lift D] Skip Lift E] Elevator Shaft

- | | |
|----------|---------|
| A | A and B |
| B | C and D |
| C | A and E |
| D | B and E |

Question 27: Please Fill In The Blanks

4 marks

The **two factors** which form the basis of the design of a typical electrical pylon are cross-bracing and (1) . This helps to (2) the structure so it can withstand rain, high winds and small earthquakes.

Possible Answers: weaken | dynamic | strengthen | triangulation

1		2	
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Question 28: Multiple Choice

4 marks

What is the mechanical advantage of a system if the load force is 300N and the effort force is 100N?

A	3000
B	30
C	1/3
D	3

This text refers to question: 29, 30

Good Things about Plastic that Help the Environment

In discussions about environmental problems, the topic of plastic is usually one of the first things to come up. It's true that plastic waste is a major problem plaguing landfills and oceans the world over. However, when used correctly and thoughtfully, plastic and the environment can live in happy harmony. Check out some of the good things about plastic that can help us take better care of our planet.

1. Reduced Weight, Increased Fuel Economy

Plastic components are being used increasingly often in new vehicles, mainly because they help make our vehicles safer. However, because plastic is also much lighter than traditional materials like metal and glass, the internal components don't have to work as hard to move the vehicle's weight forward. This means greater fuel economy and less fossil fuel usage.

2. Reduced Packaging

Because plastics are light and sturdy, product packaging has become more streamlined. Lids are getting smaller and packages are getting lighter, so when trucks don't have as much weight to transport, they don't use as much fuel!

3. Lower Impact than Paper

While paper products degrade (decompose) much faster than plastic, they also require a vast amount of natural resources to create. Many trees and a significant amount of water and energy are needed to produce paper products, and the manufacturing process creates a lot of waste that can be difficult to remove. While plastics also require resources and energy to be created, they make up for it by being easier to recycle and having a far longer lifetime.

4. Energy Savings

Along with vehicle construction, plastics are also being frequently used as building materials for both commercial and residential properties. Plastic windows and other building parts can filter UV rays in order to keep buildings cool in the summer while also locking in heat to keep them warm in winter. This means it takes less money and energy to keep our homes and workplaces comfortable, which contributes to a reduced environmental footprint.

5. Strength and Durability

Because plastic is resistant to corrosion, impact, UV rays and many other environmental factors, it doesn't have to be replaced as often as other materials. Whether it's used for components in a piece of machinery, underground sewage piping or a reusable water bottle, it can help save time and expense by reducing the need for maintenance and replacement.

6. How can you help?

Plastic use can be reduced; but plastic can also be reused and recycled,(both up-cycled and down-cycled).

7. SA's first Eco-friendly Plastic Road:

Motorists have been able to make use of South Africa's first and only plastic road since March, 2020, in Jeffrey's Bay in the Kouga Municipality. The project aimed at recycling thousands of kgs of plastic to create a sustainable road that will last longer. The Kouga Municipality is the first to trial the concept of a plastic road, made from recycled plastic materials broken down into pellets. The road is expected to last much longer than conventional tar roads and save money in upkeep (maintenance).

8. There has been talk of opening a factory in Kouga and spreading the plastic road trend throughout South Africa. A new factory in the area could resolve South Africa's general road upkeep problem as well as create jobs and use plastic in a positive and sustainable way. Roughly 1500kg of plastic is used to complete just 1 km of road, this is equal to 1.8-million plastic shopping bags.

Adapted from:

<https://www.acplasticsinc.com/informationcenter/r/good-things-about-plastic>

<https://www.capetownetc.com/cape-town/sas-first-plastic-road-officially-opens/>

Question 29: True/False

2 marks

According to this article, plastic always has a negative impact on the environment.

TRUE

FALSE

Question 30: Multiple Choice

4 marks

Plastic is an energy saver because it ...

- | | |
|----------|--|
| A | allows UV rays to enter a building and this keeps it cool. |
| B | does not decompose in landfills. |
| C | corrodes and breaks down easily. |
| D | is lighter to transport from a factory to the shops. |

Total: 113 Marks