



MASIBAMBISANE HIGH SCHOOL

GRADE 10

LIFE SCIENCES

SEPTEMBER 2022

PRACTICAL TASK 3

EXAMINER: MS KAMBI

MODERATOR: MRS MGUBANTO

MARKS: 30

TIME: 1 HOUR

GRADE 10

SURNAME.....

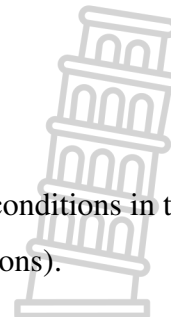
NAME.....

GRADE 10.....

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions:

1. This is a formal SBA task and needs to be done under supervised conditions in the classroom.
2. Each learner completes this task on his/her own (under test conditions).
3. Present your answers per the instructions of each question.
4. Draw all diagrams in pencil and labels in blue/black ink.
5. The diagrams in this task may NOT be drawn to scale.



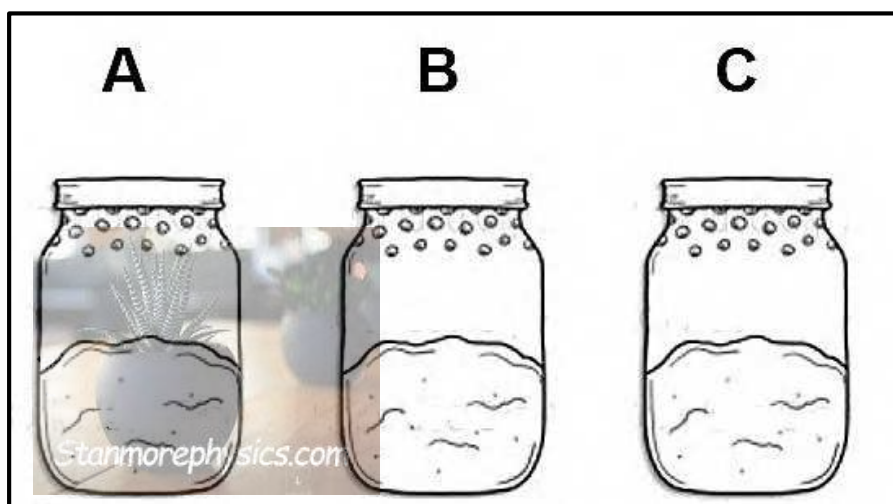
BACKGROUND INFORMATION

The biosphere is the thin layer of land, air and water around the earth's surface that supports life. The abiotic, or non-living, portion of each ecosystem in the biosphere includes the flow of energy, nutrients, water, and gases and the concentrations of organic and inorganic substances in the environment. The biotic, or living, portion includes organisms based on their methods of acquiring energy: the primary producers, largely green plants; the consumers, which include all the animals; and the decomposers, which include the microorganisms that break down the remains of plants and animals into simpler components for recycling in the biosphere.

Ecological pyramids are a graphical representation in the shape of a pyramid to show the feeding relationship of groups of organisms, and the flow of energy or biomass through the different trophic levels in a given ecosystem.

QUESTION 1: ABIOYIC FACTORS

Grade 10 learners carried out an investigation to determine the water content, permeability to water and humus, content of different soils in the school grounds. Three samples were collected (**A**, **B** and **C**), from different places on the grounds then analyzed.



The results are shown in the table below.


Factor analysed	Soil samples		
	A	B	C
Water content (%)	30	10	60
Permeability (ml of water passing through 100 g soil)	20	50	05
Humus content (%)	25	05	10

1.1 According to the results above, which sample (**A**, **B** and **C**) is:

- (a) Sandy? _____ (1)
- (b) Clay? _____ (1)
- (c) Loam? _____ (1)

1.2 Which ONE of the three soils would most easily become water-logged? _____ (1)

1.3 Explain why plants will wilt quickest in sample **B**. (2)

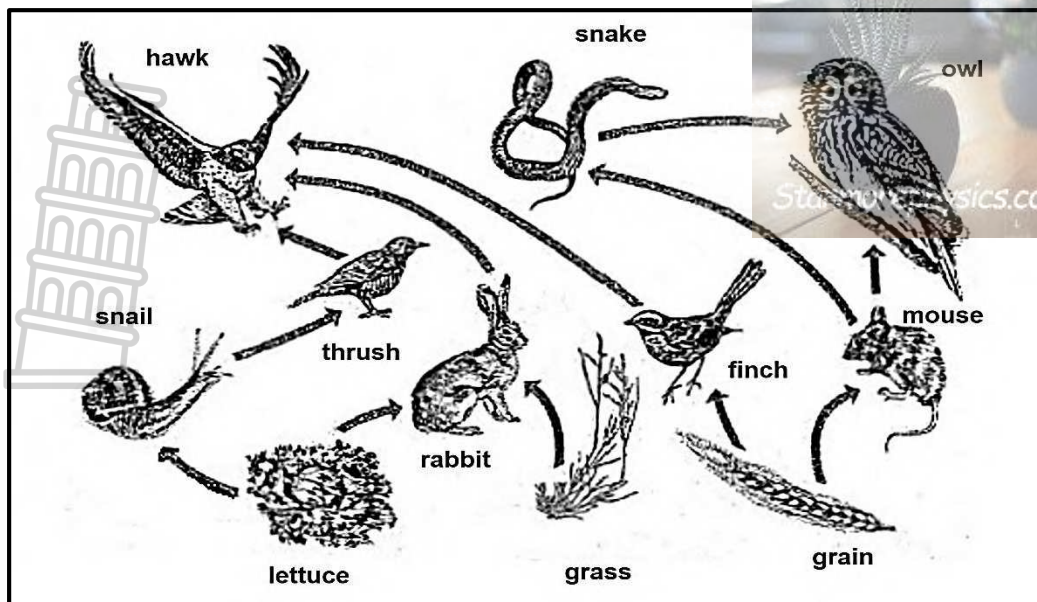


1.4 Draw a bar graph in same axis to illustrate the results of the **water** and **humus** found in the three soil samples. (6)



1.5 State ONE way in which the grade 10 learners can improve the reliability of their investigation. (1)

(13)



2.1 What do the arrows in the food web represent? (1)

2.2 Give the name of ONE organism that is found in the trophic level containing the most amount of energy. (1)

2.3 Give the name of the TWO tertiary consumers. (2)

2.4 From the above food web formulate one food chain with four trophic levels. (2)

2.5 Explain why a food web is more beneficial for an ecosystem than a single food chain. (2)



(8)

The Fynbos biome.

Many fynbos species are typically confined to acidic, nutrient-poor sandstone soils. 5000 species are not found anywhere else in the world; many are rare and some 1700 species exist on the edge of extinction.

Fynbos vegetation found in nutrient poor sandstone soils can be divided into 4 plant species

- proteas – 330 species
- ericas – 600 species
- reed-like plants – 310 species
- bulbous herbs – 1400 species

3.1 Give the correct term of organisms that are not found everywhere in the world but can be found in a particular area. (1)

3.2 Draw a table, using the information in the extract of the **numbers** of plant species of fynbos found in South Africa. (5)



3.3 Calculate the percentage of the total number of 1100s species that are bulbous herbs.

Show all your working.

(3)



(9)

GRAND TOTAL: 30



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Practical Task Term 3

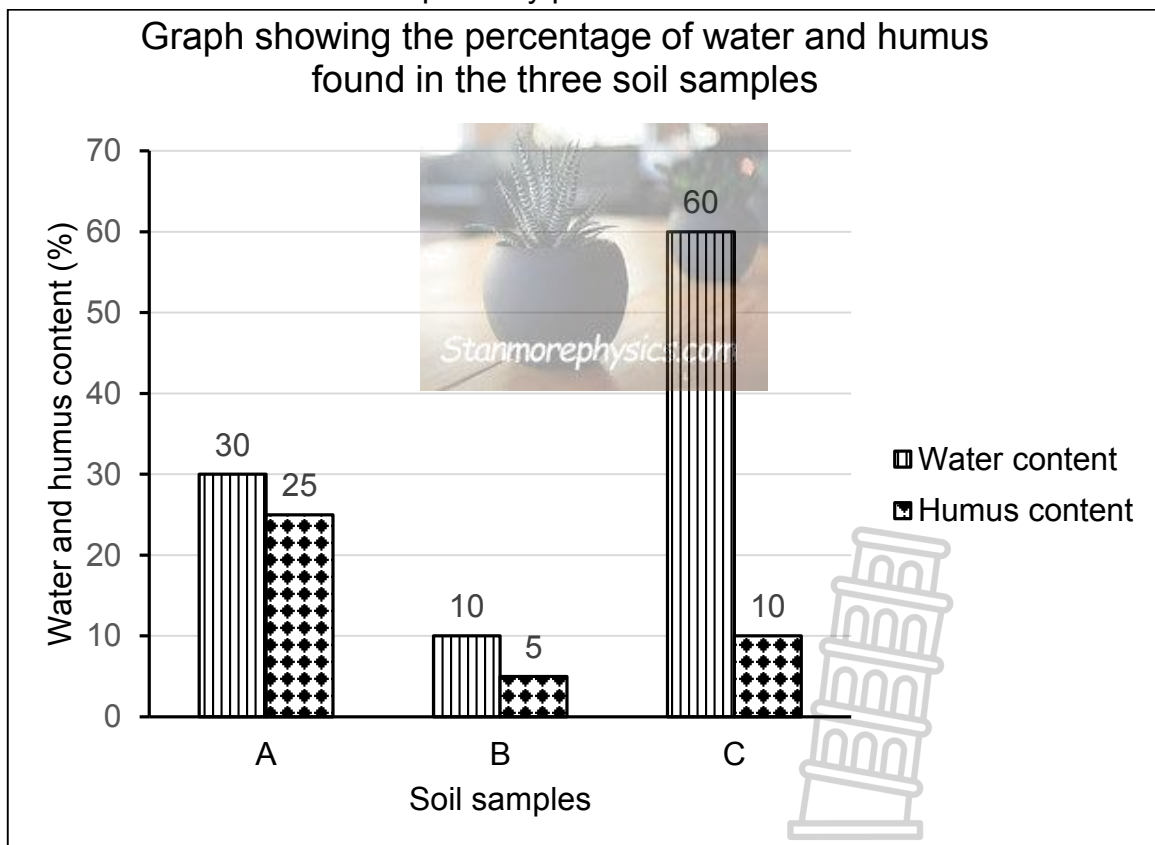
Marking Guideline

Total	
	30

QUESTION 1: Abiotic factors

- 1.1 (a) B✓ (1)
 (b) C✓ (1)
 (c) A✓ (1)
- 1.2 C✓ (1)
- 1.3 – It contains the least water✓ since most water passes through it✓
OR
 – It does not retain water✓ because soil easily becomes dry and less water is available for uptake by plants✓ (2)

1.4



Rubric for assessment of the graph

Criterion	Mark Allocation
Correct type of graph (T)	1
Caption for graph (C)	1

Correct label for X		1
Correct label and unit for Y-axis (%) (L)		
Equal width and interval of bars		
Correct scale for Y-axis (S)	1	
Required bars drawn (N)	1	Only REQUIRED bars drawn
Drawing of bars (B)	1	All 6 REQUIRED bars drawn correctly

NOTE:

If the wrong type of graph is drawn: marks will be lost for 'correct type of graph'.
 If a line graph is drawn marks will also be lost for drawing of bars.
 If axes are transposed: marks will be lost for labelling and scaling of X-axis and Y-axis

(6)

- 1.5 – Repeat the investigation✓
 – Increase the number of soil samples taken✓

Mark first ONE only

Any 1

(1)
(13)

QUESTION 2: Food webs and energy flow

2.1 Energy flow from one organism to another✓

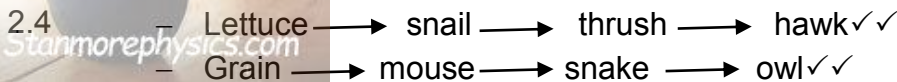
(1)

2.2 Lettuce✓/grass/grain

(1)

- 2.3 – hawk✓
 – owl✓

(2)



NOTE: no marks are awarded if the arrows are not included or facing the wrong direction

(2)

- 2.5 – More than one food source ensures that when one food source decreases✓
 – The ecosystem can still sustain itself ✓over time
 – Reflecting a stable/balanced ecosystem✓

Any 2

(2)
(8)

QUESTION 3: Biomes of South Africa

3.1 Endemic ✓

(1)

3.2 Table showing the number of fynbos plant species in South Africa.

Name of plant species	Number of species
Proteas	330
Ericas	600
Reed-like plants	310
Bulbous herbs	1400

Rubric for assessment of the table

Criteria		Mark allocation
Heading	(H)	1
Drawing of table with outer and inner lines (T)		1
Column headings	(C)	1
Data	(D)	1: 1 – 7 correct 2: All 8 correct

(5)

3.3. (330 + 600 + 310 + 1400 = 2640)

$$\frac{1400}{2640} \times 100 = 53\% \text{ or } 53.03\%$$

(3)

(9)

TOTAL: 30



Practical Task 1

Weighting: Practical Skills

Practical Skills						
Follow instructions	Handle equipment	Make observations	Draw a diagram	Calculation	Interpret	Design/Plan
✓		✓	✓	✓	✓	✓

Weighting: Cognitive Levels & Levels of Difficulty

Question	Cognitive Levels				Levels of Difficulty			
	Level A Knowledge	Level B Understanding	Level C Application	Level D Evaluate, analyse & synthesize	Easy	Medium	Difficult	Very difficult
1.1 (a)			1			1		
1.1 (b)			1			1		
1.1 (c)			1			1		
1.2				1		1		
1.3		2					2	
1.4	1	2	3			6		
1.5			1					1
2.1	1				1			
2.2		1				1		
2.3		2				2		
2.4		2				2		
2.5				2			2	
3.1	1					1		
3.2	1		4		1		4	
3.3		3				3		
Total	4	12	11	3	2	19	8	1
Percentage	13	40	37	10	6	64	27	3