Sustainable Schools

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Name of School	

Subject	**Examiner**
Life Sciences	
Date	**Total marks**
	60
Type	**Duration**
Practical Task Term 3	
Grade	**Moderator**
10	

Special Instructions/Equipment

This Practical Task aims to take learners out of the classroom. They need to engage with their environment and be aware of what is happening around them. The task also integrates the concepts of biodiversity in relation to abiotic and biotic factors and their interactions, the trophic relationships in an ecosystem and the biodiversity within the. environmental interactions and interdependence. Learners must make clear decisions on selecting a plot; measure, observe, collect data, think out of the box and identify social-ecological challenges and threats to their ecosystems and organisms within their ecosystem. They need to suggest solutions on how to address these challenges and threats.

The task can be used as a formal assessment practical task for term 3. Remember, for a formal practical task, learners work alone. Use the memorandum/rubric to assess this task.
For additional resources on Biodiversity, search for the following resources on the Nature Connect website:

- Biodiversity Network Guidebook
- My School's Biodiversity (Audits)

Equipment and resources:

- Identification guides and keys to groups of organisms
- Access to an ecosystem (Preferably on school grounds).
- Map of South Africa
- Appropriate instruments for measuring abiotic factors.

Instructions: Use Report Rubric to mark learners' reports.

CAPS Link

Biosphere to Ecosystems – Week 1 - 6 Term 3

Sustainable Schools

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LIFE SCIENCES

PROJECT: ENVIRONMENTAL STUDIES

GRADE 10 **TERM 3**

MARKS (60)

Instructions:

- Read the task carefully before you attempt to answer the questions.
- When collecting a leave or flower specimen, two examples are enough.
- Do not touch or harm any animal, including insects, spiders and other living organisms in your study area.
- Look at the Appendixes for more information on different ecosystems.
- This practical task consists of
    - Task 1: Background information
    - Task 2: Methods and observations.
- Make a front cover for your report. Your front cover should include the following information
    - Name and surname
    - Grade and class
    - The title of your report
- Please look at the rubric to see how you will be assessed on the research of your task.

Task 1: Background Information

You need to do research on the biome where you live/will be visited before you are going to do the fieldwork.

1.1 Write a summary that will include the name of the biome you live in. (Or where you will conduct your fieldwork research). Do research on your biome and identify the type of plants, animals and climate that is typical of your biome. Ensure that you define the following terminology: biome, ecosystem, physiographic factors, biotic and abiotic factors. Write this information in your report. (11)

1.2 What do you think are the positive and negative human impacts on the ecosystem? (2)

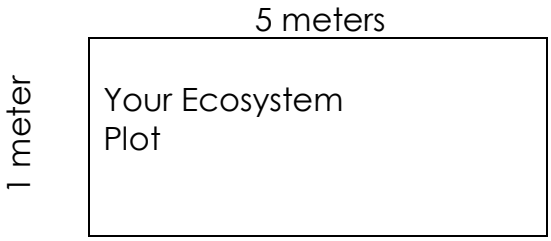
1.3 You need to write a reference list at the end of your report, including all the names of the books and authors you have used. Do research on how to do in-text referencing as well as a reference list

[13]

Task 2: Investigate an ecosystem in your school grounds or your garden

2.1. Choose an ecosystem on your school grounds, in your garden or in another safe location. It can be on the beach, a park, a sports field, the area around a tap, a fishpond, a school garden or a compost heap.

2.2. Measure a plot that you would like to study and secure the corners with pegs. The plots size can vary from 1 meter (5 m x 1m) to 10 meters by 10 meters (10 m x 10 m)



2.3. Look around your ecosystem well without damaging, moving or disturbing anything.

2.4. Identify what type of ecosystem your study area classifies as.

2.5. Focus your investigation on your ecosystem's main living (biotic) organisms and non-living (abiotic) elements. Research what plants and animals live in this type of ecosystem and how they interact with each other.

2.6. Study your ecosystem carefully and make notes in your workbook. Sit in your study area and observe and note everything you see.

2.7. Write down a description of your ecosystem, including the following points:

i. Location of the ecosystem (where is it and what is around it) (1)
ii. Size of the ecosystem (1)
iii. Main features, such as a road, a path, large trees, grouping of plants, rocks, type of plants, birds, animals, etc. (2)

2.8. Draw a map of your ecosystem. Include the following on your map:

i. Heading (1)
ii. Labels of main features of your ecosystem (1)
iii. An arrow to indicate north (1)
iv. A scale bar (1)

2.9. Take a photo of your ecosystem or make a drawing of your ecosystem.(1)

[9]

Task 3: Biotic Factors

3.1 Plants

Study the plants in your ecosystem.
Identify TWO plants in your ecosystem. Make use of field guides. Copy the table below and record this information. (4)

Scientific Name	General Name

3.2 Insects

- Observe as many insects as possible from the air, bush, grass and ground in your ecosystem.
- Count how many of each type you have observed.
- Make use of field guides and identify the insects.
- Copy the table below and record this information.

Insect	Number	What they feed on	Type of consumer

(Two marks per correctly completed row) (4)

3.3 From your observations:

- Draw a food chain that could exist in your ecosystem; include the insects and other organisms that you have observed.

- Indicate the trophic level of each organism in your food chain.

Criteria	Mark allocation
Drew a food chain	1
Arrows in food chain correct	1
Food chain starts with a producer	1
All organisms used in food chain occur in ecosystem	1
Indicated the trophic level of each organism in food chain	1

3.4 Draw a table of all the biotic components studied in your ecosystem under plants and insects and include the following information in your table:

- Name of organism
- Scientific name of organism
- Food source
- Tropic level
- Number of each organism observed, except for producers.
- The following rubric will be used to assess your table.

Criteria	Mark allocation	
Heading	Incomplete/Absent Complete (both variables)	0 1
Descriptive column headings	Incomplete/Absent Complete	0 1
Descriptive row headings	Incomplete/Absent Complete	0 1
Format of table	Table completely drawn	1
Data entered in the table	All correctly placed	1
Total		**5**

3.5 Draw a bar graph of the different arthropods and the number of each observed. This graph should be recorded in your report. The following grid will be used to assess your graph

Criteria	Mark allocation
The correct type of graph	1
Suitable heading describing both variables and types of graph	2
Bars equal size and spacing equal	1
Suitable scale on y-axis (vertical) Labelling y-axis (vertical)	1
Plotting of bars (all bars correct)	2
Total	**7**

3.6 List and describe each of the abiotic factors in your ecosystem. (2)

3.7 Describe how the abiotic factors of the ecosystem affect the plants and animals. Think about the behaviour of the organisms and their structure. (5)

3.8 Name, count and describe your ecosystem's plants and animals (biotic factors). Use a field guide to help you identify the plants and animals. Record your answers in a table like the one below. (8)

Plants	Animals			
	Herbivore	Carnivore	Omnivore	Decomposers

3.9

a) Identify the human interference in the area, for example, litter, pathways, or evidence of plants that have been cut down. (2)
b) Describe the effect of human interference on your ecosystem. (2)

3.10 In your own words, explain what is meant by **biodiversity.** (2)

3.11 Discuss how human interference has affected the biodiversity of your ecosystem. (4)

FINAL REPORT: Write a report on your findings

- Make a Cover Page for your report that includes the following information
    - Your Name and Surname
    - Grade and Class
    - Study area location
    - Type of ecosystem
    - Date of observations
- Read the Rubric below carefully and write your report accordingly.
- Make sure that you include the correct headers and question numbers.
- Remember to include a Reference list.

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Report Rubric

	Mark Allocation
Formatting of Report	
Cover page with name, surname, grade	/2
Reference • At least four references (1) • References listed at the end of the report with header "References".(1) • References are correctly written (2). • Include rough work and written observation in the back of report	/4
Report neat and well structured	/1
Each section has the correct heading	/1
	/8
Task 1: Background Information	
Heading: Summary A summary that will include the name of the biome you live in. (1) Identify the type of plants, (2) animals (2) and climate that is typical of your biome (2). Ensure that you define the following terminology: biome (1), ecosystem (1), physiographic factors (1), biotic and abiotic factors (1).	/11
Heading: Positive and negative human impacts on the ecosystem.	/2
	/13
Task 2: Investigate an ecosystem in your school grounds or your garden	
Heading: Description of ecosystem Write down a description of your ecosystem, including the following points: • Location of the ecosystem (where is it and what is around it) (1) • Size of the ecosystem (1) • Main features, such as a road, a path, large trees, grouping of plants, rocks, type of plants, birds, animals, etc. (2)	/4

Heading: Map /4

Draw a map of your ecosystem. Include the following on your map:

a) Heading (1)
b) Labels of main features of your ecosystem (1)
c) An arrow to indicate north (1)
d) A scale bar (1)

Heading: Photo or Drawing /2

Take a photo of your ecosystem or make a drawing of your ecosystem

/10

Task 3: Biotic Factors

Heading: Plants /4

Identify TWO plants in your ecosystem. Make use of field guides. Copy the table below and record this information

Scientific Name	General Name
(1)	(1)
(1)	(1)

Heading: Insects /4

Observe, count and identify the insects. Copy the table below and record this information.

Insect	Number	What they feed on	Type of consumer

(Two marks per correctly completed row)

Heading: Food chain /5

Draw a food chain that in your ecosystem.

Criteria	Mark allocation
Drew a food chain	1
Arrows in food chain correct	1
Food chain starts with a producer	1
All organisms used in food chain occur in ecosystem	1
Indicated the trophic level of each organism in food chain	1

Heading: Biotic components of my ecosystem. /5

Draw a table of all the biotic components studied in your ecosystem under plants and insects and include the following information in your table:

- Name of organism
- Scientific name of the organism
- Food source
- Tropic level
- Number of each organism observed, except for producers.
- The following rubric will be used to assess your table.

Criteria	Mark allocation	
Heading	Incomplete/Absent Complete (both variables)	/1
Descriptive column headings	Incomplete/Absent Complete	/1
Descriptive row headings	Incomplete/Absent Complete	/1
Format of table	Table completely drawn	/1
Data entered in table	All correctly placed	/1

Heading: Bar Graph of the different arthropods and the number of each observed. /7

Criteria	Marks
Correct type of graph	1
Suitable heading describing both variables and types of graph	2
Bars equal size and spacing equal	1
Suitable scale on y-axis (vertical) Labelling y-axis (vertical)	1
Plotting of bars (all bars correct)	2

Heading: The abiotic factors in my ecosystem. /2

1 mark per entry

Heading: The biotic factors in my ecosystem. /2

Plants	Animals			
	Herbivore	Carnivore	Omnivore	Decomposers

1 mark per entry

Heading: Human interference /2

Heading: Effects of human interference /2

Heading: Biodiversity /2

Heading: Affects of human interference on biodiversity /4

[39]

TOTAL **[60]**

Appendix A: Examples of organisms in your ecosystem.

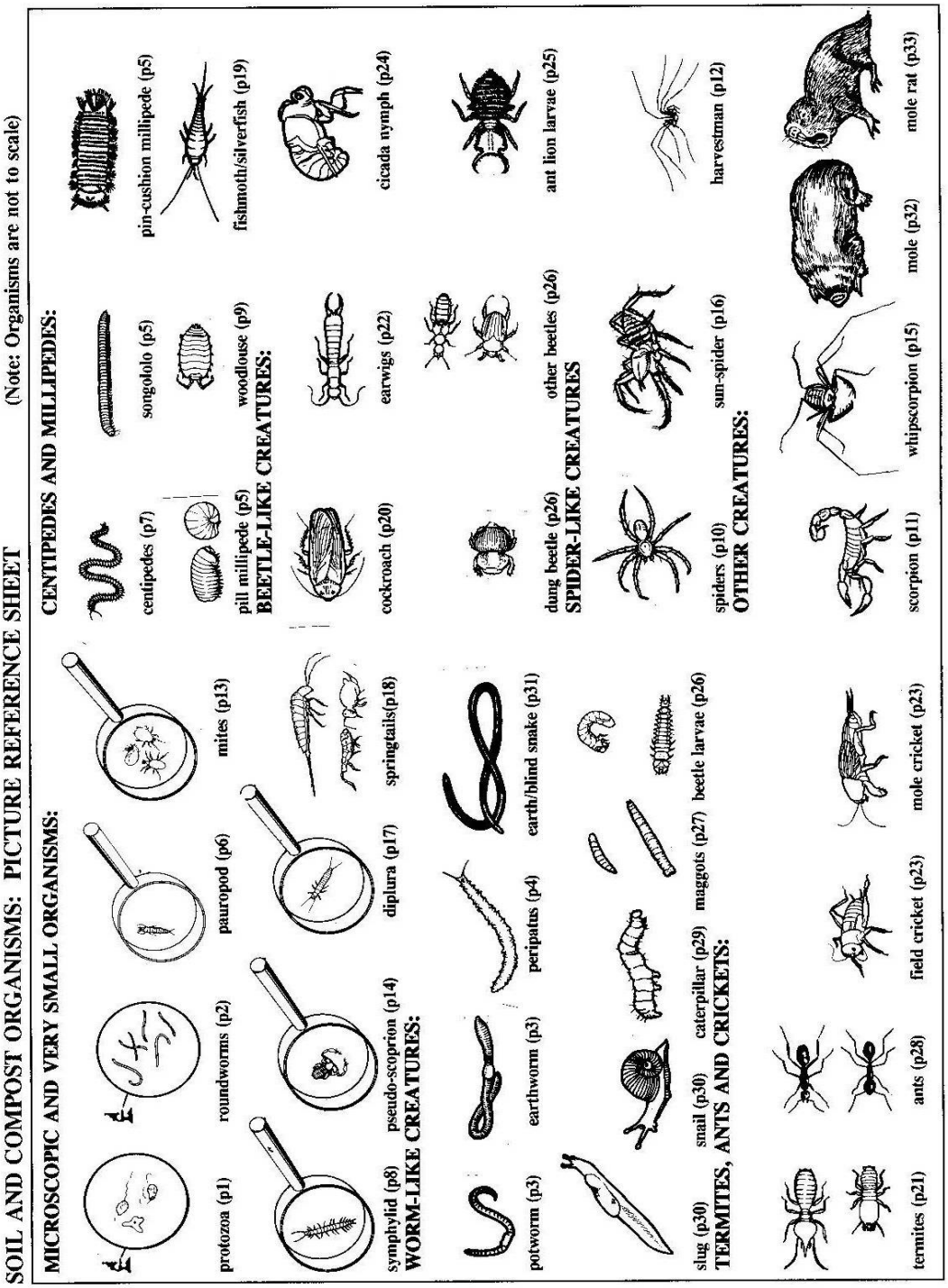

Figure 1: Soil and Compost Organisms - Available at: https://docs.google.com/document/d/1CxpNMp9h_NmdycFByWTfEd7fjp4vXlBP/edit?usp=sharing&ouid=104214709973770054707&rtpof=true&sd=true

For more information on the birds in your area please visit: SA Birding at: http://www.sabirding.co.za/rmm/tour/id.htm and https://southafrica.co.za/south-africa-bird-guide.html