Sustainable Schools

Powered by NATURE CONNECT

Name of School

Subject	**Examiner**
Natural Sciences and Technology	
Date	**Total marks**
	30
Type	**Duration**
Practical Task Term 1	
Grade	**Moderator**
8	

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 going on around them. The task also integrates the concepts of biodiversity in relations to 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 1. 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:

- My school's Biodiversity
- Biodiversity New Guidebook
- School Biodiversity lesson

Nature Connect also has a lesson plan that you can use to introduce the topic of Biodiversity to your class.

- Biodiversity - Lesson plan for Evaluation

CAPS Link

Interactions and interdependence within the environment – Week 7 - 9 Term 1

Skills Developed

Accessing and recalling information, Observing, Measuring, Sorting and classifying, Investigating, Recording information, and Language Skills.

Specific Link and alignment with other Subject Assessments include:

- Home Language – Term 2 June Exam Paper 3 – Biodiversity
- Geography – Term 1 Task – Map Skills and the introduction of Biodiversity

Sustainable Schools

Powered by NATURE CONNECT

NATURAL SCIENCE AND TECHNOLOGY

FORMAL ASSESSMENT PRACTICAL TASK

GRADE 8 **TERM 1**

MARKS (30)

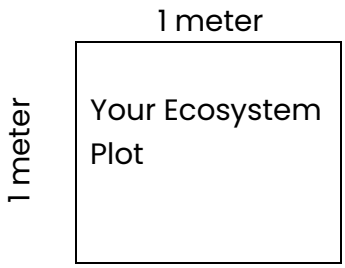
Instructions:

- 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
    - Activity 1: Research Phase
    - Activity 2: Writing a report.
- Make a front cover for your report. Your front cover should include the following information
    - Name and surname
    - Grade and class
    - Name of your two Green Careers
- Once you've conducted your research, answer Questions 1 to 17 of the project question on an exam pad. Add your Project Cover.

Activity 1: Investigate an ecosystem in your school grounds or your garden

1. Choose an ecosystem on your school grounds or in your garden. It can be a sports field, the area around a tap, fishpond, school garden or a compost heap.

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



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

4. Focus your investigation on the main living (biotic) organisms and non-living (abiotic) elements in your ecosystem. Do some research as to what plants and animals live in this type of ecosystem and how they interact with each other.

5. Study your ecosystem carefully and make notes in your workbook. Sit in your study area and observe and make notes of everything that you see.

6) List and describe each of the abiotic factors in your ecosystem. For a period of one week, observe and record the following observations in a **table** each day:

   a) The amount of sunlight during the day. Is there full sun, half sunlight or complete shade? (3)

   b) Water: is there any source of water in the area, such as a stream or a tap? Has it rained? (2)

   c) Wind: describe the wind. Is it strong or gentle? Is your ecosystem protected from or exposed to wind? (2)

   d) Temperature: use the thermometer to measure the temperature and record it in your table. (3)

   e) Soil type: describe the colour of the soil. Is it sandy, clayey or loamy? Is it dark or light? (2)

   f) Slope: Is it light or dark?

	Monday	Tuesday	Wednesday	Thursday	Friday
Sunlight					
Water					
Wind					
Temperature					
Soil Type					
Slope					

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)

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

Learners: Complete the final version of the Task				
Plants	Animals			
	Herbivore	Carnivore	Omnivore	Decomposers

9) Describe the relationships (such as feeding relationships) that also make up the biotic factors in the ecosystem. (5)

10)
   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)

11) Study a small sample of soil from your ecosystem with a hand lens.
   a) Identify any remains of plants or animal in the soil (2)
   b) Is the soil suitable for plant growth? Give a reason for your answer (2)

Activity 2: 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 questions below carefully. Answer the questions on your exam pad or as instructed by your teacher.
- Make sure that you number your questions correctly & Submit your findings in a report format.

1. Use your textbook and dictionary to define the following terms
   a) Ecosystem
   b) Biotic
   c) Abiotic

d) Investigate
e) Observation
f) Herbivore
g) Carnivore
h) Omnivore
i) Food web
j) Biodiversity
k) Threat
l) Urban ecosystem

2. What type of ecosystem did you investigate? (1)

3. Name the location of your ecosystem. (1)

4. List and describe each of the abiotic factors in your ecosystem. For a period of one week, observe and record the following observations in a **table** each day: (12)
   c) The amount of sunlight during the day. Is there full sun, half sunlight or complete shade? (2)
   d) Water: is there any source of water in the area, such as a stream or a tap? Has it rained? (2)
   e) Wind: describe the wind. Is it strong or gentle? Is your ecosystem protected from or exposed to wind? (2)
   f) Temperature: use the thermometer to measure the temperature and record it in your table. (2)
   g) Soil type: describe the colour of the soil. Is it sandy, clayey or loamy? Is it dark or light? (2)
   h) Slope: Is it light or dark? (2)

	Monday	Tuesday	Wednesday	Thursday	Friday
Sunlight					
Water					
Wind					
Temperature					
Soil Type					
Slope					

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)

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

Learners: Complete the final version of the Task				
Plants	Animals			
	Herbivore	Carnivore	Omnivore	Decomposers

9. Describe the relationships (such as feeding relationships) that also make up the biotic factors in the ecosystem. (5)

10. Draw a food chain of your ecosystem. Include herbivores, carnivores, scavengers or decomposers. (4)

11. Evaluate your ecosystem's biodiversity. Is your ecosystem biodiverse? Provide a reason for your answer. (2)

12. Suggest two ways to increase the biodiversity of your ecosystem. (2)

13 a) Identify the human interference in the area, for example litter, pathways, or evidence of plants that have been cut down. (2) (4)
b) Describe the effect of human interference on your ecosystem. (2)

14. Identify two possible threats to your ecosystem. (2)

15. Provide two possible solutions to overcome these threats. (2)

16. How do these identified threats affect the biodiversity of your ecosystem? (1)

17. Why is biodiversity within an ecosystem important? (1)

TOTAL [50 X 0.60 = 30 marks]

Appendix A: Examples of organisms in your ecosystem.

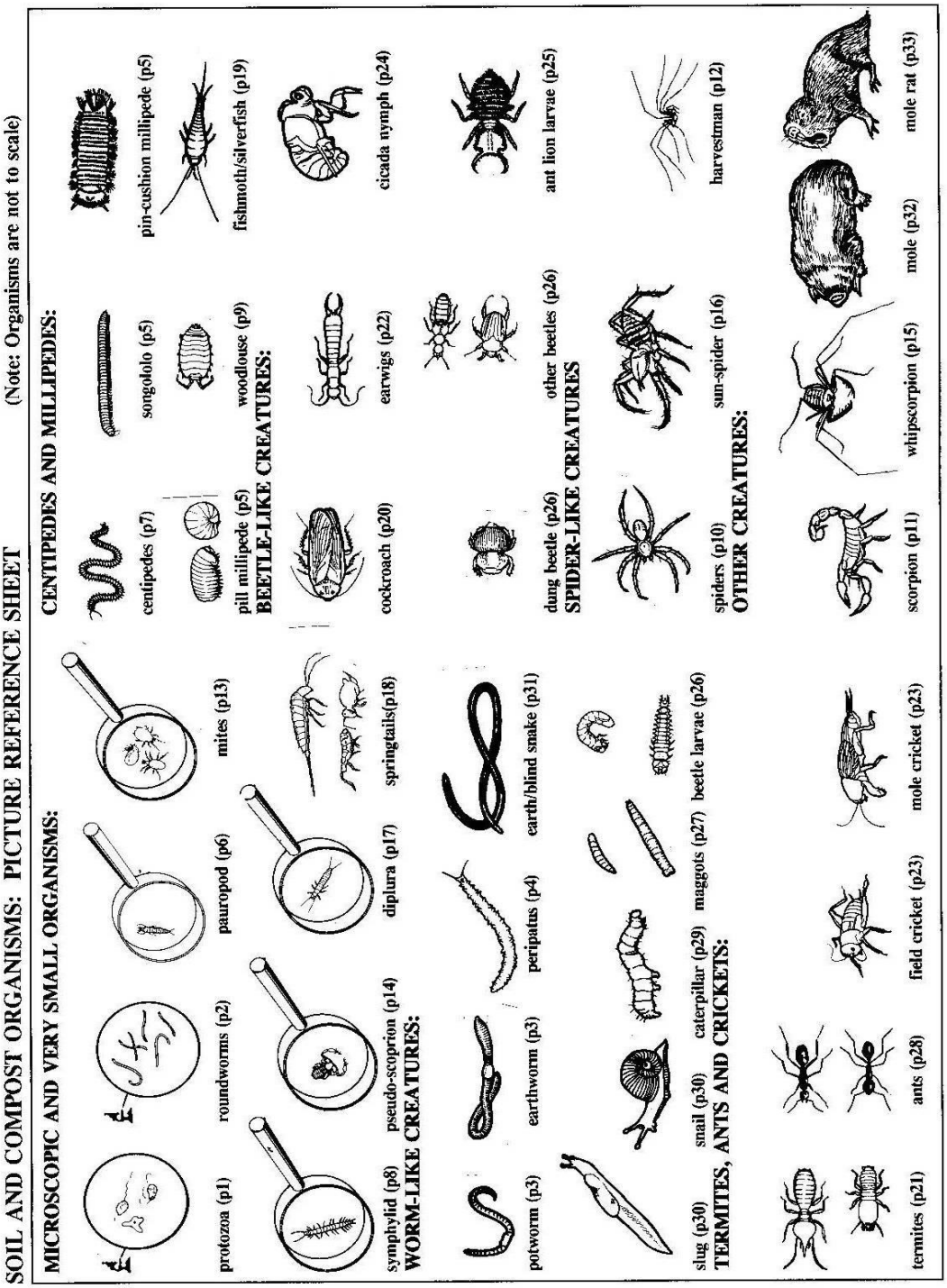


Figure 1: Soil and Compost Organisms - Available at: https://docs.google.com/document/d/1CxpNMp9h_NmdycFByWTfEd7fjp4vXlBP/edit?usp=sharing&ouid=104214709973770054707&rtpof=true&sd=true

Appendix B – Food Chains (Question 10)

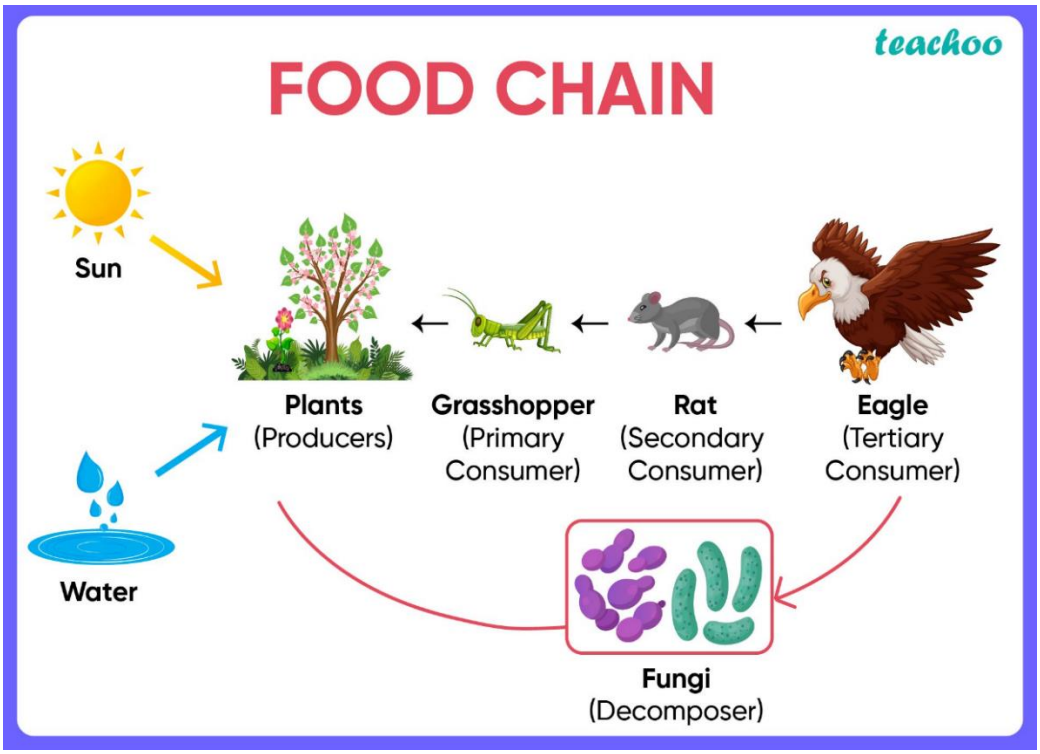


Figure 5: Food web Images available at:
https://www.teachoo.com/12932/3534/Question-2/category/Case-Based-Questions/

Sustainable Schools

Powered by NATURE CONNECT

Natural Science and Technology Practical Task - MEMO

1. Use your textbook and dictionary to define the following terms: *This question is crucial to make sure learners understand the terminology used in the practical task. Question 1 does not count as part of the assessment, but learners need to complete this section nonetheless as part of their language skills development.*
   a) Ecosystem: *A biological community, together with, and interacting with its physical & chemical environment.*
   b) Biotic: *living*
   c) Abiotic: non-living
   d) Investigate: *carry out research or study into (a subject or problem, typically one in a scientific or academic field)*
   e) Observation: *The action or process of closely observing or monitoring something or someone.*
   f) Herbivore: *A herbivore is an animal anatomically and physiologically adapted to eating plant material*
   g) Carnivore: *meat-eater is an animal whose food and energy requirements derive from animal tissues*
   h) Omnivore: *Animal that eats plants and animals*
   i) Food web: *A food web is the natural interconnection of food chains and a graphical representation of what-eats-what in an ecological community.*
   j) Biodiversity: *Biodiversity or biological diversity is the variety and variability of life on Earth. Biodiversity is a measure of variation at the genetic, species, and ecosystem level*
   k) Threat : *a person or thing likely to cause damage or danger*.
   l) Urban ecosystem: *Urban ecosystems are cities and the surrounding, socio-ecological systems where most people live*

2. What type of ecosystem did you investigate? (1)
   ✔ (1 mark) for correct ecosystem. *Including urban ecosystem, river, mountain, sea, pool, rocky shore, wetlands, grasslands, forest, desert.*

3. Where is your ecosystem located and describe your ecosystem? (2)
   Location ✔ (1 mark)
   Description ✔ (1 mark)

4.

	Monday	Tuesday	Wednesday	Thursday	Friday
Sunlight	✔ ✔ *(2 marks for completing 5 days data descriptive and accurately)*				
Water	✔ ✔ *(2 marks for completing 5 days data descriptive and accurately)*				
Wind	✔ ✔ *(2 marks for completing 5 days data descriptive and accurately)*				
Temperature	✔ ✔ *(2 marks for completing 5 days data descriptive and accurately)*				
Soil Type	✔ ✔ *(2 marks for completing 5 days data descriptive and accurately)*				
Slope	✔ ✔ *(2 marks for completing 5 days data descriptive and accurately)*				

7. Describe how the abiotic factors of the ecosystem affect the plants and animals. Think about the behaviour of the organisms and their structure.

Abiotic factors form the non-living part of the ecosystem ✔ *1 mark and include temperature, wind, water, light intensity, soil and slope.* ✔ *1 mark*
Any three of the following should be mentioned.

- Temperature can be hot or cold and can affect where animals and plants can survive (5)
- Wind can stunt plant growth and affect animal activity. The wind is used by some plants for pollination and the distribution of seeds.
- Water in needed for all organisms to survive. Where water is limited, plants and animals must be able to reduce water loss.
- Plants need light for photosynthesis.
- Each type of soil has different properties, and these properties influence the kind of plants that can grow in them.
- Slopes describe how steep the land is. Water runs off steep slopes quickly, and there is little soil because of erosion. Few plants can grow in these conditions.

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

Living organisms (Biotic)				
Plants	Animals			
	Herbivore	Carnivore	Omnivore	Decomposers

Look at examples of plants that learners may find in their ecosystem. Real names must be provided Tree, grass or bird is not correct. Teachers may assist learners in identifying the correct names for the species in their ecosystem during the practical session. Learners can also describe the tree or grass if they do not know the name.

8 plants (½ mark each) and ✓ ✓ ✓ ✓
8 animals (½ mark each). ✓ ✓ ✓ ✓ (8 marks)

9. Describe the relationships (such as feeding relationships) that also make up the biotic factors in the ecosystem. (5)

Producers make food for themselves during **photosynthesis** ✓ through **sunlight** ✓ and **water**, ✓
Herbivores ✓ feed on plants, **Omnivores** are animals that eat plants and animals. ✓ (1 mark for omnivores or 1 mark for carnivores)
Carnivores feed on other animals that are living or dead
Scavengers are carnivores that feed on dead animals and insectivores feed on insects.

10. Draw a food chain of your ecosystem. Include herbivores, carnivores, scavengers or decomposers. (4)

Producer (½ mark); producer (½ mark); primary consumer (½ mark)
Decomposer (½ mark) ✓ ✓
Learning correctly drew the food chain (1 mark) and named all the parts correctly (1 mark) ✓ ✓.
Look for an example of a food chain in your textbook or in appendix B.

11. Evaluate your ecosystem's biodiversity. Does your ecosystem have a high biodiversity or low biodiversity? Provide a reason for your answer. (2)

Biodiversity is a term used to describe the enormous variety of life on Earth. It can be used more specifically to refer to all of the species in one region or ecosystem. Biodiversity refers to every living thing, including plants, bacteria, animals, and humans. High biodiversity means that a region supports a wide variety of species, while low biodiversity implies

that an area supports only a few. The reasons for variances in biodiversity are complex, but they include both natural and man-made causes.

- *Low or high biodiversity (1 mark)* ✔
- *Reason for the answer (1 mark) The reason must correlate the number of different species and the total of each species data that the learner listed in question 4.* ✔

12. Suggest two ways to increase the biodiversity of your ecosystem. (2)

TWO suggestions. 1 mark each ✔ ✔

Any answer that will increase biodiversity such as

- *Building an insect house*
- *Add a bee hotel, so that bees can move into the area*
- *Plant fruit trees to attract more birds*
- *Clean up the rubbish*
- *Remove alien plant species*
- *Tackle soil erosion*
- *Nesting boxes*
- *Rock gardens*
- *Build a frog pond*
- *Educate the community on protecting diversity*

13. c) Identify the human interference in the area, for example, litter, pathways, or evidence of plants that have been cut down. (2) (4)

Any human interference identified ✔ ✔

d) Describe the effect of human interference on your ecosystem. (2)Any two reasonable effects. ✔ ✔

Species can become extinct, loss of biodiversity, los of fauna and flora

Increase in water temperature leads to a reduction of water quality.

14. Identify two possible threats to your ecosystem. (2)

- *Two threats. 1mark each* ✔
- *Alien species, littering, deforestation, Illegal dumping, Illegal hunting, urbanisation, fires etc*

15. Provide two possible solutions to overcome these threats. (2)

- *TWO solutions. 1 mark each ✔ ✔*

Any reasonable solution must be marked as correct

16. How do these threats affect the biodiversity of your ecosystem and if so, how? *A reasonable explanation of why the threat can decrease the different species and amount of species in the ecosystem.* (1)
1mark ✔

17. Why is biodiversity within an ecosystem important? (2)
TWO reasons. 1 mark each ✔ ✔

- *Ecological life support— biodiversity provides functioning ecosystems that supply oxygen, clean air and water, pollination of plants, pest control, wastewater treatment and many ecosystem services.*
- *Biodiversity Provides the Food We Eat. …*
- *Biodiversity Keeps Us Healthy. …*
- *Biodiversity Supports our Ecosystem. …*
- *Biodiversity Safeguards Nature…*
- *Biodiversity Helps Our Economy Thrive. …*
- *Biodiversity Can Potentially Provide A Solution to Climate Change*
- *Biodiversity ensures health and food security. Biodiversity underpins global nutrition and food security. …*
- *Biodiversity helps fight disease. Higher rates of biodiversity have been linked to an increase in human health*

TOTAL (50 x 0.6 = 30)