

Living Together In Different Ecosystems: Field, Forest and Stream

Subject(s) Basic Science, Social Science, English

Year(s) 9–10

Learning Intention(s)

Increase awareness of how living things and non-living things influence each other and interact within three different eco-systems.

Curriculum Links

Basic Science

Strand: S9.1 Living Things and the Environment

Sub-strand:

S.9.1.2 Living Together

Learning Outcome(s)

- S9.1.2.2 Explore the wide variety of organisms in the ecosystems and show their interdependence as a means of survival
- S9.1.2.3 Explain the types of interactions which occur between the living things, and with their physical environment for survival

Social Science

Strand: SS9.3 Place and the Environment, SS10.3 Place and the Environment

Sub-strands:

SS 9.3.1 Mapping

SS10.3 .1 Geography of Fiji

Learning Outcome(s)

- SS 9.3.1.2 Explore and justify the importance of conserving our fragile ecological environment and our National heritage to promote environmental sustainability.
- SS10.3.1.2 Compare and contrast sustainable and non-sustainable land use to mitigate environmental degradation.

English

Strand: EN 9.3 Writing and Shaping

Sub-strand:

EN9 .3.4 Language Learning Processes and strategies

Learning Outcome(s)

- 9.3.4.1 Use appropriate writing strategies to develop a variety of writings.

Instructions

This activity takes place over two weeks and spans several lessons. It requires some advance preparation by the teacher.

Note: The activity is adapted from the 'Sustainable Forestry [Initiative](#)' in Project Learning Tree, [PreK-8 Environmental Education Activity Centre](#).

Materials Required

- 'Ecosystem Observation Chart' handout – print 2 per team
- Butchers paper for displaying results on fieldtrip – 2 sheets per team
- Trowels or digging sticks – 1 per team
- Observational tools: ruler, measuring tape, magnifying glass, thermometer, light meter, compass, smartphones with compass app – depending on availability

Activity 1: Class discussion of ecosystems

- **Introduce** the concept of ecosystems and the importance of how living things and non-living things influence and interact with each other to maintain a healthy environment.
- **Elicit** students' understanding of ecosystems – what examples of ecosystems do they see around them at school or at home?
- **Encourage** the students to think of the different types of plants and animals that live in the surrounding environment. Make a list of these different plants and animals in their exercise books. Also make another list of other types of plants and animals they know of that do not live in their immediate surroundings.

An eco-system is a community of different species interacting with each other, and with chemical and physical factors that compose its nonliving environment. It is a system of inter-relationships among organisms and between organisms and the physical environment.

Plants and animals in an environment interact with each other in various ways. For example, plants may depend on insects or birds to pollinate flowers and on earthworms to aerate the soils. Animals may depend on plants for food or shelter.

(PreK-8 Environmental Education Activity Centre, p 257)

- **Conduct** a class discussion to find out students' knowledge of why different plants and animals choose to live in certain environments. Introduce terms such as living things, non-living things, sunlight, soil moisture, temperature, wind, water flow. How do these factors affect plant and animal life and existence in the three different ecosystems?
- **Inform** students that this study topic requires them to go outdoors to observe living things and living things in the surrounding areas.

Activity 2: Preparing for Fieldwork

1. **Teacher preparation prior to lesson:** Identify three study sites that differ from each physically (e.g. sunlight, air temperature, soil mixture, wind, topography and number and types of plant and animal species living there). Field, forest and stream are useful categories to consider. For example:
 - **Field:** sports field or park; open lawn area
 - **Forest:** vegetable garden; bush or grassland area
 - **Stream:** pond or stream; river

The class will need to visit the sites at least twice over two weeks, so check that the locations are safe, accessible and, if relevant, the owner gives permission for the visit. Ideally, visits would take place at roughly the same time of day. Students must be supervised at all sites so recruit other teachers or parent helpers to assist.

2. **Using observational equipment:** Before commencing fieldwork, students should practise using the observational tools (e.g. thermometers, compass, magnifying glass, light meter, smartphone compass app (on smartphones) in a classroom or school yard.
3. **Organising student teams:** Each site will be monitored by two (or more) teams. The ideal group size is 4–5, so create appropriate groups depending on class size and allocate two (or more) groups to each site.

Activity 3: Ecosystem Observation Fieldwork

1. Each team is given 2 copies (more, if more than 2 site visits are planned) of the ‘Ecosystem Observation Chart’ handout to record their observations.
2. Student teams rotate through the selected sites. For each site they must observe and note their findings for the ecosystem components listed on the Ecosystem Observation Chart. Emphasise to students that they must collect detailed information so they can complete the follow-up presentation task and written report.

Activity 4: Team Presentations

1. After each site visit, student teams use a sheet of butchers paper to write up their observations and findings from the sites.
2. Display the charts on the classroom wall and allow time for students to walk around and read others’ work.
3. After each visit or, if preferred, when all visits are complete, have each team present their main results and findings to the class (5 mins each presentation).

Activity 5: Class discussion and reflection

After the presentations, conduct a whole class discussion to answer the following questions:

- Which ecosystem has the greatest number of plants or animals? Which has the least of each? How do you explain this difference?
- What plants and animals are found at more than one site? How are the plants and animals the same and how are they different at the different sites?
- Which site had the highest temperature and which one had the lowest? How about the most or least wind?
- What site has the wettest soil and which one has the driest?
- How are the number and type of plants in an area affected by light intensity, air temperature and soil temperature?
- How does water influence the soil temperature, air temperature and soil moisture?
- What relationship does light have with air temperature and with soil moisture and with plants?
- How might water flow affect soil moisture and plants?

Task

Ecosystem report

Write a 300-word report outlining the main features of the three ecosystems studied.

1. What are the similarities and differences of the ecosystems?
2. For each of the ecosystems, explain which of the elements observed (e.g. soil, wind and sun, temperature, lay of the land) seemed to have the most important influence on the diversity and number of plants and animals found at each site.

Refer to the data collected as well as your learnings arising from the class discussion to support your views.

Teaching Notes

Additional information if required.

Physical attributes of the environment are determined by factors such as topography, proximity to water, elevation, or geological features. In addition, the resident organisms (particularly plants) may affect the sunlight, moisture, temperature, and wind of the area. For example, the tall trees in a forest tend to block sunlight and thus create a dark moist environment, or microclimate on the forest floor that is suitable for shade-loving plants but is too shady for other kinds of plants.

Microclimate refers to special conditions of light, moisture and temperature that occur in a narrowly restricted area within an ecosystem, such as under a bush or in a small woodland opening

Source: [PreK-8 Environmental Education Activity Centre](#), p. 258

Ecosystem Observation Chart

Team members:

Ecosystem Component	Site 1	Site 2	Site 3
Soil <ul style="list-style-type: none"> ▪ Moisture: wet, moist, dry? ▪ Texture /Colour ▪ Smell ▪ Animals or plant material 			
Wind and Sun <ul style="list-style-type: none"> ▪ Amount of wind ▪ Wind direction ▪ Amount of sunlight (e.g. shady, dappled, bright) 			
Temperature <ul style="list-style-type: none"> ▪ At ground level ▪ At 2.5 cm deep ▪ At 1 metre above ground 			
Lay of the Land <ul style="list-style-type: none"> ▪ Flat or sloped ▪ Other land features (e.g. trees, cliffs, hills) ▪ Direction of water flow ▪ Body of water into which site drains (e.g. sea or river) 			
Plant Life <ul style="list-style-type: none"> ▪ Common plants ▪ Where each type grows 			
Animals <ul style="list-style-type: none"> ▪ Animals seen ▪ Place where seen ▪ Animal evidence (e.g. droppings, tracks) 			