ECOSYSTEMS

SUMMARY/OVERVIEW

Grades:
3-5

Prep Time:
1 Hour

Learning Environment:
Outdoor & Indoor

Total Lesson Length:
5 hours

DESCRIPTION:

This booklet introduces students to the topic of ecosystems. Activities involve outdoor exploration as well as indoor worksheets and discussion topics. Students will examine different types of ecosystems, focusing on the interaction between living and non-living things. The booklet includes 5 hours of activities, which can be delivered separately or on the same day.

CURRICULUM EXPECTATIONS:

Questioning and Predicting:
- Make observations in familiar or unfamiliar contexts
- Demonstrate curiosity about the natural world

Processing and analyzing data and information:
- Experience and interpret the local environment

Evaluating:
- Make simple inferences based on their results and prior knowledge

BACKGROUND:

An ecosystem is a geographic area where plants, animals, and other organisms, as well as weather and landscape, work together to form a "bubble of life". Ecosystems contain biotic (living) parts, as well as abiotic factors (non-living parts). Biotic factors include plants, animals, and other organisms. Abiotic factors include rocks, temperature, and humidity.

Source: https://www.nationalgeographic.org/encyclopedia/ecosystem/print/

LESSON PLAN

TIME	ACTIVITY	LOCATION	MATERIALS
30 mins	1. Introduction	Indoors	Dry-erase board
30 mins	2. Is this an ecosystem?	Indoors	Projector
2 hours	3. Types of ecosystems	Indoors	Coloured cardstock, thick cardboard, scissors, glue, rulers, sharpies, coloured pencils
1.5 hours	4. Ecosystem survey	Outdoors	Printed worksheet
30 mins	5. Conclusion	Indoors	None

TIME	**ACTIVITY**	**LOCATION**	**MATERIALS**
30 mins	1. Introduction	Indoor	Dry-erase board

Introduction:
What is an Ecosystem?

GOAL: Students will be introduced to the concept of ecosystems.

PREPARATION: Draw 3 rectangles (vertical/portrait orientation) on the board and write the names of 3 different ecosystems at the top of each rectangle (see example on the following page).

LESSON PLAN: Ask the students which components they think are part of that ecosystem, based on the definitions below. Make sure to ask about the **INTERACTION** between the elements.

INTRODUCTION:

An ecosystem is a geographic area where plants, animals, and other organisms, as well as weather and landscape, work together to form a "bubble of life". Ecosystems contain biotic (living) parts, as well as abiotic factors (non-living parts). Biotic factors include plants, animals, and other organisms. Abiotic factors include rocks, temperature, and humidity.

Every factor in an ecosystem depends on every other factor, either directly or indirectly. A change in the temperature of an ecosystem will often affect what plants will grow there, for instance. Animals that depend on plants for food and shelter will have to adapt to the changes, move to another ecosystem, or perish.
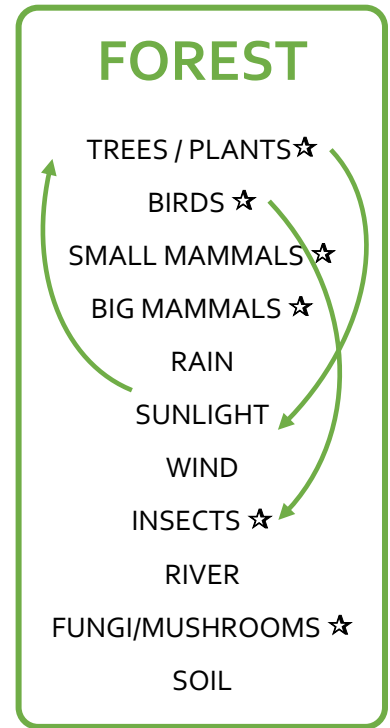
Ecosystems can be very large or very small. Tide pools are complete tiny ecosystems. Tide pools generally contain seaweed (a kind of algae), which uses photosynthesis to create food. Herbivores such as abalone eat the seaweed. Carnivores such as sea stars eat other animals in the tide pool, such as clams or mussels. Tide pools depend on the changing level of ocean water. Some organisms, such as seaweed, thrive in an aquatic environment, when the tide is in and the pool is full. Other organisms, such as hermit crabs, cannot live underwater and depend on the shallow pools left by low tides. In this way, the biotic parts of the ecosystem depend on abiotic factors.

The whole surface of Earth is a series of connected ecosystems!

Source: https://www.nationalgeographic.org/encyclopedia/ecosystem/print/

EXERCISE EXAMPLE:

DESERT

CACTUS ☆
SAND DUNES
ROCKS
WIND
CAMELS ☆
VERY LITTLE RAIN
RATS ☆
BATS ☆
BEETLES ☆
SNAKES ☆
LIZARDS ☆

OCEAN

SALT WATER
FISH ☆
ALGAE ☆
REEFS ☆
OCEAN FLOOR/SAND
PLANKTON ☆
MARINE MAMMALS ☆
SEA STARS ☆
INTERTIDAL BIRDS ☆
CURRENTS
SUNLIGHT (TOP/PELAGIC)

FOREST

TREES / PLANTS ☆
BIRDS ☆
SMALL MAMMALS ☆
BIG MAMMALS ☆
RAIN
SUNLIGHT
WIND
INSECTS ☆
RIVER
FUNGI/MUSHROOMS ☆
SOIL

Use **arrows to exemplify interaction** between the elements of each ecosystem!

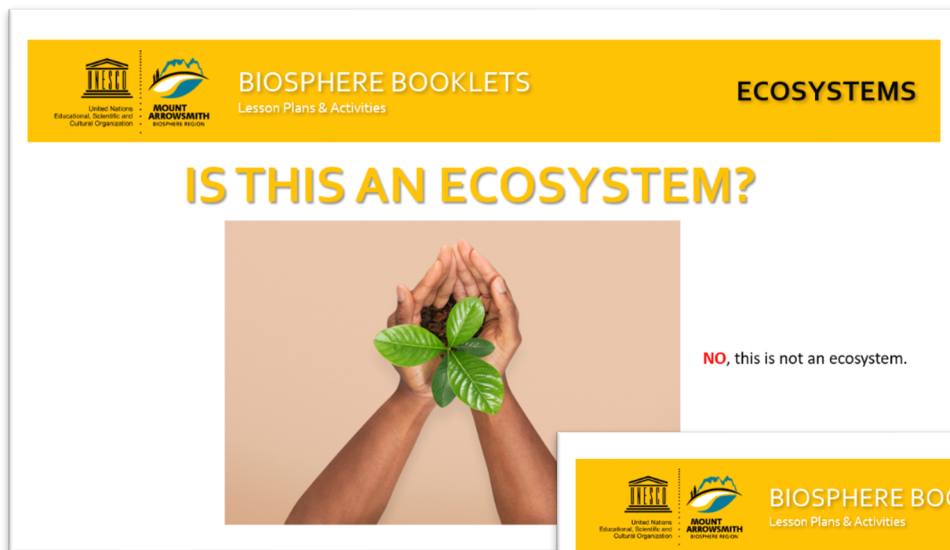**ADDITIONALLY:** Ask students to classify each word as **BIOTIC** ☆ **(alive)** or **ABIOTIC** **(not alive)**

TIME	**ACTIVITY**	**LOCATION**	**MATERIALS**
30 mins	2. Is this an Ecosystem?	Indoor	Projector

Is this an Ecosystem?

GOAL: To identify which images represent an ecosystem and which ones do not - a visual "True or False" activity.

PREPARATION: Download slides available.

LESSON PLAN: Go through each of the slides and ask the students to tell you if the image (or which of the images) represents an ecosystem. For each image, ask for their explanation: are there any interactions between biotic and abiotic components in this ecosystem? Are there food chains? Etc.
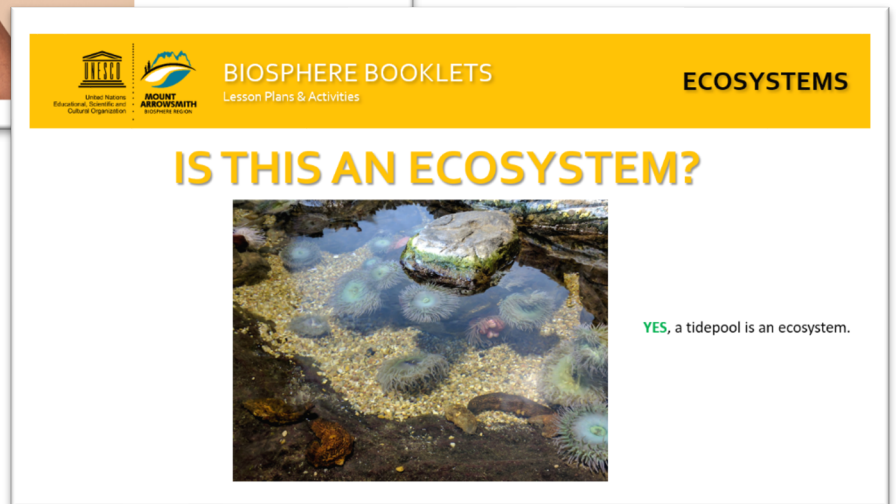
TIME	**ACTIVITY**	**LOCATION**	**MATERIALS**
2 hours	3. Types of Ecosystems	Indoor	Coloured cardstock, thick cardboard, scissors, glue, rulers, sharpies, coloured pencils

Types of Ecosystems

GOAL: Introduce students to different types of ecosystems.

PREPARATION: Write the names of different ecosystems on small pieces of paper. Fold them and place them inside a bowl. Students will draw a card and base their game on the ecosystem they drew.

LESSON PLAN: Students will explore different types of ecosystems by creating a game. The game can be simple, such as a memory game or dominoes with images and their respective definitions. Or they can be more complex, with characters, rules and points, such as board games. The point is to **show the interaction** between the different components of the ecosystem. Students can work in pairs or teams.

GAME IDEAS: Some ideas to get students started:

- Ecosystem Jeopardy game
- Monopoly style game where different components of the ecosystem are the properties
- Ecosystem memory/matching game (have to match image and word that go together)
- Pictionary with ecosystem related terms
- Charades with ecosystem related actions
- Heads up game using ecosystem terms
- Ecosystem Go Fish card game

TYPES OF ECOSYSTEMS:

- **Tropical Rainforest (includes canopy ecosystem and forest floor**

- **Ocean (includes coral reefs and tidepools)**

- **Wetlands (marshes, swamps – includes terrestrial and aquatic ecosystems)**

- **Deserts (tundras are treeless polar deserts)**

- **Savanna Grassland (grass, spaced out trees, high temperatures year-round)**

- **Caves (no sunlight, water flow)**

OTHERS: Montane Ecosystem, Freshwater Ecosystem, Urban Ecosystem, Estuary Ecosystem, etc.

TIME	ACTIVITY	LOCATION	MATERIALS
1.5 hours	4. Ecosystems survey	Outdoors	Printed worksheet

Ecosystems Survey

GOAL: For students to observe their surroundings and understand how it works (focus = interaction within the ecosystem).

PREPARATION: Print worksheet (page 7).

LESSON PLAN: Students will go to an outdoor place (beach, lake, river or forest) and make notes about their observations. Students will then conclude which type of ecosystem they are in, based on their gathered data.

Ecosystem Survey

At the chosen location, observe the environment around you and answer the questions below.

SURVEY INFO:

Date: _____/_____/_____   Time: _____   Location: _____

Surveyor's name: _____   School: _____

OBSERVATIONS:

1. Biotic (living) components: _____

2. Abiotic (non-living) components: _____

3. Type(s) of water body: _____

4. Type(s) of vegetation: _____

5. Does temperature change over the year? _____

6. What **PREDATOR** animals can you encounter? _____

7. What **PREY** animals can you encounter? _____

8. Do animals migrate from/to other places? _____

9. How much human presence is there at your location? _____

10. How much space does this ecosystem take up? Big? Small? _____

TIME	**ACTIVITY**	**LOCATION**	**MATERIALS**
30 mins	5. Conclusion	Indoor	None

Conclusion

GOAL: For students to review/reflect on what they have learned about ecosystems.

PREPARATION: Activities 1-4.

LESSON PLAN: Ask students follow-up questions to review what they have learned.

CONTENT:

1. What is one thing you learned that **surprised** you?

2. What is one concept that was hard to **understand**?

3. Which ecosystems would you like to **visit**?

4. What human activities **threaten** ecosystems? Pollution of rivers and air, overfishing, habitat destruction, climate change, wild fires (and accidental human-caused fires) are some examples.

5. Do ecosystems have many or few **components**? Many.

Source: https://www.nationalgeographic.org/encyclopedia/ecosystem

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Show us your results! Snap a picture and share it with us on social media,
or email it to the MABR Coordinator at
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