



Name: \_\_\_\_\_ #: \_\_\_\_\_

## Habitats and Ecosystems Biotic and Abiotic Yard Survey

**Estimated Time:** 15-20 Minutes

**Age Range:** 5<sup>th</sup>-6<sup>th</sup> grade

**What you need:** writing utensil, paper or journal, clipboard or hard writing surface

**Instructions:** Go through the background information at the beginning and build your base knowledge of ecosystems before going out into the field. Following the lesson, there is a nature journaling activity where you will be observing, categorizing, and sketching biotic and abiotic features in a natural area of your choice. This area could be a park or your yard. Most importantly, choose a natural area where you feel safe.

### New Words

**Ecosystem:** a natural area where biotic and abiotic factors come together and interact.

**Biotic Factors:** Living organisms that make up part of an ecosystem

**Abiotic Factors:** Nonliving things make up part of an ecosystem

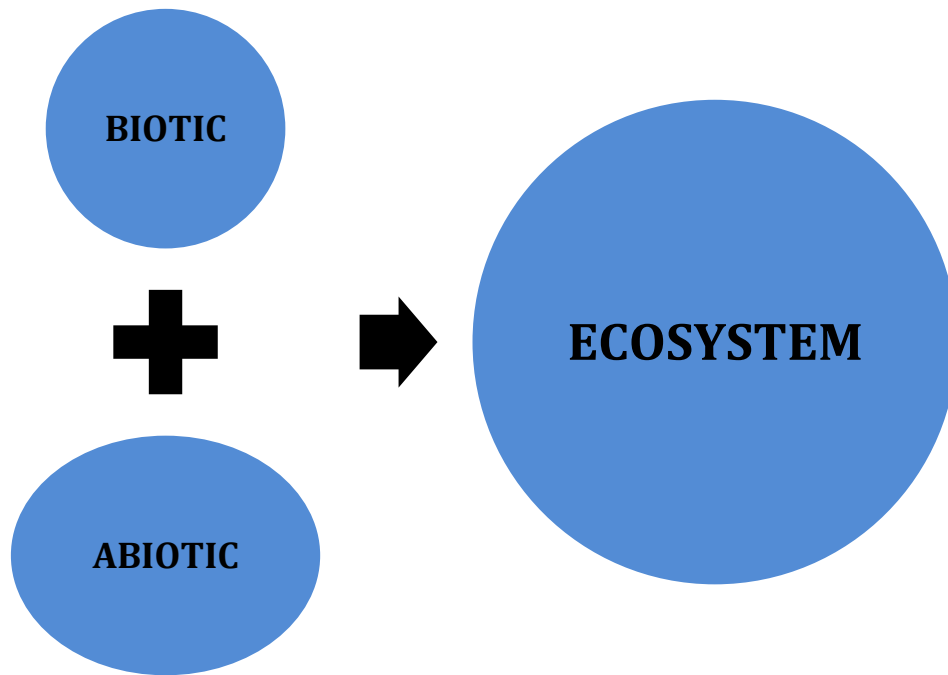
### Objectives:

- Learn the definitions of biotic and abiotic by breaking down the words
- Gain a solid understanding of what an ecosystem is and how it functions.
- Identify biotic and abiotic factors in local ecosystem
- Engage in field journaling
- Create accurate drawings of biotic and abiotic factors through observation



## Background Information

**Ecosystem:** An ecosystem is a system where biotic and abiotic things come together and interact.



Take a moment and imagine you are walking in a forest. The oxygen is clean and cool. Warm sunlight is shining through the tree branches and the temperature is perfect. On your walk, wherever you are, what might you be hearing or seeing? Perhaps you hear a songbird, or maybe you see mushrooms growing around a fallen tree. You might even see deer feeding on grass. All of the things you are experiencing create an ecosystem.

What is the difference  
between oxygen and deer?

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What is the relationship  
between oxygen and the deer?

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What is the relationship  
between deer and grass?

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**Explanation:** This is how an ecosystem works, where nonliving things affect living organisms and living organisms rely on nonliving things for survival. An ecosystem cannot exist without both living and nonliving things interacting.

**Answers:**

1. Oxygen is nonliving and deer are living
2. Deer breath oxygen
3. Deer eat grass

## Biotic vs. Abiotic

Breaking down the words

<b>Biotic</b>	<b>Abiotic</b>
<b>Bio = Life</b>	<b>Abio = Without life</b>

**Biotic:** Living things/organisms

Examples

- Plants – Hibiscus Flower
- Animals – Squirrel

**Abiotic:** Non-living physical and chemical things/components

Examples

- Temperature – hot/cold/warm/cool
- Water – River



**Biotic**



**Abiotic**

**Biotic Factors:** Living organisms that interact with other living organisms to form part of an ecosystem.

**Producers:** Organisms that produce their own food and energy

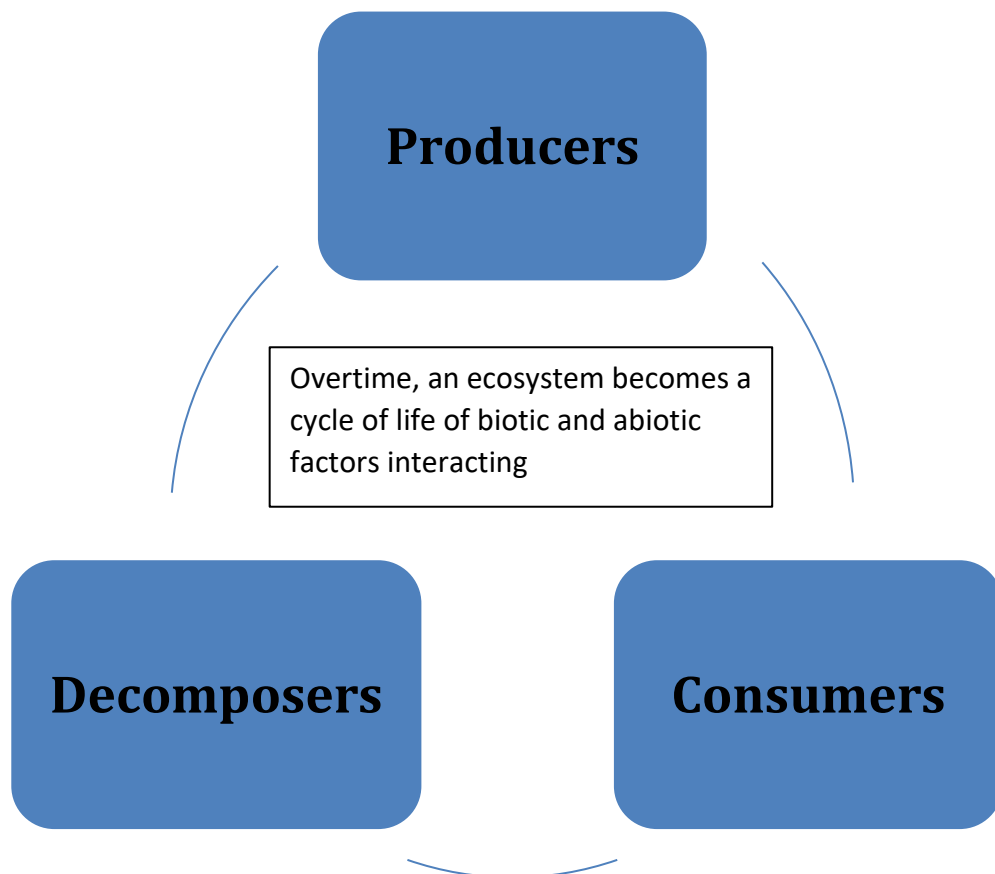
- Grass
- Plants

**Consumers:** Organisms that consume other organisms for energy

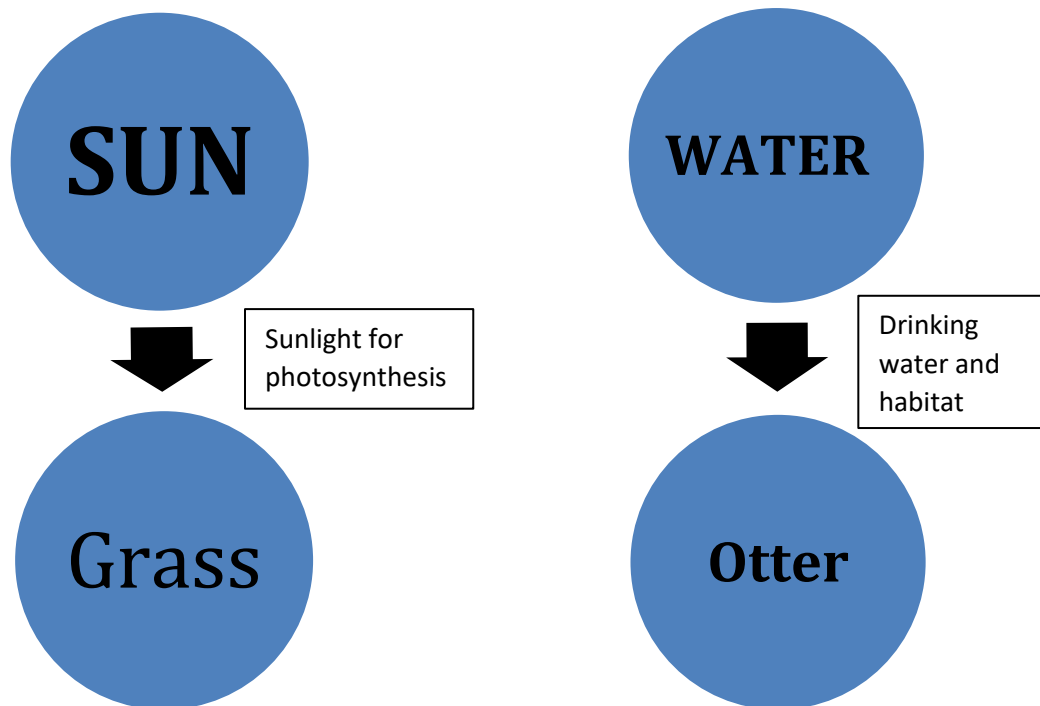
- Deer
- Mountain lion

**Decomposers:** Organisms that break down (decompose) dead organisms

- Mushrooms
- Earthworms



**Abiotic Factors:** Nonliving physical and chemical things/components that affect biotic factors to form a part of an ecosystem.



**Examples:** The diagrams above show simplified relationships between abiotic factors and biotic factors. More examples of this include...

- Rocks provide habitat for animals
  - Bears often make dens in caves
- Temperature affects how certain animals behave
  - Cold blooded reptiles rely on warmth from the sun because they cannot generate their own body heat...look for lizards sunning on rocks next time you are out in nature
- Oxygen allows living organisms to breath
  - Even fish breathe dissolved oxygen in water

What is an example of a biotic factor interacting with an abiotic factor?

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Where around the world might you find biotic factors and abiotic factors interacting?

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Which is biotic and which is abiotic between these two things... temperature and mosquito?

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**Possible answers:**

1. Ants living under a rock/Coyotes drinking water
2. Great Barrier Reef/Amazon Jungle/Sahara Desert
3. Temperature is abiotic and mosquitos are biotic



## Field Journaling and Drawing Outside

**Overview:** In this activity, you will be journaling in nature. Grab your writing utensil, paper, and writing surface and head outside. Find a space in nature where you feel comfortable. Look around and try to identify biotic and abiotic factors. Write down what you are seeing. Perhaps you see a dandelion growing in your yard. Sketch the dandelion to the best of your ability. Sketching will help you visually connect a natural thing with its common scientific name. To help you better understand the journaling process; follow the instructions with pictures provided below. One important thing to note before beginning the activity is that you are not copying the images below; you are creating your own work and putting your own interpretation of what you are experiencing on paper.

**Step 1:** Find an outdoor space. Take your materials.





**Step 2:** Observe your surroundings and try to identify biotic and abiotic factors.



**Step 3:** Create a table where you can list biotic and abiotic things that you are experiencing.



A photograph of a spiral-bound notebook with a table for recording biotic and abiotic factors. The notebook is open to a page with a table that has two columns: 'Biotic' and 'Abiotic'. The table is divided into two sections by a vertical line. The 'Biotic' section has five rows, and the 'Abiotic' section has five rows. The notebook is placed on a surface of dry grass and straw.

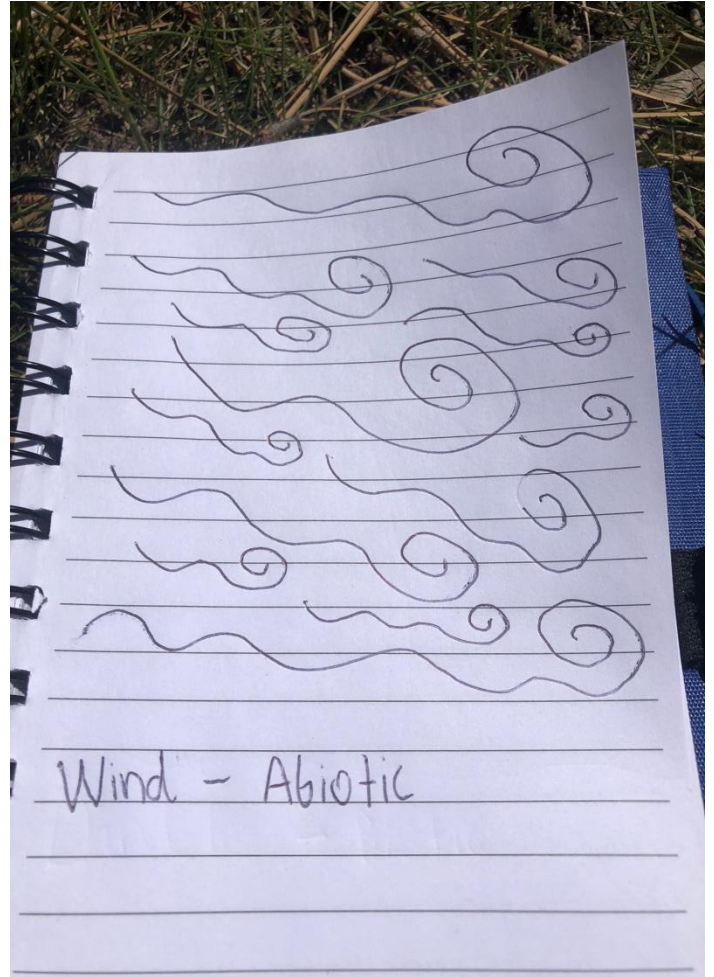
Biotic	Abiotic



**Step 4:** Jot down at least 3 things in each category.

Biotic	Abiotic
Dandelion	Rocks
Grass	Sunlight
Pine Tree	Wind

**Step 5:** Sketch at least one thing from each category



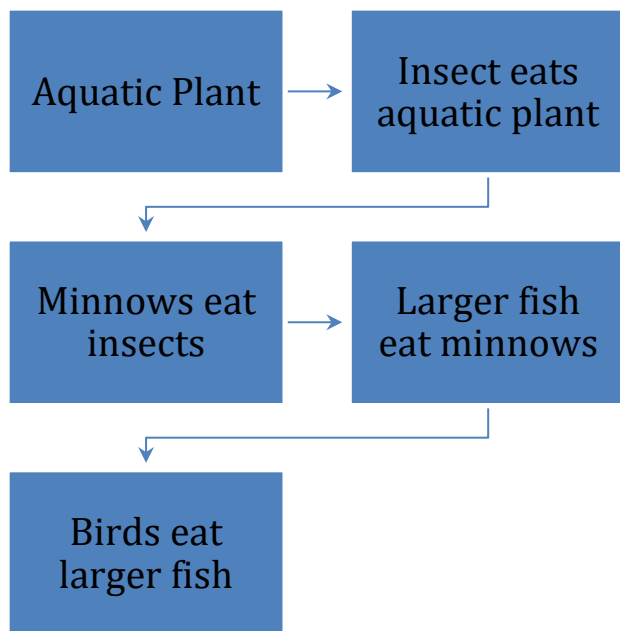
**Debrief:** If exploring and being in nature is something that you like, you are encouraged to take a journal with you. You might find a species that you have never seen before and a good way to identify the species is by sketching an image and jotting down characteristics. Later you can find the species on the internet or in a field guide. You can also get creative with your sketches and include colors. You are also encouraged to use the knowledge that you gained from this lesson/activity when you are out in nature. Categorize biotic and abiotic things in your head and try to figure out relationships between them. This simple exercise will build your scientific vocabulary and hopefully boost your curiosity towards nature.

## Optional Activity for Older Students

Imagine a pond ecosystem with...

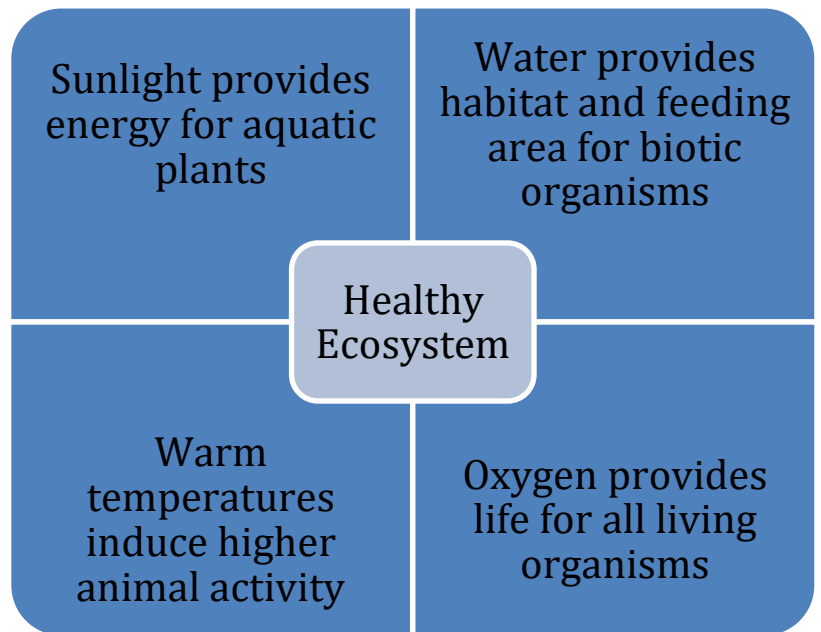
### Biotic

- Aquatic plants
- Insects
- Minnows
- Larger fish
- Birds



### Abiotic

- Sunlight
- Water
- Temperature
- Oxygen
- Wind



What if sunlight was removed from the example above?

- Which biotic organisms would zero sunlight affect?
- Would the ecosystem survive or break down?

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What would happen if the temperature of the water is cold?

- Which organism in the food chain would be affected the most from cold temperatures?

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How would the ecosystem be affected during a drought?

- Do you think some organisms would adapt to low water conditions?

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**Possible answers:**

1. Plants would not be able to get energy and grow
  - a. Plants would be affected the most
  - b. If plants cannot grow then the entire ecosystem would breakdown because there is a missing link in the food chain
2. There would be less animal activity
  - a. The birds would be negatively affected because the fish would not be feeding at the surface
3. There would be less space for the fish and the fish would compete for resources
  - a. Yes, some organisms like birds can simply relocate to a different water source for food.

**Important note:** The answers are not restricted to the examples above. If the answers are similar or explain a different relationship that is OK.