



GRAB-AND-GO WATER ACTIVITIES

for Orange County K-12 students



WHAT'S INCLUDED

- ✓ Activity Background
- ✓ Learning Objectives
- ✓ Activity Procedure
- ✓ List of Materials
- ✓ Engineering and Design Process Worksheet
- ✓ Natural and Human Social Systems Venn Diagram
- ✓ Key Terms and Definitions
- ✓ Nature Journal Example
- ✓ Q&A Prompts
- ✓ Additional Activities

Observing the Natural World

Children actively engage with nature and discover the importance of water to all living things. On school grounds, at a park, or in their own backyard, students are encouraged to walk outside to observe and document how water is connected to every part of life. Using the engineering design process— Ask, Research, Imagine, Plan, Create, Test, Improve, and Share – students investigate their surroundings and develop solutions to a real-world problem. The suggested materials will help students draw, color, write, and record their discoveries in a “Nature Journal.” Through this exercise, students observe first-hand that water is a vital resource and is necessary to the health and sustainability of our ecosystems and our way of life.

Activity Background

Did you know? Water in all forms – liquid, solid, and gas – makes life on Earth possible. While rivers and lakes hold less than 1% of the world’s freshwater, they are essential for nature’s survival. Freshwater provides habitats for a variety of living things, including plants, insects, amphibians, birds, reptiles, mammals, and over 10,000 species of fish. Our oceans cover over 70% of the Earth, providing homes to about 226,000 marine species, with more discovered each year. Oceans are also an essential part of the water cycle. When the sun causes the ocean to heat up, some of the water evaporates and is stored in clouds. The clouds eventually grow and create precipitation (rain, ice, or snow). Then, rainfall flows over the ground, ending up in rivers, stored in freshwater lakes, or as groundwater. Over time, all of this water re-enters the ocean, where it begins the cycle over again.

Water also moves through living organisms in an ecosystem. An ecosystem is made up of different types of living things like animals, plants, and bacteria. These living things interact with their environment through water, sunlight, air, soil, and more. An ecosystem can be as large as an ocean or as small as a tide pool. All organisms in an ecosystem are interdependent, either directly or indirectly, meaning they depend on their interactions with each other. A change in the temperature or the amount of water in an ecosystem can affect what plants will grow there. Animals that depend on plants for food and shelter must adapt to the changes or move to another ecosystem for survival.

Having a wide variety of plants and animals in an ecosystem is called biodiversity, and it is an essential factor for a healthy environment. Water plays a significant role in every ecosystem. Although every ecosystem is different, they are all connected by their need for water.

Just like plants and animals, humans thrive on interaction with nature. Human activities can also alter natural systems, both positively and negatively. We are more likely to care for and protect the world around us when we better understand it.



Learning Objectives

Through this activity, students should be able to:

- ◆ Explore real-life instances in nature that illuminate the critical importance of water to all living things.
- ◆ Explore and explain how water interacts with nature in various ways.
- ◆ Observe and note elements that make up the natural environment.
- ◆ Practice various components of nature journaling for descriptive, informational, narrative, and persuasive writing, illustration techniques, and personal expression.
- ◆ Use basic scientific methods to examine a real-world problem and offer solutions.

Creating your Nature Journal

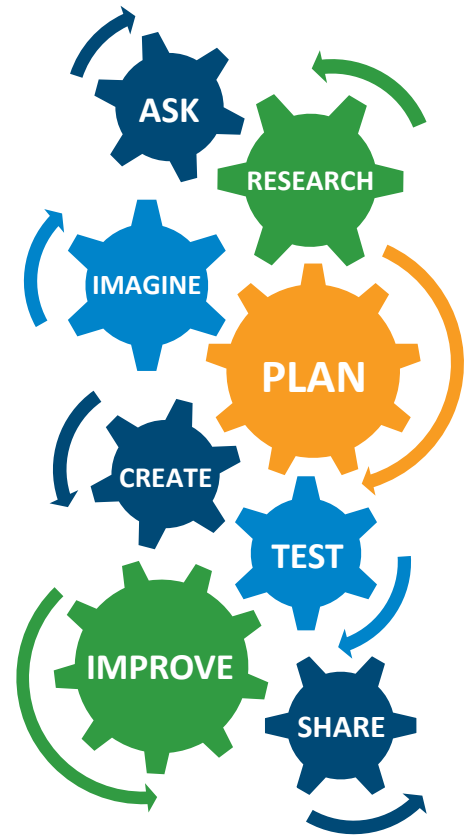
Nature is a rich and meaningful place to learn. Nature journaling can be an effective learning tool for traditional classrooms, homeschools, community-led programs, and outdoor education programs alike. Through guided, interactive lessons like this one, students are inspired to be keen observers of natural places, whether in their backyard, school playground, city park, or family vacation spot.

Nature journaling is a highly effective way to learn and hone various skills, including observation, critical thinking, writing, drawing, and presenting to others. Journal entries that include descriptive elements like words, pictures, and numbers lead the journaler to think differently and make a more complete record of what they see.

The nature journal process is flexible and can be introduced with various prompts, questions, and activities. Extended activities are listed on pages 8-11. Students can record their observations over a specific period – a month, a semester, or even a year – adding new activities each time. Some activities can be as short as 10-15 minutes, while others can extend to 30-60 minutes. Each activity can be adapted to reach students in any grade level.

PROCEDURE:

- ◆ Gather some basic journaling materials using the suggested Materials List.
- ◆ Instruct students on the best way to set up their journal page (examples provided on page 7).
- ◆ Go outside to complete the journaling activity. Have students explore independently or with a partner or small group.
 - ◆ **Prompt:** What do you see? Look for signs of insects, plants, or animals. Where are animals getting water? Is there a stream, river, pond, or lake nearby? Do the animals have to travel to find water? Is there enough?
 - ◆ If students are feeling stuck, introduce focused statements: “*I wonder...*”, “*I notice...*”, “*It reminds me of....*”
- ◆ Engage students in discussion after the activity.
 - ◆ **Prompt:** What did you observe? How did different environmental elements interact with each other—sunlight, water, plants, and animals? Why should people care about nature? Ask students to explain and build on their journal observations.
- ◆ Have students reflect and share what they found.
- ◆ Additional resources, prompts, and activity extensions are included on pages 8-11.



LIST OF MATERIALS

- ✓ Journal or Paper
- ✓ Pencil
- ✓ Colored Pencils
- ✓ Magnifying Glass
- ✓ Binoculars
- ✓ Scissors
- ✓ Thermometer
- ✓ Ziploc Bags/Container/Jar
- ✓ Glue Stick/Tape
- ✓ Ruler/Tape Measure

Note: Materials can be anything readily available to you. You can keep it simple and just use a piece of paper and a pencil for a short activity or gather more materials for longer activities.



Observing the Natural World

NAME: _____

Engineering Design Process Worksheet

DATE: _____

ASK

When you are in nature, what do you see? What living creatures (plants and animals) can you find, and how is water involved? How much water can you find? Are there plants and animals that survive on a small amount of water?

RESEARCH

Use books, technology, or human resources to research water use for plants and animals found in your area. Where does water come from? What natural ways do we get water in Orange County? What about the water that comes out of the faucet? Did you discover something new that you didn't know before?

IMAGINE

What would happen to plants, animals, and humans if no water was available? Why is there a need for humans to bring water to nature through irrigation systems like sprinklers and garden hoses?

PLAN AND CREATE

Plan a perfectly balanced ecosystem. A perfectly balanced ecosystem has a large diversity of plants and animals. Look at the ways plants and animals interact with each other. Name some ways your ecosystem is perfectly balanced. How can humans alter the ecosystem, both positively and negatively?

TEST AND IMPROVE

We know an ecosystem must have water, but is there an opportunity to save water and have less waste in your ecosystem? If so, how? Test your water-saving method and make notes on what worked, what didn't work, and why.

SHARE

Communicate your process and results to peers, family members, or others. This can be in the form of a presentation, written report, short-form video, or other communications method.



Observing the Natural World

NAME: _____

Natural Systems and Human Social Systems

DATE: _____

System: When different parts or components connect to form a whole. Example: pedals, handlebars, and wheels are different parts or components that connect to form a bicycle.

Natural Systems: Systems that occur in nature without any human influence like weather, rivers, or trees.

Human Social Systems: Systems that are created by humans to support a way of life like schools, freeways, and government.

STEP 1

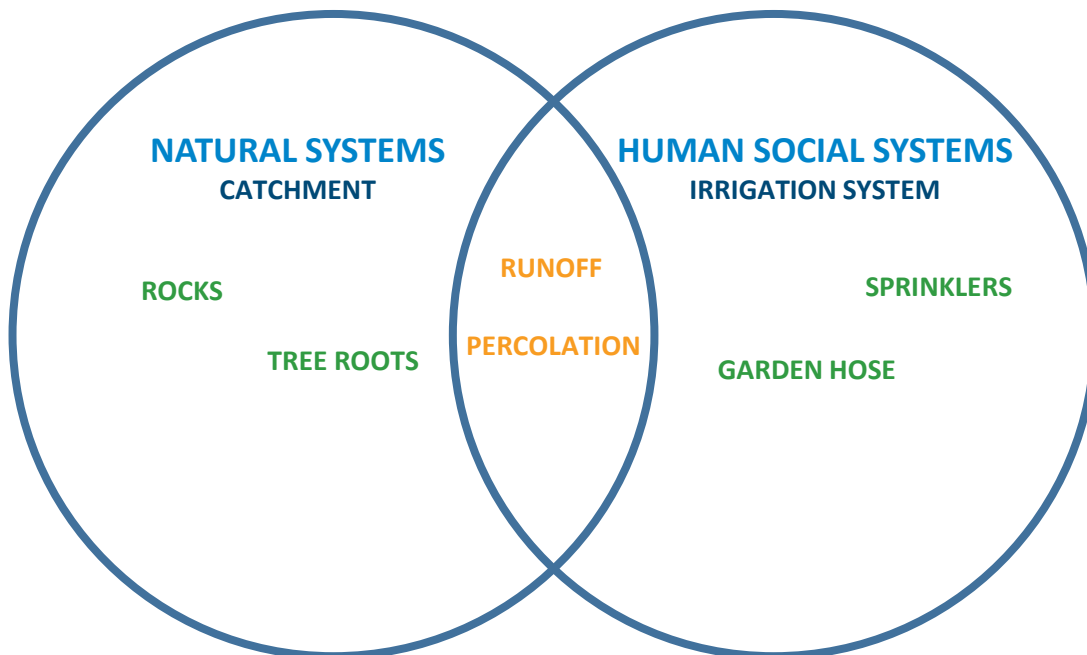
Explore your home, school, or neighborhood. Observe examples of natural and human social systems. Where do you find water? How is the water used? How does water get to this area? Why is water used or needed in this location? Are there different sources of water?

STEP 2

Where water flows and whether it percolates into the ground depends on the land's soil type and physical shape or 'topography.' This channeling system is called a catchment. What natural elements affect the flow of a catchment system? How has human interaction changed this process? You can expand on the examples used below or populate your own diagram with other examples.

STEP 3

Irrigation systems, like sprinklers, are human social systems. They are built and connected to deliver water to the outdoor plants in our communities. Take a walk outside and observe your surroundings. What examples of irrigation equipment do you see? How have humans impacted the water delivery and catchment systems in this area? You can expand on the example used below or populate your own diagram with other examples.



STEP 4

Identify the similarities and differences between a natural system and a human social system. Where do they intersect? In the center of the two circles, make a list of the connections. In the two outer circles, note what makes them different.

How have human activities caused changes to other natural systems in your home or neighborhood?
Are there ways that you can help save water at home or at school?



Observing the Natural World

Key Terms and Definitions



- 01 Biodiversity:** The variety of life found on Earth, in a particular habitat or ecosystem comprised of plants, animals, or organisms.
- 02 Catchment:** A system of land topography that channels water down along streams and through soil and rock, eventually ending up in lakes or the ocean.
- 03 Connection:** A relationship, link, or association with something else.
- 04 Ecosystem:** A community of organisms and the non-living things in the physical environment surrounding them.
- 05 Freshwater:** Naturally occurring water such as glaciers, lakes, rivers, and streams.
- 06 Habitat:** The natural home of an animal, plant, or other organism.
- 07 Interdependent:** Two or more things that depend on each other for success or survival.
- 08 Natural Resources:** Materials or substances from nature that can be used by people, like air, plants, animals, soil, and water.
- 09 Observe:** To see, watch, perceive, or notice.
- 10 Organism:** An individual plant, animal, or single-celled life form.
- 11 Percolation:** The slow movement of water through the pores in soil or permeable rock; filter.
- 12 Topography:** The arrangement and shape of the land's natural and artificial features.



Nature Journal Page Examples



The following pages provide examples to help you get started with your nature journal. There is no right or wrong way to set up a journal page. You can use store-bought items to illustrate your ideas and observations, like paint and pencils. You can also use items collected from the surrounding environment like leaves, feathers, and flowers.

Answer the following prompts:

I see:

I wonder:

I feel:

This reminds me of:





Nature Journal Prompts

General Inquiry Questions



This page is for facilitators, teachers, and parents. You can select any combination of questions to expand on the lesson. These questions can also be paired with other prompts found throughout the Grab-and-Go.

Identify

Does our understanding of the environment affect how we interact with it?

Protect

Why is it important to take care of the natural world?

Why should people care more about nature?

Investigate

How can humans impact an ecosystem?

What happens when we disturb an ecosystem?

What does a “perfect or balanced” environment look like?



Examine

Where do our natural resources, like water, come from?

Why is it important to save water?

How does water affect our bodies?

What predictions can we make about what might happen if the water supply was cut off?





Additional Journal Prompts



This page is for facilitators, teachers, and parents. You can select any combination of questions to expand on the lesson. These questions can also be paired with other prompts found throughout the Grab-and-Go.

Explore

Explore aspects of biodiversity by recording the number of plants or animals.

Explore and record aspects of the ecosystem in your area. Does it have everything it needs including water?

Explore the dirt. Make a list of what you find under rocks or wood.



Draw

Draw the shape of a body of water like a stream or river.

Draw cloud formations.

Draw plants and animals that are native to your area.

Specify

Use your senses – record what you see, hear, smell, or feel.

Use numbers in a chart to track plant growth or the number of animals you find.

Write a story or poem about a specific plant or animal that you see. Describe your surroundings in detail.



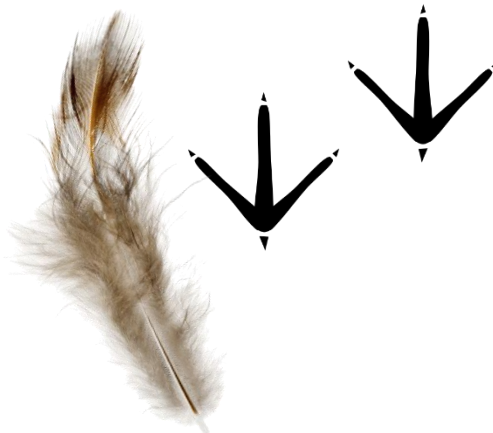
Record

Record the natural and human social systems you see.

Record details including date, time, location, weather, and water availability.

Record seasons – sit in the same spot at least once during each season and record how it is different.

Record how nature changes with the presence of water, this could be a river, ocean, or after rain.





Observing Animals

Specific Inquiry Questions



This page is for facilitators, teachers, and parents. You can select any combination of questions to expand on the lesson. These questions can also be paired with other prompts found throughout the Grab-and-Go.

Attributes

What do you notice about a particular animal in this area?

Have the animals had to adapt to live here?

What words would you use to describe the animals in this area?



Location

Do you see scat or animal tracks?

Do you see other signs of animals in the area? Flattened leaves, holes, or something else?

Where are the animals spending their time?

Do the animals here depend on each other? How?

Nutrition

What are animals in this area eating? Is there a water source nearby?

Would human interaction help or hurt the animal's health?



Neat Fact

Research an animal in this area and share an interesting fact about it with your class, family, or friends.





Observing Plants



This page is for facilitators, teachers, and parents. You can select any combination of questions to expand on the lesson. These questions can also be paired with other prompts found throughout the Grab-and-Go.

Attributes

What do you notice about the stem, leaves, and roots?

How do the plants look, feel, and smell?

Complete a leaf rubbing or press a flower in your journal.

Location

How might the weather or time of day/year be affecting how the plants look?

What type of plants do you see most in this area? Why do you think this is the case?

Do you see any weeds? How do you think they got here?

Neat Fact

Research a plant in this area and share an interesting fact about it with your class, family, or friends.



Nutrition

How does this plant get water? Is it through a natural process like rain or snow (natural system), or through a sprinkler system (human social system)?

What other types of nutrients does this plant need to survive? How is it getting those nutrients now? Would human interaction help or hurt the plant's health?

Life Cycle

Can you find multiple states of a plant or tree's life cycle in this area?

Plant seeds and record their progress. How do natural elements like sun or water affect plant growth? How about elements from human social systems like asphalt or buildings?