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of the National Park Service



LEARN AND DISCOVER MORE

WITH NATUREBRIDGE

FAMILY LEARNING ADVENTURES

Learn and connect with your family during an educational, fun, and relaxing experience in Washington's most ecologically diverse national park.

TEACHER PROFESSIONAL DEVELOPMENT

Teachers explore Olympic National Park and return to their classrooms with new, engaging techniques for connecting their students to science.

naturebridge.org/olympic

NAME _____

SCHOOL _____

DATE _____



FIELD JOURNAL

OLYMPIC

Field guide images by the following:

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- Joseph Kinyon
- NatureBridge staff, including Ingrid Apter, Rachel Loud, Anjanette Garcia, and Estrella Risinger

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Invertebrate: an animal without a backbone

Macroinvertebrate: an invertebrate that can be seen with the naked eye, without magnification

Native: organisms that originated in the district or habitat in which they live

Natural selection: the mechanism of evolution—the survival and reproduction of individuals best adapted to their environment and the elimination of those that are not

Niche: the role of an organism in its community

Nutrient cycling: the process of cycling living and nonliving matter back to simple components that can be reused by producers, usually plants

Omnivore: an animal that eats both plants and animals

Phenology: the study of plant and animal life cycle stages, such as leafing and flowering, especially in regards to their timing and relationships with weather and climate

Population: the individuals of a certain species living in a certain area

Producer: an organism that produces its own food with the help of sunlight, typically plants

Rain shadow: the relatively dry area on the lee side of a mountain range

Riparian: relating to the area around a natural watercourse such as a river, stream, or lake



Scat: animal droppings

Stewardship: the careful and responsible management of something entrusted to one's care

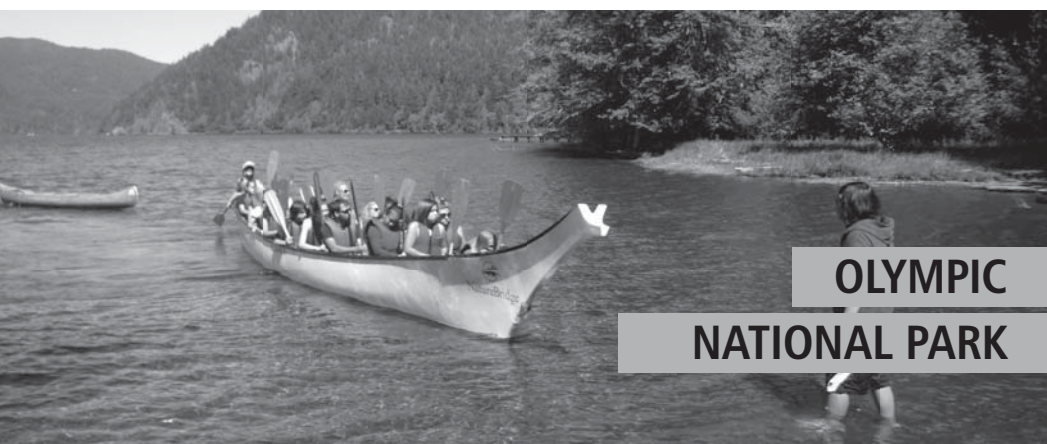
Symbiosis: an interdependent relationship between species

Temperate rainforest: an area that receives 60-200 inches of rain a year and is characterized by a climate that has one long wet season and one short dry season

Tide pool: a pool of ocean water left when the tide recedes

Watershed: all the land that drains into a specific body of water

Weather: the condition of the atmosphere due to wind, temperature, clouds, precipitation, and barometric pressure



VOCABULARY

Abiotic: anything that is not alive or never was alive (such as air and water)

Adaptation: a physical trait or behavior that helps an organism survive

Biodegradable: a substance that is able to decay under natural conditions

Biodiversity: the variety of different living things in a particular environment

Biologist: a scientist who studies living things

Biome: an ecological community characterized by climatic conditions of the region and distinctive plant and animal species

Biotic: anything that is or once was alive (such as animals and dead leaves)

Carnivore: an animal that eats mostly meat—a secondary consumer

Chaparral: an ecological community composed of shrubby plants adapted to dry summers and moist winters

Climate: how the atmosphere “behaves” over relatively long periods of time, such as decades or centuries. Climate determines the major physical challenges an organism must adapt to, including temperature, moisture, and seasonal patterns

Community: a collection of organisms that live together in the same place

Consumer: an organism that needs to eat other organisms and cannot produce its own food

Decomposer: an organism that consumes dead or decaying material, breaks it down, and returns the organic nutrients to the environment

Ecology: the study of the natural environment and the relationships of organisms to one another and their surroundings

Ecosystem: all the interconnected parts, abiotic, biotic, and cultural, of a particular area

Endemic: an organism that is restricted to a specific locality or region

Energy flow: the flow of energy from one organism to another in an ecosystem

Erosion: the carrying away of land or soil by wind, water, or ice

Evolution: the changes in a species over generations

Exotic species: an organism that has been introduced, usually by humans, into an ecosystem in which it is not native

Food web: a way of representing various paths of energy moving through an ecosystem through the consumption of food

Geology: a science that deals with the history of the Earth, especially as recorded in rocks

Habitat: the place where an organism lives, which provides what it needs to survive

Herbivore: an animal that eats plants—a primary consumer

Invasive: a non-native species whose introduction causes environmental harm

Founded in 1971, NatureBridge provides environmental science education for students in the world’s best classrooms—our national parks. Through residential education programs, NatureBridge connects students to the wonder and science of nature and inspires the stewards of tomorrow.

As the largest residential education partner of the National Park Service, NatureBridge serves more than 30,000 students each year and offers programs in six national parks: Yosemite National Park, Golden Gate National Recreation Area, Olympic National Park, Santa Monica Mountains National Recreation Area, Channel Islands National Park, and Prince William Forest Park. NatureBridge also offers professional development opportunities for teachers and family and youth programs.

WELCOME TO OUR CLASSROOM!

NatureBridge science programs in Olympic National Park take place on the shores of glacially carved Lake Crescent. Ancient forests, alpine terrain, coastal marine habitats, and the largest river restoration in U.S. history make Olympic National Park a quintessential living laboratory. Before becoming a national park in 1938, the area was home to multiple Native American tribes, some of whom still live in the area. Today, Olympic National Park counts among its almost 1 million acres North America’s best remaining example of temperate rainforest as well as marine and alpine ecosystems.

WHAT IS A FIELD JOURNAL?

A field journal is any kind of notebook used to write or draw your observations of the natural world—the field. This field journal is for you to use during your stay with NatureBridge. It’s one way to save your memories. All kinds of people, including scientists and artists, use field journals to learn more about nature. When you return home, you can create your own and use it to help you get to know the outdoors better in your own community.



MY EDUCATOR

MY CHAPERONE

BE PREPARED

BACKPACK CHECKLIST

Have the following items with you every morning:

- Backpack with room for lunch
- Water bottle filled with water
- Rain gear and warm clothes
- Sun protection, including sunscreen and hat
- Field journal along with pen or pencil
- Bandanna (crumb catcher)
- Medication (including inhalers and EpiPens)
- Empty bladder (go to the bathroom)
- Positive Mental Attitude (PMA)



DAILY SCHEDULE

7/7:30/8 a.m.	Good morning & breakfast
9 a.m.	Meet your educator
Noon	Lunch with your field group
4 p.m.	Free time
5/5:30/6 p.m.	Dinner
7 p.m.	Evening program
9:30 p.m.	Quiet hours

What's the difference between climate and weather? Weather describes the conditions of the atmosphere over a short period of time such as days, weeks, or months, and climate is how the atmosphere "behaves" over relatively long periods of time, such as decades or centuries.

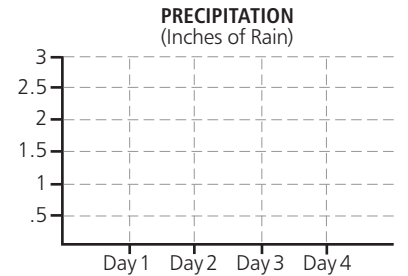
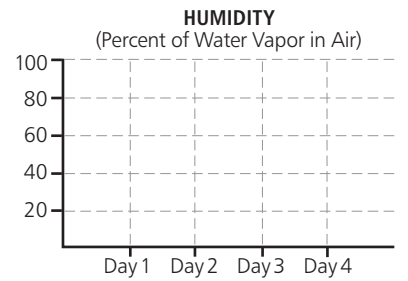
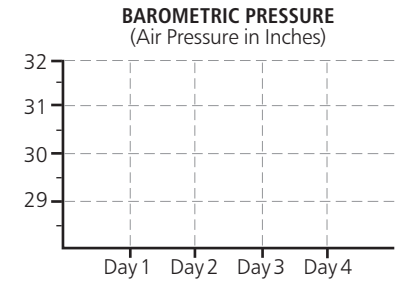
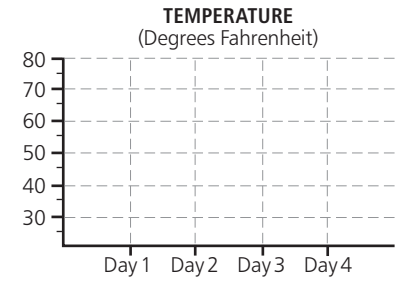
My Weather Observations & Predictions

DAY 1

DAY 2

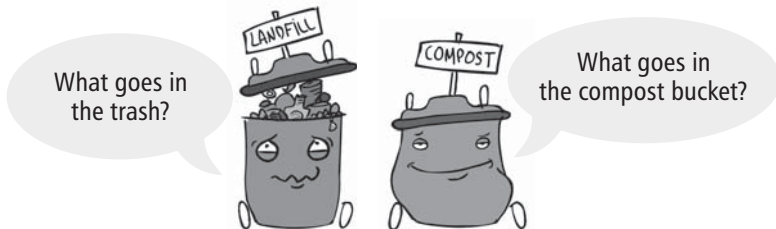
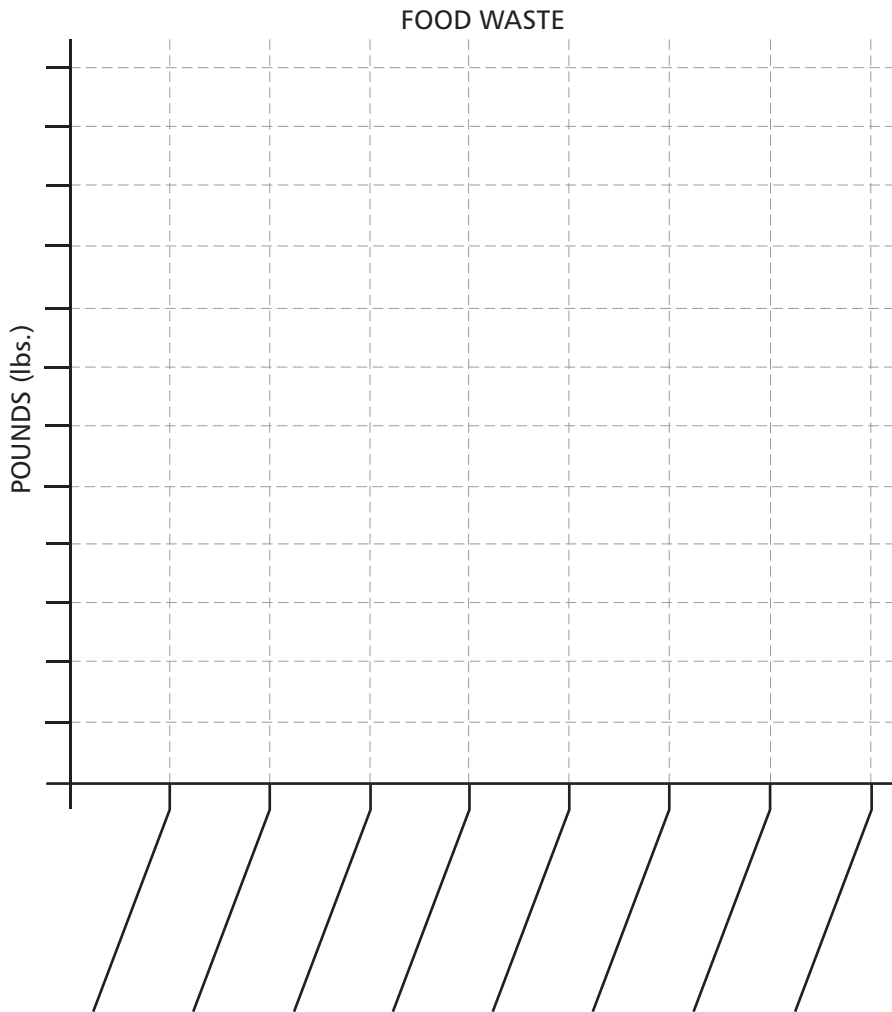
DAY 3

DAY 4



GARBOLOGY

Garbology is the **STUDY OF WASTE**—what’s in our trash and where does it go? Find out more at garbology.org



LEAVE NO TRACE SEVEN PRINCIPLES

An excellent motto for minimizing your impact is **“Take only pictures, leave only footprints.”** Below are the Leave No Trace Seven Principles, which can be found in greater detail at Int.org

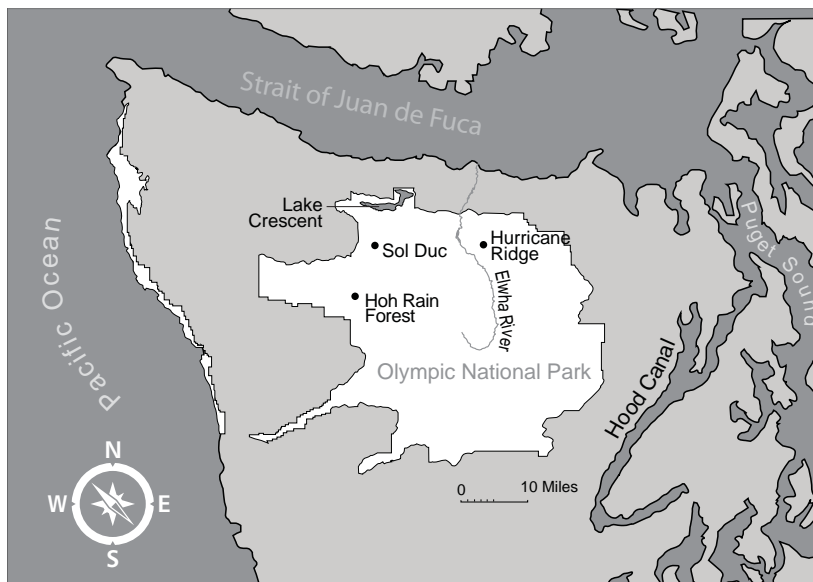
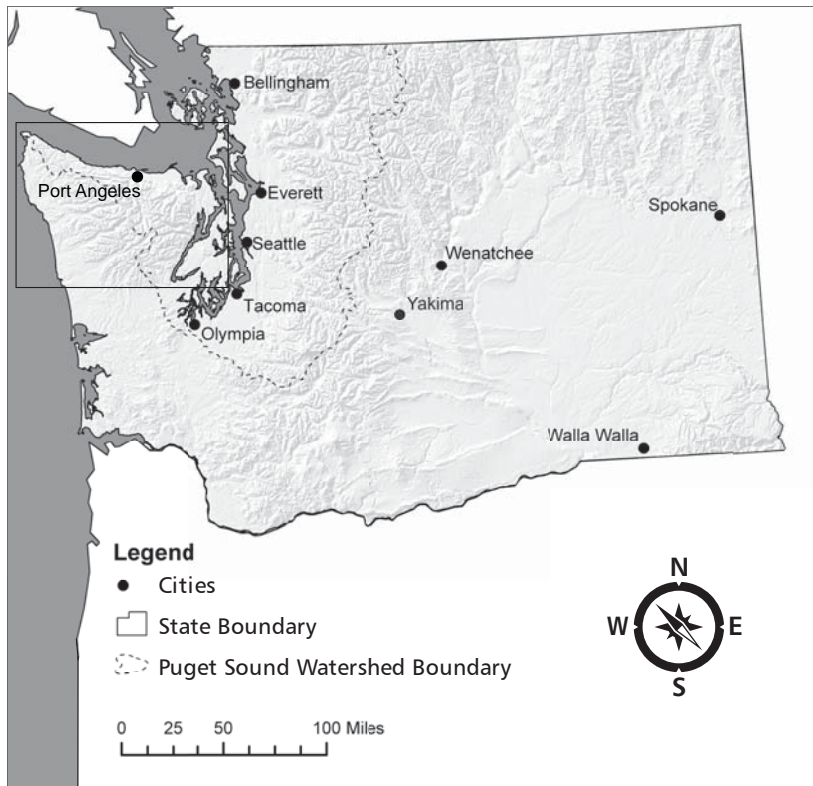


- 1 **Plan ahead and prepare**
Wear and pack appropriate gear and know the area you are traveling in.
- 2 **Travel and camp on durable surfaces**
Protect wild animals and plants by staying on the trail and camping in designated areas.
- 3 **Dispose of waste properly**
Pack out everything you bring and help take out any trash you find.
- 4 **Leave what you find**
Allow others to enjoy the same rocks, twigs, feathers, and artifacts you discovered.
- 5 **Minimize campfire impacts**
Use established fire rings and know the restrictions for collecting wood.
- 6 **Respect wildlife**
Observe wildlife from a distance and never allow wild animals to access your food.
- 7 **Be considerate of other visitors**
Respect other visitors and protect the quality of their experience.



The Leave No Trace Seven Principles have been reprinted with the permission of the Leave No Trace Center for Outdoor Ethics. For more information, visit: Int.org

WHERE AM I NOW?



WHAT I CAN DO TO MAKE A DIFFERENCE

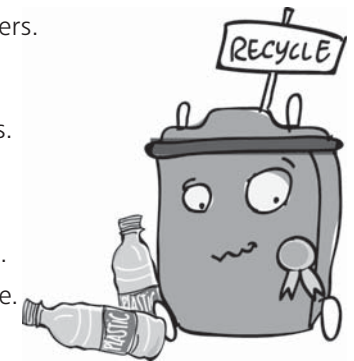
Individuals, communities, and environments are interconnected; you can make a difference in your daily life by protecting the balance between the three! Every action counts. Below are a few ideas of actions you can take.

Conserve Resources and Energy (Reduce! Reuse! Recycle!)

1. Recycle your plastic, aluminum, glass, batteries, paper, and cardboard products.
2. Turn off lights and appliances when they are not in use.
3. Walk, ride a bike, carpool, or take public transportation.
4. Use cloth bags for groceries and reusable containers for food.
5. Turn off the faucet and take shorter showers.

Respect the Environment

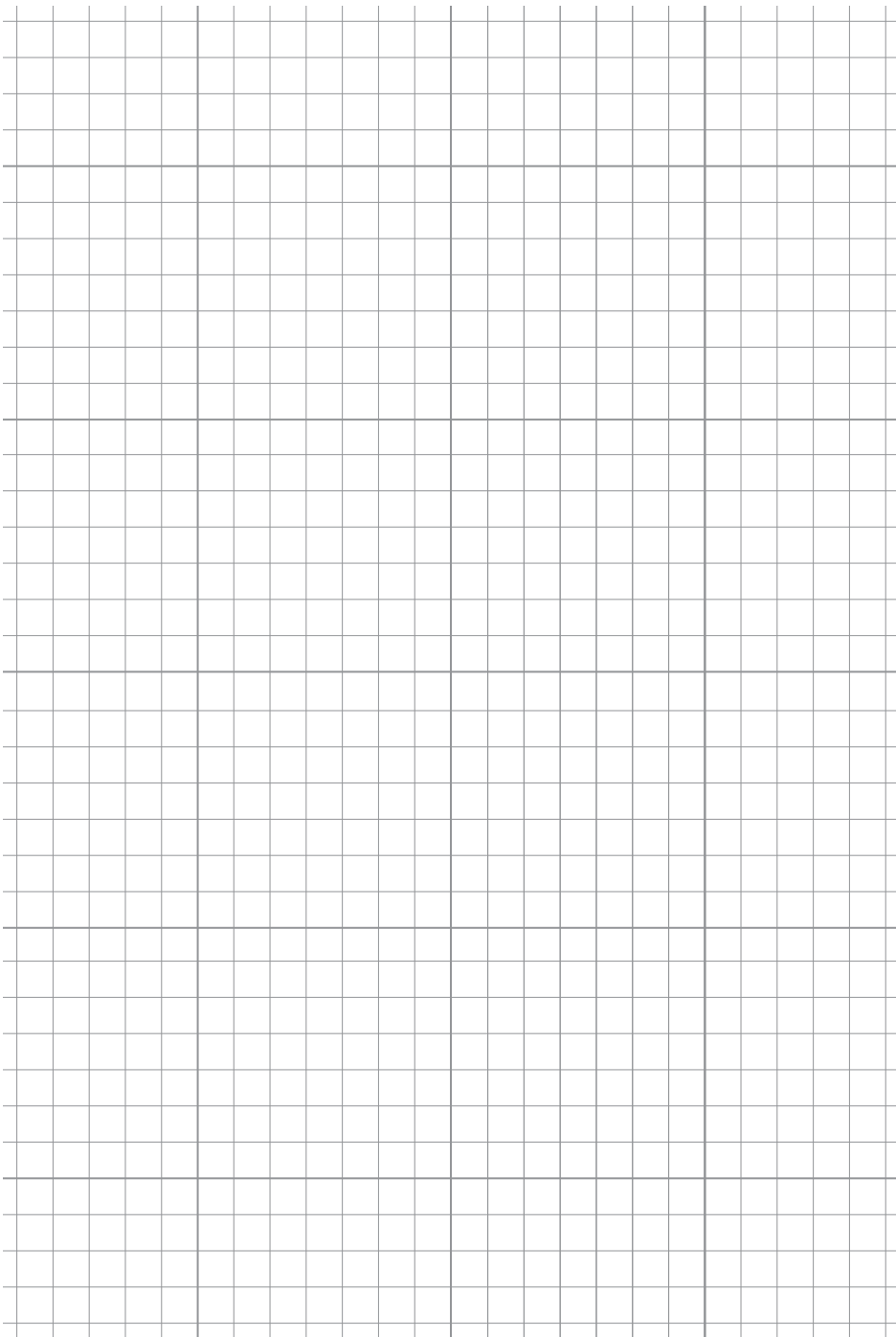
1. Follow the Leave No Trace Seven Principles.
2. Plant native trees and plants.
3. Start your own garden and compost pile.
4. Pick up trash around your school or home.
5. Buy local and seasonal food when possible.



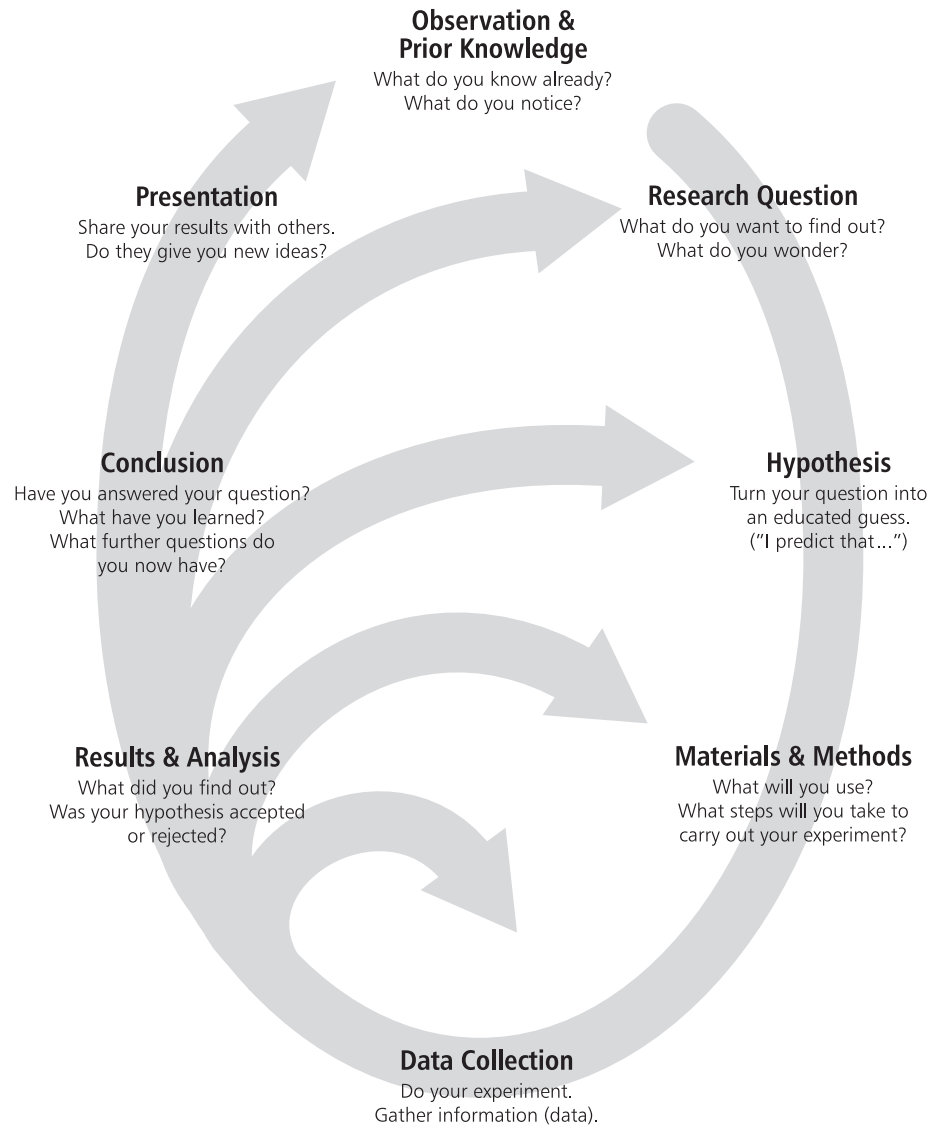
Learn and Share

1. Spend your free time outside hiking, biking, and going to the beach.
2. Learn about the plants and animals in your area.
3. Visit national and state parks.
4. Get involved with local organizations and community projects.
5. Share your knowledge and resources with others.

“When I return home I will” ”



SCIENTIFIC INQUIRY



MICROSCOPE LAB

Describe and sketch what you see in the microscope:

SUBJECT:

SUBJECT:

Remember to label your sketches so that someone else can determine exactly what you saw.

Now that you have looked through the microscope, what questions do you have?

How would you go about answering your questions?

What did you discover about the microscopic world of Olympic National Park?



What do you observe about the creek ecosystem?

How might you test the overall health of the creek?

What questions do you have about this habitat?

How might you go about answering your questions?

CLASS 1: Animals intolerant of pollution



Mayfly nymph



Caddisfly nymph



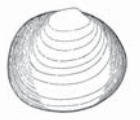
Stonefly nymph



Net-spinning Caddisfly nymph



Water Penny



Freshwater Clam

CLASS 2: Animals tolerant of a little pollution



Amphipod (scud)



Aquatic Isopod



Damselfly nymph



Dragonfly nymph

CLASS 3: Animals tolerant of pollution



Midge larva



Cranefly larva



Mosquito larva



Blackfly larva



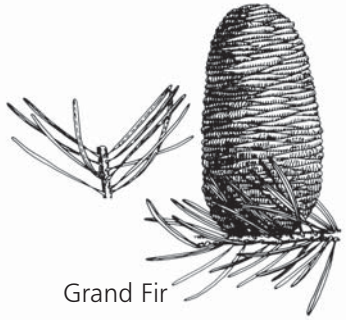
Rat-tailed Maggot



Aquatic Earthworm

Field Guide: PLANTS

(Not to scale)



Grand Fir



Douglas Fir



Western Red Cedar



Vine Maple



Bigleaf Maple



Red Alder



Oregon Grape



Salal

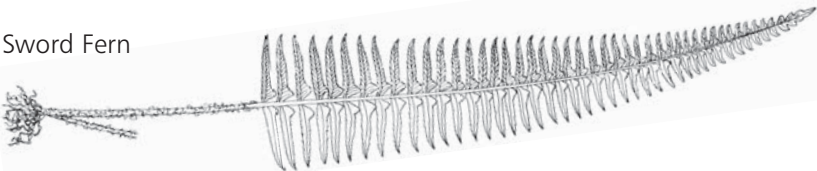


Red Huckleberry

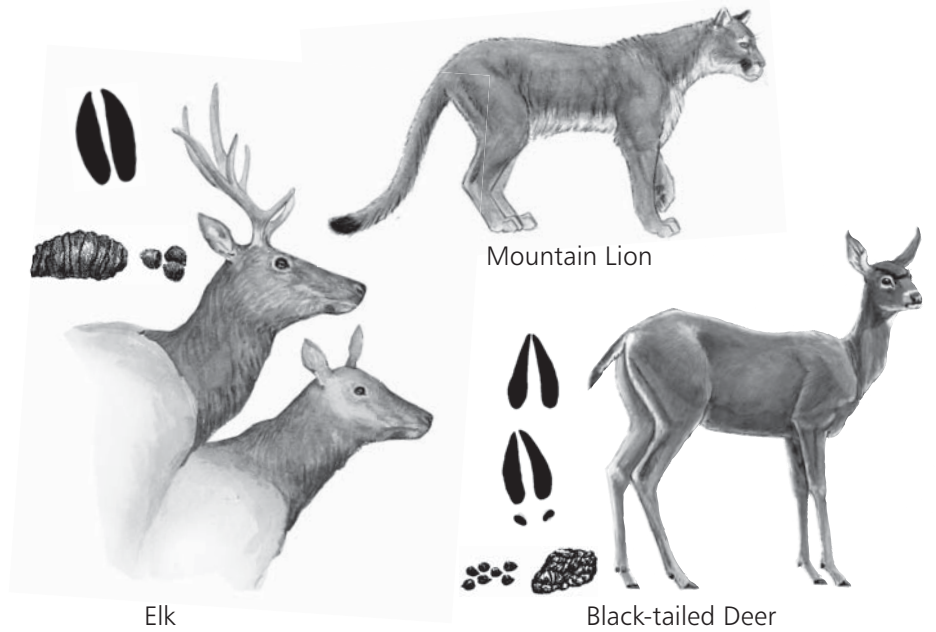
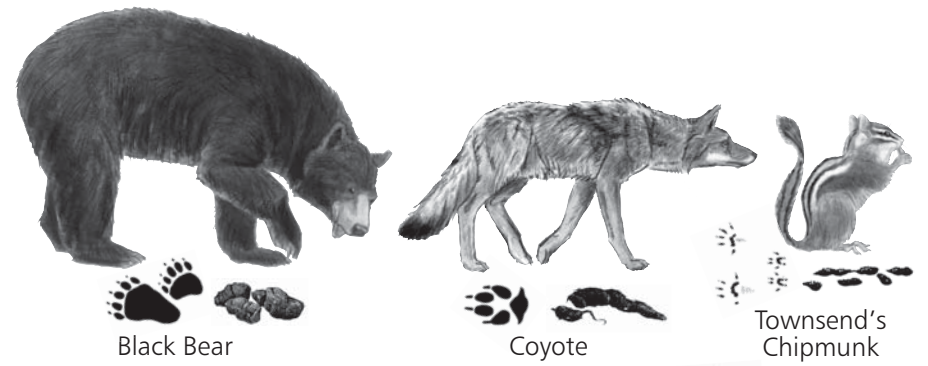
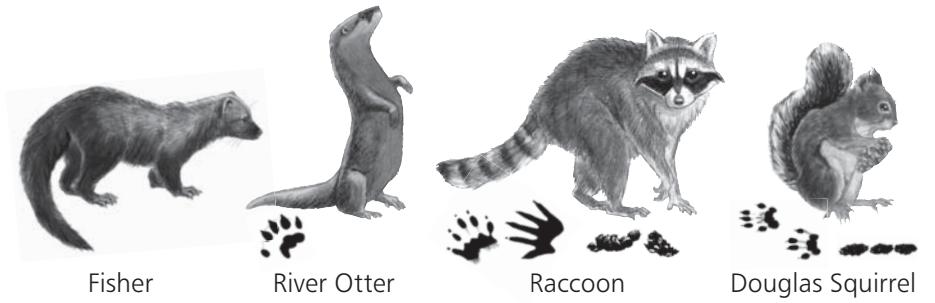


Devil's Club

Sword Fern



(Not to scale)



Field Guide: BIRDS

(Not to scale)



Chestnut-backed Chickadee



American Dipper



Dark-eyed Junco



Pacific Wren



Violet-green Swallow



Barn Swallow



Varied Thrush



American Robin

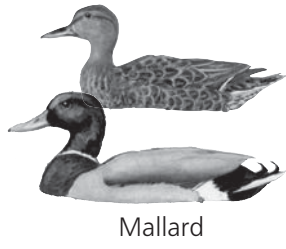


Gray Jay

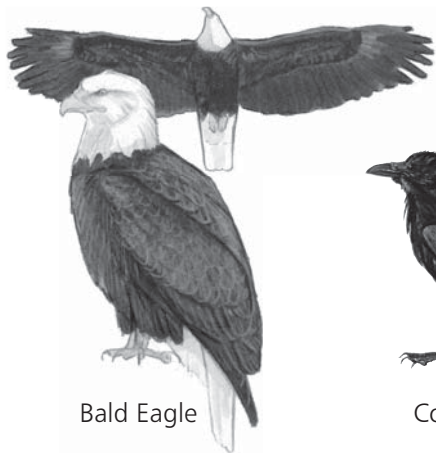


Steller's Jay

Barred Owl



Mallard



Bald Eagle



Common Raven



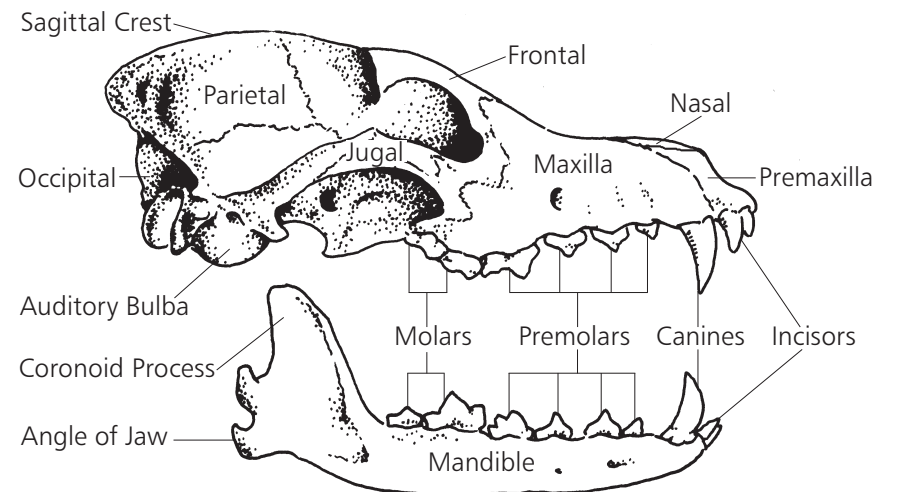
American Crow

List Observations

Herbivore Omnivore Carnivore

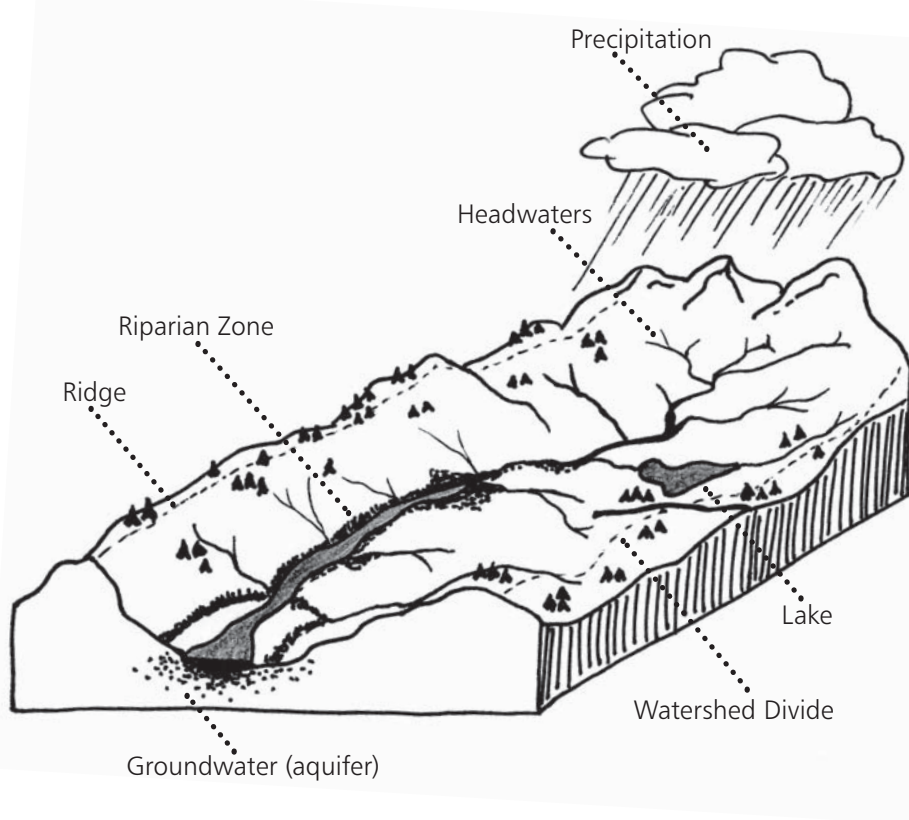
Sketch

SUBJECT:



WHAT IS A WATERSHED?

A **WATERSHED** is all the land that drains into a specific body of water.

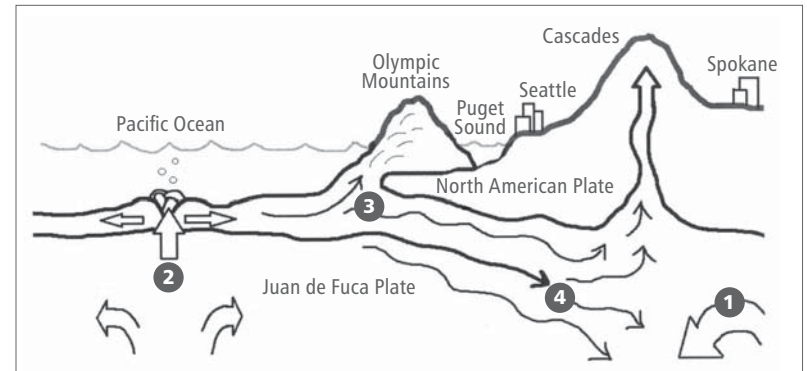


What impacts do humans have on their watershed?

GEOLOGY

Scientists who study rocks, or **GEOLOGISTS**, recognize three major groups of rocks.

- 1 Igneous rocks** form when hot, liquid rock, or magma, cools. When this magma slowly cools underground, it forms intrusive igneous rock. Magma that quickly cools aboveground becomes extrusive igneous rock.
- 2 Sedimentary rocks** result when various weathering processes break down other types of rocks into particles, or sediment, or when once-living organisms accumulate. With the help of time and external pressures, these sediments get compacted into sedimentary rock.
- 3 Metamorphic rocks** are created through the metamorphosis, or change, of other types of rocks. This normally happens deep underground where heat, pressure, and chemical activity can actually alter the minerals inside rocks.



- 1.** Deep below the Earth's surface molten magma circulates, slowly moving the plates that are floating on top of it.
- 2.** Divergent plate boundary: two plates spread apart in the Pacific Ocean and hot magma pours out of the crack.
- 3.** Convergent plate boundary: in a process called subduction, the dense oceanic plate dives under the continental plate. As this happens, rock is scraped off the subducting oceanic plate and the Olympic Mountains are formed.
- 4.** As the oceanic plate is subducted below the continental plate, the rock is melted into molten magma. The magma eventually makes its way back to the surface in the form of the Cascade volcanoes.