



Who lives in my Backyard?

Learn about the wild plants and animals that live near you, and how they share their home. Then, compare your local flora and fauna to those from a different part of Wyoming.

Grade Level: Second grade

Number of Lessons: 3

Essential Question:

Why do organisms live where they do in Wyoming?

Objectives:

At the end of this unit, students will be able to:

- *recognize* common and important plants, animals and other organisms that live near their home.
- *identify* abiotic conditions that control plant and animal distributions.
- *describe* some of the relationships between plants and animals that share the same habitat.
- become *familiar* with local plants and animals.
- *explain* how differences in abiotic factors lead to different plant and animal inhabitants.

Assessment opportunities:

At the end of this unit, you will be able to assess students through:

- Asking students to identify organisms and relationships as they construct a food web.
- Students making a field guide for distribution to family and community members.
- Students communicating their learning of the topic to another class.

Performance Expectations:

2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats.



Disciplinary Core Ideas: Next Generation Science Standards:

LS2.A: Interdependent Relationships in Ecosystems

Plants depend on water and light to grow. (2-LS2-1)

Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

<http://www.nextgenscience.org/2ls2-ecosystems-interactions-energy-dynamics>

LS4.D: Biodiversity and Humans.

There are many different kinds of living things in any area, and they exist in different places on land and in water.

<http://www.nextgenscience.org/2ls4-biological-evolution-unity-diversity>

Wyoming State Standards:

SC4.1.3: Organisms and their Environments: Students show connections between living things, their basic needs and their environments.

Resources:

Species Identification:

<http://www.wyobio.org/index.php/resources/identification/>

Land cover map:

http://www.wyobio.org/files/9914/1347/0102/Wyoming_vegmap_knight.pdf

Who lives in my Backyard?

Vocabulary

Abiotic

Biotic

Producer

Consumer

Riparian

Sagebrush community

Forest community

Alpine community

Niche

Adaptations

Habitat

Vegetation types of Wyoming

A useful first step in thinking about your local plants and animals, is to determine the vegetation type where you live. Types are identified by a dominant plant species or group of species. Since animals are associated with particular vegetation types, these categories are useful for both plants and animals. The map to the right shows the distribution of 12 vegetation types across the state.

Ponderosa pine forest Aspen Bur oak (bh) White spruce (bh) Paper birch (bh)	Sagebrush shrubland
Lodgepole pine forest Aspen Douglas-fir & limber pine (th) Whitebark pine (gye)	Desert shrubland
Engelman spruce-subalpine fir forest Aspen Whitebark pine (gye)	Grassland
Alpine tundra Mountain meadows	Sand dunes Active & stabilized
Aspen and oak woodland Bur oak (bh) Gambel oak (sm)	Riparian wetlands
Juniper woodland Foothills shrubland	Lakes and reservoirs
	Cultivated land Hayland
	Urban and industrial Coal mines

Background Information

Ecosystems consist of all the living organisms and non-living (abiotic) elements within a self-sustaining natural system. The presence of specific plants and animals is determined by many factors, including the abiotic components (minimum and maximum temperatures, availability of water and nutrients, soil and water chemistry, etc.), and by interactions with other species.

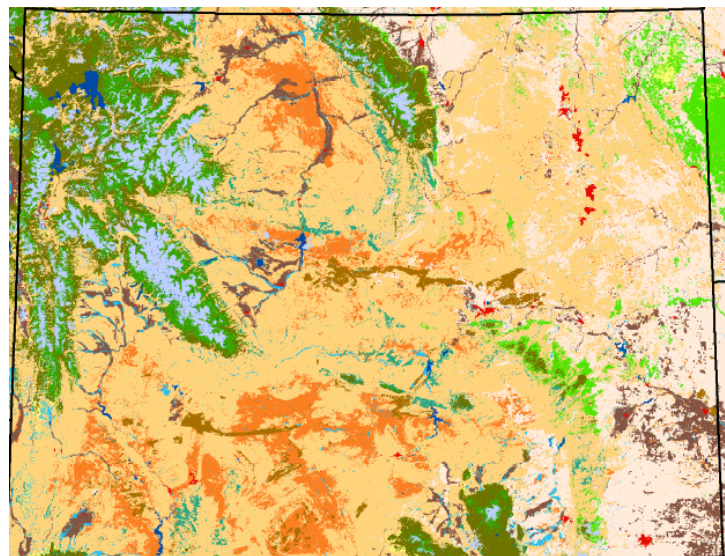
In the case of plants, distribution is controlled in large part by temperature and precipitation, but also by the presence or absence of associated animals and fungi, including insect pollinators and pests, herbivores, pathogens, and root symbionts. Like animals, plants must compete for resources like water and space, but unlike animals, they also compete for sunlight.

Because animals can move when conditions don't suit them, they are a bit less constrained by temperature, water availability, and other abiotic elements. However, they compete constantly for food and shelter, and must avoid predators and pathogens.

Some species have a bigger effect on the ecosystem than would be expected, based on their numbers alone. These keystone species may provide or maintain physical structure of the habitat, directly or indirectly, and affect the numbers and kinds of species in the environment. Examples of keystone species in Wyoming include prairie dogs, wolves, and aspen trees.

For example, prairie dogs not only provide food for a number of predators (eagles, coyotes, and black-footed ferrets to name just three), they provide habitat for a huge number of animals that either share the prairie dogs' burrows or use abandoned burrows, including insects, spiders, snakes, and owls.

Prairie dogs also affect the plant species by preferentially feeding on some species, trimming others to keep predators in sight, and digging in the soil, which provides growing sites for many species that prefer disturbed sites. The loss of prairie dogs from an area results in a rapid reduction in biodiversity for the ecosystem.



Knight, D.H., G.P. Jones, W.A. Reiners and W. H. Romme. 2014. Mountains and Plains: The Ecology of Wyoming Landscapes, 2nd edition. Yale University Press, New Haven

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Lesson 1: Plant Neighbors

Objectives:

- Students will *recognize* common and important plants, animals and other organisms that live near their home.
- Students will *identify* abiotic conditions that control plant and animal distributions.

Time Commitment:

45 minutes in the field;
30 minutes in classroom to organize information for WyoBio;
additional hour for follow-up discussion and to complete field guide.

Preparation:

Each student will need:

- a clipboard or other hard surface,
- the worksheets from the following pages,
- and writing/drawing materials: a pencil or a selection of colored pencils.
- Magnifying glasses are a nice addition.

Camera(s) needed to upload images to WyoBio.

Field guides for local plants to assist with identification.

Assessment:

Students will make a field guide for distribution to family and community members.

Directions:

1. All field biologists start with a description of their study site, which includes notes about weather, geology (rocks, soils, topography), and habitat. This last category includes vegetation type--desert, shrubland, forest, etc. Students should write their observations on page one, and make a drawing of the site on the right.

2. Ask each student to select two plants to describe and draw. If you plan to compile their work into a field guide, then have the students select as many different plants as possible. If you will not be making a field guide, have students observe the commonest plants. Have each student or a designated person photograph each plant.

3. It is important to have a name for each plant, since that is how scientists and non-scientists talk about organisms. The students can apply what they know, which may be as simple as tree, cottonwood tree, wildflower, or grass. You or another expert may be able to provide a more specific name. Using the field guides will help students learn what traits of plants to observe and record. WyoBio resources may be helpful, as well.

4. Back in the classroom, make a list on the board of all the different plants that students observed. Add interesting observations, such as, which plants grow closest to water, which had many insect visitors, etc.

5. Contribute the observations to WyoBio.

6. Use WyoBio and other resources to discover where each plant species is found, and where it is not found. Use this information as a basis to discuss the abiotic factors that control plant distribution.

7. (optional) Scan the students' work and compile into a book. The students can write an introduction describing what they know about the site and the plants.

Disciplinary Core Ideas:

LS4.D: Biodiversity and Humans.

There are many different kinds of living things in any area, and they exist in different places on land and in water.

Performance Expectations:

2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats.

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Lesson 2: The Wild Community

A food web activity

Objectives:

- Students will become *familiar* with local plants and animals.
- Students will *describe* some of the relationships between plants and animals that share the same habitat.

Time Commitment:

Preparation time variable.

Activity time 1 hour.

Preparation:

- **Cards:** Develop a list of plants and animals that live in your local area, including ones that the students know and some that will be new. Include herbivores, predators and scavengers, and plenty of insects. For each organism card, you will need a photo (or illustration), name (scientific and/or common) and a short description of what it eats, is eaten by, and where it lives, as appropriate. You may choose to include the sun. Print cards, punch two holes in each, and string so that they can be worn as necklaces. Organism and text cards for prairie ecosystem are available at: wyobio.org/index.php/education
- **Ropes:** Cut rope or sturdy yarn to 5 or 6 foot lengths. Tie four together at one end so that each student will be able to make four connections.
- **Mural (optional):** Draw or print a large picture of the local landscape to hang on the wall. Prairie ecosystem mural is available at: wyobio.org/index.php/education

Assessment:

Students will identify organisms and relationships as they construct a food web.

Directions:

1. Pass out cards to students (one each). Help students identify the ones they don't know.
2. With students in a circle, hand out a bundle of rope to one. Ask the student to pass the loose ends one at a time to organisms with which he/she is connected, and explain the connection (food, shelter, etc.). Continue in this manner until all the students are connected to four others.
3. Ask the students to describe what they have done. Which organisms have the most connections? Was it the ones they expected? Have they identified a keystone species?
4. **(optional)** Students cut out organisms from card and tape to mural in appropriate place.

Vocabulary

These words have been used in the prairie text cards:

Alkaline

Arthropod

Carnivore

Carrion

Detritus

Drought

Endemic

Larva(e)

Nocturnal

Omnivore

Disciplinary Core Ideas:

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Lesson 3: Someone Else's Backyard

Objectives:

- Students will *explain* how differences in abiotic factors lead to different plant and animal inhabitants.

Time Commitment:

Prep time is variable

20-30mins: classroom time

Preparation:

- Locate a teacher at another school who is doing the same or similar project, so that classes can exchange field guides and/or pictures of their sites.
- Alternatively, or in addition, have pictures of another habitat ready.
- An excellent (adult) resource for vegetation of [Wyoming is Mountains and Plains: The Ecology of Wyoming Landscapes](#), 2nd edition, by Dennis H. Knight et al (2014).

Assessment:

Students will communicate with peers about the plants and animals found at two sites, and the biotic and abiotic factors responsible.

Directions:

1. Open WyoBio to the map application, and zoom in on the location of your outdoor activity. Turn on the Land Cover Types layer to discover the vegetation type.

2. Zoom out to see the extent of that vegetation zone. What other

vegetation types are found near your location?

3. If possible, visit another site and look for plants that are same and different from the first site. Or, look at pictures of a different area. Ask the students to describe the abiotic factors that are responsible for change in vegetation. (For example, one site may get more precipitation than the other.)

4. Have students list animals that they would expect to find at each site. Students should have good understanding now of interconnections among species, so each can explain why an animal would live where it does.

5. Trade a copy of your field guide with a class at a different school. Use WyoBio to find out the vegetation type they visited. Compare your plants with theirs. Students can use the forum feature of WyoBio, or another form of communication, to share information about climate, plants and animals with the other class.

Disciplinary Core Ideas:

LS4.D: Biodiversity and Humans.

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Performance expectations:

2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitat.

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