

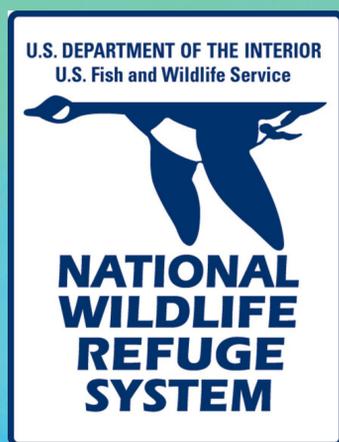
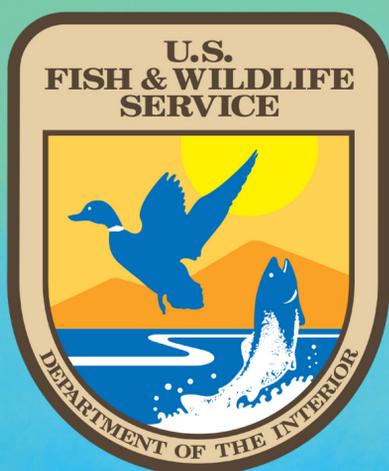


# National Elk Refuge



## K-5 Curriculum Wyoming Science Standards Education Lesson Plans

# About Us



**The National Elk Refuge is a federal agency managed by the U.S. Fish & Wildlife Service. Our site is one of over 560 sites in the National Wildlife Refuge System in the United States. National Wildlife Refuges are home to more than 700 types of birds, 220 varieties of mammals, 250 kinds of reptiles and amphibians, 1,000 species of fish, and countless invertebrates and plants. They provide havens for some 380 endangered species ranging in diversity, from the Florida panther to the polar bear.**

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# Schedule a Lesson



Dear Educators,

The education team at the National Elk Refuge is excited to offer you enjoyable, curriculum-based life sciences and natural history lessons at the Jackson Hole & Greater Yellowstone Visitor Center in Jackson, WY, or on-site at your education facility. Sites in Teton, Sublette, and Lincoln Counties in Wyoming and Teton County, Idaho are eligible for on-site lessons presented by refuge staff.

All the lessons are free of charge. To ensure adequate planning time for refuge staff, a minimum of two weeks notification is required prior to the desired lesson date.

The National Elk Refuge education team will collaborate with educators to ensure lessons align with science standards.

**To schedule a lesson, please contact:**

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# Animals In Winter

## Wyoming Science Standards

K-EES3-1, 1-LS1-1, 2-LS4-1, 3-LS3-2, 3-LS4-3, 4-LS1-1

## Suggested Grade Level

K-4th, Lesson will be adapted for each grade.

## Lesson Overview

The educational focus of the lesson is how animals adapt to the challenges they experience during winter.

## Lesson Length

30 - 45 minutes

## Setting

The lesson is an indoor activity.

## Learning Outcomes

Upon completion of the lesson, students will be able to:

- Define habitat, adaptation, migration, resist, hibernation, mimic, survive, protect, metabolism, ground hair, and guard hair.
- Give examples of how humans mimic wildlife to adapt to winter.
- Differentiate between adapting and avoiding winter.
- Determine how physical adaptations meet the needs of wildlife.

## Learning Outcomes

### Continued

- Summarize why it is important not to disturb wintering wildlife.
- Determine how the physical form of an animal helps them meet their needs.
- Explain why adaptations are critical in an animal's survival in its natural habitat.

## Theme

In order to survive, all animals must be able to adapt to conditions in their natural habitat.

## Sub-theme

Animals have developed specific adaptations to help them survive harsh winters.

## Lesson Activities

The lesson consists of an interactive presentation and optional activity that reinforces lesson objectives and content. Students will have the opportunity to make up-close observations of pelts, skulls, and other wildlife props to draw conclusions about their functions. Animals found in the Greater Yellowstone Ecosystem are featured.



A Naturalist shows students a bear skull while she discusses how bears survive winter!

# Animalympics

## Wyoming Science Standards

K-LS1-1, 2-LS4-1, 3-LS4-2, 4-LS1-1, 4-LS1-2

## Suggested Grade Level

K-4th, Lesson will be adapted for each grade.

## Lesson Overview

Students will complete an eight page Animalympics booklet or a portion of the booklet that provides activities that compare their physical abilities with wild animals found on the National Elk Refuge. Students keep the completed booklets. The concept of adaptation will be introduced and reinforced throughout the lesson.

## Lesson Length

Approximately 90 minutes to complete activities for all eight animals for a group of approximately 20 students. The lesson can be adapted to accommodate individual lessons of shorter length.

## Setting

The lesson is conducted outdoors in a large open area. Some activities can be conducted indoors.

## Learning Outcomes

Upon completion of the lesson students will be able to:

- Define adaptation.
- Explain why adaptation is important.
- Discuss at least three special adaptations possessed by animals found on the National Elk Refuge.
- Explain why the three adaptations discussed by students are critical to the animal's survival.
- Compare their physical abilities to at least three animals found on the National Elk Refuge.

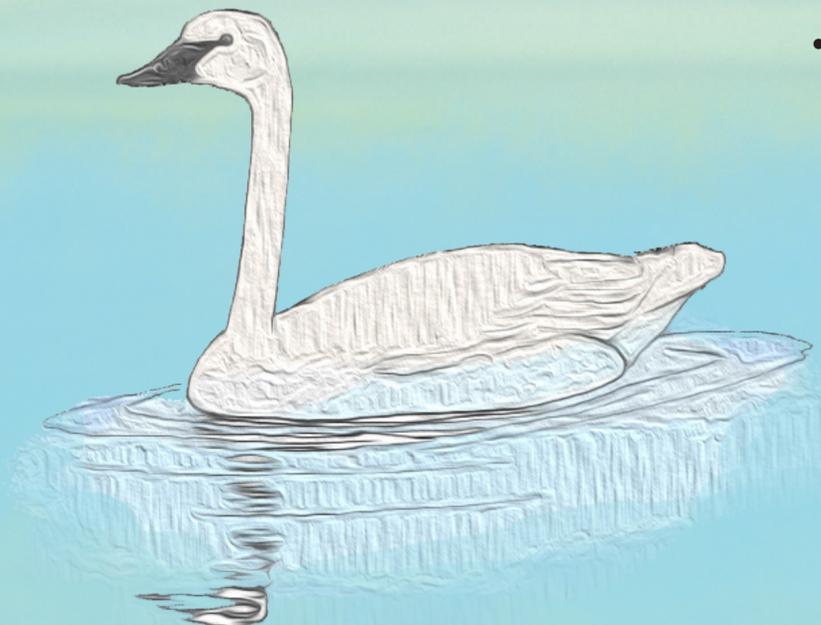
## Theme

Animals have developed special physical or behavioral adaptations (traits or skills) that help them survive in the wild.

## Lesson Activities

Any or all of a variety of activities are completed that compare students' physical abilities to wild animals including:

- Jumping a measured vertical distance (bison)
- Leaping forward a measured distance (mountain lion)
- Counting the number of times they can flap their arms in 10 seconds and taking their pulse (hummingbird)
- Running a timed distance of 45 yards (pronghorn)
- Spotting a toy mouse from a distance (bald eagle)
- Measuring the breadth of their arm span (trumpeter swan)
- Holding their breath for a timed period (moose)
- Running on their tip toes for 25 yards (elk)
- Estimating the weight of an elk antler (elk)
- Holding an elk antler on their head (elk)
- Identifying where a special "click" made by elk front legs comes from (elk)



Trumpeter Swans can often be observed on the Refuge!

# Antlers & Horns

## Wyoming Science Standards

3-LS2-1, 3-LS3-1, 3-LS3-2, 3-LS4-2, 4-LS1-1

## Suggested Grade Level

3rd-4th, Lesson will be adapted for each grade.

## Lesson Overview

The lesson will compare and contrast antlers and horns. Basic anatomy and functions will be presented. The focus is antlers and horns of mammals found in the Greater Yellowstone Ecosystem.

## Lesson Length

30 minutes

## Setting

The lesson is an indoor activity.

## Learning Outcomes

Upon completion of the lesson the student will be able to:

- Define characteristic, compete, environment, habitat, mate, migration, offspring, reproduce, survive, and variation.
- Determine two functions of antlers and horns.
- Compare and contrast at least three characteristics of antlers and horns.

## Learning Outcomes Continued

- Discuss how antler and horn structures are used in survival, finding mates, and reproduction.

## Theme

While antlers and horns have basically the same functions, there are significant differences between them.

## Lesson Activities

The lesson consists of a presentation on the natural history of antlers and horns including function, basic anatomy, composition, and growth.

## Lesson Activities Continued

Similarities and differences will be discussed. Students will have the opportunity to observe and examine real and replica specimens of antlers and horns from mammals found in the Greater Yellowstone Ecosystem. An activity is included to reinforce the information presented and give the students the opportunity to compare and contrast antlers and horns.



A Naturalist shows students velvet on an elk antler!

# Beavers & Aspen

## Wyoming Science Standards

K-ESS-2, 1-LS1-1, 1-LS1-2, 2-LS4-1, 3-LS1-1, 3-LS2-1, 3-LS4-3, 4-LS1-1, 5-LS2-1

## Suggested Grade Level

K-5th, Lesson will be adapted for each grade.

## Lesson Overview

The lesson will explore the complex relationship between beavers and aspen trees and how that relationship influences entire ecosystems. Students will further explore the industrious nature of beavers and discover how beavers are able to increase species richness and habitat diversity at the landscape scale.

## Lesson Length

30 minutes. *Optional activity can be added that is 20 minutes.*

## Setting

This lesson is an indoor activity.

## Learning Outcomes

Upon completion of the lesson, students will be able to:

- Define aspen grove, habitat, pond, deciduous, clonal colony, chlorophyll, dam, canal, lodge, organism, herbivore, photosynthesis, decompose, coprophagous, and keystone species.

## Learning Outcomes

### Continued

- Summarize the life-cycle of beavers, aspens, and beaver ponds.
- Explain how beavers can positively influence their environment.
- Summarize the concept of keystone species.

## Theme

Beavers can completely revitalize the landscape, changing the dynamic and diversity of plants and animals for years to come.

## Lesson Activities

The lesson consists of a presentation that explores the external and internal structures of beavers and aspen trees and determines how those structures support their survival. Students will have the opportunity to investigate a beaver skull, pelt, and a tree that was felled by a beaver.

*Optional Activity: Build a Beaver*  
*A student will dress up in household items that represent various parts of a beaver. This activity helps students draw connections to the complexities of beaver adaptation through familiar props and materials.*



▲ Naturalist teaches students how beavers prepare for winter!

# Bird Beak Buffet

## Wyoming Science Standard

K-LS1-1, K-ESS3-1, 1-LS1-1,  
2-PS1-2, 3-LS4-2, 3-LS4-3, 4-LS1-1

## Suggested Grade Level

K-4th, Lesson will be adapted for each grade.

## Lesson Overview

The educational focus is the shape and function of bird beaks as adaptations specific to habitats and food sources.

## Lesson Length

Approximately 30 - 60 minutes depending on group size.

A shorter version that takes 20-25 minutes is also available.

## Setting

The lesson is an indoor or outdoor activity.

## Learning Outcomes

Upon completion of the lesson, students will be able to:

- Define adaptation.
- Define habitat and name the four elements of a habitat.
- Explain why adaptation is crucial to an animal's survival.
- Discuss two functions of bird beaks.

## Learning Outcomes

### Continued

- Discuss two structural features of bird beaks.
- Compare and contrast three types of bird beaks and how they function to provide access to food.
- Explain the vital role birds play in the environment.
- Propose two actions that can be taken to protect and conserve birds and their habitats.

## Theme

Birds use specially adapted beaks to obtain the food found in their habitat.

## Sub-theme

Birds play a vital role in the environment.

## Lesson Activities

Students will use everyday objects that model different bird beaks to gather various "foods." As they gather the foods, students will place the food in a bird's "stomach." Students will discover which beaks are best adapted to gathering different types of food. Students will match the beaks with appropriate birds and their primary food.



Students use different tools modeled after bird beak adaptations to capture food!

# Build a Bison

## Wyoming Science Standards

K-LS1-1, K-ESS3-1, 1-LS1-1, 3-LS2-1, 3-LS4-2, 4-LS1-1, 4-LS1-2

## Suggested Grade Level

K-4th, Lesson will be adapted for each grade.

## Lesson Overview

The instructor will “build a bison” by decorating a student with various props that are humorous representations of bison anatomy. The lesson will explore the internal and external structures of a bison and how those structures support their survival.

## Lesson Length

30 minutes

## Setting

The lesson is an indoor or outdoor activity.

## Learning Outcomes

Upon completion of the lesson, students will be able to:

- Define adaptation, mammal, herbivore, keratin, ruminant, and ungulate.
- Explain why adaptation is crucial to an animal’s survival.

## Learning Outcomes

### Continued

- Name two specific physical adaptations possessed by the bison.
- Explain how habitat plays a role in shaping the anatomy of bison.
- Summarize the role that adaptations play in the bison’s survival in the wild.
- Determine the role the bison plays in its natural environment.

## Theme

The bison possesses specific physical adaptations that facilitate its survival in the wild.

## Sub-theme

The bison plays an important role in the health and balance of their ecosystem.

## Lesson Activities

The instructor will present a brief overview of the bison, its natural history and role in the environment. A student will be selected to be the bison and will be dressed by the instructor. Students will select props they believe represent the physical adaptations of the bison. Specific adaptations and vocabulary words will be discussed as the bison is dressed.



A student dresses in common household items to represent the external and internal adaptations of bison!

# Build a Duck

## Wyoming Science Standards

K-LS1-1, K-ESS3-1, 1-LS1-1, 3-LS2-1, 3-LS4-2, 4-LS1-1, 4-LS1-2

## Suggested Grade Level

K-4th, Lesson will be adapted for each grade.

## Lesson Overview

Students or the instructor will “build a duck” by decorating a student with various props that are humorous representations of duck anatomy. The lesson will explore the internal and external structures of a duck and how those structures support their survival.

## Lesson Length

30 minutes

## Setting

The lesson is an indoor or outdoor activity.

## Learning Outcomes

Upon completion of the lesson, students will be able to:

- Define adaptation, warm-blooded, vertebrate, water fowl, habitat, nictitating membrane, carnivorous, herbivorous, omnivorous, lamellae, down feathers, contour feathers, flight feathers, and air sacs.

## Learning Outcomes

### Continued

- Analyze why adaptation is crucial to an animal’s survival.
- Examine two functions of bird and duck bills.
- Compare and contrast down feathers, contour feathers, flight feathers.
- Explain the role hollow bones play in birds and ducks ability to fly.
- Explain the role the adaptations play in facilitating survival of ducks in the wild.
- Propose two actions that can be taken to protect and conserve ducks and their habitats.
- Determine the vital role the ducks play in their natural environment.

## Theme

Ducks possess specific physical adaptations that facilitate their survival in the wild.

## Sub-theme

Ducks play a vital role in the health and proper functioning of their ecosystem.

## Lesson Activities

The instructor will present a brief overview of ducks, their natural history and role in the environment. A student will be selected to be the duck and will be dressed by the instructor or students. Students will select props they believe represent the physical adaptations of the duck. If age appropriate, students will read definitions or concepts from cards distributed during the lesson. Specific adaptations and vocabulary words will be discussed as the duck is dressed.



A student dresses in common household items to represent the different external and internal adaptations of ducks!

# Build an Elk

## Wyoming Science Standards

K-LS1-1, K-ESS3-1, 1-LS1-1, 3-LS2-1, 3-LS4-2, 4-LS1-1, 4-LS1-2

## Suggested Grade Level

K-4th, Lesson will be adapted for each grade.

## Lesson Overview

The instructor will “build an elk” by decorating a student with various props that are humorous representations of elk anatomy. The lesson will explore the internal and external structures of an elk and how those structures support their survival. Additional discussion will focus on the role elk play in the environment and the importance of conservation.

## Lesson Length

30 minutes

## Setting

The lesson is an indoor or outdoor activity.

## Learning Outcomes

Upon completion of the lesson, students will be able to:

- Define adaptation, mammal, herbivore, keratin, ruminant, ungulate, and migratory.

## Learning Outcomes

### Continued

- Summarize why adaptation is crucial to an animal’s survival.
- Explain specific physical adaptations possessed by elk.
- Determine how elk adaptations support survival.
- Infer the role elk play in their ecosystem.
- Propose two actions that can be taken to conserve elk.

## Theme

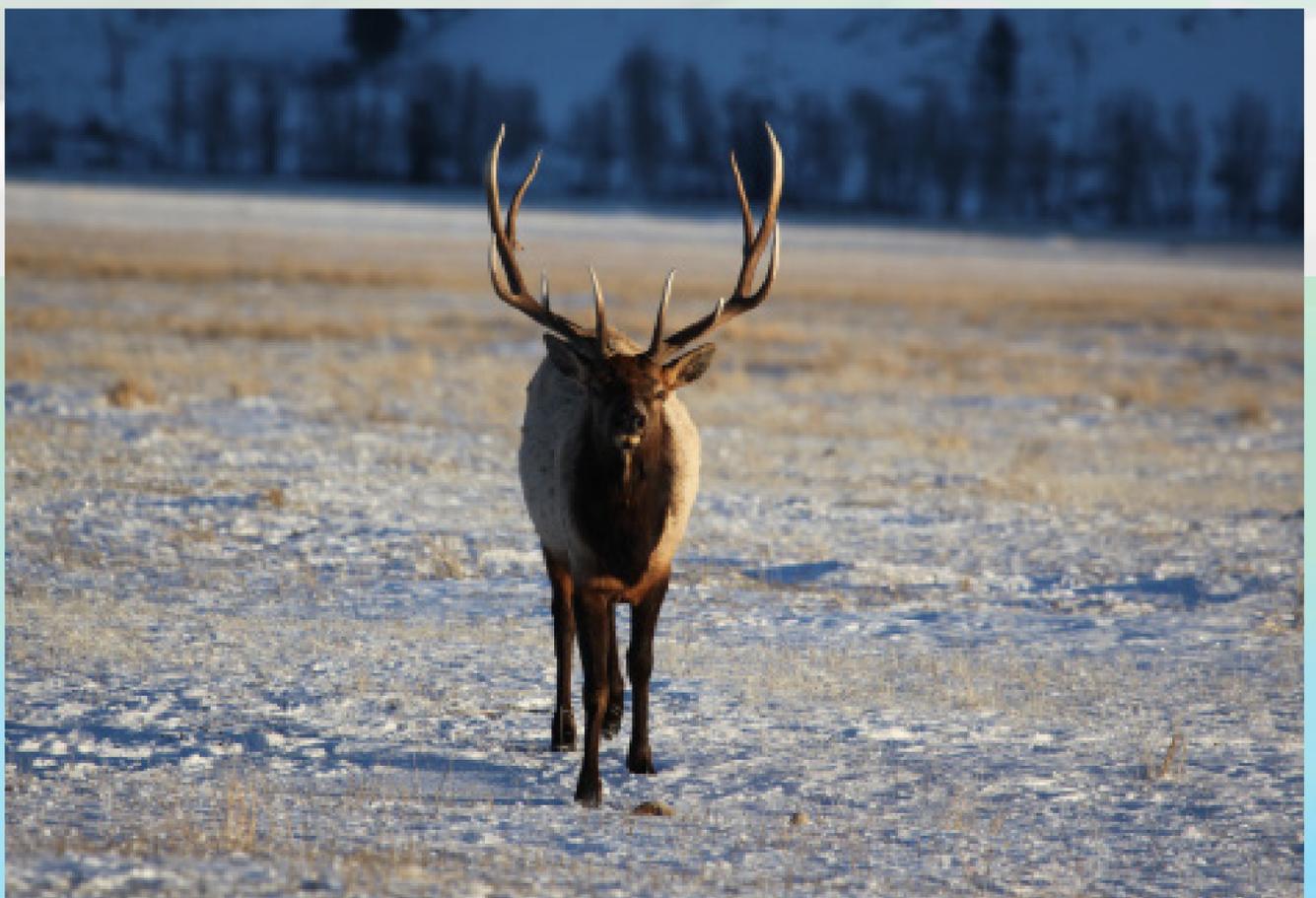
Elk possess specific physical adaptations that facilitate their survival in the wild.

## Sub-theme

Elk play an important role in the health and proper functioning of their ecosystem.

## Lesson Activities

The instructor will present a brief overview of elk, their natural history and role in the environment. A student will be selected to be the elk and will be dressed by the instructor. Students will select props they believe represent the physical adaptations of the elk. Specific adaptations and vocabulary words will be discussed as the elk is dressed.



In the winter months, elk are often visible from the Visitor Center!

# Build a Wolf

## Wyoming Science Standards

K-LS1-1, K-ESS3-1, 1-LS1-1, 3-LS2-1, 3-LS4-2, 4-LS1-1, 4-LS1-2

## Suggested Grade Level

K-4th, Lesson will be adapted for each grade.

## Lesson Overview

Students or the instructor will “build a wolf” by decorating a student with various props that are humorous representations of wolf anatomy. The lesson will explore the internal and external structures of a wolf and how those structures support their survival.

## Lesson Length

30 minutes

## Setting

The lesson is an indoor or outdoor activity.

## Learning Outcomes

Upon completion of the lesson, students will be able to:

- Define adaptation, carnivore, predator, guard hair, ground hair, canine teeth, tapetum lucidum, digitigrade.

## Learning Outcomes

### Continued

- Determine why adaptation is crucial to an animal’s survival.
- Name two specific physical adaptations possessed by the wolf.
- Explain the role the adaptations play in the wolf’s survival in the wild.
- Infer what role the wolf plays in its natural environment.

## Theme

The wolf possesses specific physical adaptations that facilitate its survival in the wild.

## Sub-theme

Wolves play a vital role in the health and proper functioning of their ecosystem.

## Lesson Activities

The instructor will present a brief overview of the wolf, its natural history and role in the environment. A student will be selected to be the wolf and will be dressed by the instructor or students. Students will select props they believe represent the physical adaptations of the wolf. Specific adaptations and vocabulary words will be discussed as the wolf is dressed.



A student dresses in common household items to represent the different external and internal adaptations of wolves!

# Energized Ecosystems

## Wyoming Science Standards

4-LS1-1, 5-PS3-1, 5-LS2-1

## Suggested Grade Level

4th & 5th, Lesson will be adapted for each grade.

## Lesson Overview

Students will investigate how energy is transferred through organisms in an ecosystem. Students will explore the dynamic and important relationships that exist among organisms in an ecosystem.

## Lesson Length

45-60 minutes

## Setting

The lesson is an indoor activity.

## Learning Outcomes

Upon completion of the lesson, students will be able to:

- Define producer, autotroph, energy, primary consumer, photosynthesis, oxygen, carbon dioxide, secondary consumer, tertiary consumer, ecosystem, abiotic, biotic, and biodiversity.
- Investigate how internal and external structures of plants and animals serve various functions in growth, survival, behavior, and reproductions.

## Learning Outcomes

### Continued

- Explain how energy is transferred from the sun to organisms.
- Summarize the importance of ecosystem balance and biodiversity.

## Theme

Ecosystems are interdependent systems that rely on complex natural processes and biodiversity to survive.

## Sub-Theme

The Greater Yellowstone Ecosystem is one of the largest nearly-intact temperate-zone ecosystems on earth and is home to the largest concentration of mega-fauna in the lower 48 states.

## Lesson Activities

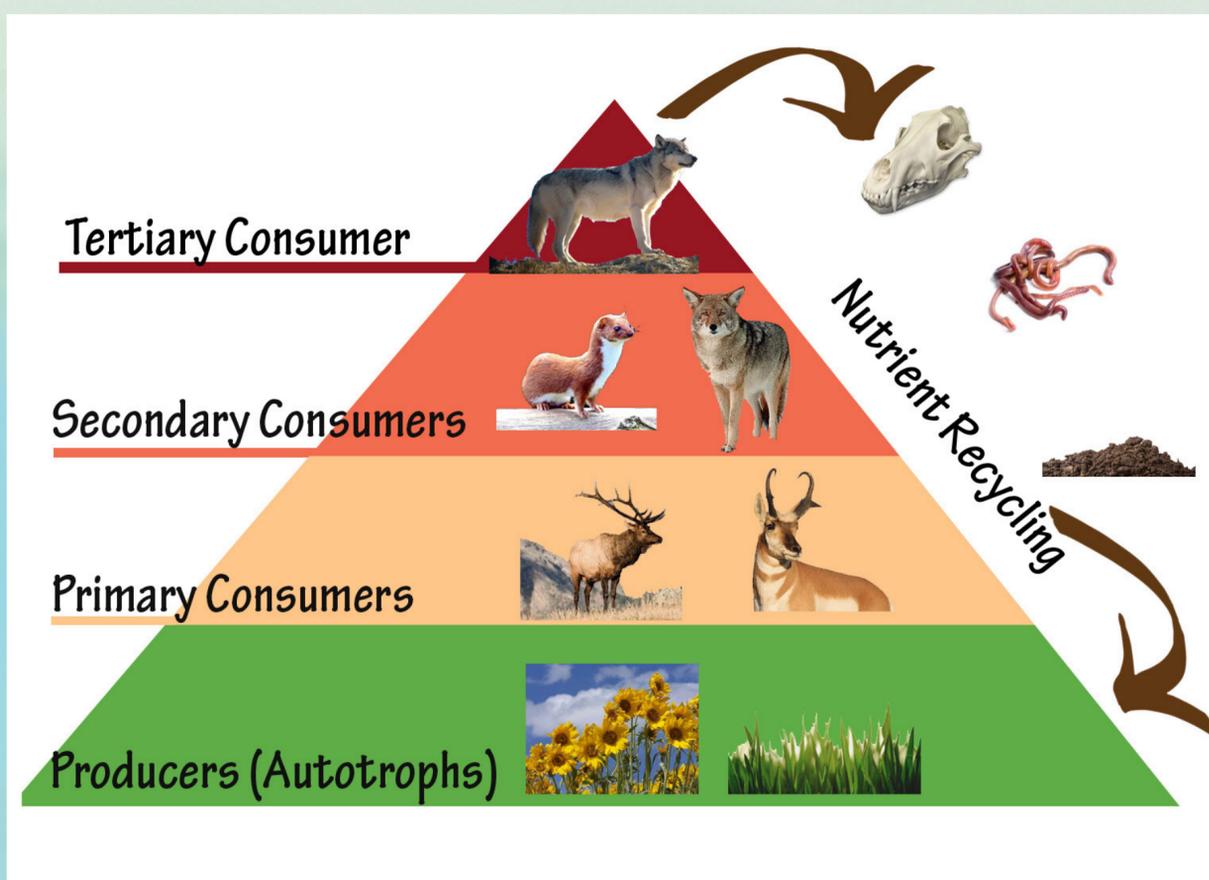
The lesson consists of a presentation and two activities. The presentation will explore the complexity of ecosystems and how energy is transferred through organisms. Students will explore energy transfer and ecosystem balance in context of the Greater Yellowstone Ecosystem.

### Activity #1: Build an Elk.

In this activity students will explore how the internal and external adaptations of elk support their survival. Students will discover how elk efficiently use their energy.

### Activity #2: Build a Wolf.

In this activity students will explore how the internal and external adaptations of wolves support their survival. Students will discover how wolves efficiently use their energy.



# Fur, Hair, & Pelts

## Wyoming Science Standards

K-LS1-1, 2-LS4-1, 3-LS4-2, 4-LS1-1

## Suggested Grade Level

K-4th, Lesson will be adapted for each grade.

## Lesson Overview

The focus of the lesson is mammal fur, its structure and functions. Students will be able to examine specimen pelts and fur swatches from various mammals found in the Greater Yellowstone Ecosystem. The lesson includes a presentation and one or more activities.

## Lesson Length

30 minutes

## Setting

The lesson is an indoor activity.

## Learning Outcomes

Upon completion of the lesson, students will be able to:

- Define three of the following: insulation, keratin, pilo-erection, follicle, adaptation, fur, hair, pelt, hide, ground hair, guard hair.
- Discuss the role hair or fur plays in an animal's survival.

## Learning Outcomes

### Continued

- Determine the basic functions of animal fur.
- Compare and contrast the two basic types of animal fur.
- Differentiate between samples of winter and summer coats from two mammals found in the Greater Yellowstone Ecosystem.
- Propose three actions that can be taken to protect and conserve wild animals and co-exist responsibly with them.

## Theme

The coats or fur found on mammals in the Greater Yellowstone Ecosystem provide protection and insulation that facilitate their survival in the challenging environment.

## Lesson Activities

The lesson consists of a presentation on the natural history of mammal fur or hair including basic structure, functions, and the differences between summer and winter coats. Students will examine both summer and winter pelts and swatches from various mammals. Activities are included that reinforce lesson content and give students an opportunity to identify pelts and swatches.



Students feel a wolf pelt to investigate the different types of hair!

# Operation Pollination

## Wyoming Science Standards

2-LS2-2

## Suggested Grade Level

2nd

## Lesson Overview

Students will investigate the process and relationships between pollinators and flowers and how the process supports balanced ecosystems. Students will explore the basic structure of a flower and determine how flowers reproduce.

## Lesson Length

30 minutes

## Setting

The lesson is an indoor activity.

## Learning Outcomes

- Investigate a simple model that mimics the function of an animal dispersing seeds and pollinating plants.
- Define disperse, pollen, reproduce, transfer, and benefit.
- Determine how the shape and stability of plant structures are related to their functions.
- Examine how flowers have adapted to attract specific pollinators.

## Learning Outcomes

### Continued

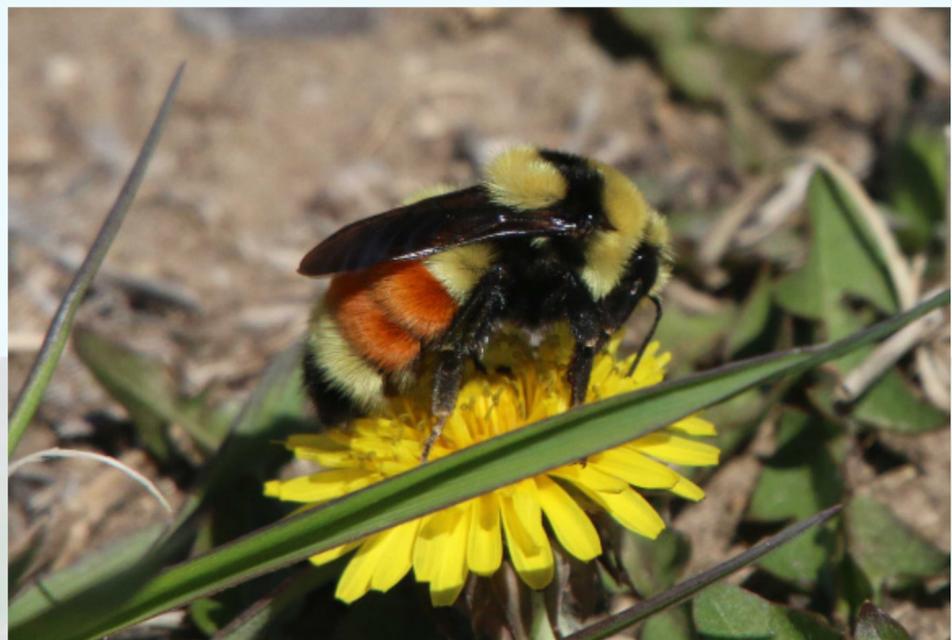
- Summarize the relationship between pollinators and flowers and explain how that relationship supports each organism's survival.

## Theme

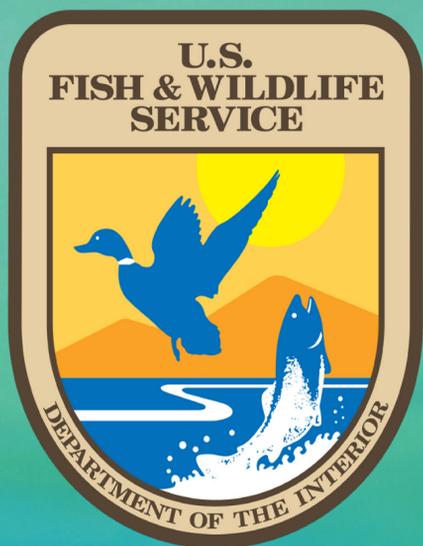
Pollinators are vital to creating and maintaining the habitats and ecosystems that many animals rely on for food and shelter.

## Lesson Activities

The lesson consists of a presentation and an activity. The presentation explores the complex structure of a flower. Students will investigate how flowers have adapted to attract specific pollinators. The activity will give students the opportunity to investigate different types of pollinators to determine what flower structure attracts them.



A flower model and bee puppet are used during this lesson to simulate pollination!



*The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.*