Montana Natural History Center
Connecting People with Nature

Museum Field Trips
Lessons At-A-Glance
2025

About our Field Trip Activities

Visitors to the Montana Natural History Center learn that naturalists use science, art, and writing to study and learn about the natural world. The subjects and skills highlighted in our museum field trips are hands-on, interdisciplinary, and encourage students to see themselves as naturalists.

Our goal is to encourage students to ask questions, make observations, and improve engagement and critical thinking skills. While each lesson has different objectives, the aim is to create learning environments where students can share their unique curiosity about nature.

Each lesson is built around a central question that students and instructors will answer together.

· ***Animals in Winter***: *How do animals adapt to winter conditions?* Students will learn the concepts "hibernator," "tolerator," and "migrator" to analyze how Montana animals adapt.
(recommended ≥ 3rd, but can be adapted for younger students)

· ***Bird Beak Bonanza:*** *How does the shape of a bird's beak affect its diet?* Students will learn the terms "structure" and "function," and compare bird "generalists" to bird "specialists" in regards to their diets—which birds have beaks that allow them to eat a variety of foods, and which birds are "specialists" with beaks adapted to specific types of food. *(recommended ≥ 3rd, but can be adapted for younger students)*

· ***Seed Dispersal: Engineering Challenge:*** *How and why do plants spread their seeds?* In this activity, students will observe types of seeds and explore why so many plants put their seeds inside a container. Using an "Ask, Imagine, Create, Improve, Reflect" engineering process, students will develop their own seed container to meet a specific habitat. *(All ages)*

· ***Skull Detectives:*** *What can the characteristics of a skull tell us about the animal it belongs to?* Students will explore skulls of familiar Montana animals, learn about traits that indicate animal behavior, and will use that knowledge to make inferences about unidentified skulls. *(All ages)*

· ***Fossil Frenzy:*** *What does it take to see the world like a paleontologist does?* Students will handle real fossils and be challenged to understand how they can be used to understand past life on earth. Students will be taught the different types of fossils, what can be learned from each type, and the importance of context when interpreting their discoveries. Lesson culminates with a question and answer session led by our resident paleontologist, Jason Poole. *(recommended ≥ 3rd for full program, but a shortened adaption available for younger students)*

· ***The Letter B:*** Kiddos will explore the museum with the theme of the letter B—Bison, Beavers, Birds, and Bear—through specimens, stories, and crafts. *(pre-k)*

Please see the following pages for more information about activities, learning objectives, assessment, and Next Generation Science Standards embedded in each lesson.

Animals In Winter (3rd-5th recommended)

<table>
<tr><td>Curriculum Strands Addressed</td><td>Ecological Knowledge
Connections
Creative Arts</td></tr>
<tr><td>Essential Question</td><td>How do animals in Montana adapt to winter conditions?</td></tr>
<tr><td>Objectives</td><td>▪ Students will identify adaptive characteristics of Montana animals that indicate whether they are migrators, hibernators, or tolerators in winter, during an exploration of the museum exhibit hall.
▪ Students will draw a real or imaginary animal that migrates, hibernates, or tolerates winter, and will be able to clearly identify adaptive characteristics using words and drawings.</td></tr>
<tr><td>Activities</td><td>▪ Exhibit hall exploration and animal categorization
▪ Montana winter animal drawing
▪ Adaptation dress-up activity (optional)</td></tr>
<tr><td>Assessment</td><td><u>Formative</u>: Instructor will observe student understanding of the concepts migrator, tolerator, hibernator, and adaptation during the exhibit exploration, and adjust explanation of concepts accordingly.

<u>Summative</u>: Students can correctly identify and match adaptive characteristics to winter behavior in their final animal drawing.</td></tr>
<tr><td>NGSS Standards Met</td><td>
<table>
<tr><td>Disciplinary Core Ideas</td><td>LS1.A: Structure and Function
LS4.C: Adaptation
ESS2.D: Weather and Climate</td></tr>
<tr><td>Cross Cutting Concepts</td><td>Patterns
Structure and Function</td></tr>
<tr><td>Scientific and Engineering Practices</td><td>Asking questions and defining problems
Developing and using models
Constructing explanations and designing solutions</td></tr>
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Bird Beak Bonanza (3rd-5th recommended)

Curriculum Strands Addressed	Ecological Knowledge Naturalist Tools and Skills Connections
Essential Question	How does the shape of a bird's beak affect its diet?
Objectives	▪ Students will understand that different forms have different functions in relation to food collection during a "Fill the Bill" activity ▪ Students will match beaks with food examples in a group picture-matching activity ▪ Students will learn the terms "structure" and "function," and describe the structure and function of a bird's beak in an exploration of the exhibit hall, as well as classify the bird as a "generalist" or "specialist."
Activities	▪ Fill the Bill experiment ▪ Beak-to-food matching ▪ Exhibit hall scavenger hunt
Assessment	Formative: The extent to which students can draw conclusions in the beak-to-food matching activity. Summative: Students can identify beak structure and function, and whether the bird is a generalist or specialist given a worksheet and time to explore the exhibit hall specimens.
NGSS Standards Met	

Disciplinary Core Ideas	**LS1.A:** Structure and Function **LS3.A:** Inheritance of Traits **LS3.B:** Variation of Traits **LS4.C:** Adaptation
Cross Cutting Concepts	Patterns Cause and Effect: Mechanism and Explanation Scale, Proportion, and Quantity Structure and Function
Scientific and Engineering Practices	Asking questions and defining problems Planning and carrying out investigations Analyzing and interpreting data Developing and using models Using mathematics and computational thinking.

Seed Dispersal: Engineering Challenge (1st-5th)

Curriculum Strands Addressed	Ecological Knowledge Naturalist Tools and Skills Connections Creative Arts
Essential Question	How and why do plants spread their seeds?
Objectives	▪ Students will use observation skills to identify adaptive characteristics of Montana plants' seeds and seed pods. ▪ Students will engineer their own seed container to meet a specific habitat and test their model for success. ▪ Students will draw conclusions about the function of different seed types based on their structures
Activities	▪ Outdoor exploration and journaling about different seed types ▪ Create-Your-Own-Seed challenge
Assessment	Formative: Instructors will assess students' grasp of why plants need to disperse their seeds and monitor conversation between students Summative: Students can identify how particular seeds spread based on their structures and provide evidence for their conclusions
NGSS Standards Met	

Disciplinary Core Ideas	**LS1.A:** Structure and Function **LS4.C:** Adaptation
Cross Cutting Concepts	Structure and Function Cause and Effect
Scientific and Engineering Practices	Developing and using models Engaging in argument from evidence Asking questions and defining problems

Skull Detectives (1st-5th)

Curriculum Strands Addressed	Ecological Knowledge Naturalist Tools and Skills Connections Creative Arts
Essential Question	What can the characteristics of a skull tell us about the animal it belongs to?
Objectives	▪ Students will draw conclusions about animal behavior given its skull structure ▪ Students will identify parts of a skull and use these traits to identify the animal it belonged to from an identification key
Activities	▪ Skull feature exploration ▪ Mystery skull identification
Assessment	Formative: During the mystery skull identification, the instructor will check in with each group to assess student understanding. Summative: Students will successfully identify mystery skulls using observation and an identification key
NGSS Standards Met	

Disciplinary Core Ideas	**LS1.A**: Structure and Function **LS3.B**: Variation of Traits
Cross Cutting Concepts	Patterns Scale, Proportion, and Quantity Structure and Function
Scientific and Engineering Practices	Asking questions and defining problems Planning and carrying out investigations Analyzing and interpreting data Using mathematics and computational thinking

Fossil Frenzy (3rd-5th)

Curriculum Strands Addressed	Earth Science Life Science Investigations
Essential Question	How do we know what we know about ancient life on our planet?
Objectives	▪ Students will be able to recognize the types of evidence that can be left behind by extinct species while understanding the importance of context and deductive reasoning when interpreting fossil evidence. ▪ Students will view fossils as clues to an organism's ecology and behavior in the same way we view the tracks, scat, and bones of modern animals.
Activities	▪ Students take on the perspective of a paleontologist, learning the two main types of fossils and working together to map out and interpret trays of trace fossils that indicate preserved animal behavior and their environments. ▪ Students work as a group to interpret a "discovery of bones dig site" and assemble their own dinosaur highlighting the challenges that paleontologists face when interpreting evidence of the past
Assessment	Formative: Instructors will check for understanding while students craft educated interpretations by asking students to root their claims in observed evidence. Summative: Students will be able to identify the different fossil types, and describe the evidence that can be known from fossils and what is hard to know.
NGSS Standards Met	3-LS4-1: **Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.**

Disciplinary Core Ideas	*LS4.A: Evidence of Common Ancestry and Diversity* - Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments.
Cross Cutting Concepts	*Scientific Knowledge Assumes an Order and Consistency in Natural Systems* *Scale, Proportion, and Quantity* - Observable phenomena exist from very short to very long time periods.
Scientific and Engineering Practices	Planning and carrying out investigations Analyzing and interpreting data to make sense of phenomena using logical reasoning

The Letter B (pre-k)

Curriculum Strands Addressed	Ecological Knowledge Connections Creative Arts
Essential Question	▪ What do Bison, Beavers, Birds, and Bears all have in common?
Objectives	▪ Students will get creative and curious about Montana animals ▪ Through Social Emotional Learning, students will begin to grasp the importance of animals within an ecosystem.
Activities	▪ Kiddos will explore the museum with the theme of the letter B—Bison, Beavers, Birds, and Bears—through specimens, stories, and crafts.
Assessment	Formative: Ensure students are making connections between different animals, and assisting students in finding objects starting with the letter "B." Summative: Students will be able to identify natural history objects that begin with the letter "B," and find similarities and differences between disparate animals.
NGSS Standards Met	

Disciplinary Core Ideas	N/A
Cross Cutting Concepts	Organizing (mapping); Analyzing (identifying components and relationships); Interpreting (describing)
Scientific and Engineering Practices	Asking questions and defining problems Planning and carrying out investigations Fine motor skills

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Curriculum Strands at a Glance

There are four strands of learning present in MNHC's Museum Field Trip curriculum:

Ecological Knowledge - learning about organismal structure and function, animal adaptations, species traits that allow for classification, and the relationship between animals and their habitat.

Naturalist Tools and Skills - learning about and practicing with instruments that allow us to observe the world quantitatively and qualitatively, as well as ask questions and analyze observations.

Connections - learning about our local environment and establishing a relationship with it using the senses.

Creative Arts - learning how to communicate observations, ideas, and feelings about the natural world as a writer and an artist.

See below for more information about which strands are addressed in each lesson.

	Ecological Knowledge	Naturalist Tools and Skills	Connections	Creative Arts
Animals In Winter	x		x	x
Bird Beak Bonanza	x	x	x	
Seed Dispersal: Engineering Challenge	x	x	x	x
Skull Detectives	x	x	x	
Fossil Frenzy	x	x	x	
The Letter "B"	x		x	x

Strand Learning Goals

Ecological Knowledge:
a. Students will understand organismal structure and function
b. Students will understand adaptation and evolution relating to animal species and characteristics
c. Students will understand habitat characteristics as they relate to animals

Naturalist Tools and Skills
a. Students will understand how to use basic naturalist tools and instruments to make observations
b. Students will develop questioning and analytical skills relating to ecological knowledge

Connections
a. Students will understand change over time in Montana, and current plant life and wildlife
b. Students will interact with representations of local wildlife and plant life using their senses

Creative Arts
a. Students will use language arts to communicate their observations of nature, flora, and fauna
b. Students will use drawings to communicate their observations of nature, flora, and fauna.