

Essential Question

How do the structures of organisms enable life's functions?

NGSS Disciplinary Core Idea

LS1.A: Structure and Function

All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts (roots, stems, leaves, flowers, & fruits) that help them survive and grow.

Learning Objective

By the end of the field trip, K through 2nd grade students will understand the relationship between an organism's external structures and how they are able to grow and survive in their specific environment.

Overall Assessment:

When students are given an opportunity to explore how an animal's structures enable it to grow and to survive, they will be able to create an imaginary animal and explain its structure/function relationships.

Curriculum Overview

Thank you for choosing Tryon Creek State Natural Area for your field trip!

This program outline can be used to give you an idea of what sorts of things your students will be doing during their field trip. **Please note that times are flexible and not all student groups will do every hike activity listed here** – our volunteer Nature Guides will be incorporating activities into their routine throughout their hike, but we encourage our educators to let the interests of the group guide their instruction, taking advantage of teachable moments and letting students ask questions that they would like to investigate.

This outline has been written to align with the [Next Generation Science Standards](#) (NGSS), which were developed based on the National Research Council's [Framework for K-12 Science Education](#), published in 2012. The Oregon Department of Education adopted the NGSS in 2014 and each district has developed a 5-year implementation plan. To the left you can review the specific Disciplinary Core Idea (based on the Kindergarten to 2nd grade band) that is addressed in this program, as well as specific Performance Expectations for each grade level below. In addition, each activity on the following pages highlights specific Science and Engineering Practices that students may use during their field trip.

NGSS Performance Expectations supported by this curriculum:

Learn more about how [our programs support your curriculum goals](#).

Kindergarten

K-LS1-1

First Grade (1-LS1-1)

1-LS1-1

Second Grade (2-LS4-1)

2-LS4-1

Some vocabulary that may be used during this field trip includes:

- Adaptation
- Camouflage
- Carnivore
- Habitat
- Herbivore
- Nocturnal
- Omnivore
- Predator
- Prey

Revised by Friends of Tryon Creek on 8/17/2018

Introduction - Jackson Shelter - 10 minutes

Welcome to Tryon Creek State Natural area! Chaperones will be invited to meet with a Nature Guide to discuss their role on the field trip, while students have some important questions to answer about their day:

Why are we all here in the forest together today?

- Hiking
- Learning
- Finding animals (or evidence of animals!)

Let them know that we will indeed be doing all of those things, with the goal of answering this question:

How do the shapes of different animals help them do their jobs in the forest?

Give logistical information (groups will be starting or ending with an activity in the classroom, and will be hiking for about an hour and 15 to 20 minutes). Make sure to bring your layers and go before you go!

Structure & Function Investigation - Nature Classroom - 20 minutes

Busy Beavers

Guiding Question: How do an animal's structures help it to survive in its environment?

Content Goal: Animals have external parts that help them survive in their specific habitats. Each of these parts has a shape (structure) which is directly related to the job (function) of that part.

Activity Procedure

1. Students work in small groups to solve different problems using an array of man-made objects:
 - a. Carry and stack small logs using a glove with 5 fingers, a glove with 4 fingers, or a plastic spoon
 - b. Strip wood off a stick using sandpaper, a metal spoon, or a plastic carving tool
 - c. Make a loud noise to warn others of danger using a piece of cloth, metal tongs, or a spatula
2. For each challenge, students identify the best tool for each job and share with each other.
3. Students make observations of taxidermied examples of beavers to look for shapes that remind them of the tools they used in step two, supporting their arguments with evidence.

Science and Engineering Practices Applied

2. Developing and using models
 - *Use a model to represent amounts, relationships, relative scale (bigger, smaller) and/or patterns in the natural world.*

Hike Activities - Tryon Creek Trails - 1 hour & 20 minutes

Seeds on the Move

Guiding Question: Do plants also have different structures that help them survive?

Content Goal: The shell of a hazelnut is a specific structure that help protect the baby plant as it grows from seed to adult!

Activity Procedure

1. Students are given 3 hazelnuts (or wooden replicas if allergic) and give them 1 minute to hide them alongside the trail as if they were squirrels stocking up for the winter.
 - a. *Is this an example of a behavior that might help a squirrel survive?*
 - b. *Do you see shapes on the squirrel pelt that might help them bury seeds in the ground?*
2. At the end of the hike, return to the location where the nuts were hidden. Ask the students to go find the nuts they hid and count how many nuts were found vs not.
 - a. *What do you think will happen to the nuts you did not find? How does this help the plant?*
3. Look carefully at the nuts:
 - a. *What part of the nut helps to protect the baby tree?*
 - b. *Why do you think it helps the tree to have squirrels move the nuts around?*
4. For the rest of the hike, encourage students to look for other examples of travelling seeds.
 - a. *How are these seeds moving around compared to the hazel nuts?*
 - b. *Can you think of other ways you have seen seeds move?*

Science and Engineering Practices Applied

6. Constructing explanations
 - o *Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.*

Digging for Dinner - Who's been here?

Guiding Question: Who made the holes we see in the ground and who made the holes we see in trees?

Content Goal: Woodpeckers and moles both find food by digging, but they look in different places and use different parts of their bodies!

Activity Procedure

1. Students make observations about the holes they find in trees and the holes they see in the ground, paying attention to the differences in size, shape, and location of the holes.
2. Students are guided to a dead log and open ground space (preferably a mole mound)
3. Students are given the following tools: spoon and a golf tee.

4. Students are asked to re-create the holes they observed on both the log and the ground trying both the spoon and screwdriver on each surface.
 - a. *Which tool allows you to best make holes on a tree?*
 - b. *Which tool allows you to best make holes in the ground?*
5. Students are shown mole pelt with feet and a woodpecker skull with beak.
 - a. *Which animal make holes in a tree? How can you tell?*
 - b. *Which animal makes holes in the ground? How can you tell?*

Science and Engineering Practices Applied

2. Developing and using models
 - *Distinguish between a model and the actual object the model represents.*
 - *Use a model to represent amounts, relationships, relative scale (bigger, smaller) and/or patterns in the natural world.*
6. Constructing explanations
 - *Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.*

Hike and Go Seek

Guiding Question: Could an animal's color also effect its ability to survive in its habitat?

Content Goal: An animal's coloration can also be something that helps them survive. For example, camouflage helps animals hide.

Activity Procedure

1. Students are given a limited time to collect hidden animal cutouts of various colors.
 - a. *Which colors were easiest to find? Hardest?*
 - b. *How do colors and patterns benefit animals?*
 - c. *Why is it helpful to be hard to see as a prey animal? As a predator?*
 - d. *What other ways to animals protect themselves from predators or work to find prey?*

Science and Engineering Practices Applied

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 - *Use a model to represent amounts, relationships, relative scale (bigger, smaller) and/or patterns in the natural world.*
6. Constructing explanations
 - *Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.*

General Observations and Teachable Moments

Guiding Question: Can we make predictions about how different plants and animals do their jobs in the forest just by making observations of them?

Content Goal: All plants and animals have external parts that tell us about how they survive in their specific habitat.

Activity Procedure

1. As different plants, animals, or evidence of different animals are found along the trail, students make observations about their physical characteristics or behavior. Students use visual aids such as pelts, skulls, preserved leaves, or pictures to investigate these characteristics.
 - a. *What does an animal's eyes/ears/nose/mouth tell us about its lifestyle?*
 - b. *How do you think this plant protects itself?*
 - c. *Do you think this animal lives here year round? Why or why not?*
 - d. *Would this animal be able to survive in the desert? On top of a mountain? Why or why not?*

Science and Engineering Practices Applied

2. Developing and using models
 - *Distinguish between a model and the actual object the model represents.*
 - *Use a model to represent amounts, relationships, relative scale (bigger, smaller) and/or patterns in the natural world.*
6. Constructing explanations
 - *Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.*

Goodbye - Jackson Shelter - 10 minutes

Thank students for coming and make sure they are aware that they just spent the day in a state park, which means it belongs to everyone, and everyone is invited back anytime! Friends of Tryon Creek is a community supported non-profit whose mission, in partnership with the Oregon Parks and Recreation Department, is to nurture and inspire relationships with nature in our unique urban forest. Providing field trips is just one way that we work towards this mission, so checkout our website for information about our fun Nature Day Camps offered throughout the year, weekend family and adult programs, special events, and more!

Remind students that even if they never make it back to Tryon Creek, they can still be exploring nature, asking questions, and learning about how animals survive in their habitats.

Invite adults to checkout promotional materials before leaving and turn things over to classroom teachers for bus/lunch instructions.

Afternoon Extension (Optional)

For an additional fee, teachers may choose to extend the program from 2-hours (outlined above) to 4-hours. This extension includes a 30-minute lunch break in the Jackson Shelter, then two activity rotations designed to supplement the morning's hike. **Because of the physical and emotional demands of being outdoors for the bulk of the school day, our 4-hour extensions are *not* recommended for 1st grade or younger**, though we are happy to discuss options for younger students as requested.

Each of the following activities are designed to be run in approximately 35 minutes, with time built in for bathroom breaks, transitions, and a closing circle.

Trail Activity - Create a Creature

Guiding Question: If there was a new animal living in Tryon Creek, what shapes would it need to survive?

Content Goal - Assessment: When given an opportunity to explore how an animal's structures enable it to grow and to survive, students will be able to create an imaginary animal and explain its structure/function relationships.

Activity Procedure

1. Tell students that they are going to create a brand-new creature that might live at Tryon. The animal can be based on an existing creature, a combination of two animals, or totally made up, but at the end of the activity they will need to be able to answer the following questions:
 - a. *How will your creature find and eat food?*
 - b. *Protect itself from predators?*
 - c. *Move around?*
2. Students will be building their creature along our paved Trillium Trail. They are allowed to use any item they can find along the trail as long as the following things are all true:
 - a. The item is not alive
 - b. Students could reach their item with both feet on the trail
 - c. The item is no longer than the student's forearm
 - d. Students are ready to leave the item in the forest at the end of the activity
3. If time and group sizes permit, once all students are finished, gather the group together and tour each of the creatures. Have the students responsible for the creation each share 1 sentence about their creature, ideally answering the questions posed at the beginning of the activity.
4. Have students say goodbye to their creatures, reminding them that they get to keep the *idea* forever but the nature items need to stay in the forest.

Nature Classroom Activity - Web of Life

Guiding Question: What kinds of relationships do different animals have with each other in their environment?

Content Goal: All species across a landscape are connected by their relationships: predator-prey, competition, and symbiosis.

Activity Procedure

1. Students each get a sheet of paper with a animal, along with it's food source and habitat, drawn on it. Each of these papers are placed around a large blank sheet.
2. Ask students for suggestions about what kinds of interactions two different animals might have with each-other:
 - a. One animal eats another (predator-prey)
 - b. They eat the same kind of food/use the same shelter (competition)
 - c. They can help each-other/one helps another (symbiosis: mutualism and commensalism)
 - d. They might suck their blood/live on their bodies (Symbiosis: parasites)
3. As each connection is suggested, have students draw lines between animals on the carpet that they think might have that relationship.
 - a. *What evidence can you provide to justify your claim?*

Back at School (Optional)

Kindergarten (K-LS1-1)

Use observations to describe patterns of what plants and animals (including humans) need to survive.

- Provide pictures or models of different animals from habitats across the world to sort into different categories based on the structures they use to survive in their specific habitat (types of teeth, coloring, eye placement, etc.)

First Grade (1-LS1-1)

Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

- Provide paired pictures of items that humans use (down jacket, swim goggles, garden rake, water float, tweezers) and pictures of different animal parts (thick fur, clear eyelid, digging claws, thin beak) and ask students to match functions.

Second Grade (2-LS4-1)

Make observations of plants and animals to compare the diversity of life in different habitats.

- Tour the schoolyard or a nearby park to make observations of urban habitats and compare to findings at Tryon Creek. How is this environment different than Tryon Creek and how do living things adjust?

Essential Question

How do the structures of organisms enable life's functions?

NGSS Disciplinary Core Idea

LS1.A: Structure and Function

Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.

Learning Objective

By the end of the field trip, 3rd through 5th grade students will understand the relationship between an organism's external structures and how they are able to grow and survive in their specific environment.

Overall Assessment:

When students are given an opportunity to explore how an animal's structures enable it to grow and to survive, they will be able to create an imaginary animal and explain its structure/function relationships

Curriculum Overview

Thank you for choosing Tryon Creek State Natural Area for your field trip!

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NGSS Performance Expectations supported by this curriculum:

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Third Grade

3-LS3-1, 3-LS4-3

Fourth Grade

4-LS1-1, 4-LS1-2

Fifth Grade

5-LS2-1

Some vocabulary that may be used during this field trip includes:

- Adaptation
- Camouflage
- Carnivore
- Crepuscular
- Diurnal
- Habitat
- Herbivore
- Nocturnal
- Omnivore
- Permeable
- Predator
- Prey

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Introduction - Jackson Shelter - 10 minutes

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Why are we all here in the forest together today?

- Hiking
- Learning
- Finding animals (or evidence of animals!)

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How do the shapes of different animals help them do their jobs in the forest?

Give logistical information (groups will be starting or ending with an activity in the classroom, and will be hiking for about an hour and 15 to 20 minutes). Make sure to bring your layers and go before you go!

Structure & Function Investigation - Nature Classroom - 20 minutes

Busy Beavers

Guiding Question: How do an animal's structures help it to survive in its environment?

Content Goal: Animals have external parts that help them survive in their specific habitats. Each of these parts has a shape (structure) which is directly related to the job (function) of that part.

Activity Procedure

1. Students work in small groups to solve different problems using an array of man-made objects:
 - a. Carry and stack small logs using a glove with 5 fingers, a glove with 4 fingers, or a plastic spoon
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2. For each challenge, students identify the best tool for each job and share with each other.
3. Students make observations of taxidermied examples of beavers to look for shapes that remind them of the tools they used in step two, supporting their arguments with evidence.

Science and Engineering Practices Applied

3. Planning and Carrying out Investigations
 - *Test two different models of the same proposed object to determine which better meets criteria for success.*

Hike Activities - Tryon Creek Trails - 1 hour & 20 minutes

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 - a. *What do you think will happen to the nuts you did not find? How does this help the plant?*
3. Look carefully at the nuts:
 - a. *What part of the nut helps to protect the baby tree?*
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4. For the rest of the hike, encourage students to look for other examples of travelling seeds.
 - a. *How are these seeds moving around compared to the hazel nuts?*
 - b. *Can you think of other ways you have seen seeds move?*

Science and Engineering Practices Applied

3. Planning and Carrying Out Investigations
 - *Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.*

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Science and Engineering Practices Applied

2. Developing and Using Models
 - *Develop and/or use models to describe and/or predict phenomena.*
 - *Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.*
6. Constructing explanations
 - *Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.*

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ADAPTABLE ANIMALS

YEAR-ROUND • 3RD TO 5TH GRADE • 2 OR 4 HOURS

Nature Classroom Activity - Web of Life

Guiding Question: What kinds of relationships do different animals have with each other in their environment?

Content Goal: All species across a landscape are connected by their relationships: predator-prey, competition, and symbiosis.

Activity Procedure

1. Students each get a sheet of paper with a animal, along with it's food source and habitat, drawn on it. Each of these papers are placed around a large blank sheet.
2. Ask students for suggestions about what kinds of interactions two different animals might have with each-other:
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 - b. They eat the same kind of food/use the same shelter (competition)
 - c. They can help each-other/one helps another (symbiosis: mutualism and commensalism)
 - d. They might suck their blood/live on their bodies (Symbiosis: parasites)
3. As each connection is suggested, have students draw lines between animals on the carpet that they think might have that relationship.
 - a. *What evidence can you provide to justify your claim?*

Back at School (Optional)

Third Grade (3-LS1-1)

Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

- Using examples of animals found at Tryon Creek, students sort animals into different categories of life cycles: complete metamorphosis, incomplete metamorphosis, or simple growth.

Fourth Grade (4-LS1-1)

Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

- Write a story about the creature that was created during the afternoon extension, describing its structures in more detail.
- If students did not create a creature at the park, do that activity in class by drawing or modeling with clay.

Fifth Grade (5-LS2-1)

Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

- On a large sheet of paper, write or draw all the different plants and animals discussed during the field trip. Next, draw lines showing how matter and energy moves through that community.
- Other inter-dependent relationships (predator-prey, mutualism, or competition) can also be included using lines of different colors.