



NATURE CENTER STEAM BINS

Afterschool Activity Center Lesson Plans

Elementary · Grades K–5

7 Thematic Units · 36 Guided Lessons · NGSS-Aligned

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Animal Tracking

LESSONS COVERED

1. What Are Animal Tracks and Why Are They Important? 2. Reading the Clues in Tracks 3. Common Animal Tracks 4. Tracking in Different Habitats 5. Be a Junior Tracker!

NGSS STANDARDS ADDRESSED

Standard	Performance Expectation
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
1-LS1-2	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
3-LS4-3	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

LEARNING OBJECTIVES

Grades K–2 (SWBAT): Describe what an animal track is and identify one clue (size, shape, or spacing) that a track reveals about the animal that made it.

Grades 3–5 (SWBAT): Analyze track patterns — gait, size, and claw or hoof marks — to infer an animal's identity and behavior, and explain how habitat shapes the tracks found there.

KEY VOCABULARY

track / print • gait • predator • prey • claw marks • webbed foot • habitat • tracker

GUIDING QUESTIONS

- What clues can a track give us about the animal that made it?
- How does where an animal lives change the kind of tracks it leaves behind?
- Why do scientists study tracks instead of only observing the live animal?

CENTER MATERIALS

#	Center	Materials Needed
1	Books and Puzzles	Animal-track identification books; track-matching puzzles
2	Games	Track matching / memory game; track bingo
3	Rubbings and Replicas	Track rubbing plates, crayons, paper; animal track replicas
4	Rubber Stamps	Rubber animal-track stamps, ink pads, paper
5	Foam Stamps	Foam animal-track stamps, ink pads or paint, paper

ASSESSMENT / WRAP-UP

- Daily Wrap-Up: students write 2–3 facts learned and draw a matching picture.
- Formative check: "Who's Who?" track-to-animal matching activity (built into Lesson 1).
- Observation: listen for correct use of vocabulary (track, gait, predator/prey) during center time.

Dinosaurs and Fossils

LESSONS COVERED

1. What Are Dinosaurs and When Did They Live? 2. Plant-Eaters vs. Meat-Eaters 3. What Are Fossils? 4. How Do Scientists Find Dinosaur Fossils? 5. Fun Facts and Cool Discoveries

NGSS STANDARDS ADDRESSED

Standard	Performance Expectation
3-LS4-1	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
3-LS4-3	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
3-LS4-4	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there change.
4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

LEARNING OBJECTIVES

Grades K–2 (SWBAT): Describe what a dinosaur is, when dinosaurs lived, and explain that a fossil is evidence left behind by a living thing from long ago.

Grades 3–5 (SWBAT): Use fossil evidence to explain what scientists can learn about an extinct organism and its environment, and compare structures that helped plant-eating versus meat-eating dinosaurs survive.

KEY VOCABULARY

fossil • paleontologist • extinct • herbivore • carnivore • excavate • Mesozoic Era • bonebed

GUIDING QUESTIONS

- How do fossils act as evidence of organisms that lived long ago?
- What structures helped plant-eating dinosaurs survive, and how were meat-eaters' structures different?
- How do paleontologists find and carefully uncover fossils?

CENTER MATERIALS

#	Center	Materials Needed
1	Stampers	Dinosaur and fossil stamps, ink pads, paper
2	Books and Puzzles	Dinosaur books; dinosaur/fossil puzzles
3	Games	Dinosaur matching or board games
4	Rubbing Plates & Fossil Molds	Fossil rubbing plates, crayons, paper, playfoam for mold impressions
5	X-Ray Cards and Manipulatives	Dinosaur skeleton/X-ray cards; bone manipulatives

ASSESSMENT / WRAP-UP

- Daily Wrap-Up: students write 2–3 facts learned and draw a matching picture.
- Sorting check: can students correctly sort a dinosaur as herbivore or carnivore using tooth/claw evidence?
- Discussion: students explain in their own words how a fossil forms.

Insects

LESSONS COVERED

1. What Is an Insect? 2. Butterflies 3. Bees 4. Ladybugs, Ants, and Dragonflies 5. Is a Spider an Insect?

NGSS STANDARDS ADDRESSED

Standard	Performance Expectation
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
2-LS4-1	Make observations of plants and animals to compare the diversity of life in different habitats.
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.
4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

LEARNING OBJECTIVES

Grades K–2 (SWBAT): Identify the body parts common to all insects (head, thorax, abdomen, six legs) and describe one way insects help their environment.

Grades 3–5 (SWBAT): Sequence the stages of complete metamorphosis (egg, larva, pupa, adult) for a butterfly or bee, and compare the structures of an insect to those of an arachnid.

KEY VOCABULARY

insect • arachnid • thorax • abdomen • antennae • pollinate • metamorphosis • larva / pupa

GUIDING QUESTIONS

- What structures do all insects share, no matter their size or habitat?
- How is a spider different from an insect, even though people often confuse them?
- Why is metamorphosis an important part of a butterfly's life cycle?

CENTER MATERIALS

#	Center	Materials Needed
1	Stampers	Insect stamps, ink pads, paper
2	Games	Insect matching or board games
3	Rubbing Plates	Insect rubbing plates, crayons, paper
4	Figures / Magnifiers / Magnets (Table 1)	Plastic insect figures, magnifying glasses, insect magnets
5	Figures / Magnifiers / Magnets (Table 2)	Plastic insect figures, magnifying glasses, insect magnets

ASSESSMENT / WRAP-UP

- Daily Wrap-Up: students write 3–4 facts learned or draw a picture about what they learned.
- Sequencing check: can students place butterfly/bee life-cycle cards in the correct order?
- Discussion: students name one structure that makes an animal an insect vs. an arachnid.

Space and Weather

LESSONS COVERED

1. Earth: Our Home 2. The Moon 3. The Sun and Our Solar System 4. Outer Space 5. Weather

NGSS STANDARDS ADDRESSED

Standard	Performance Expectation
K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
1-ESS1-1	Use observations of the sun, moon, and stars to describe patterns that can be predicted.
5-ESS1-1	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
5-ESS1-2	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of stars in the night sky.

LEARNING OBJECTIVES

Grades K–2 (SWBAT): Describe daily weather patterns and observe that the sun appears to move across the sky in a predictable pattern each day.

Grades 3–5 (SWBAT): Explain the relative positions of Earth, the sun, and the moon in the solar system, describe why the moon appears to change shape, and relate weather phenomena to observable data.

KEY VOCABULARY

orbit • rotation • atmosphere • gravity • crater • solar system • meteorologist • precipitation

GUIDING QUESTIONS

- What patterns do the sun, moon, and stars follow in the sky?
- What makes Earth different from other planets in our solar system?
- How do scientists observe and predict weather?

CENTER MATERIALS

#	Center	Materials Needed
1	Stencils and Stampers	Space and weather stencils, stamps, ink pads, paper
2	Books	Space and weather books related to the bin subject
3	Magnets and Inflatables	Magnetic solar-system sets; inflatable planets/globe
4	Puzzles / Games	Space and weather puzzles and board games
5	Card Games	Space and weather themed card games

ASSESSMENT / WRAP-UP

- Daily Wrap-Up: students write 3 facts learned and draw a matching picture.
- Modeling check: can students correctly order or describe the relative positions of the sun, Earth, and moon?
- Discussion: students describe one pattern they notice in the sky or the weather.

Animals of the World

LESSONS COVERED

1. Wild Wonders of North America 2. Rainforest Treasures of South America 3. Savannah Giants and Jungle Mysteries of Africa 4. Mysterious Creatures of Asia 5. Down Under's Wild Side / Antarctica's Frozen Frontier 6. Hidden Treasures of Europe

NGSS STANDARDS ADDRESSED

Standard	Performance Expectation
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
2-LS4-1	Make observations of plants and animals to compare the diversity of life in different habitats.
3-LS4-3	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

LEARNING OBJECTIVES

Grades K–2 (SWBAT): Identify one animal from each of several world regions and describe a basic need it meets in its habitat.

Grades 3–5 (SWBAT): Compare structural and behavioral adaptations of animals across continents (camouflage, hibernation, group living) and explain how climate shapes which animals can survive in a habitat.

KEY VOCABULARY

habitat • continent • adaptation • camouflage • predator / prey • biodiversity • climate • ecosystem

GUIDING QUESTIONS

- How does climate shape which animals live in a region?
- What adaptations help animals survive in extreme environments like deserts, the Arctic, or the rainforest?
- Why do animals from different continents look and behave so differently from one another?

CENTER MATERIALS

#	Center	Materials Needed
1	Books and Puzzles	Continent/animal books and puzzles
2	Stampers	Animal stamps, ink pads, paper
3	Figures and Specimen	Plastic animal figures and specimens sorted by continent
4	Games #1	Continent/animal matching or board game
5	Games #2	Continent/animal matching or board game

ASSESSMENT / WRAP-UP

- Daily Wrap-Up: students write a short story about their favorite animal from the lesson and draw a picture.
- Sorting check: can students match an animal to its correct continent and one adaptation?
- Discussion: students explain how climate affects an animal's adaptations.

Birds and Bats

LESSONS COVERED

1. Feather Types and Purposes 2. Nests and Eggs 3. Bird Calls and Communication 4. Raptors 5. Bats

NGSS STANDARDS ADDRESSED

Standard	Performance Expectation
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.
1-LS1-2	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

LEARNING OBJECTIVES

Grades K–2 (SWBAT): Identify feathers, beaks, and wings as external structures that help birds survive, and describe how bird parents care for eggs and young.

Grades 3–5 (SWBAT): Explain how feather types and beak or talon shapes function for specific purposes (flight, insulation, hunting), and compare bird senses to bat echolocation as adaptations for finding food.

KEY VOCABULARY

feather • talon • raptor • echolocation • nocturnal • incubate • plumage • mammal

GUIDING QUESTIONS

- How do a bird's feathers help it survive in its environment?
- What makes bats different from birds, even though both can fly?
- How do birds and bats communicate or sense the world around them?

CENTER MATERIALS

#	Center	Materials Needed
1	Books and Puzzles	Bird and bat books and puzzles
2	Games	Bird and bat matching or board games
3	Stampers	Bird and bat stamps, ink pads, paper
4	Manipulatives	Feather, wing, and nest manipulatives
5	Bird Call Identifier and Binoculars	Bird call identifier device; binoculars

ASSESSMENT / WRAP-UP

- Daily Wrap-Up: students write 2–3 facts learned and draw a matching picture.
- Structure/function check: can students match a feather or beak type to its purpose?
- Discussion: students explain how echolocation helps a bat find food in the dark.

Trees, Leaves, and Plants

LESSONS COVERED

1. The Importance of Trees and Plants 2. Parts of Trees and Plants 3. The Life Cycle of Trees and Plants 4. Leaves and Their Superpowers 5. Tree and Plant Adaptations

NGSS STANDARDS ADDRESSED

Standard	Performance Expectation
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.
2-LS2-1	Plan and conduct an investigation to determine if plants need sunlight and water to grow.
2-LS2-2	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
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.
4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

LEARNING OBJECTIVES

Grades K–2 (SWBAT): Identify what plants need to grow (sunlight, water, air) and name the basic parts of a plant (roots, stem, leaves).

Grades 3–5 (SWBAT): Explain the function of plant and tree structures (roots, leaves, photosynthesis, transpiration), sequence a tree's life cycle from seed to mature tree, and describe one adaptation that helps a plant survive in an extreme environment.

KEY VOCABULARY

photosynthesis • transpiration • chlorophyll • seedling • pollination • adaptation • deciduous • germinate

GUIDING QUESTIONS

- What do all plants need in order to survive and grow?
- How do leaves make food for a plant, and why does that matter for us?
- How do structures like spines, roots, or waxy coatings help a plant adapt to its environment?

CENTER MATERIALS

#	Center	Materials Needed
1	Stampers	Tree, leaf, and plant stamps, ink pads, paper
2	Books and Card Games	Plant-related books; plant-themed card games
3	Rubbings and Stencils	Leaf rubbing plates and stencils, crayons, paper
4	Building Blocks	Tree/plant-themed building blocks
5	Magnets and Wooden Manipulatives	Plant-part magnets; wooden tree/plant manipulatives

ASSESSMENT / WRAP-UP

- Daily Wrap-Up: students write 3 facts learned and draw a matching picture.
- Labeling check: can students name and describe the function of a plant's basic parts?
- Discussion: students describe one plant adaptation and the problem it solves.

PROGRAM OVERVIEW

Tying It All Together

This sheet connects all seven Nature Center STEAM Bin units into one cohesive afterschool science program. Each unit below runs as its own set of guided lessons and rotating hands-on centers, but together they build a full year of NGSS-aligned exploration across life science, earth and space science, and engineering-adjacent observation skills.

STANDARD 60-MINUTE LESSON STRUCTURE

Segment	Time	Purpose
Guided Lesson	15 min	Instructor presents slide-based content on the day's topic
Brain Break	5 min	Movement/song video to reset attention before centers
Read Aloud	5 min	Live or online read-aloud tied to the topic
Center Time	30 min (2 rotations)	Students rotate in color groups through 2 of the unit's 5 centers
Wrap-Up	5 min	Students record 2–3 facts learned and draw a picture

Note: the Dinosaurs and Fossils unit's guide allots 15 minutes to Center Time; adjust rotation length or center count for that unit accordingly.

CENTER ROTATION MODEL

- Each unit has 5 centers; students are divided into 5 color groups (Blue, Red, Green, Orange, Purple).
- Groups rotate through 2 of the 5 centers per lesson in two 15-minute sessions; the rotation chart shifts each lesson so every group eventually visits every center across the unit.
- Set up all 5 centers before the lesson begins so transitions stay quick and seamless.

UNITS AT A GLANCE

Unit	Lessons	Primary NGSS Focus
Animal Tracking	5	K-LS1-1, 1-LS1-2, 3-LS4-3, 4-LS1-1
Dinosaurs and Fossils	5	3-LS4-1, 3-LS4-3, 3-LS4-4, 4-LS1-1
Insects	5	K-LS1-1, 2-LS4-1, 3-LS1-1, 4-LS1-1
Space and Weather	5	K-ESS2-1, K-ESS3-2, 1-ESS1-1, 5-ESS1-1, 5-ESS1-2
Animals of the World	6	K-LS1-1, 2-LS4-1, 3-LS4-3, 4-LS1-1
Birds and Bats	5	1-LS1-1, 1-LS1-2, 4-LS1-1
Trees, Leaves, and Plants	5	K-LS1-1, 2-LS2-1, 2-LS2-2, 3-LS1-1, 4-LS1-1

Total: 7 units, 36 guided lessons, 35 activity centers.

CROSS-CUTTING THEMES ACROSS THE PROGRAM

Theme	Units Where It Appears
Structure & Function	Animal Tracking, Birds and Bats, Insects, Animals of the World, Trees/Leaves/Plants
Life Cycles	Insects, Trees/Leaves/Plants, Dinosaurs and Fossils (extinction)
Habitats & Adaptation	Animal Tracking, Animals of the World, Trees/Leaves/Plants, Insects
Patterns in Nature	Space and Weather, Animal Tracking, Birds and Bats
Evidence From the Past	Dinosaurs and Fossils

Theme	Units Where It Appears
Earth & Space Systems	Space and Weather

FULL LIST OF NGSS STANDARDS ADDRESSED

Standard	Performance Expectation
1-ESS1-1	Use observations of the sun, moon, and stars to describe patterns that can be predicted.
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.
1-LS1-2	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
2-LS2-1	Plan and conduct an investigation to determine if plants need sunlight and water to grow.
2-LS2-2	Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
2-LS4-1	Make observations of plants and animals to compare the diversity of life in different habitats.
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.
3-LS4-1	Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
3-LS4-3	Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
3-LS4-4	Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there change.
4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
5-ESS1-1	Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth.
5-ESS1-2	Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of stars in the night sky.
K-ESS2-1	Use and share observations of local weather conditions to describe patterns over time.
K-ESS3-2	Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.
K-LS1-1	Use observations to describe patterns of what plants and animals (including humans) need to survive.

INSTRUCTOR TIPS

- Preview each unit's guided-learning slide deck before the lesson; slides carry the presentation for you.
- Set up all 5 centers before students arrive so Center Time starts immediately after the read-aloud.
- Keep the same 5 color groups across a unit's lessons so the rotation chart stays simple to follow.
- Use the Wrap-Up sheet each day as a quick, consistent formative assessment across every unit.