Unit 3 Animals Two by Two

Content Area: **Science**
Course(s): **Science**
Time Period: **Marking Period 4**
Length: **10 Weeks**
Status: **Published**

Unit Overview

The **Animals Two by Two Module** provides early-childhood students with close and personal interaction with some common land and water animals. Students observe and describe the structures of fish, birds, snails, earthworms, and isopods. Appropriate classroom habitats are established, and students learn to care for the animals. In four investigations, animals are studied in pairs. Students observe and care for one animal over time, and then they are introduced to another animal similar to the first but with differences in structure and behavior.

Students learn what animals need to survive and the relationship between their needs and where they live. The firsthand experiences are enriched with close-up photos of animals, some related to animals that students have observed in class and some to animals that are new. This process enhances observation, communication, and comparison.

Throughout the **Animals Two by Two Module**, students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and obtaining information from photographs. Students gain experiences that will contribute to an understanding of the crosscutting concepts of patterns; cause and effect; systems and system models; and structure and function.

Standards

Disciplinary Core Ideas (DCI's)

K-ESS2	Earth's Systems
K-ESS2-2	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
K-ESS3	Earth and Human Activity
K-ESS3-1	Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.

Crosscutting Concepts (CC's)

CCC.1.1	children recognize that patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.
CCC.2.1	students learn that events have causes that generate observable patterns. They design simple tests to gather evidence to support or refute their own ideas about causes.
CCC.4.1	students understand objects and organisms can be described in terms of their parts; and systems in the natural and designed world have parts that work together.
CCC.6.1	students observe the shape and stability of structures of natural and designed objects are related to their function(s).
SCI.K-2.4.2	Systems in the natural and designed world have parts that work together.
SCI.K-2.7.2	Things may change slowly or rapidly.

Science and Engineering Practices (SEP's)

SEP.1	Asking Questions and Defining Problems
SEP.3	Planning and Carrying Out Investigations
SEP.4	Analyzing and Interpreting Data
SEP.5	Using Mathematics and Computational Thinking
SEP.6	Constructing Explanations and Designing Solutions
SEP.8	Obtaining, Evaluating, and Communicating Information

Essential Questions

Investigation 1 - Goldfish and Guppies

- What are the parts of a goldfish?
- What do goldfish need to live?
- What do goldfish do?
- How are guppies and goldfish different? How are they the same?
- What birds visit our schoolyard?

Investigation 2 - Water and Land Snails

- What are the parts of a water snail?
- How can shells be grouped?
- What do land snails do?

Investigation 3 - Big and Little Worms

- What are the parts of a redworm?
- What do redworms need to live?
- How are redworms and night crawlers different? How are they the same?

Investigation 4 - Pill Bugs and Sow Bugs

- What are isopods?
- How are pill bugs and sow bugs different? How are they the same?

- How do isopods move?
- What do animals need to live?

Application of Knowledge: Students will know that...

- Birds are animals that have basic needs
- Different kinds of birds have similar but different structures and behaviors.
- Different kinds of fish have similar but different structures and behaviors.
- Different kinds of isopods have some structures and behaviors that are the same and some that are different.
- Different kinds of snails have some structures and behaviors that are the same and some that are different.
- Different kinds of worms have similar structures and behaviors; they also have differences (size, color).
- Fish are animals and have basic needs.
- Fish have structures that help them live and grow.
- Isopod behavior is influenced by conditions in the environment.
- Isopods are animals and have basic needs—water, air, food, and space with shelter.
- Shells differ in size, shape, pattern, and texture.
- Snails are animals and have basic needs—water, air, food, and space with shelter.
- Snails have senses.
- There is great diversity among isopods.
- There is great diversity among snails.
- Worm behavior is influenced by conditions in the environment.
- Worms are animals and have basic needs.
- Worms change plant material into soil.
- Worms have identifiable structures.

Application of Skills: Students will be able to...

- arrange to provide help for the needs of the aquarium
- compare how redworms and night crawlers are the same and different
- compare the structure and behaviors of two kinds of fish
- compare two kinds of isopods, commonly known as pill bugs and sow bugs
- compile observations of the structures, behaviors, and needs of earthworms
- critique several kinds of animals living together in a terrarium habitat
- describe, compare and communicate the similarities and differences of the two kinds of snails
- interpret observations of animal structures and behaviors
- list the behaviors of land snails in a terrarium

- list the behaviors of water snails in an aquarium
- record changes in the aquarium over time

Assessments

Pre-Assessment/Survey

Investigation 1:

- Formative Assessments: Science Notebook entry, Embedded Assessment, and Performance Assessment
- Benchmark Assessments: Survey, Investigation 1 I-Check

Investigation 2 -

- Formative Assessments: Science Notebook entry and Embedded Assessment
- Benchmark Assessments: Investigation 2 I-Check

Investigation 3 -

- Formative Assessments: Science Notebook entry, Embedded Assessment, and Performance Assessment
- Benchmark Assessments: Investigation 3 I-Check

Investigation 4 -

- Formative Assessments: Science Notebook entry, Embedded Assessment, and Performance Assessment
- Benchmark Assessments: Posttest

Suggested Activities

INVESTIGATION 1: Goldfish and Guppies

Part 1. The Structure of Goldfish (center)

- introduce the aquarium and goldfish to the class
- observe and discuss goldfish and aquarium

- student notebook entry

2. Caring for Goldfish (center)

- feed the fish
- enrich the environment in which the fish live
- student notebook entry

3. Goldfish Behavior (center)

- compare the structures and behaviors of the goldfish to those of other fish, guppies
- put the tunnel in the aquarium
- make a paper aquarium
- model fish behavior
- student notebook entry

4. Comparing Guppies to Goldfish (center/whole class)

- compare photos of fish
- read about fish- Fish Same and Different, Fish Live in Many Places
- discuss the readings and photos
- student notebook entry

5. Comparing Schoolyard Birds (whole class)

- move the focus to birds
- go bird watching in the schoolyard and compare features and behaviors of birds
- discuss bird movement,structures, sightings
- read Birds Outdooors
- online videoThe Urban Habitat of Peregrine Falcons
- set up a birdfeeder

INVESTIGATION 2. Water and Land Snails

Part 1. Observing Water Snails (center)

- introduce water snails
- obsevre snails in vials
- compare two types of snails
- student notebook entry

2. Shells (center/whole class)

- introduce the video Seashore Surprise
- students work with a variety of seashells, discussing similarities and differences in their size, shape, color, and texture
- seriate shells

- student notebook entry

3. Land Snails (center/whole class)

- students match shell pairs, make designs, and create patterns.
- students explore the schoolyard to find local land snails
- compare their structures and behaviors to water snails
- read Water and Land Snails
- student notebook entry

INVESTIGATION 3. Big and Little Worms

1. The Structure of Redworms (center)

- introduce redworms
- dig for worms
- feed worms
- study their behavior

2. Redworm Behavior (center)

- dig for redworms
- observe red worm movement
- block the worms path
- construct worm jars and provide for the needs of the composting worms
- study their behavior
- student notebook entry

Part 3. Comparing Redworms to Night Crawlers (center/whole class)

- compare the redworms to night crawlers, which are much larger
- compare photos and
- read about worms and their activities in soil- Worms in the Soil
- student notebook entry

INVESTIGATION 4. Pill Bugs and Sow Bugs

Part 1. Isopod Observations (center)

- review the first three investigations
- introduce the isopods
- observe structures of two kinds of isopods
- introduce using a hand lens and vialstudent notebook entry

Part 2. Identifying Isopods (center/whole class)

- complete isopod sorting sheet
- learn to identify which are pill bugs and which are sow bugs
- provide observation time
- read Isopods and discuss the reading
- student notebook entry

Part 3. Isopod Movement (center/whole class)

- discuss an isopod hunt- search outdoors for isopods
- introduce the racetrack
- hold isopod races
- read Animals Around Us
- discuss the reading
- student notebook entry

Part 4. Animals Living Together (center/whole class)

- make a terrarium in which all the land animals live together.
- compare photos and read about isopods
- read about and compare illustrations of a variety of animal- Living and Nonliving/ Animals Two by Two
- Online activity Find the Parent
- discuss the differences between living and nonliving things

Activities to Differentiate Instruction

Differentiation for special education:

General modifications may include:

- Modifications & accommodations as listed in the student's IEP
- Assign a peer to help keep student on task
- Modified or reduced assignments
- Reduce length of assignment for different mode of delivery
- Increase one-to-one time
- Working contract between you and student at risk
- Prioritize tasks
- Think in concrete terms and provide hands-on-tasks
- Position student near helping peer or have quick access to teacher
- Anticipate where needs will be
- Break tests down in smaller increments

Content specific modifications may include:

- Provide multiple means of representation. Give learners various ways (ie Internet, ipads) to acquire information and knowledge.
- Provide multiple means of action and expression. Offer students alternatives for demonstrating what they know.
- Provide multiple means of engagement. Help learners get interested, be challenged, and stay motivated.
- Allow students to express their understanding through a variety of modalities.
- Provide more experiences building explanations of the science concepts orally or in writing or drawing.
- Making vocabulary more explicit through new concrete experiences.

Differentiation for ELL's:

- General modifications may include:
    - Strategy groups
    - Teacher conferences
    - Graphic organizers
    - Modification plan
    - Collaboration with ELL Teacher

Content specific vocabulary important for ELL students to understand include:

- race roll up round section sow bug turn over breathe characteristic egg fin fish gill oxygen scale shelter worm Investigation foot moist sense snail tentacle burrow clitellum compost segment antenna isopod living mammal nonliving offspring aquarium backward behind below bill bird bottom color compare different dirty eye feather female fin fish fly food forward fresh water gill goldfish guppy head in front of male middle mouth next to plant prefer same scale surface swim tail through tunnel water wing dark float foot land snail large light rough sea animal shell sideways small smooth snail tentacle terrarium upside down vial water snail body bristle clitellum earthworm moist night crawler redworm segment soil swollen antenna ball carapace flat isopod jagged living moisture nonliving pill bug protect

Differentiation to extend learning for gifted students may include:

- Integrate language-arts instruction to enhance science learning
- Label diagrams, pictures and science notebook recordings.
- Utilize the Math extension problems and Science extensions provided in Foss Teacher Manual

Integrated/Cross-Disciplinary Instruction

Use the Standards tab to indicate which of the Student Learning Standards for Math and ELA standards that will be covered in this unit.

Language Extensions

- Use a graphic organizer or Venn diagram to compare and contrast goldfish and guppies
- Write a How To create a aquarium
- keep a classroom snail journal

Math extensions

- sort shells by size, color or shape
- compare the lenght of night crawlers

Art Extensions:

- create binoculars out of toilet paper towel tubes
- make paper bowl snails
- male a classroom mural where animals can be found in nature

MA.K.MD.A.1	Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
MA.K.MD.A.2	Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference.
MA.K.G.B.4	Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length).
LA.W.K.2	Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.
LA.W.K.3	Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.
VPA.1.3.2.D.1	Create two- and three-dimensional works of art using the basic elements of color, line,

shape, form, texture, and space, as well as a variety of art mediums and application methods.

Resources

TEACHER MATERIALS:

Foss teacher's edition
Fossweb information.

WEBSITES:

All About Snails
URL: www.kiddyhouse.comDescription: This site includes information about the snail, coloring activities, worksheets, clip art, stories and Internet-based lesson.
Calflora: A Botanical Resource For California On The Internet
URL: www.calflora.orgDescription: Search plants found in California. Nonnatives are included here, too.
Frogland
URL: allaboutfrogs.orgDescription: This site is everything you always wanted to know about frogs.
I Was Wondering: Women's Adventures in Science
URL: Description: This project of the National Academy of Sciences showcases the accomplishments of contemporary women in science and highlights the varied and intriguing careers of some of today's most prominent scientists.
Journey North: A Global Study Of Wildlife Migration
URL: www.learner.orgDescription: Students across North America gathered migration data and posted results. This can be an opportunity for students to get involved and post their own data.
Kid's Corner
URL: education.usgs.govDescription: Explore the USGS Biological Resources Division for kids.
Kiddy House
URL: www.kiddyhouse.comDescription: Stories, crafts, and information on frogs, farms, and snails are just a few of the offerings at this site for parents, kids, and teachers. The All About Snails site includes information about land and pond snails, activities, and worksheets.
Live Owl Cam
URL: www.owlcam.comDescription: NULL
NOAA's Ark
URL: www.photolib.noaa.govDescription: This collection of images from the National Oceanic and Atmospheric Administration (NOAA) includes many wonderful pictures of both land- and ocean-dwelling creatures, including bears, whales, birds, and walruses.
Raising Snails
URL: www.nal.usda.govDescription: USDA site explaining how to commercially raise snails, and lots of other information about snails in general.
Tryscience.org Field Trips
URL: www.tryscience.orgDescription: Find out about more than 400 science and technology centers and museums worldwide. Use an interactive map of the world to find and explore a science and technology center or museum near you. You can also find online adventures and field trips, ideas for experiments at home, plus live webcams. TryScience.org is your gateway to experience the excitement of contemporary science and technology through on and offline interactivity with science and technology centers worldwide. TryScience is brought to you through a partnership between IBM Corporation, the New York Hall of Science (NYHOS), the Association of Science-Technology Centers (ASTC), and science centers worldwide.

BOOKS: FICTION

- *A Fish Out of Water*
- *A House for Hermit Crab*
- *Amigo*
- *Animals Should Definitely Not Wear Clothing*
- *Around the World: Who's Been Here?*
- *Blue Hat, Green Hat*
- *Children of the Earth...Remember*
- *Clementina's Cactus*
- *Dig, Wait, Listen*
- *Farmer Duck*
- *Growing Frogs*
- *If I Ran the Rain Forest: All about Tropical Rain Forests*
- *In the Tall, Tall Grass*
- *Look to the North: A Wolf Pup Diary*
- *Mr. Gumpy's Outing*
- *Our Big Home: An Earth Poem*
- *Puffins Climb, Penguins Rhyme*
- *Rainbow Fish*
- *Secret Place*
- *Snail Girl Brings Water: A Navajo Story*
- *Some Smug Slug*
- *Swimmy*
- *The Hat*
- *This Year's Garden*
- *Thunder Cake*
- *Two Bad Ants*
- *When Clay Sings*
- *Who Hops?*

BOOKS:NON-FICTION

- *A Cheeky Chiller*
- *A Cool Caper*
- *A Crocodile Grows Up (Series)*
- *A Kangaroo Grows Up (Series)*
- *A Kangaroos World (Series)*
- *A Koala's World (Series)*
- *A Pinky Is a Baby Mouse: And Other Baby Animals' Names*
- *A Polar Bear's World*
- *A Stickler on Stilts*
- *A Swim Through the Sea*
- *A Walrus' World*
- *A Wombat's World (Series)*
- *About Reptiles: A Guide for Children*

- *All Around Me I See*
- *Animal Camouflage in the Desert*
- *Animal Camouflage in the Ocean*
- *Animal Dads*
- *Animal Patterns (Series)*
- *Animales en invierno / Animals in Winter*
- *Animals Big and Small*
- *Animals in Camouflage*
- *Animals in Winter*
- *Animals in Winter*
- *Animals Two By Two*
- *Are You A Snail?*
- *Are you Living? A song about Living and Nonliving Things*
- *Around One Log*
- *Asphalt to Ecosystems: Design Ideas for Schoolyard Transformation*
- *At Home In The Rainforest*
- *Ballenas/ Whales (Spanish and English in one book)*
- *Bats (Nocturnal Animals Series)*
- *Beaks*
- *Beyond Ecophobia: Reclaiming the Heart of Nature Education*
- *Big and Small: An Animal Opposites Book (Series) (Spanish and English in one book)*
- *Biggest, Strongest, Fastest*
- *Birds: Nature's Magnificent Flying Machines*
- *Black Widow Spiders (Spiders Series)*
- *Bottlenose Dolphins*
- *Castles, Caves, and Honeycombs*
- *Caterpillars*
- *Cheetahs*
- *Chick*
- *Chickens Aren't The Only Ones*
- *Cobras*
- *Colors of the Ocean*
- *Coral Reefs: Colorful Underwater Habitats*
- *Desert Trip*
- *Disgusting Animals (Series)*
- *Each Living Thing*
- *Eggs, Eggs, Everywhere: Teacher's Guide*
- *Elephants Swim*
- *Fish*
- *Fish Faces*
- *From Tadpole to Frog: Following the Life Cycle*
- *Gardens (Series)*
- *Garter Snakes*
- *Gemma And The Baby Chick*
- *Giant Pandas*
- *Goldfish*
- *Gran tiburón blanco / Great White Shark*
- *Great Explorations in Math and Science (GEMS)*
- *Hammerhead Shark*

- *Hammerhead Shark*
- *Hands-On Life Science Activities for Grades K—6*
- *Hands-on Nature: Information And Activities For Exploring The Environment With Children*
- *Hedgehogs (Nocturnal Animals Series)*
- *Here Is the African Savanna*
- *Here Is the Arctic Winter*
- *Here Is the Coral Reef*
- *Here Is the Southwestern Desert*
- *Here Is the Tropical Rain Forest*
- *Here Is the Wetland*
- *Hibernar/ Hibernation (Spanish and English in one book)*
- *High and Low: An Animal Opposites Book (Series)*
- *Homes*
- *Horses*
- *How Do We Learn?*
- *I am a Sea Horse: The Life of a Dwarf Sea Horse*
- *I am an Octopus: The Life of a Common Octopus (Series)*
- *If I Were a Veterinarian*
- *It Could Still Be A Worm*
- *Last Chance To See*
- *Lets Look at Animal Bottoms (Series)*
- *Lets Look at Animal Ears (Series)*
- *Lets Look at Animal Eyes (Series)*
- *Lets Look at Animal Feet (Series)*
- *Lets Look at Animal Legs (Series)*
- *Lets Look at Animal Tails (Series)*
- *Lets Look at Animal Wings (Series)*
- *Lifetimes: A Beautiful Way To Explain Death To Children*
- *Light*
- *Living Things Need Food*
- *Lizards*
- *Look Once, Look Again: Animal Eyes*
- *Look Once, Look Again: Animal Feet*
- *Look Once, Look Again: Animal Tails*
- *Looking Closely Through the Forest*
- *Meerkat*
- *Meerkats*
- *My Visit to the Zoo*
- *Mystery Animal Tracks: A Photo Riddle Book*
- *On One Flower: Butterflies, Ticks, and a Few More Icks*
- *Orangutans*
- *Outbreak! The Science of Pandemics*
- *Patterns Outside*
- *Pillbugs*
- *Puffer Fish*
- *Puffins*
- *River of Life*
- *Safe, Warm, and Snug*
- *Salamanders*

- *Salmon Stream*
- *Schoolyard-Enhanced Learning: Using the Outdoors as an Instructional Tool, K-8*
- *Sea Urchins (Series)*
- *Seres vivos y no vivos / Living and Nonliving (Lo basico de la naturaaleza / Nature Basics Series)*
- *Snails*
- *Snowy Owls*
- *Starfish*
- *Swallows in the Birdhouse*
- *Ten-Minute Field Trips: A Teacher's Guide to Using the Schoolgrounds for Environmental Studies (3rd edition)*
- *The Aye-Aye*
- *The Naked Mole-Rat*
- *The Sky's the Limit: Stories of Discovery by Women and Girls*
- *They All Laughed...From Light Bulbs to Lasers: The Fascinating Stories Behind the Great Inventions That Have Changed Our Lives*
- *They Call Me Woolly: What Animal Names Can Tell Us*
- *Tools*
- *Water*
- *Whale Shark*
- *What If There Were No Sea Otters?: A Book about the Ocean Ecosystem*
- *What Will The Weather Be?*
- *What's Faster than a Speeding Cheetah?*
- *What's Smaller than a Pygmy Shrew?*
- *What's the Difference Between a Dophin and a Porpoise?*
- *What's the Difference Between a Frog and a Toad?*
- *When A Storm Comes Up*
- *Who Lives Here?*
- *Whose Feet Are These?*
- *Why do Bears Sleep All Winter?*
- *Women Inventors (Vol. 1-4)*
- *Working with Wildlife: A Guide to Careers in the Animal World*
- *Worms Eat My Garbage*
- *Zion National Park*

21st Century Skills

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP11	Use technology to enhance productivity.

CRP.K-12.CRP12	Work productively in teams while using cultural global competence.