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Unit Title: Animals Two by Two		Content Area: Life Science		Grade Level: K	
<p>Unit Summary: Animals Two by Two provides students with close and personal interaction with some common land and water animals. Appropriate classroom habitats are established, and students learn to care for the animals, emphasizing the development of observation and descriptive communication skills and building explanations based on experience. Animals are studied in pairs through a sequence of four progressive activities, enhancing opportunities for comparison. [NJCCCS 5.3 Life Science: All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.] The cross cutting concepts; patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence are organizing concepts for this unit. (K-LS1-1), (1-LS3-1). Students are expected to demonstrate mastery in identifying living things, what living things need to survive, the difference between various living things, and how they interact with their habitat.</p>					
<p>Unit Essential Questions:</p> <ul style="list-style-type: none"> • How can energy be transferred from one material to another? • What do all living things have in common? • How is matter transformed, and energy transferred /transformed in living systems? • In what ways do organisms interact within ecosystems? • How do organisms change as they go through their life cycle? • In what ways are organisms of the same kind different from each other? How does this help them reproduce and survive? • What is the source of the resources used to meet the basic needs of living organisms? 			<p>Unit Enduring Understandings:</p> <ul style="list-style-type: none"> • How to properly care for animals. • All animals need food in order to live and grow. • Land animals need air, water, food, and shelter. • Water animals need the appropriate kind of water, oxygen from the water, food, and shelter. • Animals obtain their food from plants or from other animals. • A habitat is a place where animals live and their needs are met. • Plants need water and light to live and grow. 		
<p>Possible Student Misconceptions:</p> <ul style="list-style-type: none"> • Students may have misconceptions correctly distinguishing the difference between various non-living and living things 					
<p>NJCCCS: 5.3.2.A.1, 5.3.2.B.1, 5.3.2.B.2, 5.3.2.C.1, 5.3.2.C.2, 5.3.2.D.1, 5.3.2.E.1, 5.3.2.E.2, 5.4.2.G.3</p>					
<p>NGSS Performance Expectations: <i>Students who demonstrate understanding can...</i></p> <ul style="list-style-type: none"> • K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. • 1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. • 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. 					
<p>Primary CCSS ELA/Literacy Connections: SL.K.3,.5, W.K.2,.7</p>			<p>Primary CCSS Mathematics Connections: K.MD.A.2</p>		
Lesson Pace & Sequence					
<p>Lesson Title/Number: Goldfish and Guppies / 1</p>		<p>Learning Objective(s): Students will be able to observe, describe, and identify what goldfish and guppies need for survival as well as their habitat.</p>		<p>Lesson Duration: 2 to 3 weeks/320 to 480 minutes</p>	
<p style="text-align: center;">Learning Cycle</p> <p style="text-align: center;"><i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i></p> <p style="text-align: center;"><i>*Elements do not have to be in conducted in sequence.</i></p>	<p style="text-align: center;">Learning Activities</p> <p style="text-align: center;"><i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i></p>	<p style="text-align: center;">Resources/Materials</p> <p style="text-align: center;"><i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i></p>	<p style="text-align: center;">Science and Engineering Practices</p> <p style="text-align: center;"><i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i></p>	<p style="text-align: center;">Disciplinary Core Ideas</p> <p style="text-align: center;"><i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i></p>	<p style="text-align: center;">Crosscutting Concepts</p> <p style="text-align: center;"><i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i></p>
<p>Elicit: <i>How will you access students' prior knowledge?</i></p>	<p>Students' prior knowledge will be accessed through topic introduction and circle time</p>		<p>Planning and Carrying Out Investigations: -Make predictions based on prior</p>		

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	discussions. (Text-to-self connections, text-to-text connections, and text-to-world connections. Please note to record responses on an anchor chart to refer back to in following lessons)		experiences.		
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Students' interest and minds will be focused on the topic as teacher will begin their class discussions and introductions with educational and captivating video/photographs. (see Resources/Materials)	<ul style="list-style-type: none"> Goldfish and Guppies: http://www.vidacollection.org/browse/browseRecords/detail?recordId=609 			
Explore: What hands-on/minds-on common experience(s) will you provide for students?	Students with teacher guidance will set up aquarium and observe and journal about their observations of the goldfish/guppies, their body parts, and life cycle		Analyzing and Interpreting Data: -Record information (observations, thoughts, and ideas). -Use and share pictures, drawings, and/or writings of observations	LS1: From Molecules to Organisms: Structures and Processes: -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. (1-LS1-1)	Patterns: -Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.
Explain: How will you help students connect their exploration to the concept/topic under investigation?	<p>Students observe goldfish living in a simple aquarium. They look for and name different parts of the fish. Students look to see if all the fish are alike or if there are some differences such as color and size. (Part 1)</p> <p>Students learn how to care for goldfish by giving them food and fresh water and adding plants to the aquarium. (Part 2)</p> <p>Students add a tunnel to the aquarium to observe how the fish respond. Students will then create paper aquariums to model the fish behavior they have observed. (Part 3)</p>	<ul style="list-style-type: none"> Investigation 1 - Part One: The Structure of Goldfish TE Pages 10-16 Investigation 1 - Part Two: Caring for Goldfish Activity TE Pages 17-21 Investigation 1 - Part Three: Goldfish Behavior Activity TE Pages 22-25 Investigation 1 - Part Four: Comparing Guppies to Goldfish Activity TE Pages 26-29 KWL Chart Class Word Bank (Words listed in Investigation 1: TE Page 8) Center Cards (Student sheet numbers 2-7 located 	Planning and Carrying Out Investigations: -With guidance, plan and conduct an investigation in collaboration with peers. -Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.	LS1: From Molecules to Organisms: Structures and Processes: -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, fruit) that help them survive and grow. (1-LS1-1) -All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-	Systems and System Models: -Objects and organisms can be described in terms of their parts.

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	Students compare the structures and behaviors of guppies to those of goldfish and identify the guppies by gender. (Part 4)	in the Investigation Duplication Masters Tab in TE)		LS1-1)	
Evaluate: How will students demonstrate their mastery of the learning objective(s)?	Students will also demonstrate their mastery of the learning objective through teacher questioning, anecdotal notes, etc.		Asking Questions and Defining Problems -Ask questions based on observations to find more information about the natural and/or designed world(s). -Ask and/or identify questions that can be answered by an investigation.		
Lesson Title/Number: Big and Little Worms/ 2		Learning Objective(s): Students will be able to observe, describe, and identify what big and little worms need for survival as well as their habitat.			Lesson Duration: 1 week/ 160 minutes
Learning Cycle <i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i> <i>*Elements do not have to be in conducted in sequence.</i>	Learning Activities <i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i>	Resources/Materials <i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i>	Science and Engineering Practices <i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i>	Disciplinary Core Ideas <i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i>	Crosscutting Concepts <i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i>
Elicit: How will you access students' prior knowledge?	Students' prior knowledge will be accessed through topic introduction and circle time discussions. (Text-to-self connections, text-to-text connections, and text-to-world connections. Please note to record responses on an anchor chart to refer back to in following lessons)		Planning and Carrying Out Investigations: -Make predictions based on prior experiences.		
Engage: How will you capture students' interest and get students' minds focused on the concept/topic?	Students' interest and minds will be focused on the topic as teachers will begin their class discussions and introductions with educational and captivating video/photographs. (see Resources/Materials)	<ul style="list-style-type: none"> National Geographic – Earthworm: http://kids.nationalgeographic.com/animals/earthworm.html 			
Explore: What hands-	Teacher will set up terrarium and		Analyzing and Interpreting Data:		Patterns in the natural and

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<p>on/minds-on common experience(s) will you provide for students?</p>	<p>allow students to observe and journal about their observations of the big and little worms, their body parts, and life cycle</p>		<p>-Record information (observations, thoughts, and ideas). -Use and share pictures, drawings, and/or writings of observations</p>		<p>human designed world can be observed, used to describe phenomena, and used as evidence. (K-LS1-1), (1-LS3-1)</p>
<p>Explain: How will you help students connect their exploration to the concept/topic under investigation?</p>	<p>Students will dig through a terrarium to discover that there are red worms living in the soil. Students look for structures they have studied so far. (Part 1)</p> <p>Students focus on the movement and behavior of red worms. Students notice how the worm's body contracts and stretches to move forward. They also will observe the worm to see if it can move in other directions by blocking its pathway to see how the worm responds. (Part 2)</p> <p>Students discover a new kind of worm in their terrarium called night crawlers. Students observe the two kinds of worms and compare the structures and behaviors of the two animals. (Part 3)</p>	<ul style="list-style-type: none"> Investigation 3 - Part One: The Structure of Red Worms Activity TE Pages 8-12 Investigation 3 - Part Two: Red Worm Behavior Activity TE Pages 13-16 Investigation 3 - Part Three: Comparing Red Worms and Night Crawlers TE Pages 17-20 KWL Class Word Bank (Words listed in Investigation 3: TE Page 7) Center Cards (Student sheet numbers 14-17 located in the Investigation Duplication Masters Tab in TE) 	<p>Planning and Carrying Out Investigations: -With guidance, plan and conduct an investigation in collaboration with peers. -Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.</p>	<p>LS1: From Molecules to Organisms: Structures and Processes: -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, fruit) that help them survive and grow. (1-LS1-1)</p> <p>-All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)</p>	<p>Cause and Effect: Mechanism and Prediction: -Events have causes that generate observable patterns.</p> <p>Scale, Proportion, and Quantity: -Relative scales allow objects and events to be compared and described (e.g., bigger and smaller, hotter and cooler, faster and slower)</p>
<p>Evaluate: How will students demonstrate their mastery of the learning objective(s)?</p>	<p>Students will explain in their own words how you can tell if two animals are related. Students will also demonstrate their mastery of the learning objective through teacher questioning, anecdotal notes, etc.</p>	<ul style="list-style-type: none"> FOSS web Animals Two by Two Chant: http://www.fossweb.com/web/foss-fossweb/module-notes?parentID=d564315#module-teaching-notes 	<p>Asking Questions and Defining Problems -Ask questions based on observations to find more information about the natural and/or designed world(s). -Ask and/or identify questions that can be answered by an investigation.</p>		
<p>Lesson Title/Number: Water Snails and Shells/ 3</p>		<p>Learning Objective(s): Students will be able to observe, describe, and identify what water snails and shells need for survival as well as their habitat.</p>			<p>Lesson Duration: 2 weeks/ 320 minutes</p>

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<p>Learning Cycle</p> <p><i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i></p> <p><i>*Elements do not have to be in conducted in sequence.</i></p>	<p>Learning Activities</p> <p><i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i></p>	<p>Resources/Materials</p> <p><i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i></p>	<p>Science and Engineering Practices</p> <p><i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i></p>	<p>Disciplinary Core Ideas</p> <p><i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i></p>	<p>Crosscutting Concepts</p> <p><i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i></p>
<p>Elicit: <i>How will you access students' prior knowledge?</i></p>	<p>Students' prior knowledge will be accessed through topic introduction and circle time discussions. (Text-to-self connections, text-to-text connections, and text-to-world connections. Please note to record responses on an anchor chart to refer back to in following lessons)</p>		<p>Planning and Carrying Out Investigations: -Make predictions based on prior experiences.</p>		
<p>Engage: <i>How will you capture students' interest and get students' minds focused on the concept/topic?</i></p>	<p>Students' interest and minds will be focused on the topic as teachers will begin their class discussions and introductions with educational and captivating video/photographs. (see Resources/Materials)</p>	<ul style="list-style-type: none"> The Living World of Mollusks: http://molluscs.at/gastropoda/index.html?gastropoda/freshwater.html 			
<p>Explore: <i>What hands-on/minds-on common experience(s) will you provide for students?</i></p>	<p>Teacher will allow students to observe and journal about their observations of the water snails and shells, their body/parts, and life cycle</p>		<p>Analyzing and Interpreting Data: -Record information (observations, thoughts, and ideas). -Use and share pictures, drawings, and/or writings of observations</p>		

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<p><i>Explain: How will you help students connect their exploration to the concept/topic under investigation?</i></p>	<p>Students get to know one species of land snail by handling the snails, observing their features, and see how they interact with objects. (Part 1)</p> <p>Students observe one aspect of snail behavior, how land snails move by concluding the investigation with a snail race for lettuce. (Part 2)</p> <p>Students are introduced to an aquatic snail. Students investigate its characteristics and behavior, and compare land and aquatic snails for similarities and differences. (Part 3)</p> <p>Students observe seashells by using their experience with living snails to look for/identify shells they think might have belonged to relatives of the land snail they observed. (Part 4)</p>	<ul style="list-style-type: none"> Investigation 2 - Part One: Land Snails TE Pages 9-13 Investigation 2 - Part Two: Snail Races TE Pages 14-17 Investigation 2 - Part Three: Observing Water Snails TE Pages 18-21 Investigation 2 - Part Four: Shells Activity TE Pages 22-24 KWL Chart Class Word Bank (Words listed in Investigation 2: TE Page 8) Center Cards (Student sheet numbers 8-13 located in the Investigation Duplication Masters Tab in TE) 	<p>Planning and Carrying Out Investigations:</p> <ul style="list-style-type: none"> -With guidance, plan and conduct an investigation in collaboration with peers. -Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. 		
<p><i>Elaborate: How will students apply their learning and develop a more sophisticated understanding of the concept/topic?</i></p>	<p>Students may work with a partner or small group to organize shells into pairs or groups. Students will provide rationales for their decisions.</p>	<ul style="list-style-type: none"> Investigation 2: Part 4 Activity TE Pages 23-24 			
<p><i>Evaluate: How will students demonstrate their mastery of the learning objective(s)?</i></p>	<p>Scoring of Activity Review Sheets (See Resources/Materials) Students will also demonstrate their mastery of the learning objective through teacher questioning, anecdotal notes, etc.</p>		<p>Asking Questions and Defining Problems</p> <ul style="list-style-type: none"> -Ask questions based on observations to find more information about the natural and/or designed world(s). -Ask and/or identify questions that can be answered by an investigation. 		<p>Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. (K-LS1-1), (1-LS3-1)</p>

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<p>Extend: How will students deepen their conceptual understanding through use in new context?</p>	<p>Students work in groups to construct a visual representation of a habitat. They identify all living organisms of the habitat, and then identify which elements (living and non-living) of the habitat provide all organisms with food, shelter and water.</p>	<ul style="list-style-type: none"> All About Snails by Kiddy House: http://www.kiddyhouse.com/Snails/ 				
<p>Lesson Title/Number: Pill Bugs/Isopods/ 4</p>		<p>Learning Objective(s): Students will be able to observe, describe, and identify what pill bugs and isopods need for survival as well as their habitat.</p>			<p>Lesson Duration: 2 weeks/ 320 minutes</p>	
<p>Learning Cycle</p> <p><i>What lesson elements will support students' progress towards mastery of the learning objective(s)?</i></p> <p><i>*Elements do not have to be in conducted in sequence.</i></p>	<p>Learning Activities</p> <p><i>What specific learning experiences will support ALL students' progress towards mastery of the learning objective(s)?</i></p>	<p>Resources/Materials</p> <p><i>What curricular resources/materials are available to facilitate the implementation of the learning activities?</i></p>	<p>Science and Engineering Practices</p> <p><i>What specific practices do students need to use in order to progress towards mastery of the learning objective(s)?</i></p>	<p>Disciplinary Core Ideas</p> <p><i>What core ideas do students need to understand in order to progress towards mastery of the learning objective(s)?</i></p>	<p>Crosscutting Concepts</p> <p><i>What crosscutting concepts will enrich students' application of practices and their understanding of core ideas?</i></p>	
<p>Elicit: How will you access students' prior knowledge?</p>	<p>Students' prior knowledge will be accessed through topic introduction and circle time discussions. (Text-to-self connections, text-to-text connections, and text-to-world connections. Please note to record responses on an anchor chart to refer back to in following lessons)</p>		<p>Planning and Carrying Out Investigations: -Make predictions based on prior experiences.</p>			
<p>Engage: How will you capture students' interest and get students' minds focused on the concept/topic?</p>	<p>Students' interest and minds will be focused on the topic as teachers will begin their class discussions and introductions with educational and captivating video/photographs. (see Resources/Materials)</p>	<ul style="list-style-type: none"> Pill Bug Activities: http://blog.growingwithscience.com/2009/10/pill-bug-activities-for-kids/ 				

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<p>Explore: What hands-on/minds-on common experience(s) will you provide for students?</p>	<p>Teacher will set up terrarium and allow students to observe and journal about their observations of the pill bugs and isopods, their body parts, and life cycle</p>		<p>Analyzing and Interpreting Data: -Record information (observations, thoughts, and ideas). -Use and share pictures, drawings, and/or writings of observations</p>	<p>ESS2.E: Biogeology Plants and animals can change their environment. (K-ESS2-2)</p>	
<p>Explain: How will you help students connect their exploration to the concept/topic under investigation?</p>	<p>Students investigate two kinds of isopods (sow bugs and pill bugs). Students draw upon knowledge and experience gained from previous activities to investigate the structure and behavior of isopods. (Part 1)</p> <p>Students compare the isopods and sort them into two groups based on the different structures and behavior they observe. (Part 2)</p> <p>Students conduct isopod races as a way to focus observation on isopod movement. (Part 3)</p> <p>Students build a class terrarium to observe how several animals live together. Students place the isopods and a few snails into the earthworm terrarium, and then add objects from the natural environment to create an appropriate habitat for the animals. (Part 4)</p>	<ul style="list-style-type: none"> • Investigation 4 - Part One: Observing Isopods Activity TE Pages 8-11 • Investigation 4 - Part Two; Identifying Isopods Activity TE Pages 12-15 • Investigation 4 - Part Three: Isopod Races Activity TE Pages 16-19 • Investigation 4 - Part Four: Animals Living Together Activity TE Pages 20-23 • KWL Chart • Class Word Bank (Words can be found in Investigation 4: TE Page 7) • Center Cards (Student sheet numbers 18-22 located in the Investigation Duplication Masters Tab in TE) 	<p>Planning and Carrying Out Investigations: -With guidance, plan and conduct an investigation in collaboration with peers. -Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.</p>		

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<p><i>Evaluate: How will students demonstrate their mastery of the learning objective(s)?</i></p>	<p>Students will also demonstrate their mastery of the learning objective through teacher questioning, anecdotal notes, etc.</p> <p>The Foss Website provides teachers with a printable Science notebook index template for students to record vocabulary words and brief descriptions and/or illustration</p>	<ul style="list-style-type: none">• Teacher Notes: http://www.fossweb.com/web/foss-fossweb/module-notes?parentID=d564315#module-teaching-notes	<p>Asking Questions and Defining Problems</p> <ul style="list-style-type: none">-Ask questions based on observations to find more information about the natural and/or designed world(s).-Ask and/or identify questions that can be answered by an investigation.		<p>Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. (K-LS1-1), (1-LS3-1)</p>
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