

Instructional Plan for the Unit	
<p>The Exploring Ecosystems unit is designed for students to demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems.</p> <p>The Science Support document guides all content and assessments.</p>	


Major Unit Objectives	Standards/ Competencies Correlation
1. Summarize the composition of an ecosystem, considering both the biotic, including communities, populations and microorganisms, and abiotic factors	SC 5-2.2
2. Compare the characteristics of terrestrial ecosystems, including forests and grasslands, and aquatic ecosystems, including lakes, ponds, marshes, estuaries, and oceans.	SC 5-2.3
3. Identify the roles of organisms as they interact and depend on one another through food chains and food webs, considering producers and consumers, including herbivores, carnivores, and omnivores and decomposers. .	SC 5-2.4
4. Create a food chain and food web with recognition of the roles of predators and prey within the food chain and food web.	SC 5-2.4
5. Explain how limiting factors, including food, water, space and shelter, affect populations in ecosystems.	SC 5-2.5

Lesson One: Introducing Ecosystems	
Main Idea	Living and nonliving things interact in ecosystems every day.
Standard	5-2.2 Summarize the composition of an ecosystem, considering both biotic factors, including populations, to the level of microorganisms, and communities, and abiotic factors.
Objective	The student will discuss the components of an ecosystem, including all of the organisms and their nonliving surrounding environment.
Essential Questions	What is an ecosystem? How do living organisms and nonliving things interact in an ecosystem?
Resources	<i>National Geographic Explorer: Web of Life</i>
Procedure	<ol style="list-style-type: none"> <li>1. The teacher will introduce the term – ecosystem.</li> <li>2. The students will generate a definition of ecosystem in their own words through brainstorming. The teacher will assist by breaking the word to “eco” meaning life and “system” implying organization and structure.</li> <li>3. Each student will receive a copy of the <i>National Geographic Explorer: Web of Life</i>.</li> </ol>



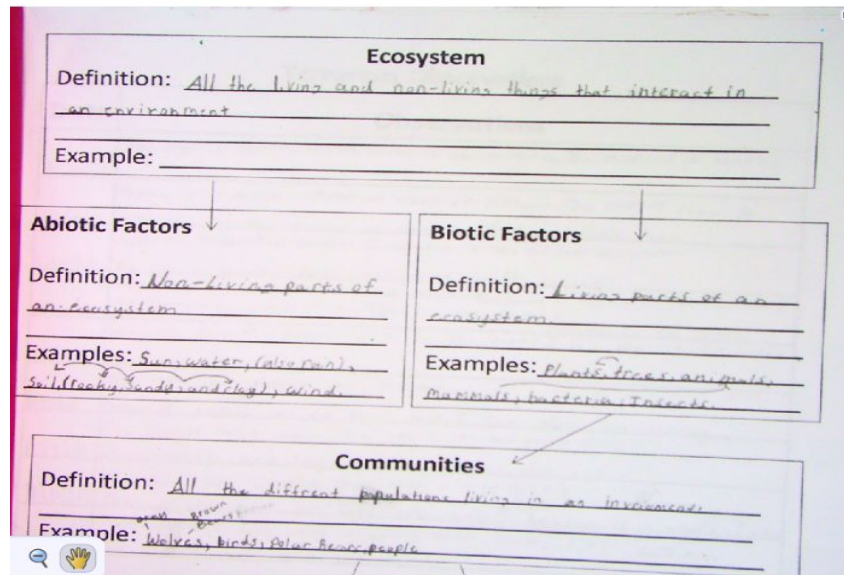
4. The students will picture and caption walk through the article, and discuss what has caught their interest. Allow students time to pair share and share with the class.
5. The teacher will conduct a group read aloud and discussion of the article “Web of Life” by Gary Miller.
6. The class will create a word web of vocabulary from the article, including ecosystem, food chain, food web, producer, consumer, and decomposer. \*This article is the first introduction to the terms. These terms will be used as the class discusses as scientists throughout the unit. Definitions will be placed in ecosystems notebooks in later lessons.
7. The students will be given index cards and asked to write a living organism from the coral reef ecosystem they have just read about.
8. The teacher will place the students in groups of five and ask them to link themselves into a food chain using their chosen organisms.
9. The students will present their food chains to the other students.
10. The teacher concludes with an explanation of the many ecosystems we will be learning about in the unit, including forests, grasslands, lakes, ponds, estuaries, and oceans.
11. The teacher will create anticipation and enthusiasm by informing the students that they will be creating two ecosystems to observe in our classroom – a terrarium and aquarium.

Assessment	The teacher will monitor students' participation in class discussion. The index cards of organisms for the food web will be collected and assessed for participation.
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<b>Lesson Two: Exploring Ecosystems</b>	
Main Idea	Living and nonliving things interact in ecosystems every day. These living and non living things are defined as biotic factors and abiotic factors.
Standard	5-2.2 Summarize the composition of an ecosystem, considering both biotic factors, including populations, to the level of microorganisms, and communities, and abiotic factors. 5-2.3 Compare the characteristics of different ecosystems, including estuaries/salt marshes, oceans, lakes and ponds, forests, and grasslands.
Objective	The student will define an ecosystem as all of the organisms and their nonliving surrounding environment that contribute to the functioning of an ecosystem.
Essential Questions	What is an ecosystem? How do living organisms and nonliving things interact in an ecosystem?
Resources	Exploring Ecosystems student notebook Study Jams: Ecosystems
Procedure	<ol style="list-style-type: none"> <li>1. The teacher will show the students the previous brainstorm about what is an ecosystem.</li> <li>2. The teacher will ask the students if they have ideas to add or change from the previous brainstorming.</li> <li>3. The teacher will distribute the Exploring Ecosystems student notebooks that will be used throughout the unit.</li> <li>4. The teacher will tell the students the goal of the day is to discover what an ecosystem is and what the components of an ecosystem are.</li> <li>5. The teacher will show the Study Jams video Ecosystems.</li> </ol>  <ol style="list-style-type: none"> <li>6. The teacher will use the students' list to write the formal definition of an ecosystem as "all the living and nonliving things interacting in their environment."</li> <li>7. The student will write the definition on the Ecosystems vocabulary map in their notebooks.</li> <li>8. The teacher will introduce the ecosystems to be studied in the unit, including forests, grasslands, lakes, ponds, estuaries and oceans.</li> </ol>

	9. The students will use these to write an example of an ecosystem. The students may also use their prior knowledge from 4 <sup>th</sup> grade, including rivers and streams, tropical rain forests, deserts and polar regions.
Assessment	The teacher will check the notebooks for completion and accuracy.

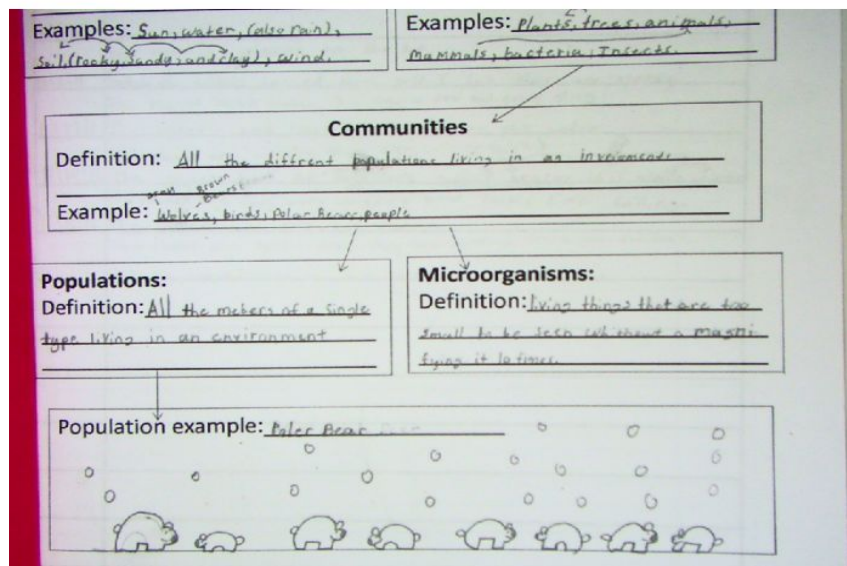
## Student Work

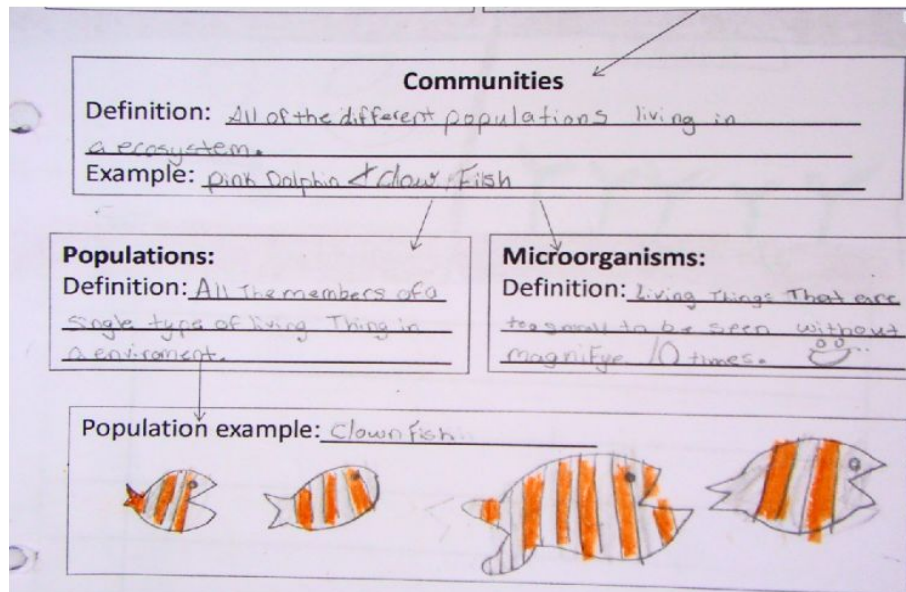


Lesson Three: Biotic factors and Abiotic factors in an ecosystem	
Main Idea	Living and nonliving things interact in ecosystems every day. These living and non living things are defined as biotic factors and abiotic factors.
Standard	5-2.2 Summarize the composition of an ecosystem, considering both biotic factors, including populations, to the level of microorganisms, and communities, and abiotic factors.
Objective	The student will define the components of an ecosystem, including the living organisms as they are classified by communities and populations.
Essential Questions	What are the biotic factors and abiotic factors in an ecosystem?
Resources	Exploring Ecosystems student notebook <i>Discovery Education: The Science of Plants</i> "Ecosystems and Biomes"
Procedure	<ol style="list-style-type: none"> <li>1. The teacher will introduce the terms "biotic" and abiotic"</li> <li>2. The teacher will show the <i>Discovery Education: The Science of Plants</i> "Ecosystems and Biomes"</li> </ol>

	 <ol style="list-style-type: none"> <li>3. The students will generate definitions for abiotic factors and biotic factors using information from the video.</li> <li>4. The students will continue to complete the vocabulary map in their notebooks. The students will define abiotic factors as non living factors and biotic factors as living factors in an ecosystem.</li> <li>5. The student will write examples of the factors from the ecosystem they chose in the prior lesson.</li> <li>6. The students will share their factor examples with the class.</li> <li>7. The students will generate definitions for communities using information from the video.</li> <li>8. The students will define communities as a group of different populations of organisms in an ecosystem.</li> <li>9. The students will write examples of communities from the ecosystem they chose in the prior lesson.</li> <li>10. The students will share their community examples with the class.</li> <li>11. The students will generate definitions for populations and microorganisms using information from the video.</li> <li>12. The students will write an example of a population from the ecosystem they chose in the prior lesson and illustrate the population.</li> <li>13. The students will share their population examples with the class.</li> </ol>
Assessment	The teacher will check the vocabulary maps for accuracy and completion.

## Student Work





<b>Lesson Four and Five: Biotic factors and Abiotic Factors in an Ecosystem</b>	
Main Idea	Living and nonliving things interact in ecosystems every day. These living and non living things are defined as biotic factors and abiotic factors.
Standard	5-2.2 Summarize the composition of an ecosystem, considering both biotic factors, including populations, to the level of microorganisms, and communities, and abiotic factors.
Objective	The student will define and classify the abiotic factors and biotic factors in an aquatic ecosystem and a terrestrial ecosystem.
Essential Questions	What are the biotic factors and abiotic factors in an ecosystem?
Resources	Exploring Ecosystems student notebook FOSS Kit materials for creating the terrariums and aquariums.
Procedure	<ol style="list-style-type: none"> <li>1. The teacher will introduce the two types of ecosystems that the students will create: terrestrial and aquatic.</li> <li>2. The teacher will ask the students to define terrestrial and aquatic.</li> <li>3. After discussing, the students should conclude that terrestrial ecosystems are land ecosystems and aquatic ecosystems and water ecosystems.</li> <li>4. The students will create their terrariums in groups of four.            *Groups are determined by academic ability and behavior           <ol style="list-style-type: none"> <li>a. 1" layer of rocks</li> <li>b. 4" layer of potting soil.</li> <li>c. Draw a four section grid in the soil.</li> <li>d. Plant mustard, rye, alfalfa seeds.</li> </ol> </li> </ol>

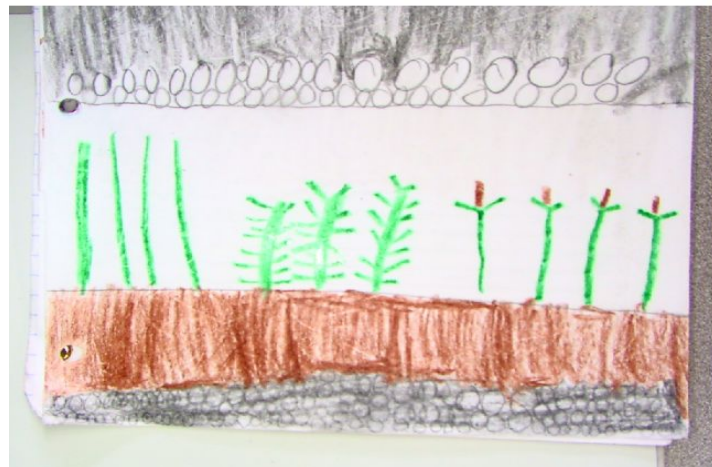


	<ul style="list-style-type: none"> <li>e. Label quadrants.</li> <li>f. Illustrate terrarium.</li> <li>g. Place lid and water using eye droppers.</li> <li>h. Write first observation.</li> <li>i. Store terrariums on window sill.</li> </ul> <p>5. The students will create their aquariums in groups of four. The groups are the same as the terrarium groups.</p> <ul style="list-style-type: none"> <li>a. 5" layer of rocks</li> <li>b. Fill with water.</li> </ul> <p>6. The teacher will set the observation schedule for three times a week- Monday, Wednesday and Friday.</p>
Assessment	The teacher will monitor participation within the groups while creating their terrarium and aquarium.

<b>Lesson Six: Biotic factors and Abiotic factors in an Ecosystem</b>	
Main Idea	Living and nonliving things interact in ecosystems every day. These living and non living things are defined as biotic factors and abiotic factors.
Standard	5-2.2 Summarize the composition of an ecosystem, considering both biotic factors, including populations, to the level of microorganisms, and communities, and abiotic factors.
Objective	The student will define and classify the abiotic factors and biotic factors in an aquatic ecosystem and a terrestrial ecosystem.
Essential Questions	What are the biotic factors and abiotic factors in an ecosystem?
Resources	Exploring Ecosystems student notebook FOSS Kit materials for creating the terrariums and aquariums.
Procedure	<ol style="list-style-type: none"> <li>1. The teacher will review the two types of ecosystems that the students will create: terrestrial and aquatic.</li> <li>2. The teacher will ask the students to define terrestrial and aquatic.</li> <li>3. The students should recall terrestrial ecosystems are land ecosystems and aquatic ecosystems are water ecosystems.</li> <li>4. The students will add the biotic factors to their aquariums and terrariums. <ol style="list-style-type: none"> <li>a. Terrarium <ol style="list-style-type: none"> <li>i. The biotic factor of the plants should have 2" of growth.</li> <li>ii. Add pill bugs and crickets.</li> <li>iii. Add dead plant matter found on playground.</li> </ol> </li> <li>b. Aquarium <ol style="list-style-type: none"> <li>i. Plant elodea</li> <li>ii. Add duckweed</li> <li>iii. Add algae</li> <li>iv. Add guppy</li> </ol> </li> </ol> </li> <li>5. The students will illustrate their terrariums and aquariums.</li> <li>6. The students will name the biotic and abiotic factors.</li> </ol>

	<ol style="list-style-type: none"> <li>7. The class will discuss all the biotic and abiotic factors present in their ecosystems.</li> <li>8. The students will complete the graphic organizers for the aquariums and terrariums recording <ol style="list-style-type: none"> <li>a. Description</li> <li>b. Abiotic and biotic factors</li> <li>c. Community</li> <li>d. Populations</li> </ol> </li> <li>9. <b>The students will make three observations a week on Mondays, Wednesdays and Fridays in their Exploring Ecosystems notebooks.</b></li> </ol>
Assessment	The teacher will monitor participation within the groups while adding the living factors to the terrariums and aquariums. The teacher will check the notebooks for the illustrations, graphic organizers and scientific observations of the ecosystems.

### Student Work





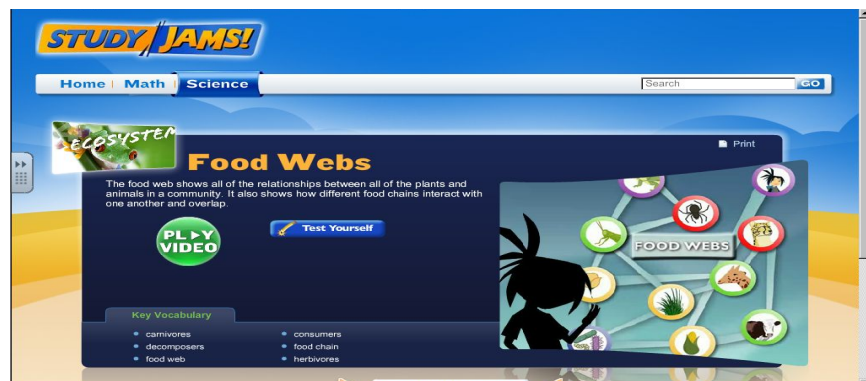
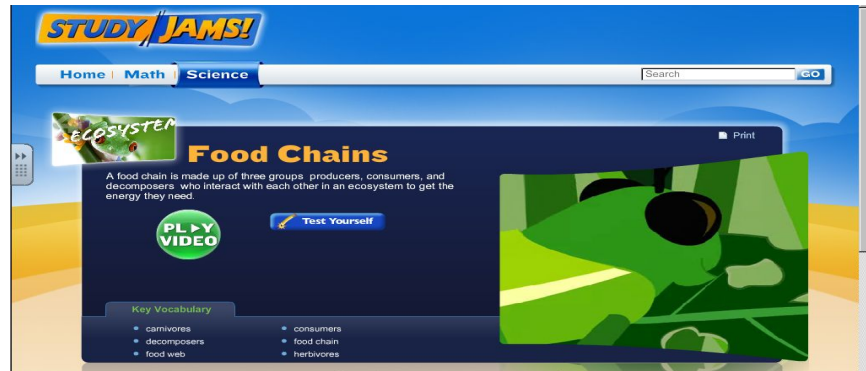


Terrarium Observations	
Date	Observations
10/26/11	The Rye is taller. The Alfalfa is about 4 cm. The mustard is bending.
10/28/11	Today all we saw is crickets no sign of pillbugs. The crickets seem to like the leg. One cricket is sleeping. Add new little ones. Still no pillbugs. Just crickets. I wonder if the pill bugs are under.
10/31/11	The Rye is growing taller and taller by the second.
11/2/11	again no pill bugs. A cricket had grown. We have a fly in our terrarium! Our mustard has wily stem. Rye is so tall! Alfalfa is so short.
11/4/11	We only saw one cricket were is the rest? I saw the alfalfa plant grow a lot.
11/7/11	The rye is almost to the top. Today the crickets buried them self. I bet they are sleepy. The plants need water. The Rye is so tall every day.
11/9/11	The crickets and rilly Billy (pillbugs) are still under. The plants are wiggly than ever. (I think)

Aquarium Observations	
Date	Observations
10/31	biggy has grown a little bigger.
11/02	<sup>the water</sup> My little blacky chane is almost out of
11/04	Biggy has grown bigger than before.
11/07	We have got two fish today.
11/09	biggy has grown 6 inches longer
11/14	Are duck weed is gone.
11/16	The duck weed has been eaten by the fish.
11/18	The water is turning gray.

Lesson Seven, Eight, Nine: Food Chains and Food Webs – Who's eating who?	
Main Idea	All organisms need energy to live and grow. This energy is obtained from food. The role of an organism serves in an ecosystem can be described by the way in which it gets its energy.
Standard	5-2.4 Identify the roles of organisms as they interact and depend on one another through food chains and food webs in an ecosystem, considering producers and consumers, including herbivores, carnivores, and omnivores, decomposers, including microorganisms, termites, worms and fungi, predators and prey, and parasites and hosts.
Objective	The student will identify roles of organisms in an ecosystem by recognizing the organization of organisms in a food chain and food web.
Essential Questions	How does the way an organism obtains energy determine the organism's role in the food chain or food web?
Resources	Exploring Ecosystems student notebook Study Jams – Food Chains Study Jams – Food Webs SheppardSoftware.com – Animals: Food Chain SheppardSoftware.com – Animals: Producer, Consumer, Decomposer SheppardSoftware.com – Animals: Carnivore, Herbivore, Omnivore
Procedure	Lesson Seven <ol style="list-style-type: none"> <li>1. The teacher will begin the lesson by discussing how we all get our food, and how food gives us all energy.</li> <li>2. The teacher will introduce the terms food chain and food web by explaining how ALL organisms are linked by how they obtain their food.</li> </ol>

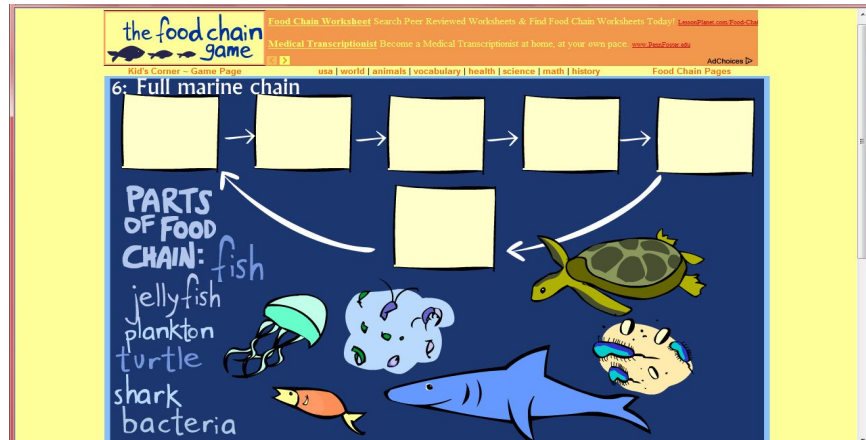
3. The teacher will ask the students to recall their coral reef food chains from the first lesson with the *National Geographic*.
4. The teacher will show Study Jams: Ecosystems – Food Chains and Food Webs.



5. The teacher will use SheppardSoftware.com – Animals: Food Chains to demonstrate food chains







6. The students will be called to connect the food chains.
7. The students will create their own food chains in their Exploring Ecosystems notebooks.
8. The students will model their food chains in small groups for the class.

#### Lesson Eight

1. The teacher will review food chains and food webs.
2. The teacher will introduce the 3 roles of organisms within the food chain and food web – producer, consumer and decomposer.
3. The teacher will use SheppardSoftware.com – Animals: Producers, Consumers and Decomposers to explain the 3 roles.



- a. Producers make their own food.
    - i. The Sun is the main source of energy for ALL ecosystems.
  - b. Consumers eat other organisms.
  - c. Decomposers break down dead organisms and return nutrients to the ecosystem.
4. The students will define the 3 roles in their Exploring Ecosystems notebooks.
  5. The students will draw a producer, consumer and decomposer.

#### Lesson Nine

1. The teacher will ask the students to recall the roles of producers, consumers, and decomposers.

2. The teacher will ask for examples of each and create a brainstorming three column list.
3. The teacher will circle the consumers column and inform the students consumers are the focus of the lesson.
4. The teacher will introduce 3 types of consumers – herbivores, carnivores, and omnivores.
5. The teacher will ask the students if they can define any of the three terms.
6. The teacher will create a brainstorming list.
7. The teacher will circle ideas from the students that are on the correct path.
8. The teacher will define the terms. The teacher will use SheppardSoftware.com – Animals: Herbivore, Carnivore and Omnivore to explain the 3 roles.
9. The students will play the Herbivore, Carnivore and Omnivore game.
10. The students will write definitions in the Exploring Ecosystems notebooks.
11. The students will name examples of each.

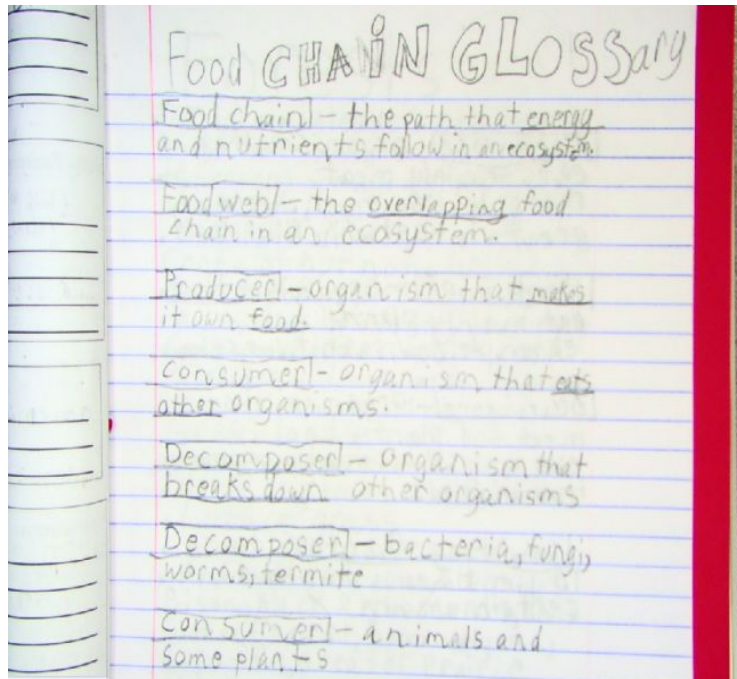


Assessment


The teacher will check the student notebooks for accuracy and completion.



## Student Work



<b>Lesson Ten, Eleven, and Twelve: Exploring Aquatic and Terrestrial Ecosystems</b>	
Main Idea	There are different types of ecosystems with specific organisms that depend upon the abiotic factors present in the environment, including forests, grasslands, lakes, ponds, estuaries and oceans.
Standard	5-2.3 Compare the characteristics of different ecosystems, including estuaries/salt marshes, oceans, lakes and ponds, forests and grasslands.
Objective	The student will record the characteristics of forests, grasslands, lakes and ponds, estuaries, and oceans, including specific abiotic and biotic factors.
Essential Questions	What are the characteristics of different ecosystems, including the biotic and abiotic factors?
Resources	Exploring Ecosystems student notebook Missouri Botanical Garden - <a href="http://www.mbgnet.net/">http://www.mbgnet.net/</a>
Procedure	<ol style="list-style-type: none"> <li>1. The teacher will review the term – ecosystem.</li> <li>2. The teacher will ask the students to recall the difference between a terrestrial ecosystem and an aquatic ecosystem. <ol style="list-style-type: none"> <li>a. References should be made to the in class ecosystem observations of the terrariums and aquariums.</li> </ol> </li> <li>3. The teacher will ask the students to name ecosystems.</li> <li>4. The teacher will inform the students that we will be studying through the next three lessons different ecosystems and the specific abiotic and biotic factors of each ecosystem, including forests, grasslands, ponds and lakes, estuaries and oceans.</li> <li>5. The teacher will guide the students in their note taking by titling the ecosystem and sectioning for the biotic and abiotic factors.</li> <li>6. The teacher will use the website Missouri Botanical Garden - <a href="http://www.mbgnet.net/">http://www.mbgnet.net/</a> to guide the research.</li> </ol>

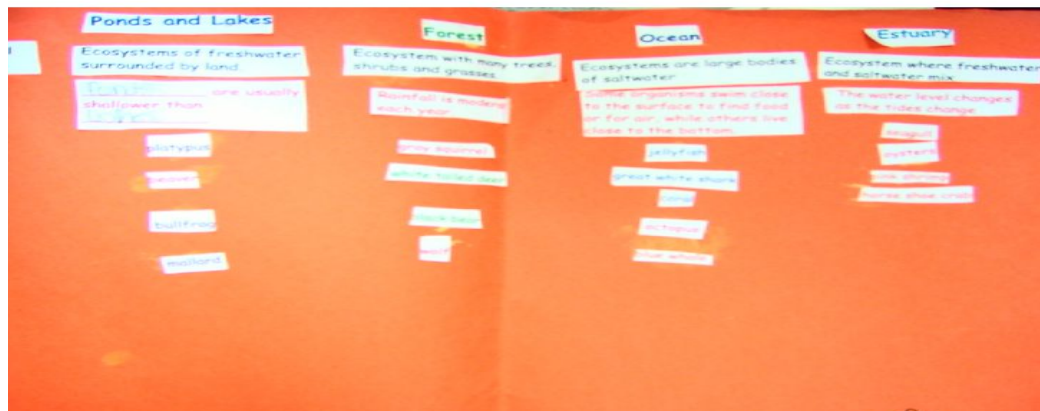
	 <p>a. Temperate – Deciduous Forests b. Grasslands c. Ponds and Lakes d. Shorelines (Estuaries) e. Temperate Oceans and Tropical Oceans</p> <p>7. The students will record the abiotic factors and biotic factors, including animals and plants.</p> <p>8. The students will demonstrate food chains using animals and plants from the ecosystems.</p> <p>9. This process will take THREE lessons.</p>
Assessment	The teacher will monitor students' participation in class discussion. The teacher will check the student notebooks for completion and accuracy.

<b>Lesson Thirteen: Exploring Aquatic and Terrestrial Ecosystems</b>	
Main Idea	There are different types of ecosystems with specific organisms that depend upon the abiotic factors present in the environment, including forests, grasslands, lakes, ponds, estuaries and oceans.
Standard	5-2.3 Compare the characteristics of different ecosystems, including estuaries/salt marshes, oceans, lakes and ponds, forests and grasslands.
Objective	The student will compare the characteristics of different ecosystems, including forests, grasslands, lakes, ponds, estuaries and oceans.
Essential Questions	What are the characteristics of different ecosystems, including the biotic and abiotic factors?
Resources	Exploring Ecosystems student notebook Exploring Ecosystems Sort
Procedure	<ol style="list-style-type: none"> <li>1. The teacher will review the ecosystems, including estuaries/salt marshes, oceans, lakes and ponds, forests and grasslands.</li> <li>2. The students will recall the different abiotic factors and biotic factors in the ecosystems. <ol style="list-style-type: none"> <li>a. The students should utilize their notebooks during discussion.</li> </ol> </li> <li>3. The teacher will guide the students in their note taking by titling the ecosystem and sectioning for the biotic and abiotic factors.</li> <li>4. The teacher will show the students the Exploring Ecosystems Sort.</li> </ol>


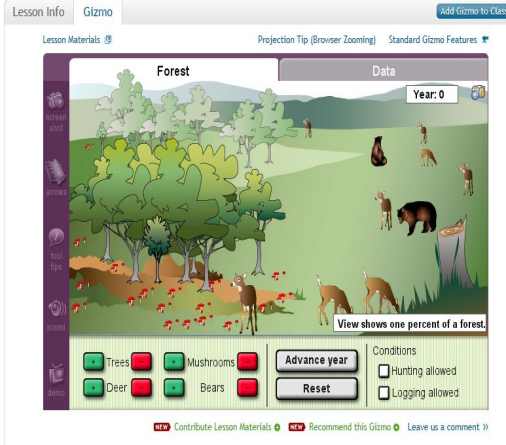
	<div data-bbox="540 195 948 1272"> <div> <div>Estuary</div> <div>Ponds and Lakes</div> </div> <div> <div>Grassland</div> <div>Ocean</div> <div>Forest</div> </div> <div> <div>Ecosystems of freshwater surrounded by land.</div> <div>The water level changes as the tides change</div> </div> <div> <div>Ecosystems are large bodies of saltwater</div> <div>Rainfall is moderate to low each year.</div> </div> <div> <div>Ecosystem made of fertile soil and covered with tall grasses.</div> <div>Rainfall is moderate each year.</div> </div> <div> <div>Ecosystem with many trees, shrubs and grasses.</div> <div>_____ are usually shallower than _____.</div> </div> <div> <div>Ecosystem where freshwater and saltwater mix</div> <div> <div>seagull</div> <div>prairie dog</div> <div>bison</div> <div>bullfrog</div> <div>African elephant</div> </div> </div> <div> <div>Some organisms swim close to the surface to find food or for air, while others live close to the bottom.</div> <div> <div>oysters</div> <div>platypus</div> <div>wolf</div> <div>mallard</div> <div>coral</div> <div>blue whale</div> <div>beaver</div> <div>octopus</div> <div>jellyfish</div> </div> </div> <div> <div>horse shoe crab</div> <div>black bear</div> <div>great white shark</div> <div>fox</div> <div>white tailed deer</div> <div>gray squirrel</div> <div>pink shrimp</div> <div><a href="#">Extend Page</a></div> </div> </div>
Assessment	The teacher will check the students' sort for accuracy.

5. The teacher will model how the students will cut apart the sort and separate the characteristics of each of the ecosystems.
6. Distribute the materials to each student– glue, scissors, large orange construction paper to glue sort words, Exploring Ecosystems sort.
7. The students independently complete their ecosystems sort.
  - a. The students may use their Exploring Ecosystems notebooks.
8. The teacher will collect the students' work.
9. The teacher will review the correct placement of the sort.

## Student Work



Lesson Fourteen and Fifteen: Limiting Factors in Ecosystems	
Main Idea	In ecosystems, all living things have an interdependence upon one another and on the abiotic factors. Changes and limiting of biotic and abiotic factors dramatically affect the success of the ecosystem.
Standard	5-2.5 Explain how limiting factors, including food, water, space and shelter, affect populations in ecosystems.
Objective	The student will explain how limiting factors affect populations in ecosystems.
Essential Questions	How do limiting factors affect populations in ecosystems?
Resources	Exploring Ecosystems student notebook Explore Learning: Gizmos 1. Prairie Ecosystem 2. Forest Ecosystem
Procedure	<ol style="list-style-type: none"> <li>1. The teacher will ask students to recall a food chain.</li> <li>2. A group of students will present a food chain.</li> <li>3. The teacher will ask the students to predict what would happen if one student was removed from the food chain.</li> <li>4. The students should predict that the other organisms that depend on that one for energy will need to find a new food source or die.</li> <li>5. The teacher will explain how this change in population is one of the many factors that can affect an ecosystem.</li> <li>6. The teacher will ask the students what other changes could affect an ecosystem. Examples – floods, drought, fire.</li> <li>7. The teacher will use the Explore Learning Gizmos for the Prairie Ecosystem and Forest Ecosystem to show how limiting factors affects the population. <ol style="list-style-type: none"> <li>a. Utilize the data tables to show graphs of changes.</li> </ol> </li> </ol>

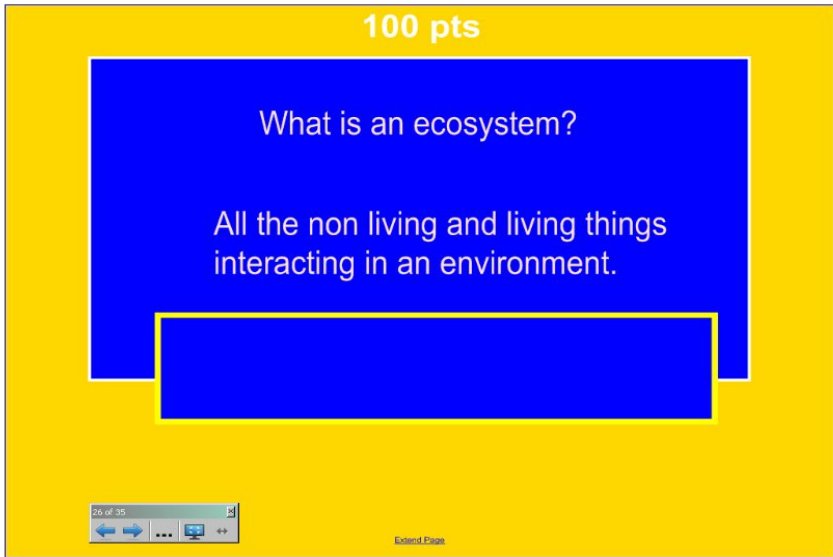
	<p><b>Prairie Ecosystem</b></p> <p>Observe the populations of grass, prairie dogs, ferrets and foxes in a prairie ecosystem. Investigate feeding relationships and determine the food chain. Bar graphs and line graphs show changes in populations over time.</p>  <p><b>Forest Ecosystem</b></p> <p>Observe and manipulate the populations of four creatures (trees, deer, bears, and mushrooms) in a forest. Investigate the feeding relationships (food web) in the forest. Determine which creatures are producers, consumers, and decomposers. Pictographs and line graphs show changes in populations over time.</p>  <p>8. The students will suggest changes and predict the effect of the change.</p> <p>9. The students will record examples in their notebooks.</p>
Assessment	The teacher will monitor students' participation in class discussion. The student notebook will be checked for accuracy.

<b>Lesson Seventeen: Exploring Ecosystems Review</b>	
Main Idea	Living and nonliving things interact in ecosystems every day. These living and non living things are defined as biotic factors and abiotic factors. All organisms need energy to live and grow. This energy is obtained from food. The role of an organism serves in an ecosystem can be described by the way in which it gets its energy. An ecosystem depends on a balance of biotic and abiotic factors because the changes and limiting of these factors greatly affect the success of the ecosystem.



Standard	<p>5-2.2 Summarize the composition of an ecosystem, considering both biotic factors, including populations, to the level of microorganisms, and communities, and abiotic factors.</p> <p>5-2.3 Compare the characteristics of different ecosystems, including estuaries/salt marshes, oceans, lakes and ponds, forests and grasslands.</p> <p>5-2.4 Identify the roles of organisms as they interact and depend on one another through food chains and food webs in an ecosystem, considering producers and consumers, including herbivores, carnivores, and omnivores, decomposers, including microorganisms, termites, worms and fungi, predators and prey, and parasites and hosts.</p> <p>5-2.5 Explain how limiting factors, including food, water, space and shelter, affect populations in ecosystems.</p>
Objective	The student will demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems by verbal and written response.
Essential Questions	What is an ecosystem? How do living organisms and nonliving things interact in an ecosystem? What factors determine the success of an ecosystem?
Resources	Exploring Ecosystems SmartBoard Jeopardy Exploring Ecosystems Student Study Guide
Procedure	<ol style="list-style-type: none"> <li>1. The teacher will introduce the Exploring Ecosystems SmartBoard Jeopardy and divide the class into two teams.</li> <li>2. The teacher will give each student a study guide for the students to complete as questions are asked and answered during the review.</li> <li>3. The class will play the game. <ol style="list-style-type: none"> <li>a. The teacher must be sure to repeat, explain and elaborate on answers given to the questions.</li> </ol> </li> </ol>



	
Assessment	The teacher will check the students' study guides for accuracy.

<b>Lesson Eighteen: Exploring Ecosystems Summative Assessment</b>	
Main Idea	Living and nonliving things interact in ecosystems every day. These living and non living things are defined as biotic factors and abiotic factors. All organisms need energy to live and grow. This energy is obtained from food. The role of an organism serves in an ecosystem can be described by the way in which it gets its energy. An ecosystem depends on a balance of biotic and abiotic factors because the changes and limiting of these factors greatly affect the success of the ecosystem.
Standard	<p>5-2.2 Summarize the composition of an ecosystem, considering both biotic factors, including populations, to the level of microorganisms, and communities, and abiotic factors.</p> <p>5-2.3 Compare the characteristics of different ecosystems, including estuaries/salt marshes, oceans, lakes and ponds, forests and grasslands.</p> <p>5-2.4 Identify the roles of organisms as they interact and depend on one another through food chains and food webs in an ecosystem, considering producers and consumers, including herbivores, carnivores, and omnivores, decomposers, including microorganisms, termites, worms and fungi, predators and prey, and parasites and hosts.</p> <p>5-2.5 Explain how limiting factors, including food, water, space and shelter, affect populations in ecosystems.</p>
Objective	The student will demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems by verbal and written response.
Essential Questions	What is an ecosystem? How do living organisms and nonliving things interact in an ecosystem? What factors determine the success of an ecosystem?
Resources	Exploring Ecosystems Summative Assessment

Procedure	1. The teacher will administer the summative assessment
Assessment	The teacher will check the students' work for accuracy.

### Student Work

6. List for the aquarium. Be specific

Abiotic Factors	Biotic factors
1. non living parts of an ecosystem	1. living parts of an ecosystem
2. O <sub>2</sub> , CO <sub>2</sub> , water, sun, gravel are non living things in an aquarium.	2. The fish, two snail, eel, algae, duckweed are living things in an aquarium.
3. It helps biotic parts live.	3. Biotic parts sometime help abiotic part live.
4. Abiotic do not to help the aquarium live.	4. Biotic keep the aquarium live and healthy

7. List for the terrarium. Be specific

Abiotic Factors	Biotic factors
1. non living parts an ecosystem	1. living parts of an ecosystem.
2. Sun, soil, dead plants, water are the abiotic of a terrarium.	2. The 4 crickets, pillbugs, the alafa, mustard, rye are the biotic of a terrarium.
3. The abiotic in the terrarium are keeping the biotic alive.	3. Some of the biotic are keeping the abiotic alive.
4. The Abiotic is keeping the terrarium alive & healthy.	4. The Biotic is keeping the terrarium alive & healthy.

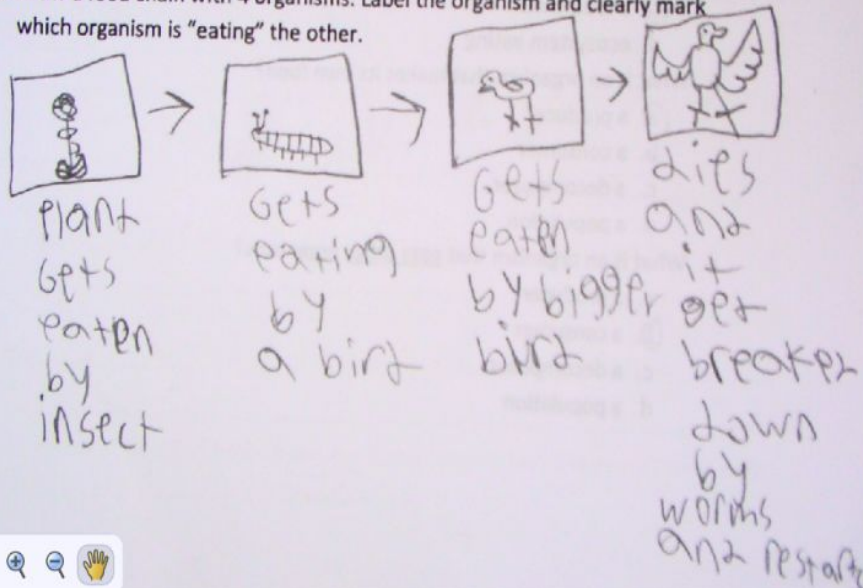
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2. Sun, soil, dead plants, water are the abiotic of a terrarium.	2. The 4 crickets, pillbugs, the alafa, mustard, rye are the biotic of a terrarium.
3. The Abiotic in the terrarium are keeping the biotic alive.	3. Some of the biotic are keeping the abiotic alive.
4. The Abiotic is keeping the terrarium alive & healthy.	4. The Biotic is keeping the terrarium alive & healthy.

11. Give an example of a decomposer AA bacteria

12. Give an example of a predator and prey  
a bird to a worm

13. Draw a food chain with 4 organisms. Label the organism and clearly mark which organism is "eating" the other.



⊕ the sun

9. Give an example of a producer algae

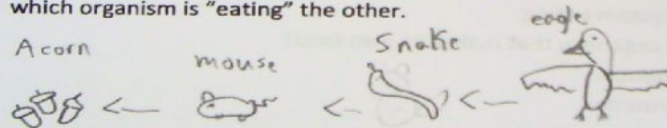
10. Give an example of a consumer lion

11. Give an example of a decomposer worm

12. Give an example of a predator and prey

a Snake and eagle

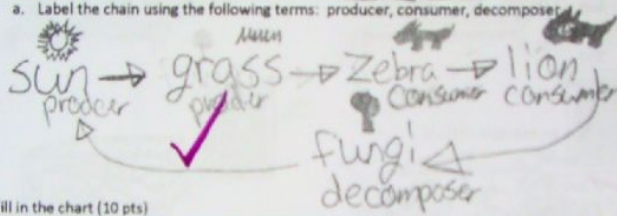
13. Draw a food chain with 4 organisms. Label the organism and clearly mark which organism is "eating" the other.



19. Compare and contrast the diet of an omnivore to a carnivore. (5pts)

So they both eat meat.   
 Same Carnivore eats only meat and omnivore eat plants and meat.   
 different Carnivore eats only meat and omnivore eat only plants.   
 eat meat 2 3 4 3

20. Draw a food chain below using the following terms: grass, lion, sun, fungi, zebra (8pts)



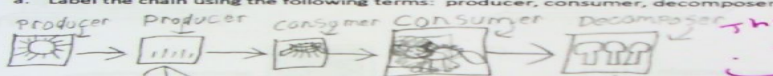
21. Fill in the chart (10 pts)

ESTUARY (Biotic Factors)	Abiotic Factors both biomes have in common	GRASSLANDS (Biotic Factors)
1. Shrimp	1. rock	1. perritis dog
2. Crab	2. Sun	2. ferrets
3. pink dolphin	3. air	3. Fox

Compare and contrast the diet of an omnivore to a carnivore. (5pts)

omnivore eats both carnivore and herbivore  
carnivore eats meat.

Draw a food chain below using the following terms: grass, lion, sun, fungi, zebra (8pts)



Fill in the chart (10 pts)

ESTUARY (Biotic Factors)	Abiotic Factors both biomes have in common	GRASSLANDS (Biotic Factors)
1. Fish	1. Water	1. Giraf
2. crabs	2. trees	2. Lion