

Jennifer Carmack Cannon's Point Unit –

Unit Organizer: (Approximate Time: 5 days)
<p>OVERVIEW: Organisms are dependent upon other organisms for survival. The absence of one organism can disrupt all other organisms and endanger their species, which in turn disrupts the ecological balance.</p>
STANDARDS ADDRESSED IN THIS UNIT
<p>Focus Standards: S7L4 Students will examine the dependence of organisms on one another and their environments.</p> <p style="margin-left: 40px;">a. Demonstrate in a food web that matter is transferred from one organism to another and can recycle between organisms and their environments.</p> <p style="margin-left: 40px;">b. Explain in a food web that sunlight is the source of energy and that this energy moves from organism to organism.</p>
<p>Supporting Standards: S7CS10. Students will enhance reading in all curriculum areas by: building vocabulary knowledge</p> <ul style="list-style-type: none"> • Demonstrate an understanding of contextual vocabulary in various subjects. • Use content vocabulary in writing and speaking. • Explore understanding of new words found in subject area texts.

CONCEPTS:	
Symbiotic, Predatory, and Competitive	
LANGUAGE:	
<ul style="list-style-type: none"> • Symbiotic • Mutualism • Commensalism • Parasitism • Predation • Competition • Ecological Balance 	
MISCONCEPTIONS	PROPER CONCEPTIONS

<ul style="list-style-type: none"> • A disruption in the ecological balance does not affect living organisms. • Some animals are just annoying and serve no purpose. • If we killed every snake, mosquito, and spider in the world, Earth would be a better place. 	<ul style="list-style-type: none"> • If the ecological balance is disturbed, there can be severe consequences to all living organisms. • Animals are dependent upon one another for survival. • Even though some animals are scary, they still serve a purpose and are important to the ecological balance.
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ENDURING UNDERSTANDINGS
<p><i>Students will understand that:</i></p> <ul style="list-style-type: none"> • Organisms are dependent upon on another for survival. • The three different types of relationships between organisms are symbiotic, competitive, and predation. • A symbiotic relationship has three types: mutualism, commensalism, and parasitism. • The sun is a source of energy that starts the cycle and that energy moves from one organism to another. • There is a difference between competition and predation. • A food web shows the flow of energy as one organism is consumed by the other.
ESSENTIAL QUESTIONS:
<p><i>Overarching Essential Question:</i> How does the existence of one organism depend upon the existence of another? Give examples.</p> <p><i>Topical Essential Questions:</i> What are some important characteristics of a symbiotic relationship? What are some important characteristics of a predation relationship? What are some important characteristics of a competitive relationship? What constitutes an ecological balance? Why is it important to show the flow of energy in a food web?</p>
EVIDENCE OF LEARNING:
<p>By the conclusion of this unit, students should be able to demonstrate the following competencies:</p> <p>Culminating Activity:</p> <p>Goal:</p> <p>Summative Assessment/Scrapbook: Each student will take a camera with them to Cannon’s Point in order to take pictures. The students will be given a worksheet to help them organize their pictures and information for their scrapbook. The worksheet will detail that the student will need to take pictures of at least 5 organisms making sure to include relationships it has with</p>

surrounding organisms. The scrapbook will be approximately 7 pages. The first page will be an introductory/title page, the next five pages will cover all of the possible relationships between organisms (i.e. the three different symbiotic relationships, predation, and competition), the final page will be a reflection answering the following questions:

1. Focus on one organism and describe at least three different relationships it has with other organisms.
2. How would the extinction of an organism affects it's relationships with other organisms?" (Please include all of the different types of relationships in your response).

The student will present his/her scrapbook to the entire class on the last day of the unit.

Product: The students are responsible for creating a scrapbook that shows all of the different types of relationships between organisms (i.e. symbiotic, predation, and competition).

Standard: See rubric.

TASK 1
The collection of the following tasks represents the level of depth, rigor and complexity expected of all physical science students to demonstrate evidence of learning
Task: Key Term foldable for Intro to Ecological Relationships between Organisms
Description: Student's will create a foldable that has all the key terms, definitions, and pictures that relate to the key term. (see lesson plan below)
Discussion, Suggestions for use: Discuss what the students already know before they define the key terms, go through each term individually and ask the students what they think the definition is. Have students think about each term and draw a picture that they associate with that particular term.
Possible Solution: Foldable will be used as the informal assessment

TASK 2

The collection of the following tasks represents the level of depth, rigor and complexity expected of all physical science students to demonstrate evidence of learning

Task: Symbiotic Relationships

Description: Create a circle map for each of the symbiotic relationships, have students put points of reference in each corner of the circle map including prior knowledge, teacher/classmates, video, and text. This can be done on the interactive/smart board or with chart paper. Video with quiz. (see lesson plan below)

Discussion, Suggestions for use: “What is a symbiotic relationship?” “What are some characteristics of a mutualistic relationship?” “What are some characteristics of a commensalism relationship?” “What are some characteristics of a parasitic relationship?”

Possible Solution:

Circle map will be used as the informal assessment

TASK 3

The collection of the following tasks represents the level of depth, rigor and complexity expected of all physical science students to demonstrate evidence of learning

Task: Predator vs. Prey and Competitive Relationships

Description: Students will create a tree diagram showing animals that have a predator vs. prey relationship and a competitive relationship. Students will watch a video on predator vs. prey relationships and take a short quiz. (see lesson plan below) There is also a lesson extension for biomes that include important information about biome and food web.

Discussion, Suggestions for use:

Competitive relationships are not discussed in the video. Please make sure students have a good understanding of the difference between predator vs. prey and competitive relationships.

Possible Solution:

Tree diagram, quiz from video, and biome/food web worksheet.

TASK 4
The collection of the following tasks represents the level of depth, rigor and complexity expected of all physical science students to demonstrate evidence of learning
Task: Field Trip Day
Description: Student's will be given a camera to use while in cannon's point. The object is to take pictures of symbiotic, predatory, and competitive relationships. (See lesson plan and rubric)
Discussion, Suggestions for use: Teacher may need to allow for computer time to research animals and organisms to help assist student with scrapbooks.
Possible Solution: Scrapbook will be used a Summative Assessment. Students can present to class any day designated by the teacher

Lesson Plans Day 1

Lesson Plan: Key Term foldable for Intro to Ecological Relationships between Organisms

Standards:

S7L4 Students will examine the dependence of organisms on one another and their environments.

- a. Demonstrate in a food web that matter is transferred from one organism to another and can recycle between organisms and their environments.
- b. Explain in a food web that sunlight is the source of energy and that this energy moves from organism to organism.

EQ:

- What is an Ecological Balance?

Activity:

- Symbiotic
- Mutualism
- Commensalism
- Parasitism
- Predation
- Competition
- Ecological Balance
- Native Species
- Nonnative Species
- Extinction
- Coevolution

Have students create a foldable with the above terms, they need to define each term, give an example, and draw a picture of what reminds them of the term. In order to create the foldable have students fold a sheet of paper hotdog style, then fold in half, then fold in half again, and fold in half one more time. When the foldable is back to hotdog style, there should be sixteen sections. On the left side of the paper, have students cut along the fold so when placed back in hotdog style there is a solid back and strips that open up in order to read information behind it. Students will then write a vocab word one on each strip. Since there is only 11 terms, there will be five extra spot for a term at the bottom (you can fill this in with any extra terms). Students will use the solid back to write down definition and draw pictures.

Play the video for the students. There is a quiz included in this packet for students to take after the video.

<http://education-portal.com/academy/lesson/how-introduced-and-invasive-species-alter-ecological-balance.html#lesson>

Quiz questions are produced by education portal.

Informal Assessment:

Foldable and short quiz can be used as an informal assessment

Lesson Plan Day 2

Lesson Plan: Symbiotic Relationships

Standards:

S7L4 Students will examine the dependence of organisms on one another and their environments.

- a. Demonstrate in a food web that matter is transferred from one organism to another and can recycle between organisms and their environments.
- b. Explain in a food web that sunlight is the source of energy and that this energy moves from organism to organism.

EQ:

- What are some important characteristics of a symbiotic relationship?

Activity:

Activator: Review key terms with students such as symbiotic relationships, mutualism, parasitism, and commensalism.

Have students work individually filling out the circle map on symbiotic relationship. Students need to notate what they know about symbiotic relationships in the prior knowledge point of reference. Then have students open text and discuss with a partner to learn more. Finally, students will watch the video and write down what they learn from the video. It is important that all students put their frame of reference with corresponding information. Once students have created their own individual circle map, the teacher can create one for the entire class. This insures that everyone has the same information by the end of the lesson and it makes for a better study guide. If you have an interactive notebook, this is an excellent assignment to add.

Lesson Extension:

If you need more activities to go along with this lesson, have student's complete the quiz for the video.

<http://education-portal.com/academy/lesson/symbiotic-relationships-mutualism-commensalism-amensalism.html#lesson> or

<http://app.discoveryeducation.com/search?Ntt=symbiotic+relationships>

Quiz questions are produced by education portal.

Informal Assessment: Circle map and quiz from video.

Lesson Plan Day 3

Lesson Plan: Predator vs. Prey and Competitive Relationships

Standards:

S7L4 Students will examine the dependence of organisms on one another and their environments.

- a. Demonstrate in a food web that matter is transferred from one organism to another and can recycle between organisms and their environments.
- b. Explain in a food web that sunlight is the source of energy and that this energy moves from organism to organism.

EQ:

- What are some important characteristics of a predation relationship?

- What are some important characteristics of a competitive relationship?

Activity:

Teacher will review the following key terms with the student: predator, prey, and competition. Students will fill out the tree diagram putting animals on either side of the line that are predator and prey, and animals that compete with one another for food. Students will watch a video and take a short quiz.

Lesson extension: If you have already discussed biomes with students, I have provided an additional worksheet for biomes. The top of the page has important information about that particular biome, and the bottom of the worksheet has a food web showing the energy flow. Students will need to list 3 producers, 6 1st level consumers, 6 2nd level consumers, and 1 decomposer.

<http://education-portal.com/academy/lesson/interspecies-competition-and-predator-prey-interactions.html#lesson>

Quiz questions are produced by education portal.

Informal Assessment: Tree Diagram, quiz from video, and biome/food web worksheet.

Lesson Plan Day 4

Lesson Plan: Field Trip Day
Standards: S7L4 Students will examine the dependence of organisms on one another and their environments. a. Demonstrate in a food web that matter is transferred from one organism to another and can recycle between organisms and their environments. b. Explain in a food web that sunlight is the source of energy and that this energy moves from organism to organism.
EQ: <ul style="list-style-type: none">• How can I create a scrapbook, incorporating ecological relationships and discussing ecological balance?
Activity: <p>Each student will take a camera with them to Cannon’s Point in order to take pictures. The students will be given a worksheet to help them organize their pictures and information for their scrapbook. The worksheet will detail that the student will need to take pictures of at least 5 organisms making sure to include relationships it has with surrounding organisms. The scrapbook will be approximately 7 pages. The first page will be an introductory/title page, the next five pages will cover all of the possible relationships between organisms (i.e. the three different symbiotic relationships, predation, and competition), the final page will be a reflection answering the following questions:</p> <ol style="list-style-type: none">1. Focus on one organism and describe at least three different relationships it has with other organisms.2. How would the extinction of an organism affects it’s relationships with other organisms?” (Please include all of the different types of relationships in your response). <p>The student will present his/her scrapbook to the entire class on the last day of the unit.</p> <p>Product: The students are responsible for creating a scrapbook that shows all of the different types of relationships between organisms (i.e. symbiotic, predation, and competition).</p> <p>Standard: See rubric.</p>
Summative Assessment: Scrapbook, see rubric.

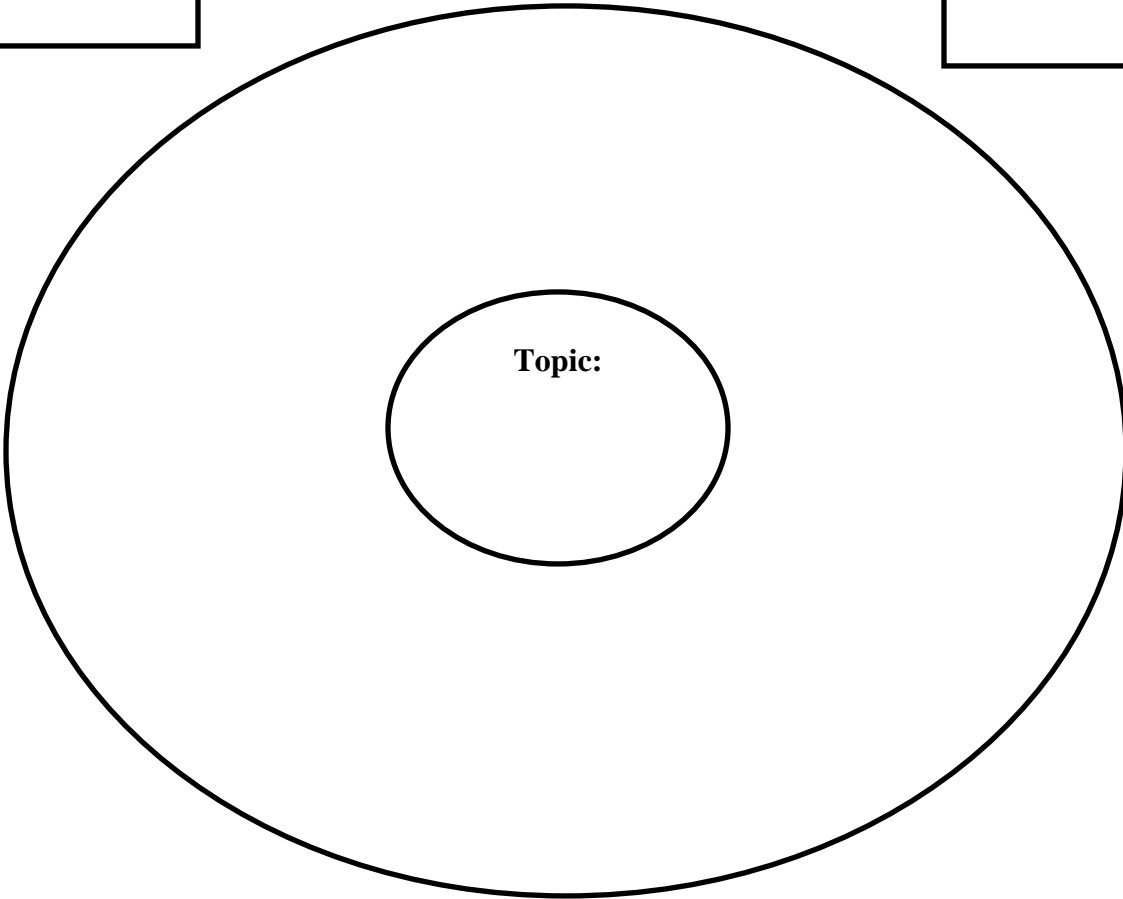
Rubric

	Exceed Expectations	Meets Expectations	Does Not Meet Expectations
<p>Content Accuracy and understanding</p> <p>70 pts</p>	<p>Student will exceed expectation if all information is shown correctly including all of the three symbiotic relationships, predation, and competitive. Student shows that he/she understands the target areas with 100% accuracy.</p>	<p>Student will meet expectations if most of the information is correct in regards to organism relationships, but they left out one to two different types of relationship. Student shows that he/she understands the target areas with 90% accuracy.</p>	<p>Student will not meet expectation if most of the information's is incorrect or they left out more than two different types of relationships. Student shows that he/she understands the target areas with less than 90% accuracy.</p>
<p>Elements of the Scrapbook</p> <p>10</p>	<p>Student will exceed expectations if there is a title page with description, 5 picture pages are present and personal reflection with detailed answered questions (a full paragraph)</p>	<p>Student will meet expectation if there is a title page with description, 3-4 picture pages are present and personal reflection with a few questions answered (less than a paragraph)</p>	<p>Student will not meet expectations if the title page is not present or does not have a description, less than 3 picture pages and/or no personal reflection.</p>
<p>Creativity</p> <p>10 Extra Points</p>	<p>Student will exceed expectations if they used materials provided in a creative and new way when completing the assignment. Pictures are uniquely displayed.</p>	<p>Materials are used appropriately, with adequate assignment completion. Pictures are displayed appropriately.</p>	<p>Scrapbook is messy, materials were not used appropriately, and pictures are not displayed appropriately.</p>
<p>Presentation</p> <p>10 pts</p>	<p>Student will exceed expectations if the presentation last 3 minutes, and student explains all pictures with accuracy.</p>	<p>Student will meet expectations if the presentation last at least 2 minutes, and student explains most pictures with accuracy.</p>	<p>Student will not meet expectations if the presentation last less than 2 minutes, and little to no explanation of pictures or explanation is inaccurate.</p>
<p>Spelling/Grammar</p> <p>10 pts</p>	<p>Student will exceed expectations if there are no grammatical/spelling errors.</p>	<p>Students will meet expectations if there are less than 3 grammatical/spelling errors.</p>	<p>Students will not meet expectations if there are more than 3 spelling/grammatical errors.</p>

Circle Map

Point of Reference
Video

Point of Reference
Previous Knowledge



Point of Reference
Text

Point of Reference
Teacher/Classmates

Predatory
Relationships

Competitive
Relationships

Tree Diagram

Quiz for Ecological Balance Video

1. What is an invasive species?
 - A species that is naturally found in an area and was not introduced by humans.
 - A species that is living outside of its native environment and was brought there by human activity.
 - Any introduced species that survives and thrives in its new environment.
 - A non-native species whose introduction into an area has caused economic or ecological harm.
2. Which of the following processes provides balance within the native habitat of a species, but is no longer present once the species is introduced into a new habitat?
 - Competition
 - Niche differentiation
 - Evolution
 - Migration
3. Which of the following is a true statement about introduced species?
 - Coevolution
 - Introduced species that become established in their new environment are able to do so because they are able to evolve quicker than introduced species that do not become established.
 - Introduced species are usually better equipped to survive in an ecosystem than the native species are.
 - Ecologists can easily predict the effects of introducing a new species to an ecosystem.
 - If an introduced species becomes established it will always become invasive.
 - To be successful, introduced species must find a way to survive all of the same environmental and community factors that native species have to survive.

Quiz Symbiotic Relationships

- Which of the following is true about amensalism?
 - Amensalism sometimes happens when a bigger, more established organism outcompetes a smaller organism for resources.
 - In amensalism, one species is harmed and the other species significantly benefits.
 - Sea turtles and the algae that grow on their shells are sometimes considered an example of amensalism.
 - Amensalism only occurs between plant species.
 - Amensalism occurs very rarely.
- When a bee gathers nectar from a certain type of flower to make honey and in the process pollinates the flower, what kind of relationship exists between the bee and the flower?
 - Parasitic
 - Amensalistic
 - Commensalistic
 - Serendipitous
- What is commensalism?
 - An association where the larger species benefits and the smaller species is harmed.
 - An association where one species benefits, and the other species is not significantly affected.
 - An association where both species benefit.
 - An association where the smaller species benefits and the larger species is harmed.
 - An association where one species is killed or inhibited and the other organism is not significantly affected.
- If a mosquito feeds on a bird that is infected with West Nile Virus and then feeds on a human being who then contracts the virus, what role is the mosquito playing in the infection of the person?
 - The vector
 - The parasite
 - The host
 - The symbiont
 - The pathogen

Predator vs. Prey Video Quiz

- Which of the following is not a way that organisms use chemicals?
 - Some animals spray them at predators to make them stay away
 - All of these are ways that organisms use chemicals
 - Plants use them to make themselves inedible
 - Predators use them as venom to disable or kill their prey
 - Some animals use them to make themselves poisonous to predators
- Which of the following is a true statement about coevolution?
 - Coevolution occurs when two very different predators evolve similar hunting styles to feed on the same types of prey.
 - Coevolution is when two very different species evolve similar characteristics independently.
 - Coevolution occurs when two different species evolve in the same way to avoid being preyed upon by the same predator.
 - Coevolution occurs when the fitness of two different species is tightly linked and these two species evolve in response to evolutionary changes in each other.
 - Coevolution is when species with the same fundamental niche become specialists in a very specific area of the niche, and allows
- all of the species to coexist in the same habitat.
- Which of the following is true about the similar coloration of Monarch and Viceroy butterflies?
 - Their bright coloration is an indication that they are fit individuals and help them find a mate
 - Their similar coloration is an example of Mullerian mimicry
 - Viceroy butterflies make a tasty meal for predators, so they mimic Monarch butterflies which are unpalatable to predators
 - Their similar coloration is an example of Batesian mimicry
 - They are similarly colored because they are very closely related.
- Which of the following is true about the effects predation has on prey?
 - Predation is a strong selective force for prey organisms.
 - Predation doesn't have any long term effects on prey organisms.
 - Predation will make prey organisms wait longer to reproduce.
 - Predation affects all prey the same.
 - Predation makes all of the individuals in the populations being preyed upon less fit.

Answer Key to Quizzes

Ecological Balance

- A non-native species whose introduction into an area has caused economic or ecological harm
- Coevolution
- To be successful, introduced species must find a way to survive all of the same environmental and community factors that native species have to survive.

Symbiotic Relationships:

- In amensalism, one species is harmed and the other species significantly benefits.
- Commensalistic
- An association where one species benefits, and the other species is not significantly affected.
- The parasite

Predator vs. Prey

- All of these are ways that organisms use chemicals
- Coevolution is when two very different species evolve similar characteristics independently.
- Their similar coloration is an example of Mullerian mimicry
- Predation is a strong selective force for prey organisms.

