

Biology Summer Assignment

PART 1

Topic: Ecosystems

Directions

Instructions:

Review the information provided. Work through the various activities on the slides. Please record your responses to the questions on the answer sheet that follows the order of the slides. Additional information via video can be found at the end of the Slide Deck under Need Additional Help.

This summer assignment will be your first major assignment for Biology. The content covered will assist your learning throughout the school year. Please put your best efforts into this assignment. Good luck and all the best to you in the coming year.



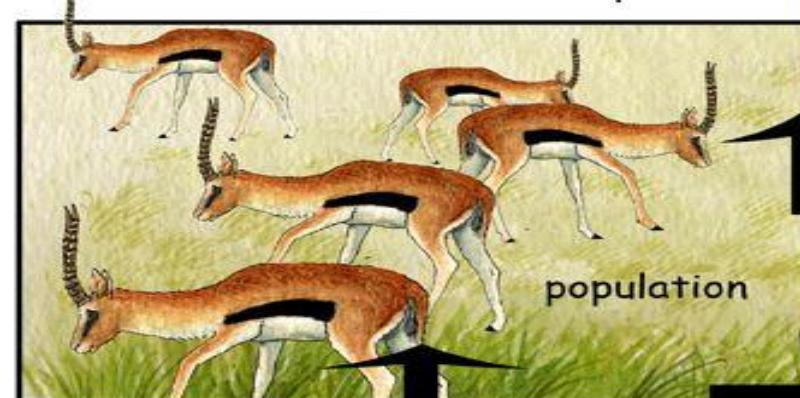
Task 1

Ecology

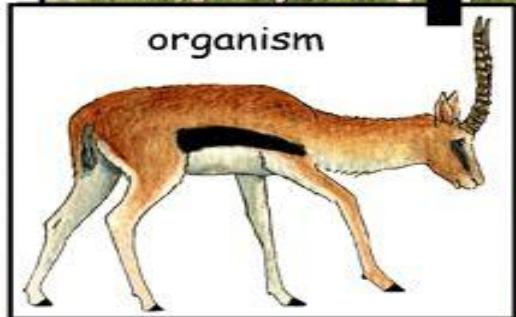
Organizing Living Things in their Environments



biosphere

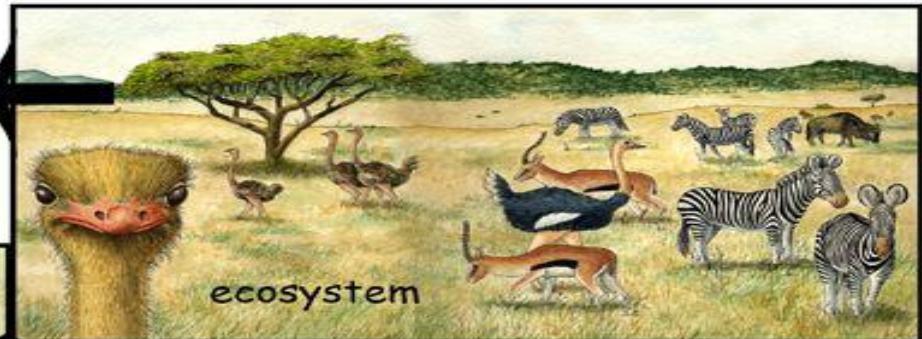


population



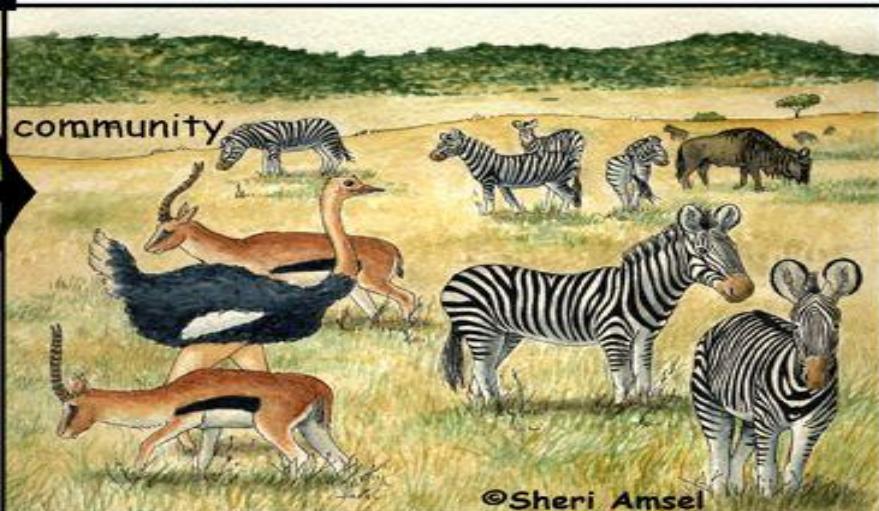
organism

Individual living things are called **organisms**. Many organisms of one species living in one area is called a **population**. Many different populations living in one area is a **community**.



ecosystem

A **community** together with the non-living environment (air, water, etc.) is an **ecosystem**. All the ecosystems on Earth make up the **biosphere**.



community

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Ecosystems

1. Preview the questions below.
2. Watch [this video](#) about ecosystems.
3. Answer the questions based on the video.

Explain what an ecosystem is in your own words. Give two different examples of an ecosystem.

1. An ecosystem...
2. An example of an ecosystem is...
3. Another example of an ecosystem is...

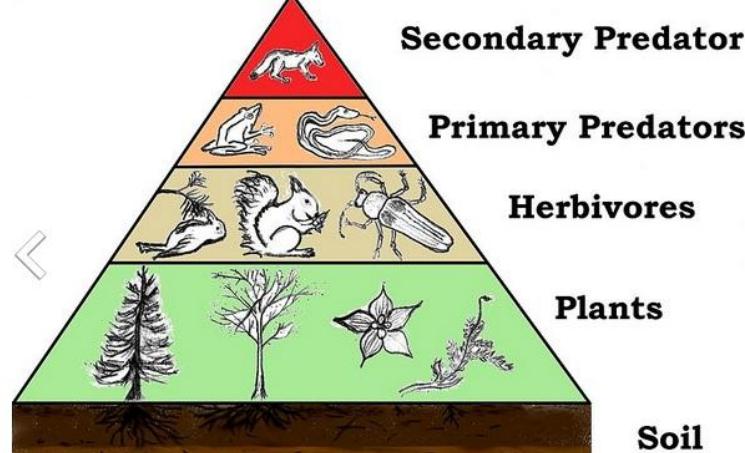


What is the difference between the biotic and abiotic components of an ecosystem? Give an example of each.

4. The difference between biotic and abiotic components is...
5. An example of a biotic component is...
6. An example of an abiotic component is...

Trophic Levels

1. Preview the questions below.
2. Take note as you watch [this video](#) about trophic levels.
3. Answer the questions based on the video.



1. In your opinion, what are the three most important ideas from the video?

- a.
- b.
- c.

What percent of energy is transferred to the next level in an energy pyramid? What does this mean as you go up the pyramid?

- 2. The amount of energy that is transferred from one energy to the next is...
- 3. This means that...

Decomposers and Detritivores

1. Preview the questions below.
2. Take note as you watch this video about decomposers and detritivores.
3. Answer the questions based on the video.

1. What is the difference between a decomposer and a detritivore?

A decomposer... while a detritivore...

2. Why are decomposers and detritivores important to ecosystems?

Decomposers and detritivores are important to ecosystems, because they...

Ecological Relationships



1. Preview the questions below.
2. Watch [this video](#) about ecological relationships.
3. Answer the questions based on the video.

1. What are the three types of ecological relationships? Describe each in 1 -2 sentences.

a.

b

c.

2. What are the three types of symbiosis? Describe each in 1 -2 sentences.

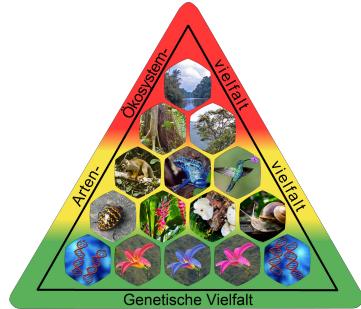
1.

2.

3.

Task 2

Biodiversity



1. Preview the questions below.
2. Watch [this video](#) about biodiversity.
3. Answer the questions based on the video.

1. In 1 -2 sentences, explain biodiversity in your own words.

2. Why is biodiversity important to an ecosystem?

Pollinators



1. Preview the questions below.
2. Watch [this video](#) about pollinators.
3. Answer the questions based on the video.

1. In what ways are bees important to ecosystems? Give 2 - 3 reasons.

2. Do you think our ecosystems would survive without bees? Why or why not?

Abiotic Factors



1. Preview the questions below.
2. Watch [this video](#) about pollinators.
3. Answer the questions based on the video.

List 5 examples of abiotic factors.

- 1.
- 2.
- 3.
- 4.
- 5.

Choose one abiotic factor from the list. What do you predict would happen to an ecosystem if that factor was not present or its levels were too high? Explain in 2-3 sentences. .

Need Additional Help?

Review the videos on the next slide

Need Help? Watch the videos below

Biotic and Abiotic

<https://www.youtube.com/watch?v=fX31EymLQZQ>

Trophic Levels

https://www.youtube.com/watch?v=T5XhbhqOL_c

Decomposers

<https://www.youtube.com/watch?v=zGkSDcgzOI4>

Symbiosis

<https://www.youtube.com/watch?v=GXTLvCrFl2o>

Biodiversity

https://www.youtube.com/watch?v=GK_vRtHJZu4

Atmosphere

https://www.youtube.com/watch?v=n_HIWovib3Y

Task 3

Ecology and Niches

Ecosystems

1. Preview the task on the next slide.
2. Watch [this video](#) about ecosystems.
3. Write two new things you learned about ecosystems from the video.
Then complete the task on the next slide.

1. One new thing I learned about ecosystems is...

2. Another thing I learned is...

Levels of Organization: Put the levels of organization in order from broadest to narrowest. Then give an example of each.

broad —————→ narrow

Level					
Example					

biosphere

community

ecosystem

organism

population

Ecological Niches

1. Preview the questions below.
2. Watch [this video](#) about niches.
3. Answer the questions based on the reading.

1. Define “niche” in your own words.

A niche is...

2. What is the difference between fundamental and realized niches?

Fundamental niches are...
while realized niches are...

Limiting Factors

1. Preview the questions below.
2. Watch [this video](#) about limiting factors
3. Answer the questions based on the reading.

1. Explain limiting factors in your own words.

Limiting factors are...

2. Explain one of the types of limiting factors in your own words.

One example of a limiting factor is... It can affect a species by...

Competitive Exclusion Principle

1. Preview the questions below.
2. Click this link and scroll down to the section title “Competitive Exclusion Principle”. Read this section as well as “Resource Partitioning”.
3. Answer the questions based on the reading.

Explain the competitive exclusion principle in your own words. Then give an example that might happen in nature.

1. The competitive exclusion principle means..
2. An example that might happen in nature

3. How could competition be avoided? Use your example in the previous question to explain.

Need Additional Help?

Review the videos on the next slide.

Need Help? Watch the videos below

Limiting Factors

<https://www.youtube.com/watch?v=pPw51fDTI68>

Bottom-Up & Top-Down

<https://study.com/academy/lesson/bottom-up-top-down-models-of-community-organization.html>

Trophic cascades

https://www.youtube.com/watch?v=j_5rqiK_wBI

Ecological Niche

<https://www.youtube.com/watch?v=xIVixvcR4Jc>

https://www.youtube.com/watch?v=W_QUCMwSSes

https://www.youtube.com/watch?v=W_QUCMwSSes

Competitive exclusion principle

<https://www.youtube.com/watch?v=YyT--fATbJU>

Niche partitioning

<https://www.youtube.com/watch?v=8eH6X2rAQEs>

Biology

Summer Assignment 2020

PART 2

Directions

Work through the activities, click the links to view valuable resources. You will record your responses to questions and complete all directives on a separate answer sheet.

Task 1

Ecosystems, Biomes and Biosphere

Task 1: Levels of Biological organization

Preview the questions below and on the next slide.

Watch [this video](#).

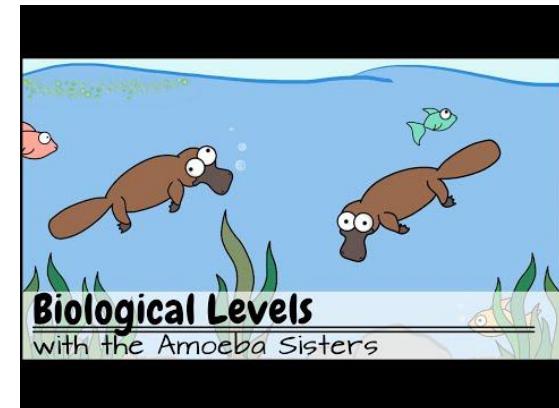
Answer the questions.

1. Why do we care about the levels?

The biological levels...

2. What level begins to include abiotic factors?

Abiotic factors are first included in

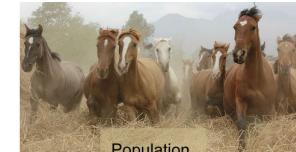
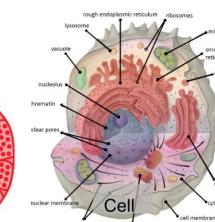
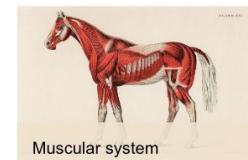
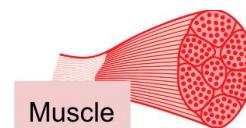


Biological Levels
with the Amoeba Sisters

largest

3. Place the pictures on the line in order from smallest to largest.

smallest



Task 1: Biome Overview

4. Watch the video. Then list two things you wonder about Biomes in the box provided below.

a.

b.



Choose a Biome

Consider the video that you watched, then choose one of the Biomes to explore throughout the rest of this lesson.

Which Biome did you choose? Why?

I chose... because...

On your answer sheet you will create a project to summarize a biome of your choice. Follow the prompts on your answer sheet.

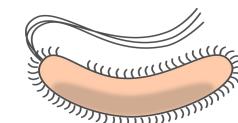
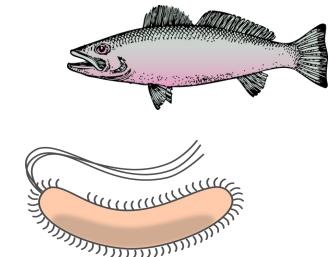
Task 2

Biotic and Abiotic parts of the ecosystem

Task 2: Biotic and Abiotic factors

7. Biotic are living and abiotic are non-living parts of ecosystems.

Sort the pictures into biotic or abiotic by dragging the pictures to the appropriate row.



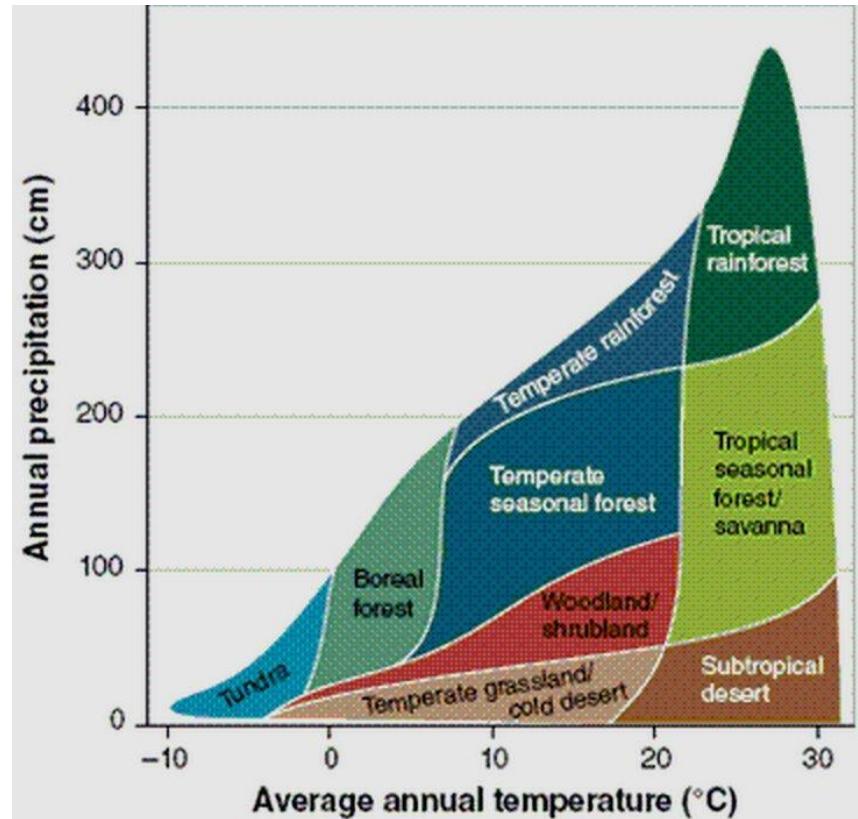
Biotic

Abiotic

Task 2: Climate in Biomes

Analyze the graph to the right. Use the data to answer the questions below.

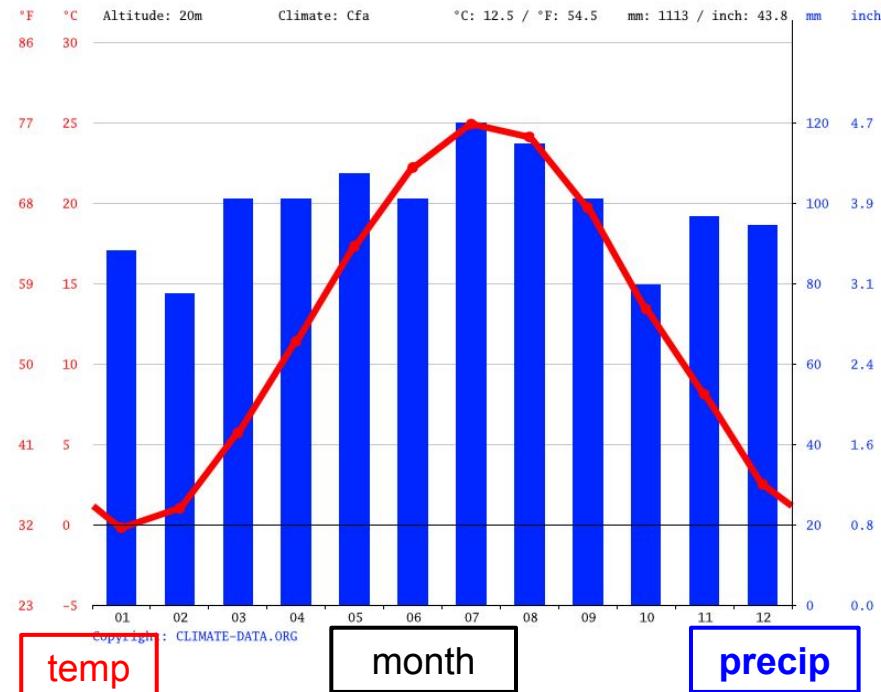
- Which biome has the highest precipitation and temperature?
- Why is the tundra also known as a cold desert?
- What factor determines if a biome is a grassland, shrubland or forest?



Task 2: Climatograph

9. This is a climatograph for Philadelphia. Click the graph to see a larger graph. Analyze the graph to answer the questions.

- a. Which month(s) have the lowest precipitation?
- b. What is the highest average monthly temperature?
- c. What is the range in precipitation between winter and summer?



**Add to your Biomes project on your answer sheet,
show the climate of your biome. Don't forget to scroll
down to the end of your answer sheet.**

Include:

Climatograph

2 sentence summary

Task 3

Organisms and their Adaptations

Task 3: Biotic organisms and their adaptations

Organisms evolve adaptations to enable them to survive in the conditions of the ecosystem in which they live. Watch [this video](#) to learn about adaptations that help organisms survive.

Examine the [list of organisms in Biomes](#), and choose 5 organisms from your biome to learn more about.

1 plant 1 mammal 1 bird

1 insect 1 reptile, amphibian or fish

On your answer sheet, write the names of the animals that you chose.



Now you will add to your biome project, you will collect information about each of the organisms you chose.

Make sure to include:

- Picture
- Common Name
- Scientific name
- Size
- Food preferences
- Adaptation for the environment
- 1 interesting fact

Design suggestions:

- Use bullet points of 7-9 words
- Don't copy/paste information
- Italicize the scientific name (genus species)
- Font size should be at least 20

Eastern Gray Squirrel

Sciurus carolinensis



- Up to 20" long with the tail
- Omnivorous: eats plants and animals- prefers seeds
- Melanistic (black) individuals survive better in colder areas.
- Scatter-hoarder: Use scent to find their hidden food stashes

Task 4

Energy Flow & Food Webs

Task 4: Energy Flow and Food Webs

11. Watch this video. Then, draw arrows to correctly show the direction of **energy flow** in the food chain (on your answer sheet).



Task 4: Energy Flow and Food Webs

12. On your answer sheet, order the steps to match the order of the energy flow in a food chain. Use the last slide to help. First item on top and last item on the bottom.

Step

1

Grasshoppers and other insects get energy from eating grass.

2

Frogs get energy from eating insects.

3

Plants absorb light energy from the sun

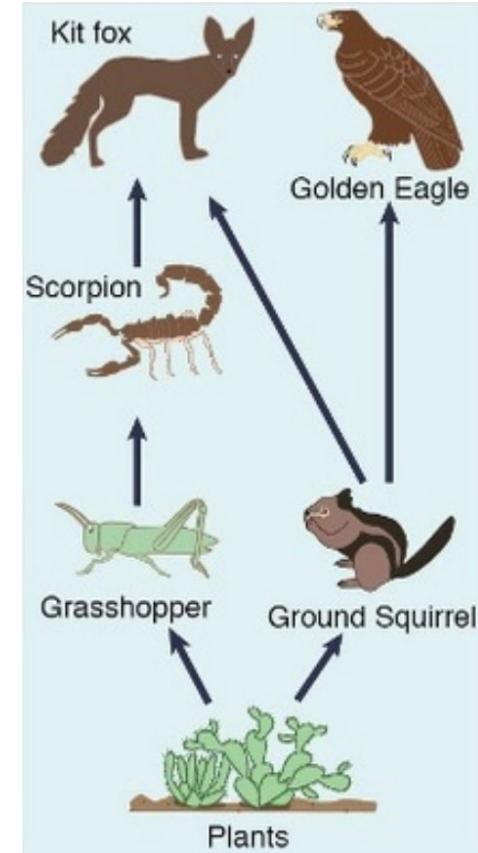
4

Plants convert light energy into chemical energy

Task 4: Energy Flow and Food Webs

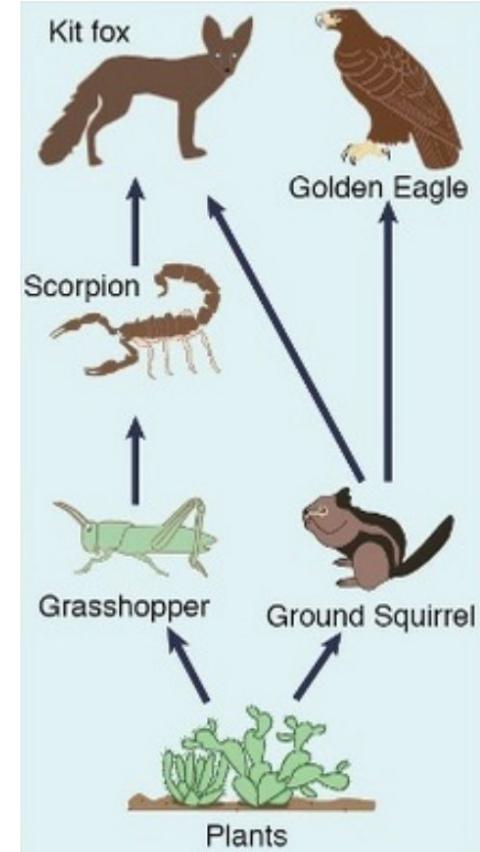
Analyze the image to the right. Remember that the arrows represent the flow of energy and point to the organism that consumes the other. **Other than the organisms, how is this food web different from the food chain from the last 2 slides?**

The main difference between a food web and a food chain is....



Task 4: Energy Flow and Food Webs

Food webs are more accurate than food chains. They show how energy can follow more than one path through an ecosystem. Most organisms eat or are eaten by multiple organisms. You will be add a representative food web in your biome, like the one to the right.





Food Web Directions

Make sure to include:

- 6 different species from your biome (same ones researched yesterday or different ones)
- Picture & common name for each organism
- Arrows showing the direction of the flow of energy
- Multiple arrows going to or from organisms

Task 5

Biotic Interactions

Task 5: Biotic Interactions

Preview the questions below and on the next 2 slides.

Watch this video to learn about different biotic interactions.

Answer the questions.

a. What is the difference between predation and competition?

The difference between predation and competition is...

Task 5: Biotic Interactions

b. Is this video an example of predation or competition? Explain.



This is an example of.... I know this because....

Task 5: Biotic Interactions

Symbiosis is when 2 species live in relationship with each other on purpose.

c. Complete the table below.

Kind of Symbiosis	Species A	Species B
<u>Commensalism</u>	Receives benefit	
<u>Mutualism</u>		Receives benefit
<u>Parasitism</u>		Harmed

In your biome project, show one example of a symbiotic relationship in your biome. Make sure that both species live in your biome.

Make sure to include:

- Common name for each organism
- Picture or video showing the relationship
- Type relationship (commensalism, mutualism, or parasitism) with explanation

Commensalism

Beech Blight Aphid and American Beech tree

- Aphid feeds on sap from American Beech trees
- American Beech trees are not harmed by this, nor do they benefit
- From far away, the aphids look like snow on the trees



Task 6

Endangered Species

Task 6: Endangered Species

15a. Endangered species are species that could go extinct.
What is an example of an organism you know of that went extinct?

One example of an organism that went extinct is....

Task 6: Endangered Species

Check out this gallery to learn more about endangered species.

b. What are 2 examples of endangered species? Insert images.

c. What are the 2 main causes of endangered species? Insert images.

Add an example of an example of an endangered species in your biome to your biome project. Example on the next slide.

Make sure to include:

- Picture
- Common name
- Scientific name
- 2 interesting facts
- Reason for being endangered

Endangered Species

Red wolf (*Canis rufus*)

- Hard for scientists to classify; somewhere between a wolf and a coyote
- Important to Cherokee spiritual beliefs
- Endangered because it is unable to adapt to changes that humans have introduced to its environment



Task 7

Human Impact on Biome

Task 7: Human Impact on Biome

To help identify human impacts on your biome, determine which of these categories is most like the biome you have been researching. Circle the correct category.



- Aquatic
- Forest
- Tundra
- Desert
- Grassland

Task 7: Human Impact on Biome

In the image to the right, find the category you selected on the last slide. Then, move this — blue line under the impact that you want to learn more about. This will be the impact that your slide focuses on.



Aquatic

Freshwater

Dams, redirection of water, pollution and runoff, introduction of invasive species, draining of wetlands, floods and droughts caused by climate change

Marine

Pollution (particularly oil spills)



Forest

Deforestation (particularly in the rainforest), logging, power generation, agriculture expansion, the paper industry



Tundra

Climate change, invasive species, pollution (especially oil spills)



Desert

Excessive evaporation, wildfires, pollution damage



Grassland

Unsustainable agriculture practices, disease and pests, pesticides, shifting weather patterns due to global warming

Add one human impact on your biome to your biome project. Example on the next slide.

Make sure to include:

- Name of impact
- Picture representing impact
- Explanation of the human action
- Explanation of the effect on the ecosystem
- One possible solution to the problem

Human Impact

Power Generation

- Surface mining takes off the tops of mountains to expose coal.
- Cuts out entire ecosystems and causes loss of continuous habitat.
- A solution is switching to renewable power so that coal mining becomes unnecessary.



Refer to your answer sheet for additional activities covering Endangered and Extinct Species