Complete the following assignments for week 2.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Agenda</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Life Science</td>
<td>1. Genetically Modified Informational Text</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Read and annotate the text and answer the questions and mini project</td>
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<tr>
<td></td>
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<td>2. Ecosystems Review Lesson</td>
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<tr>
<td></td>
<td></td>
<td>• Complete all 8 pages of the lesson.</td>
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<td></td>
<td>3. Student Response Journal Entries</td>
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<tr>
<td></td>
<td></td>
<td>• Complete the journal response entries after watching the videos or reading the quotes.</td>
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<td>4. Ecosystems Patterns Inquiry Lab</td>
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<tr>
<td></td>
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<td>• Complete the inquiry lab</td>
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<td></td>
<td></td>
<td>5. Creatures from the Deep Informational Text</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Read and annotate the text and answer the questions and mini project</td>
</tr>
</tbody>
</table>
TEXT ANNOTATION

Use the following directions to annotate each of the texts in this journal.

- **Draw an arrow pointing at** any words, phrases, or paragraphs that help the reader identify something new about the topic presented.

- **Draw a triangle next to or around** any words you do not know. Then, look up the definition of the word. Write it in the margin or in your notes for future reference.

- **Draw a star next to any significant** quotes. In the margin or in your notes, write WHY you believe the quote is significant to the passage.

- **Draw a rectangle around** the part of the passage that BEST represents the author's main idea. In the margin or in your notes, explain why.

- **Draw a circle around any use of figurative language.** In the margin or in your notes, explain how the figurative language impacts the passage.

- **Place a sticky note next to any part of the passage** that you do not understand. Write a specific question on the sticky note for class discussion.

- **Highlight ONE quote** that stands out most to you. In the margin or in your notes, explain why this quote made such an impact on you.

- **Underline any EXAMPLES** the author provides about the topic.

- **Cross out any information** that is irrelevant to the topic, if any.
Genetically modified organisms, or GMOs, are plants or animals whose genetic makeup is modified in a laboratory. This process is called genetic engineering or transgenic technology. By artificially inserting or removing the gene components of another organism, genetic engineering gives the original organism new characteristics. As with most scientific issues, there are pros and cons which need examining.

An enormous advantage to genetically engineered crops is they are made more resistant to insecticides and herbicides. This resistance allows farmers or ranchers to grow crops faster and increase their yield. Over 90% of the soybeans and corn crops have already been genetically modified. Some seeds are engineered to tolerate heat, cold, or drought. Imagine the advantage this has to farmers in drought-ridden areas across the globe.

Other engineered seeds give GMO foods brighter colors which appeal to buyers. Increasing the shelf-life is another advantage to GMO products. Ever notice the expiration date of your snack food? This long-lasting effect helps in shipping them to remote locations. Have you wondered why watermelons no longer have large black seeds? The seeds in both watermelon and grapes have been genetically engineered almost to disappear.

Why is there a reluctance in some people to eat GMO foods? Some studies have shown that GMO corn and soybeans fed to rats led to a higher risk of them developing liver and kidney problems. Currently no one knows if these results transfer to humans. People opposed to GMOs are not confident they are thoroughly tested, and if these organisms do not occur naturally, these people are highly suspicious.

Some people believe GMOs’ effect on people with allergies is unpredictable. There are lots of GMOs used in snack food, which makes it hard for people with allergies to avoid them. Other people believe there might be a connection between GMOs and cancer. There is no direct link proven at this time. Some also wonder if there is a link between GMOs and the rise of antibiotic-resistant bacteria. Again, more research is needed. However, many seeds have been engineered using antibiotic-resistant genes.

It appears that GMOs are here to stay, so consider your options carefully when deciding whether they are worth the avoidance.
Answer the questions below based on the article about GMOs.

COMPREHENSION QUESTIONS:
1. What is a GMO? Underline your answer in the text.
   ___________________________________________________________________________
   ___________________________________________________________________________
   ___________________________________________________________________________

2. How is an organism modified?
   ___________________________________________________________________________
   ___________________________________________________________________________
   ___________________________________________________________________________

3. What is an advantage to genetically engineered crops? Highlight your answer in the text.
   ___________________________________________________________________________
   ___________________________________________________________________________
   ___________________________________________________________________________

4. Why is there reluctance to embrace GMO crops?
   ___________________________________________________________________________
   ___________________________________________________________________________
   ___________________________________________________________________________
   ___________________________________________________________________________

5. How has a watermelon been genetically altered?
   ___________________________________________________________________________
   ___________________________________________________________________________

6. Do you have any problem eating GMO foods? Why or why not?
   ___________________________________________________________________________
   ___________________________________________________________________________
   ___________________________________________________________________________
   ___________________________________________________________________________

Mini-PROJECT: DESIGN A MENU

A local restaurant has hired you to create an organic, farm-to-table menu for their establishment. Research where you would get the fruit, vegetables, and meat without any GMOs. Then, create a menu based on the information you find. Your menu should include:
1. Appetizers, entrees, desserts, and drinks (at least two of each)
2. Menu items that are based on local or surrounding farms without GMOs
3. A unique and creative design
What is an **ecosystem**? An ecosystem is a group of interconnected living organisms and the non-living elements they rely on. For an example, let’s look at a desert ecosystem. A cactus is a living element, and it relies on the non-living rain (even though it’s infrequent) to survive. It stores that rain for long periods to live. Ecosystems can be small areas, like ponds. They can even be as small as a puddle! They can also be larger, like a bigger wooded area. And, there can be more than one ecosystem inside of a biome.

What is a **biome**? A biome is a specific area of climate and vegetation and the organisms that are adapted to live there. Biomes can be on land or in the water. Some examples of major land biomes include: deserts, forests, grasslands, and tundra.

Let’s look at an example of a biome: the rainforest! The temperature is, on average, 70-85 degrees Fahrenheit, and the plants that live there are varied. They can grow very tall or stay low to the ground, and even grow on other plants. The Amazon River ecosystem exists in a rainforest biome. It is a huge ecosystem, full of nonliving things like water, soil, and sunlight, and living things like plants, insects, birds, bacteria, and mammals.

In every ecosystem, different organisms fill different roles. Plants, like the vines of the rainforest, are producers, producing food from solar energy. Consumers are the organisms, like three-toed sloths, that eat those plants. Predators are organisms that eat other non-plant organisms, called prey. In the rainforest, jaguars are predators while rodents, deer, and even birds are their prey.

Some organisms have special relationships in an ecosystem. Phorid flies are parasites, organisms that steal nourishment from their host, the leaf-cutter ant. Other organisms are symbiotes, like capuchin monkeys and flowering plants, which mutually help each other survive.

**Reading Infographic:** Let’s take a look at our information! You’re going to make an infographic with the reading. On your answer page, draw pictures to teach the important information. Add as much information as you can and make it colorful.

**Reading Vocabulary:** Now that you’ve done the infographic and you know a little more about ecosystems and biomes, let’s break down the vocabulary. For each word, write the definition, then sketch a picture to help you remember it. Use materials available to you in your classroom for definitions.
Extension if you have less than 10 minutes left: try the following...

Fill out the Venn diagram on your page, comparing ecosystems and biomes.

Hint Bank:
- Group of connected organisms
- Can be small areas
- Can be inside a biome
- Specific area of climate
- Can have organisms
- Can be on land or water

Can you come up with any others?

Extension if you have more than 10 minutes left: try the following...

Choose a biome. Fill out the chart on your page with as many answers as you can think of. When you are finished, draw a scene from your biome.

Assessment: Now that you’ve read, completed an infographic, and looked at vocabulary, let’s see if your ideas have changed!

1. In your own words, what is a biome?
2. In your own words, what is an ecosystem?
3. List as many biome examples as you can:
4. How might a grassland biome be different from a tropical rainforest biome?

Show What You Know: On your answer page, sketch a biome found in your area. Describe the temperature and the type of vegetation that shows what biome it is.
Extension for less than 10 minutes:

- Ecosystems
- Biomes
### Extension 2:

<table>
<thead>
<tr>
<th>What is the climate like? (Describe the typical weather.)</th>
<th>What does the biome look like?</th>
<th>What kind of plants exist there?</th>
<th>What kind of animals live there?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

A scene from your biome:
Ecosystems Student Pages

Answer Sheet

Name:_________________________  Date:______

Positive Behavior Checks

😊 😞 😞

Initials: _______

☑ Independent  ☐ Partners  ☐ Small Group

Assessment:

1._____________________________________________

2._____________________________________________

3._____________________________________________

4._____________________________________________

☐ Independent  ☐ Partners  ☐ Small Group

Show What You Know:
Directions: Now that you’ve read, completed an infographic, and looked at vocabulary, let’s see if your ideas have changed!

1. In your own words, what is a biome?

_____________________________________________________________
_____________________________________________________________
_____________________________________________________________

2. In your own words, what is an ecosystem?

_____________________________________________________________
_____________________________________________________________
_____________________________________________________________

3. List as many biome examples as you can:

_____________________________________________________________
_____________________________________________________________
_____________________________________________________________
_____________________________________________________________
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4. How might a grassland biome be different from a tropical rainforest biome?

_____________________________________________________________
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Positive Behavior Check: ☺ ☒ ☒ ☒  Initials: _______
Directions: In the space below, sketch a biome found in your area. Describe the temperature and the type of vegetation that shows what biome it is.
Student Response Journal Entries
How is the health of an ecosystem related to its biodiversity?

https://www.youtube.com/watch?v=pSUfsWzWbeg
Define and sketch a watershed.

https://www.youtube.com/watch?v=QOrVotzBNto
VIDEO RESPONSE
Click on the image to see the video.

Why is the nucleus so important to the cell?

https://www.youtube.com/watch?v=sL7bE_PA_SE
“Science is the key to our future, and if you don’t believe in science, then you’re holding everybody back.”

Bill Nye
Mechanical engineer and science communicator – known as “Bill Nye the Science Guy”
“Education is the key to unlock the golden door of freedom.”

George Washington Carver
American botanist and inventor – promoted alternate crops to cotton, (sweet potatoes and peanuts)

Explain what this quote means in your own words.

How does this quote apply to your life or the world today?
Ecosystem Patterns Student Lab Sheet

**Essential Question:** How can we predict the ways organisms will interact with each other in different ecosystems?

**Background or Phenomena:**

A **competitive** relationship occurs when two organisms need the same resource. When the resource is abundant, both populations stay in balance, but if the resource becomes scarce, one population may fail.

A **predator/prey** relationship happens when one organism is the natural food source of another. The growth of these populations are also linked together.

A **symbiotic** relationship is when two organisms live closely together within an ecosystem. There are three types of symbiotic relationships: parasitism, commensalism, and mutualism.

- Ticks and humans are an example of **parasitism**, where one organism (the parasite) benefits from another (the host), but also harms it.

- **Commensalism** occurs when one organism, without being a threat or a help, benefits from the presence of another. Clownfish and sea anemones have this type of symbiotic relationship.

- **Mutualism**, portrayed by acacia trees and ants, happens where two organisms benefits from the presence of the other. The tree gives shelter to the ants in hollow thorns; the ants, in turn, protect the leaves from being eaten by herbivores.

Once we recognize the relationships between different organisms in one ecosystem, we can often predict how organisms in a different ecosystem will interact.

**Materials per Group:**

- Internet device
**Ecosystem Patterns Student Lab Sheet**

**Procedure:**

1. Go to this website to study the list of organisms in the table.
   
   [https://animaldiversity.org/](https://animaldiversity.org/)

2. Look at the table on the next page. Enter the scientific name of the first animal from the Organism column into the ADW Search on the right side of the page.

3. First, go to the **Predation** section and see if any animals across the row have a predator/prey relationship with this animal. If they do, write **P-P** in their intersecting cell.

4. Next, look at the **Food Habits** section and write down what the animal eats under the space that says “Needs:” for each organism. Some of them have been done for you.

5. Read the **Ecosystem Roles** section to find any symbiotic relationships with the other organisms in the row. Write **S-P** for symbiotic parasitism, **S-C** for symbiotic commensalism, and **S-M** for symbiotic mutualism.

6. Repeat steps 2 – 6 for each animal in the first column. (If a cell is dark grey, leave it blank; it is a repeat of another cell.)

7. When you have all the animals’ needs written in, see if there are any which would be competing for the same resources, i.e., two different animals that eat grass would be competing.

8. If there is a competitive relationship between two animals, put a large “C” in their intersecting cell.

**Check for Understanding:**

1. Describe a competitive relationship you found:

2. Describe a predator-prey relationship you found:

3. Describe a symbiotic relationship you found:
<table>
<thead>
<tr>
<th>Organism</th>
<th>black bear</th>
<th>striped skunk</th>
<th>woodland vole</th>
<th>bald eagle</th>
<th>swift crab spider</th>
<th>honey bee</th>
<th>wax moth</th>
<th>ox-eye daisy</th>
<th>apple tree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>black bear</strong> <em>Ursus americanus</em></td>
<td>Needs:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>striped skunk</strong> <em>Mephitis mephitis</em></td>
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<tr>
<td><strong>woodland vole</strong> <em>Microtus pinetorum</em></td>
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<tr>
<td><strong>bald eagle</strong> <em>Haliaeetus leucocephalus</em></td>
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<tr>
<td><strong>swift crab spider</strong> <em>Misumenops celer</em></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>honey bee</strong> <em>Apis mellifer</em></td>
<td>Needs:</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>wax moth</strong> <em>Galleria mellifer</em></td>
<td>Needs: bee hives to lay eggs in; larvae eat wax and honey intended for bees. Adults do not eat.</td>
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<tr>
<td><strong>ox-eye daisy</strong> <em>Leucanthemum vulgare</em></td>
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<tr>
<td><strong>apple tree</strong> <em>Malus pumila</em></td>
<td>Needs: insects to pollinate; animals to eat fruit to transport seeds to new locations; sunlight, water</td>
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Northern Forest Ecosystem
Ecosystem Patterns Student Lab Sheet

Procedure:

9. The organisms on the previous page were part of a northern forest ecosystem. Each organism matches a ecological role listed around the circle below. Decide which organism matches which role, and then draw or label the organism in the matching square.

- Consumer (Omnivore)
- Consumer (Predatory Bird)
- Consumer (Rodent)
- Producer (Fruit Tree)
- Consumer (Parasite)
- Producer (Flower)
- Consumer (Pollinating Insect)
Procedure:

10. The organisms in the diagram below are part of a hot desert ecosystem. Looking at your previous charts and diagrams, try to predict the relationships between several organisms. Write the predicted code on the arrows between the squares. The first set (coyote and raven) has been done for you.
Check for Understanding:

1. On what did you base your predictions for the hot desert organisms?

2. Why would the relationship between pollinators and flowers be the same in multiple ecosystems?

3. What is a symbiotic relationship?

4. List the three basic types of symbiotic relationships.
**Conclusion:** How can we predict the ways organisms will interact with each other in different ecosystems?

**Claim:**

**Evidence:**

**Reasoning:**

**Reflections:**

1. If fruit trees exist in an ecosystem, what kind of organisms would you expect to find? Why?

2. Mountain lions are carnivores, not omnivores, that live in the desert. Would they fit into the patterns of the northern forest ecosystems? Why or why not?
Use the following directions to annotate each of the texts in this journal.

1. **Draw an arrow pointing at any words, phrases, or paragraphs that help the reader identify something new about the topic presented.**

2. **Draw a triangle next to or around any words you do not know. Then, look up the definition of the word. Write it in the margin or in your notes for future reference.**

3. **Draw a star next to any significant quotes. In the margin or in your notes, write WHY you believe the quote is significant to the passage.**

4. **Draw a rectangle around the part of the passage that BEST represents the author's main idea. In the margin or in your notes, explain why.**

5. **Draw a circle around any use of figurative language. In the margin or in your notes, explain how the figurative language impacts the passage.**

6. **Place a sticky note next to any part of the passage that you do not understand. Write a specific question on the sticky note for class discussion.**

7. **Highlight ONE quote that stands out most to you. In the margin or in your notes, explain why this quote made such an impact on you.**

8. **Underline any EXAMPLES the author provides about the topic.**

9. **Cross out any information that is irrelevant to the topic, if any.**

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Earth’s surface is two-thirds covered by ocean. Unbelievably, 95% of the oceans have remained unexplored. From the shore, the first 200 meters of water is teeming with life because that’s where sunlight penetrates. Beyond that the light quickly fades away, until at 1,000 meters the water is completely devoid of light and the deep ocean abyss awaits.

You might assume that without sunlight no lifeforms can exist in this pitch-black environment, but you would be wrong. There is an astounding variety of creatures that will boggle your mind. Because the temperatures are so cold, and the pressure is 40-110 times that of Earth, scientists can’t scuba dive there. Instead, they must use sophisticated technologies to explore this vast frontier.

James Cameron, the maker of the movies *Avatar* and *Titanic*, is an avid deep-sea explorer. He explored the deepest part of the ocean called the Mariana Trench using a solo submarine called the Challenger Deep. Other types of exploration vehicles are human-occupied vehicles (HOVs) that can transport up to three people to the ocean floor. Autonomous underwater vehicles (AUVs) are robotic vehicles that can collect data from the deep parts of the ocean. These vehicles allow for greater depth in exploration of the deep ocean.

What kinds of creatures can live in this icy cold, pitch-black, crushing environment? The answer to that is thousands of fascinating animals including jellyfish, crustaceans such as shrimp and crabs, corals, fish, and worms. These animals look quite strange compared to their counterparts closer to shore. Their eyes might be huge or even eyes on stalks to capture what little light there is. Others have extremely large mouths and fang-like teeth which are always open, ready to catch food from above. Some have transparent bodies for camouflage.

A surprise discovery in the 1970s led famous deep-sea explorer Robert Ballard, who also discovered the Titanic, to find hydrothermal vents on the ocean floor. Here through cracks in the ocean floor he observed hot steaming water and smoke bubbling up into the cold ocean water. The animals living around these vents were converting energy from the minerals in the water to give them life.

There were many new species found during Ballard’s discovery. The strangest creatures were giant red-tipped tube worms and white worms as tall as your refrigerator. Explorers continue to learn many lessons from visits to the abyss.
Answer the questions below based on the article about creatures from the deep.

COMPREHENSION QUESTIONS:
1. What is the deepest part of the ocean called? Highlight your answer in the text.
   ____________________________________________________________________________
   ____________________________________________________________________________

2. Why can’t scuba divers dive to the deepest parts of the ocean? Underline your answer in the text.
   ____________________________________________________________________________
   ____________________________________________________________________________
   ____________________________________________________________________________

3. How do explorers and scientists explore the deep ocean floor? Put a star * next to your answer in the text.
   ____________________________________________________________________________
   ____________________________________________________________________________
   ____________________________________________________________________________

4. What did Robert Ballard discover in the 1970s?
   ____________________________________________________________________________

5. What kind of animals are found in the harsh environment of the floor of the ocean?
   ____________________________________________________________________________

6. What are some physical differences in these ocean animals?
   ____________________________________________________________________________
   ____________________________________________________________________________
   ____________________________________________________________________________

Mini-PROJECT: INVENT A CREATURE

You are a scientist researching the deep ocean floor. You have discovered a new sea animal. Draw a picture using document provided. Then on your own sheet of notebook paper, explain its habitat, and describe the new species in detail.
- Sketch and name the new species
- Determine its habitat, diet, and similar species
- Explain all of the above in a three-paragraph essay
Describe the creature’s habitat, diet, and similar species.