3.2.3 In the Zone!

Overview

The vast size of the ocean makes it more complicated than a terrestrial environment to describe. While the characteristics that define a terrestrial habitat are the climate and the organisms that call it home, they are not sufficient to define ocean habitats. The immense variations in temperature, depth, salinity, light, and water pressure in the ocean ecosystem have led scientists to divide the marine environment into three zones. These include the intertidal zone, the pelagic zone, and the benthic zone. By recognizing the variations in habitats among the three zones, which relate to the differences in depth of water and distance to shore, scientists can make sense of the vast biodiversity of the ocean.

In the same way, students working to understand the complexity of the ocean's habitats can use an organizational tool called a concept map to make sense of the body of knowledge about the ocean. A concept map is a web diagram that illustrates conceptual knowledge. It gathers information into a visual tool that describes relationships among subgroups and categories. It helps students attain deep learning because they can see the whole picture.

Learning Objectives

- Scientists recognize that the ocean environment has a variety of habitats based on the depth of water and distance to shore.
- Each of the three zones, intertidal, pelagic, and benthic, has specific physical characteristics that, in turn, support a unique set of plants and animals.
- A concept map is a graphic organizer that illustrates the big picture connections among ideas surrounding a central concept.

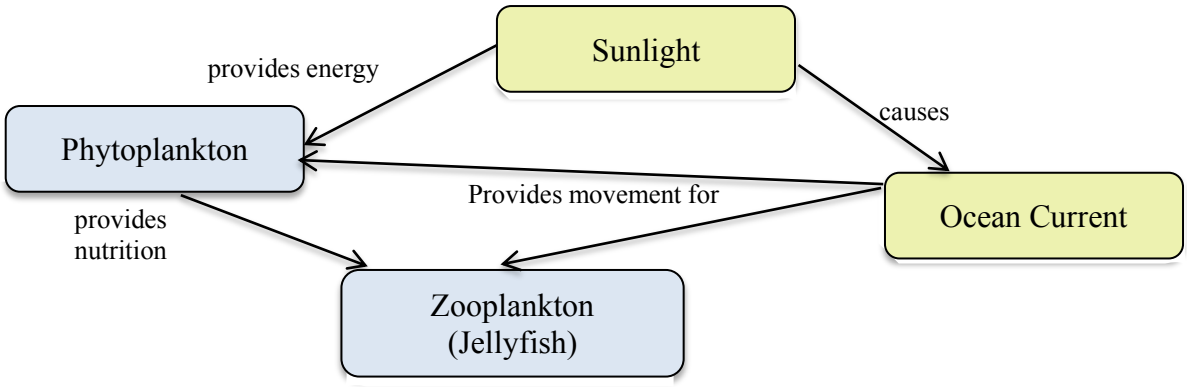
Student Activity: In the Zone!

Materials

Access to the Internet
Color printer
Poster board
Colored pens, markers, or colored pencils
Glue stick
Ruler (optional)

Advance Preparation

Practice making a concept map using some simple examples. For instance, you could make a concept map of the units you study in this year's science class. Or you could make a concept map of the defensive moves you practice as a soccer team. Pick a topic you know well so that you can get used to making connections among concept labels with arrows that create statements. See below for a brief example of a concept map.



Process and Procedures

1. Carefully read Unit 3: Ocean Ecosystems, Chapter 2: Marine Ecosystems. Take notes using a table like the one below:

Ocean Zones and Characteristics

Zones	Physical Characteristics	Biotic Characteristics (plants and animals)
Intertidal		
Pelagic		
Benthic		

2. Use your notes in the table to make a rough draft of a concept map that graphically organizes all the information from the table into a big picture of the ocean ecosystem and its parts. Be sure to have clear concept labels with connecting lines and statements.

3. Search the Internet for images of the plants, animals, and physical characteristics you have listed in your notes. Sketch or print small (about 3 cm across) copies of the images.

4. Assemble a final draft of your concept map on the poster board. Make clear concept labels using words and illustrate them with the pictures you collected in step 3. Use the ruler to keep your connecting lines straight so that you can easily write connecting statements. Use ink, markers, or colored pencils to make your work look professional.

Assessment

Exchange concept map posters with another student. “Read” the concept map by looking at each concept label and its connecting statements. Write down each of these conceptual statements in a list on a piece of paper. Evaluate the concept map:

- Which statements are factually correct?
- Which statements contain some errors?
- Are there any statements that are missing?
- How complete is the “big picture”?

Meet with the student with whom you exchanged concept map posters and share your evaluations.

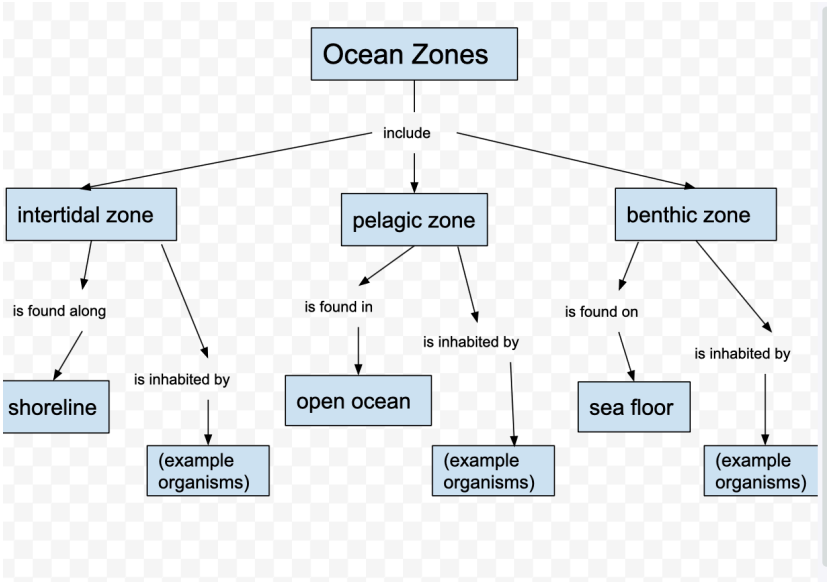
Expected Outcomes

What's the take-away?

The ocean is divided up into three main zones - intertidal, pelagic, and benthic. Each zone has its own unique physical characteristics and biotic characteristics. A graphic organizer is a useful tool that can be used to summarize and compare these characteristics.

What does the student work product look like?

A graphic organizer is similar in nature to an outline. It serves the purpose of not just summarizing information but also showing how concepts are connected and related.
This sample concept map for Unit 3 Chapter 2 reading material shows just a few categories of information. More boxes can be added to provide a greater level of detail. Although, the intent is to include the "broad strokes" of the concepts, not every small detail.



Use the mapped out concepts and connecting words in between them to make statements that emphasize or explain the connection between the words in the boxes. Students may choose to embellish their statements with details that they remember from the reading. Sample statements from Unit 3 Chapter 2 sample concept map:

1. Ocean zones include the intertidal zone, the pelagic zone, and the benthic zone.
2. The intertidal zone is found along the shoreline (between the low and high tide marks.)
3. The intertidal zone is inhabited by species such as sponges, barnacles, crabs, shrimp, and clams.
4. The pelagic zone is found in the open ocean.
5. The pelagic zone is inhabited by species such as bluefin tuna, whale sharks, dolphins, sea turtles, as well as all types of plankton.
6. The benthic zone is found on the sea floor.
7. The benthic zone is inhabited by species such as seagrass, kelp, worms, eels, and corals.