

## MS101 Unit 1: Biodiversity in the Ocean

### Slow Looking: Patterns in Structure and Function

#### Overview

##### The Art of Slow-Looking

Ready to practice the art of slow-looking? The average person looks at a piece of art for less than half a minute! In this activity, you are going to slow that down by studying pieces of art for minutes at a time. This will allow you to notice and appreciate even the smallest of details in each piece of art. Did you notice the colors? The shapes? The lines? Which objects are featured? Obscured? Study the image as if it were a page in a novel; what story does it tell? Take the time to consider how the art makes you feel and what emotions are evoked.

##### Connection to Science

One of the most significant practices that scientists engage in is careful observation. The longer and more intently you observe an object, the more likely you are to make unique observations that could add to your understanding or give you a new perspective on a topic. Do you notice any patterns? Do you see any evidence of cause and effect relationships? Could you build a model to explain what you observe? Think about the relationships and connections between the objects or ideas you are observing.

Slow it down a bit and allow the slow-looking technique to give your mind some time to make new discoveries and connections.

#### Learning Objectives

- Recognize patterns between the form and function of the physical adaptations in marine organisms.
- Provide evidence to explain observed patterns.

#### Advance Preparation

- Choose two or three pieces from the attached artwork to print out, or be prepared to view the pieces on an electronic device.
- Gather materials:
  - Drawing paper and colored pencils
  - Computer or tablet
  - Slideshow program with photo editing tools

#### Potential Misconceptions

- Organisms that are not related do not have similar body structures or body plans.
- All animals with similar body structures or body plans are directly related.

## Process and Procedures (about 40 minutes)

### Part 1: Set the Stage (about 5 minutes)

Before viewing the artwork you have selected, take a few minutes to think about what you already know about biodiversity in the ocean. Discuss and share with your partner about the topic using the questions below to guide you.

1. What unique or interesting body structures and/or systems do marine animals have that are different from terrestrial animals? The same?
2. How do the adaptations that marine organisms have help them to live and grow in their particular environment?
3. How can the characteristics of living organisms help to classify them? What can knowledge of an organism's classification tell you about its characteristics?

### Part 2: View and Discuss the Artwork (about 10 minutes)

- a. **View Independently:** Take a full five minutes to slow-look at the artwork. Play a soothing instrumental song that lasts about five minutes or use a stopwatch to time yourself. Take notes about what you see. Some suggested formats for note taking:
  - Take screenshots and then circle or highlight specific parts with editing tools.
  - Use words, sketches, and labeled diagrams written in a science journal
  - Make an audio (or video) recording that describes observations made.
- b. **View with Partner:** Set a timer for another five minutes and view the artwork with your partner. Share and compare notes. Use the following prompt to spark a discussion with your partner as you view the artwork together.

#### Discussion Prompt:

Think about the physical adaptations marine organisms have that help them to survive in their unique environments. Describe a physical adaptation you observe on an organism in the artwork. How do you think this structure functions? Describe the relationship between the form and function of the structure. Explain how the function of this structure helps the organism to meet its needs for survival. Identify a similar structure in a different animal. Describe the relationship between the two animals. Describe the body plan characteristics that they have in common and the characteristics that are unique to each.

### Part 3: Make Connections (about 5 minutes)

Use the statement and questions below to facilitate a discussion with your partner that helps to make connections between the artwork and the science you have been learning in this unit.

*From invertebrates to vertebrates, animals became more complex in body plan and organ systems.*

1. Compare the physical adaptations that make up the body plan of a marine invertebrate with the physical structures that make up the body plan of a marine vertebrate.
2. What are the advantages of a more complex organism?

#### Part 4: Show What You Learned (about 20 minutes)

Now, it's time to put it all together. Work with your partner to create a final product that shows what you have discussed.

Compare how different marine organisms (such as, fish, shark, whale, dolphin, penguin, ray, sawfish, turtle, octopus, or manatee) use their limbs (fins, flippers, lobes, arms, etc.) to meet their needs for survival. Identify patterns in how these different organisms use their physical structures.

**Provide evidence:** Collect screenshots of physical structures from 5-7 marine organisms depicted in the artwork. Organize them into a slideshow and use editing tools to label and explain the significance of each structure and the relationship between the organisms.

#### Extend Your Learning:

Many chapter books highlight science concepts in a format that is quite different from a science textbook. Choose a novel that includes science concepts as part of the plot. Create a book report that not only summarizes the story, but also explains the science that is highlighted in the book. To expand your understanding of the adaptations living things use to meet their needs for survival, read the classic novel, *Moby Dick* by Herman Melville.



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