

MS101 Unit 2: An Evolving Ocean

Slow Looking: Evidence of Changes over Time

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

- Identify favorable traits in marine organisms that are passed on from generation to generation.
- Recognize that physical adaptations that have evolved in predators and their prey over time help to keep balance in the relationship.
- Create a model that details physical adaptations that would be favorable traits to pass on to offspring.

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

Potential Misconceptions

- Favorable traits that help organisms survive are developed by chance.
- Traits that aid in the survival of a species are not passed on from parent to offspring.

Process and Procedures (about 40 minutes)

Part 1: Set the Stage (about 5 minutes)

Before you view the artwork you have selected, take a few minutes to think about what you already know about how life in the ocean has evolved. Share and discuss with your partner what you know about the topic using the statement and questions below to guide you.

Organisms best suited to survive in a particular habitat, like a marine environment, will reproduce in greater numbers, passing on those favorable traits to future generations.

1. Describe what you know about different organisms, both invertebrates and vertebrates that thrive in an ocean environment and how those organisms have changed over time.
2. What do you know about the types of traits that are useful for survival in a marine environment?
3. Can you think of any examples of favorable traits that a marine organism could pass on to future generations?

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:

Some changes that occur on Earth happen too slowly or over too much time for us to observe directly. Instead, we look for evidence to help us provide explanations for events that happened on Earth long ago. Think about what you know about how life on Earth has changed over time. Identify an adaptation in a marine organism depicted in the artwork that helps to explain how life on the oceans has changed over time. Explain why the adaptation would be beneficial to the organism and how passing it on to its offspring would help to ensure the survival of the species.

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.

Evolution of both predator and prey is inherently balanced over time.

1. What evidence did you see to support this claim?
2. How do the adaptations you saw help to provide explanations for how these creatures evolved?
3. Can you make a connection between the adaptations you observed and the environment the organism lives in?
4. What are the limiting factors, both biotic and abiotic, that could have influenced the evolution of such adaptations?

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.

Sketch a Diagram: Use drawing paper and colored pencils to sketch a diagram of a predator and its prey in their natural environment. Label the adaptations on the predator that help to make it a more efficient hunter and label adaptations on the prey that help it to avoid being caught and eaten. Write a paragraph to explain the benefit of passing on these traits to respective offspring and how these adaptations help to ensure the survival of each species.

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 plot, but also explains the science that is highlighted in the book. To expand your understanding of the evidence Charles Darwin based his ideas on, read the classic account of his famous expedition in *Voyage of the Beagle* written by *Charles Darwin*.











