

MS101 Unit 3: Ocean Ecosystems

Slow Looking: Modeling a System

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 systems and subsystems, and the components that make them up.
- Recognize that the matter and energy flow through a system.
- Create a model that explains how energy and matter flow through a system.

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

- Systems are self-contained and not influenced by outside factors.

Process and Procedures (about 40 minutes)

Part 1: Set the Stage (about 5 minutes)

Before you view the artwork, take a few minutes to think about what you already know about how the organisms in an ecosystem are interdependent. Share and discuss with your partner what you know about the topic using the questions below to guide you.

1. What do you know about the interdependence of organisms in an ecosystem?
2. Can you describe what you remember about the different ways that species in an ecosystem interact?
3. Do you remember any additional factors that influence how living things interact within an ecosystem?

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 what makes something a system. A system is organized. A system is made up of parts that form a whole. Identify a system that is represented in the artwork. Describe the components that make up the system. Identify any outside factors and forces that influence the stability of the system. Identify subsystems with your system. Explain how matter and energy flow through the system.

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.

A limiting factor is any environmental component that adversely affects the growth, distribution, or abundance of a population.

1. Can you identify the limiting factors that influence the system you identified from the artwork?
2. How do the limiting factors influence how energy and matter flow through the system?
3. In what ways could you communicate details about the system to others?

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.

Create a Model: Energy and matter flow through systems. A model can be used to show how the components of a system are interdependent and work together as a whole. Create a model that represents your system. Use drawing paper and colored pencils to sketch a diagram of the system you identified from the artwork.

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 interdependence of the biotic and abiotic components of an ecosystem, read the classic novel, *Call of the Wild* by Jack London.









