

COPR: Marine Algae (Seaweed)

Next Generation Science Standards

2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]

Lesson Plan: Marine Algae (a.k.a seaweed)

Aim

To introduce students to the study of algae (Phycology).

Objectives

- a. Students will learn that algae are classified into three categories: Red, Green, and Brown algae.
- b. Students will be able to differentiate between the different types of algae.
- c. Students will be able to understand the role algae plays in marine eco-systems.

Materials: 4 copies of *The Native Algae Field Guide of Santa Barbara* (1 for each pair of students and 1 for the docents)

Introduction: Have a few different piles of marine algae on the sand and have the students sit in a circle around the piles. Ask the students to use their senses to describe what they see. Ask them to smell and touch the algae. Explain that marine algae belongs to a large and diverse group of organisms called algae, which includes algae, protozoans and slime molds. The classification of algae is difficult and scientists do not always agree. Still other scientists believe that algae should be placed in a new group.

Show the students the picture of the six kingdom classification system, some scientists place algae in the **Protist** group and some in the **Plant** group. At this point let the students go off for a few (supervised) minutes and collect as many different types of algae as they can and bring them back to the circle. Discuss the best way to sort the algae into groups – color, texture, size....what is the best way to categorize marine algae? Describe all the parts of marine algae (page 54 in your KIN Journal)

Based on what you see, do you think there are different types of marine algae? How many?

There are red, green and brown algae. But not all marine algae can be differentiated by color since the sun tends to bleach the color from some types.

Why are marine algae important in the ocean and on the beach?

Algae are similar to higher plants in that they produce their own food from sunlight through photosynthesis. Algae creates important habitat, like kelp forests for marine life. Kelp is large brown seaweed that grows in cool waters close to the shore. On the beach, algae serve as food and shelter for animals such as invertebrates. *An invertebrate is an animal species that does not have a spine* – snails, insects, worms, clams, crabs, octopus and starfish.

Why are marine algae important to humans?

Humans use algae for many things.

Alginic acid, algin or alginate is found in the cell walls of brown algae.

Carrageenan is extracted from red marine algae and is used in cooking and baking.

Beta carotene is a natural pigment and is derived from green marine algae and is used for feed coloring.

What role does seaweed/marine algae play in the food web? Discuss the different parts that sometimes perform the same function.

Seaweed makes up a fundamental part of marine food webs because it helps create ecosystems. Algae are unique because they are the main primary producer for most ecosystems and act as both food and shelter for some marine organisms. What marine organisms use algae?

Marine algae provide animals with food and shelter. Kelp forests act as underwater nurseries for many marine animals, such as fish and snails. The lush blades form a dense forest canopy where invertebrates, fishes, birds, otters, and whales can find lots of tasty food and or sometimes a good home. Beautiful sea slugs and kelp crabs can be seen on the blades and stipes of the seaweeds, while other small marine animals like worms find their homes in the the holdfasts. Kelp forests are a huge food source for sea urchins and other grazing invertebrates.