**Are there Algae in Your House?**

**Teacher Instructions**

**Objective**

Students will understand that algae are a part of the resources that oceans provide to humans. By investigating household products, students will discover that the human senses are not enough to detect the presence of algae in food.

**Materials and Supplies**

Various food products (or just the containers)

Brownie mix, cheese, chocolate milk, coffee creamer, cottage cheese, egg substitute, evaporated milk, frozen foods and desserts, frozen yogurt, ice cream, infant formula, margarine, mayonnaise, multiple vitamins, pet food, pudding, relishes, salad dressing, sauces and gravies, sour cream, toothpaste, whipped topping, whipping cream, yogurt

Samples of brown, red, and green seaweed (from health or ethnic food stores) (optional)

**Background**

Although fish and other seafood products make delicious and healthy meals for people around the world, many American children would not object if they never had to eat another tuna casserole again. But would they object if there were no more cheese, chocolate milk, peanut butter, pudding, frozen desserts, or fruit drinks? What do these different types of food have in common? They are just a few of the foods that contain seaweed.

Many kinds of seaweed are eaten, because they are full of vitamins and iodine. Asian cultures use seaweed like Americans use green beans and carrots. Since Americans have not developed the same taste for seaweed, manufacturers use only derivatives from the seaweed. Alginate, carrageenan, and beta-carotene act as stabiliz- ers, thickeners, and colorants in the many American foods.

Seaweeds are not really weeds, but are large marine algae that grow in coastal waters. Algae include thousands of species from microscopic phytoplankton to huge floating or anchored “plants” seen washed up on shore.

The three main groups of algae are the brown, red, and green algae. They all provide important ingredients for manufactured foods.

* Carrageenan is a generic term for compounds extracted from a species of red algae used in stabilizing and gelling foods, cosmetics, pharmaceuticals, and industrial products.
* Alginates are extracted from brown algae and are used to make water-based products thicker, creamier, and more stable over extreme temperatures and time, making the food last longer.
* From green algae, the natural pigment beta-carotene is removed and used as a yellow-orange food coloring. It is currently believed to help prevent certain forms of cancer.

The seaweed derivatives are only a portion of the many products derived from ocean algae, animals, minerals, and seawater. Seaweeds and other marine organisms are also a source of unique molecules for marine-derived medicine. Together they provide many good reasons to protect Earth’s oceans.

**Activity**

This activity could be done in class with students or the teacher bringing in items or at home by students looking around their own home. Students should turn in a page showing what they find.

1. Show the class a few items with the algae derivatives, without mentioning that they come at least partially from the ocean. Ask students to guess what the foods have in common.
2. Explain that each product contains algae, which is used in many everyday foods and household items. Point out the nutrition label on the packaging. Show the students pictures or samples of brown, red, and green algae. Explain that the alginate, carrageenan, and beta-carotene are derived from the algae.
3. Ask students if they would ever eat seaweed or algae.
4. With the food items in hand, let the students hypothesize why they think the products contain algae.Have students fill out the worksheet.
5. Ask students to smell and taste the algae samples if possible.
6. Ask students why they think other cultures eat more algae than Americans do.

**Credits**

This activity is based on lesson plans from the following two websites:

* Neptune’s Web lesson plans for social studies (http://pao.cnmoc.navy.mil/educate/neptune).
* Smithsonian’s Ocean Planet There are Algae in your House! By B. Nalker and D. Casey. (http://seawifs.gsfc.nasa.gov/OCEAN\_PLANET/HTML/education\_lesson1.html).

**Resources**

Maine Coast Sea Vegetables . . . http://www.seaveg.com/

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Food Products Student Worksheet

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Product | Carrageenan | Alginates | Beta Carotene | No Algae |
| brownie mix |  |  |  |  |
| butter |  |  |  |  |
| cheese |  |  |  |  |
| chocolate milk |  |  |  |  |
| coffee creamer |  |  |  |  |
| cottage cheese |  |  |  |  |
| egg substitute |  |  |  |  |
| evaporated milk |  |  |  |  |
| frozen foods/desserts |  |  |  |  |
| frozen yogurt |  |  |  |  |
| ice cream |  |  |  |  |
| infant formula |  |  |  |  |
| margarine |  |  |  |  |
| mayonnaise |  |  |  |  |
| multiple vitamins |  |  |  |  |
| peanut butter |  |  |  |  |
| pet food |  |  |  |  |
| pudding |  |  |  |  |
| relishes |  |  |  |  |
| salad dressing |  |  |  |  |
| sauces and gravies |  |  |  |  |
| sour cream |  |  |  |  |
| soup, canned |  |  |  |  |
| toothpaste |  |  |  |  |
| whipped topping |  |  |  |  |
| whipping cream |  |  |  |  |
| yogurt |  |  |  |  |