IS THERE KELP IN YOUR CUPBOARD?

(This activity has been modified and reprinted with permission of the Monterey Bay Aquarium to include MA Science Frameworks)

Purpose: Students will use the activity sheet to find as many examples of the use of kelp in products in their home as they can. They will be asked to explain why the Kelp Forests are important to their daily life even though they do not live near one.

Grade Level: 4-8 (Can be adapted for use in other grades as needed)

Estimated Time to Complete Activity: This activity is a take home activity and will require minimal time in class to explain the activity, and then some added time in class as students list the items they found in their homes. Teachers should explain that they do not have to be confined to the kitchen, but they can look throughout their home.

Learning Outcomes:

* Students will learn to read the ingredients on products in the home
* Appreciation of how Kelp Forest products are found in their homes on a regular basis

Massachusetts Frameworks

* **Guiding Principle V**: Investigation, experimentation, and problem solving are central to science and technology/engineering education.
* **LS 3-5 (10)**: Give examples of how organisms can cause changes in their environment to survive. Explain how these changes effect the ecosystem.
* **LS 6-8 (13)**: Give examples of ways in which organisms interact and have different functions within an ecosystem enabling the ecosystem to survive.
* **LS 6-8 (16)**: Recognize that producers (plants that contain chlorophyll) use the energy from sunlight to make sugars and other products from carbon dioxide and water through the process of photosynthesis.

Vocabulary:

* Kelp
* Alginate
* Carrageenan
* Beta carotene
* Red, green and brown algae

Background: The ocean contains hundreds of different forms of plant life, with the various types of kelp being one group of these plants. Many kinds of seaweed are edible and rich in vitamins and iodine. They are as common in many Asian countries as green beans and carrots are in the United States. But until more people here develop a taste for sea vegetables, it is alginates, carrageenan, and beta carotene -- seaweed derivatives that act as stabilizers, thickeners, and colorants -- that end up on our dining room tables. Seaweeds are not really weeds but large forms of marine algae that grow in the coastal ocean waters of many countries. They include thousands of species ranging from microscopic plants called phytoplankton to giant floating or anchored plants.

This activity will help to show students how food products and other items in their home contain substances derived from kelp and other forms of algae. These products are used to help improve the quality of these products.

Procedure: Take part of the period to explain this home activity. Discuss each of the products from algae and explain what students are to do at home.

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(Cupboard - cont from page 9)

When students return, time should be taken to list the many items using the products from the algae in their home. Lists may be compiled from their sheets to lead a discussion of the importance of kelp and other algae in their daily life.

Teacher Background: The three main groups of seaweed are brown, red, and green algae, each providing important ingredients for the manufacture of food and other products. Carrageenan is a generic term for compounds extracted from species of red algae. Carrageenans are used in stabilizing and gelling foods, cosmetics, pharmaceuticals, and industrial products. From brown algae come alginates. They make water-based products thicker, creamier, and more stable over extreme differences in temperature, pH, and time. For example, alginates prevent ice crystals from forming in ice cream. Beta Carotene, a natural pigment derived from green algae, is used as a yellow-orange food coloring and may help prevent certain types of cancers.

Student Sheet: Print copies of the attached assignment sheet for the students to use in their detective work at home.

Teacher Key:

* Carrageenan ¥
* Alginate §
* beta carotene µ

Products Containing Algae (not a complete list) ¥ µ §

Brownie mix ¥ §
Cheese (yellow and orange) µ
Chocolate milk ¥
Coffee creamer ¥µ
Cottage cheese ¥
Egg substitute µ
Evaporated milk ¥
Frozen foods and desserts § µ
Frozen yogurt ¥
Ice cream ¥ µ
Infant formula ¥
Margarine µ
Mayonnaise µ
Multiple vitamins µ
Pet food ¥
Pudding (cooked) ¥
Relishes ¥ §
Salad dressing § µ
Sauces and gravies¥§
Shampoo §
Sour cream ¥
Toothpaste ¥
Whipped topping ¥ µ
Whipping cream ¥
Yogurt ¥

(Some material is from "Algae in your Home" from the Smithsonian Institution)

(Cupboard - cont on page 11)

Is There Kelp in Your Cupboard?

(Cupboard - cont from page 10)

Do you have kelp in your house? Chances are you do! Kelp and other seaweeds are used in a variety of common foods and household items like toothpaste, frozen desserts and salad dressings.

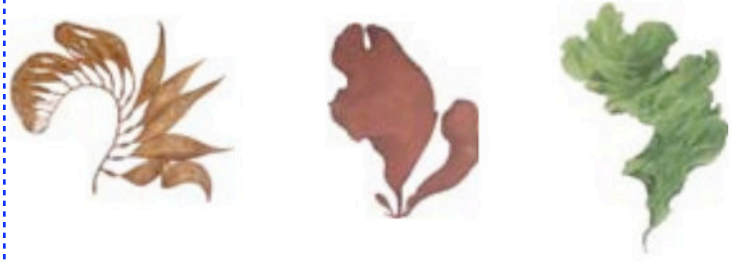
Be a seaweed sleuth and see what food or other products you can find that contain algae! Need help getting started? Read the information below, then look at the ingredients in toothpaste, ice cream and pudding.

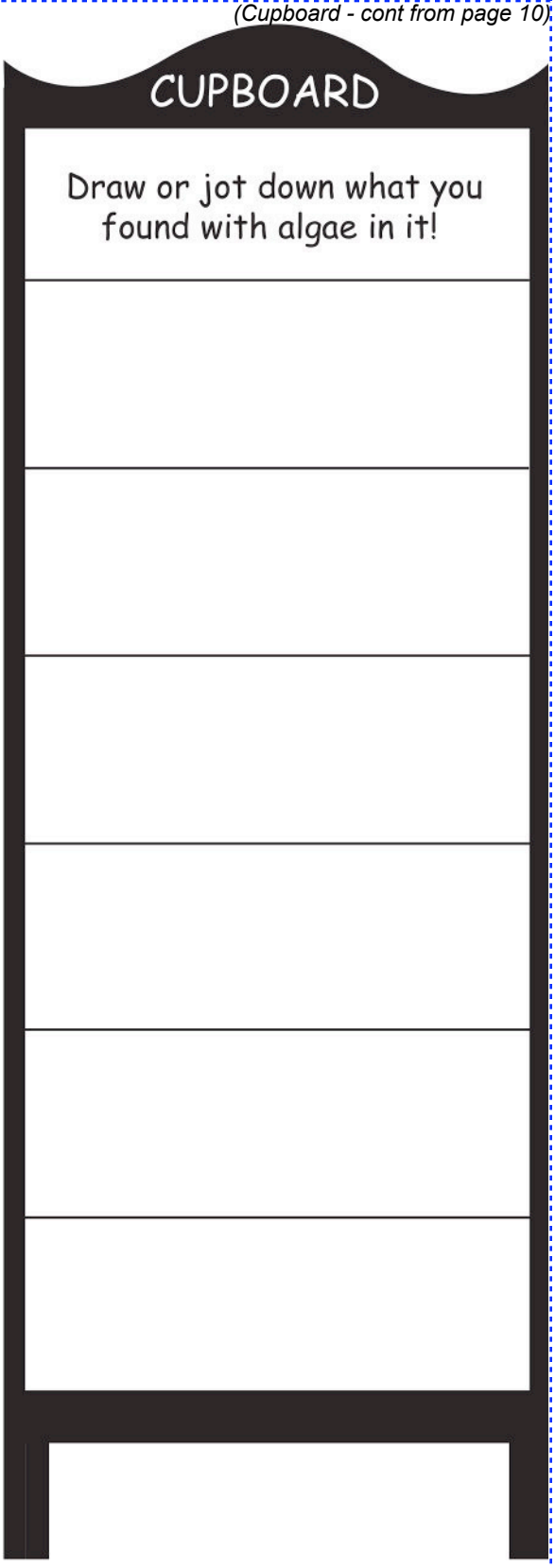
Helpful Hints:
Seaweeds are large ocean plants called algae. The three main groups of seaweed are **brown**, **red** and **green** algae, each providing important ingredients for the manufacture of food and other products. **Alginate**, **carrageenan** and **beta carotene** are the names for the algae products you might find in foods or other products in your cupboards. These seaweed derivatives help ingredients mix together and form thick, gooey gels.

Alginates come from brown algae like giant kelp, *Macrocystis porifera*. Alginates help oil and water mix together to form smooth liquids. They are used in a wide variety of foods including desserts, milkshakes, dairy products, canned foods, frozen foods, salad dressings, cake mixes and meringues. Alginates are also used in the manufacture of drugs, cosmetics, building materials, livestock and poultry feed, fertilizers and beer.

Carrageenan is an ingredient found in many kinds of red algae. It's used to gel foods like ice cream, cosmetics, medicine and other products.

Beta carotene is a natural pigment derived from green algae and other sources. It is used as a yellow-orange food coloring and may prevent certain types of cancers.





http://www.montereybayaquarium.org/lc/activities/kelp_cupboard.asp