Denver Urban Gardens School Garden and Nutrition Curriculum

What Are Whole Grains?

Lesson

Goals

Students will understand what whole grains are, why they should eat them and how to prepare a healthy snack with whole grains.

Objectives

Students will discuss what whole grains are using MyPlate and pictures of whole grains. Students will prepare a healthy snack using whole grain rolls.

Colorado Academic Standards

Science: Life Science

GR.2-S.2-GLE.2
GR.5-S.2-GLE.1
GR.5-S.2-GLE.2

Comprehensive Health: Physical & Personal Wellness in Health

GR.2-S.2-GLE.1
GR.5-S.2-GLE.1
GR.6-S.2-GLE.4

Total Time – 60 minutes

Did you know?

A food's color is not helpful in identifying whether it contains whole grain ingredients. Dark or brown bread is often a whole grain food, but it may just have molasses or caramel food coloring added. Alternatively, whole grain foods may be light in color, such as those made from oats.
Only 1 in 10 Americans eat the recommended amount of whole grains (3 servings).

Materials

- MyPlate
- Examples of whole grains (dried corn, oats, wheat berries, brown rice, quinoa, etc.)
- Wheat bran
- Paper towels
- Plastic bags
- Pictures of whole grains and the plants they come from

Background for Teachers

Whole grains are higher in fiber and about a dozen vitamins and minerals than enriched white flour. Fiber is found only in plants, in the non-digestible outer coating of grains (the bran layer), fruits and vegetables. Examples of whole grains are wheat, oats, corn, barley and rice. Grains are members of the grass family and germinate with one cotyledon (they are monocots). Processed grains (white, wheat or enriched bread) began life as whole grains but had their bran layer removed (which also removes many of the vitamins and minerals) in the manufacturing process. They then need to be enriched with added nutrients before they can be sold.

Follow up this lesson with the Fun with Fiber lesson:
http://dug.org/storage/school-garden-curriculum/Fun_with_Fiber.pdf.

Method

Introduction (15 minutes)

1. Display MyPlate to the class and review the food groups. Remind the class that half of their grains should be whole grains. Ask the class if they know what whole grains are.

2. Discuss the information in the background section. Start with discussing what whole grains are and why they are beneficial to eat. Make sure to emphasize the importance of eating fiber and the vitamins and minerals found in the bran layer.

Activity (25 minutes)

1. Display or hand out the image of the wheat kernel. Talk about each part of the kernel (the bran layer, the endosperm and the germ) and the different components of each (bran-fiber, endosperm-carbohydrates and germ-vitamins and fats).

2. Pass around examples of whole grains so the class has a chance to touch and smell them. Bringing in examples of the actual grains is great because it gives the students a chance to see them in their raw form. While talking about each grain, display images of that grain growing, so students have an understanding of what each plant looks like.

3. Explain that grains are examples of monocotyledons, which means they have one seed leaf. Compare this to a dicotyledon (beans), which have two seed leaves. Explain to the class that they will learn the difference between the two through a germination experiment.

4. Put a few wheat seeds in a moist paper towel. Make sure this is flat and put inside a sealable plastic bag. Do the same with a couple of beans. Each day have a student open the bag and gently blow on the seeds. The wheat and beans should sprout within one week. Make sure all the students see the difference between the two types of sprouts.

Conclusion (5 minutes)

Have students write a list of whole grains in their journals.

Snack (15 minutes)

Have students assemble their Boo-Wiches or Fruit Rice Cakes. Emphasize the difference in whole grains versus refined grains.

Assessment Tools

- Journals
- Presentation of Boo-Wiches or Fruit Rice Cakes

Modifications

- Make this a two-day lesson with the extensions below and use both recipes.

Extensions

- Discuss the origins of the various grains and point it out on the map.

- Discuss the process of growing and processing of different grains. Consider showing pictures of grain mills, mortar and pestle or other grinding mechanisms.

Supplemental Materials

- Wheat images: http://en.wikipedia.org/wiki/File:Wheat_close-up.JPG
- Corn images: http://en.wikipedia.org/wiki/File:ZeaMays.jpg
- Oats images: http://en.wikipedia.org/wiki/File:Avena_sativa_L.jpg
- Rice images: http://en.wikipedia.org/wiki/File:US_long_grain_rice.jpg
- Quinoa images: http://en.wikipedia.org/wiki/File:Chenopodium_quinoa_in_flower.jpg

Boo-Wiches

These sandwiches give students a chance to get creative with their food, while eating a healthy low-fat, high-fiber snack.

- Whole grain rolls
- Low-fat cream cheese or hummus
- Condiments of choice (salsa, ketchup, etc.)
- Various vegetables (lettuce, olives, celery, cucumbers, carrots, tomatoes, cabbage, etc.)
- Herbs for decoration (dill, parsley, cilantro, etc.)

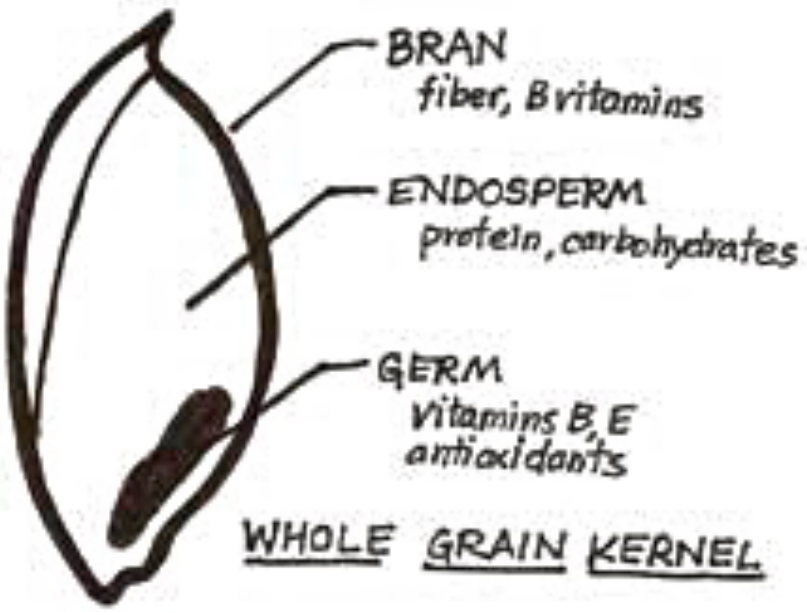
Preparation (10 minutes): Cut each roll in half and spread the cream cheese on one side. Now get creative! Give it a ghoulish touch by using the garnishes to make faces. What do you have to make eyes? Olives work great, especially pimento-filled green olives sliced in half. Carrots cut in rounds about 1/4 inch thick will do the trick. What about hair? Many herbs will fit the bill and add a touch of flavor, too.

Fruit Rice Cakes

This snack is a good source of B vitamins, fiber and protein with added antioxidants from the berries.

- Whole grain rice cakes
- Natural almond butter (no added sugar)
- Preserves, such as strawberry or raspberry (use a variety that is sweetened with plain fruit juice)
- Fruit, such as raspberries, banana slices or blueberries

Preparation (10 minutes): Spread each rice cake with almond butter and fruit preserves of your choice. Decorate with a few pieces of fruit.


BRAN
fiber, B vitamins
ENDOSPERM
protein, carbohydrates
GERM
vitamins B, E
antioxidants
WHOLE GRAIN KERNEL