



Upper Valley Farm to School Network Community Curriculum Project

February 2013 – Whole Grains

Overview: Students will taste different foods made with whole grains, and discuss how each tastes. They will play a grain identification game. They will examine intact wheat stalks and “dissect” them, and then learn about the different parts of a wheat seed by looking at examples of each part and discussing the nutrition in each part. Through these activities, they will learn the difference between whole grains and refined grains, and why it is important to eat whole grains. They will write about what they learn in their Community Curriculum Project journals.

Focusing Question: Why whole grains?

Standards Addressed:

VT Standard 7.13: The Living World: Organisms, Evolution, Interdependence: Students understand differences among living organisms, understand the role of evolution, and recognize the interdependence of all systems that support life. This is evident when students:

- a. Identify characteristics of organisms (e.g., needs, environments that meet them; structures, especially senses; variation and behaviors, inherited and learned);
- b. Categorize living organisms (e.g., plants; fruits, vegetables)

VT Standard 3.5: Healthy Choices: Students make informed, healthy choices that positively affect the health, safety and wellbeing of themselves and others. This is evident when students:

- g. Can identify and classify foods according to the Food Pyramid Guide.*

* The Food Pyramid Guide is no longer in use; we assume that this standard now refers to MyPlate, the current visual for the USDA dietary guidelines.

Common Core State Standard for Writing: Text Types and Purposes: 2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization and analysis of content.

Materials:

- Cardstock for journal
- Diagram of *A Kernel of Wheat* (one copy for each student or pair of students, or a single copy to project)

- Stalks of wheat
- Bag of white flour, bag of wheat berries, bag of whole grain flour to demonstrate processing.
- For “Match the Grains” activity:
 - Match the Grains activity sheet
 - Match the Grains bags (2 of each containing: bulgur, brown rice, barley, amaranth, spelt, millet, quinoa, popcorn, rolled oats, steel cut oats, whole wheat flour, wheat bran, wheat berries, rye berries, cornmeal, buckwheat, and all-purpose white flour)

Preparation: Be prepared to spend 30 min to 2 hours cooking whole grain foods for taste test- options and recipes listed in directions, choose whichever option fits your schedule and interests.

Procedure:

1. Hand out the teacher survey:

Before you start, give the teacher a copy of the survey, and ask if they can fill it out at the end of the lesson before you leave.

2. Introduction (5 min):

Ask the class, “Does anyone know what a whole grain is?” (Wait for responses.) Explain to participants that whole grains contain all the pieces of the grain, while refined grains are missing some parts of the grain. Demonstrate visually with bags containing wheat berries, whole-wheat flour and white flour. Ask, “Where do grains come from?” and review with students that grains come from plants we grow on farms, and that the parts of grain plants that we eat are the seeds. Tell them that grains can be & are grown in New England! “Today we are going to get a look at whole wheat seed close up to see what ‘whole grain’ really means.”

3. Dissection/Observation of Seeds (10 min):

Hand out diagram of *A Kernel of Wheat*, or if you have access to a Smartboard, the diagram can be projected on the board instead of handing it out. Read through all the different parts of the seed.

- *Germ:* The germ is the embryo, or the baby plant. It contains high quality proteins, b-complex vitamins and minerals.
- *Endosperm:* Endosperm contains the food for the seed. It contains protein, carbohydrates, iron, and the major b vitamins. It is a source of *soluble fiber*.*
- *Bran:* Is the outer layer of the kernel, contains a high amounts of B Vitamins, *insoluble dietary fibers**, minerals, and a small amount of protein

*We need both soluble and insoluble fibers in our diet.

When wheat is processed into white flour it is only the endosperm that is used. When we use the whole grain, we get the benefit of all the nutrients in the whole seed.

Hand out wheat stalk, or wheat berries if stalks are not available. Students will dissect the stalk, find a seed, and dissect a seed to see the parts of the seed.

4. Journal Writing (10 min):

Students will draw a diagram of their seed in their journal, and write some of the information they have just learned about whole grains.

- Kindergarten: Students may draw the wheat seed and stalk, and title the illustration “Wheat seed” or “Whole Grain”
- Grades 1 and 2: Students will title the illustration “Wheat Seed” or “Whole Grain,” and label the endosperm, bran and embryo.
- Grades 3 and 4: Students will title and label the parts in their diagram, and will answer with a full sentence the question: “Why are whole grains healthy?”

5. Match the Grains Activity (10 min):

Note: For younger students, you may want to leave this activity out, or use a smaller number of grains that are easy to distinguish.

“Wheat is a common grain we eat, but there are many grains out there. All whole grains are good for us, and provide our bodies with carbohydrates proteins, fibers and vitamins and minerals. In this matching game, we will see some of the many different types of grains we can eat.”

For large groups- Sitting in a circle, hand out bags of grains labeled with numbers, with two of each kind of grain in the bag. When everyone has a bag of grain, they will observe it, and walk around the room and compare their grain to their friends’ grains. When students have found their match, the whole group will work together to identify each grain. When students have found their partner, join back together in a circle, instructing the children to keep their bag on the floor or desk in front of them. “Boys and girls, listen carefully, because I am going to read some descriptions of these grains, and you need to be a detective and figure out whether I’m describing your grain. After I’ve read a description or clue, if you think I am describing your grain, raise your hand.” Read aloud the descriptions of the different grains. Students may raise their hands if they think they have the grain you are describing. Sometimes descriptions will be similar and you will have to identify the actual grain for the students.

In a smaller class you may give each student their own type of grain. Once each child has their grain, they may walk around the classroom comparing the shape and size of their whole grain, or flour. Come back to circle sitting next to people whose grains look similar.

Variation: Fill some bags with processed foods - this can be a separate exercise, or bags with processed foods can be added into the mix. Here are some examples of processed foods made from a few of the whole grains used in this activity:

- Popcorn kernels: popped corn
- Corn meal: corn chips
- Oatmeal: granola

- Whole wheat seeds/berries: whole wheat flour- whole wheat bread, whole grain pasta
- Brown rice- brown rice cakes

6. Whole Grains Taste Test (10 mins)

Have children wash their hands to taste one or more foods made with whole grains. Record students' reactions in a chart. Options for taste tests include:

- Whole grain bread
- Brown rice cakes
- Wheat berry salad
- Quinoa salad
- Whole grain muffins
- Baked oatmeal
- Brown rice sushi with veggies
- Popcorn

See appendices for recipes.

Extensions:

Grind your own flour:

Bring in a grinder to demonstrate processing grains! If you don't have a manual or electric grain grinder, a coffee grinder can work well.

Little Red Hen:

We've all heard the story of the Little Red Hen before, but know that we know so much more about growing and harvesting grains. Students may create skits using more details of each of the steps involved in making bread.

Planting grain, watering, harvesting, threshing to remove the grains from the stalk, milling grains, and baking.

Making Crackers:

To make your own whole wheat crackers is easy! If you have access to an oven, the dough can be mixed in less than five minutes. Do this at the beginning of the lesson and the crackers will be ready to eat by the time you're finished teaching!

Ingredients:

- 2 cups whole wheat pastry flour
- 1/3 cup olive oil
- 2/3 cup warm water
- 1 teaspoon salt

Directions: Combine ingredients in a bowl. Roll out dough on greased cookie sheet. Bake at 350 for 15-25 minutes or until golden brown. Let cool and enjoy. *Experiment with herbs, seeds or cheeses to make the recipe your own.*

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This lesson was developed by Chloe Powell, with assistance from Aurora Coon, Cat Buxton, Karen Ganey and Keenan Haley.

Appendices:

1. Diagram of *A Kernel of Wheat*
2. Match the Grains activity sheet
3. Whole grains recipes take-home

Background Information:

- The recommended amount from the grain group is 3-10 one-ounce equivalents, depending on calorie needs.
 - In general 1 slice of bread, 1 cup of ready to eat cereal, or ½ cup of cooked rice, pasta or cereal can be considered a one-ounce equivalent.
- Whole grains provide carbohydrates, protein, fiber, vitamins, and minerals. Carbohydrates are important as the body's main source of energy.
- It is recommended that at least half of your grains servings come from whole grains.
- Whole grains contain the entire grain-the bran, germ and endosperm.
- Refined grains have been processed. In the processing, the bran and germ are removed, which removes much of the B-vitamins, iron and dietary fiber.
- Grains are grasses! Most of the grains that we eat are grasses cultivated for their seeds. Quinoa and buckwheat are exceptions to this rule and are not true grasses, and are considered "pseudocereals".
- Many different kinds of grains can be ground and cooked into a hot breakfast cereal (not just oats), including millet, quinoa and amaranth!
- Grains are grown locally – Green Mountain Flour and Butterworks Farm sell flour made with Vermont grains. Hurricane Flats Farm in South Royalton, VT and Riverview Farm in Plainfield, NH both grow & sell popcorn.