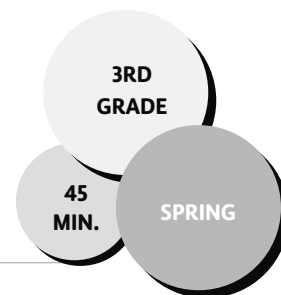


Whole Grain Crackers

THEME: PREPARING NOURISHING FOOD



ESSENTIAL QUESTION

Why are whole grains an important part of a nutritious diet?

LEARNING OBJECTIVES

- ✓ Students will be able to describe the difference between whole wheat and white flour.
- ✓ Students will be able to explain why eating whole grains is important.

CONCEPTS

wheat berry parts whole grains

ENGAGING THE CLASSROOM TEACHER

- Prior to the lesson, discuss whether the teacher is comfortable overseeing the grinding flour station, if using, or another station of your choice.
- Discuss with the teacher whether students are prepared to read nutrition labels.
- Determine whether there is another adult who can supervise a third station or whether students can work individually at one. Adjust your plan accordingly.
- During Action Step 3, suggest that the teacher supervise a station while you help students make crackers.

LESSON DESCRIPTION

In this lesson, students learn about what comprises a whole grain through exploring different flours, comparing and contrasting white and whole wheat products, and participating in other activities. They then make whole grain flatbread crackers. (It would be helpful to have an adult volunteer to supervise students as they use the toaster oven.) This lesson is designed to be taught in conjunction with the lesson *Breaking Down Rocks, Building Up Bread*.

MATERIALS

- 1 wheat berry for each student
- Wheat Berry Diagram (p. 385)
- Wheat Berry Coloring Sheet (p. 486) and pencil for each student
- Crayons or colored pencils
- Mortar and pestle (or a wheat grinder if you have one)
- 2 cups of wheat berries for grinding
- 5 small bowls, each with one of 5 different flours (buckwheat, spelt, whole wheat, all-purpose white flour, cornmeal)
- Food packaging containing whole grain and white flour ingredients
- 2–3 rolling pins (if you don't have rolling pins, students can flatten dough with their hands)
- Flatbread Cracker ingredients (see recipe)
- All-purpose flour for dusting
- Flexible cutting mats
- 1 pizza slicer, 1 set of cookie cutters (a variety is fun, but make sure they are roughly the same size for even cooking time), or 1 knife

- Vinyl tablecloth
- Toaster oven
- Extension cord
- 2 cookie sheets
- 1 cup seeds for topping crackers (sesame, poppy, etc.)
- Materials for cleanup

PREPARATION

- › Make the cracker dough. Divide the dough into four evenly sized balls (one for each group)
- › Set up four stations in the room for students to rotate through during the exploratory phase of the lesson. (See Action Step #2 below for a description of what to include at each station.)
- › Display the Wheat Berry Diagram.
- › Photocopy Wheat Berry Coloring Sheet for each student.
- › Set up space for the toaster oven, and pre-heat it to 500°F.

FLATBREAD CRACKERS

Yield: 55 1 ½-inch crackers

- 1 cup whole grain flour (whole wheat, spelt, etc.)
- 1/4 teaspoon salt
- 2 tablespoons + 2 teaspoons canola oil
- 1/2 cup water
- Sea salt
- 2 teaspoons minced rosemary, thyme, or other herb from garden (optional)

- Mix flour, salt, and oil with a fork until crumbly and mealy.

- Add 1/4 cup water, stirring while you add.
- Switch to kneading by hand when dough gets difficult to mix with a fork. Add water as necessary, until dough forms a firm ball. It should not be sticky.
- Flour rolling pin and roll out dough as thinly as possible. You should be able to see through the dough. Use cookie or biscuit cutters or a sharp knife or pizza cutter to cut crackers into desired shape.
- Reroll scraps and repeat.
- Sprinkle with choice of seeds and/or sea salt.
- Bake crackers for two to three minutes, until they puff up and brown, and then flip and bake them for one to two minutes more. They burn quickly and will still be pliable until they cool, so don't worry about underbaking them.

ACTION STEPS

1. Engage: Pass out a wheat berry to each student, and ask whether they know what it is. If students answer that it's a seed, encourage them to guess what plant it grows into. Say, *We're going to make crackers today! What do you think we'd need to do to turn these into crackers?* Discuss students' responses. Explain, *This is called a wheat berry, and it contains the seed to plant a wheat plant, but it's also what we grind down to create flour for making bread and other baked goods.* Tell students they can chew on their wheat berries and eat them if they'd like to. **(5 min.)**

2. Labeling a Wheat Berry: Show students the Wheat Berry Diagram, saying, *Do you know that inside a seed is a tiny baby plant ready to grow? The baby plant is called the germ. A seed is very smart! It packs all the things it needs. The bran is the protective shell the seed wears like a raincoat. It has lots of fiber that*

helps with our digestion. The endosperm is like the plant's lunch bag. It has starch, which is a type of sugar. This is to give the baby plant a boost of energy when it's ready to grow. It has vitamins, minerals, and protein that the plant would rely on to grow bigger. All the different parts together have vitamins, minerals, and protein. When we eat white flour, it's made just from the endosperm, the starchy, energy-boost part of the grain, but that means it's missing some of the fiber, vitamins, and protein from the bran and the germ. When we say something is a whole grain or whole wheat, that means that when it was processed, all three parts of the seed were kept. Pass out the Wheat Berry Coloring Sheet, and have students label and color their own wheat berry diagram. Consider having them draw a coat or umbrella next to the bran, a lunchbox next to the endosperm, and a baby plant or sprout next to the germ, to help remember each part's function. **(10 min.)**

3. Stations: Have students rotate through stations, spending five minutes at each station. Tell students the signal you'll use, such as clapping, call-and-response, or a chime for when they should switch to the next station. Place yourself at the cracker-making station to guide students through this process. Students can work at the other stations independently with the classroom teacher supervising. **(20 min.)**

a. Grinding Flour: While introducing this station, say, *To make flour, people grind down grains. You can use a grinder or big machines, but today we're going to do it the simplest way we can.* Set out a mortar and pestle and one quarter cup of wheat berries for each group. Have students take turns using the mortar and pestle to grind

the wheat berries. You might consider giving students a song to sing for each person's turn, so they know when to switch.

b. Flour Sensory Exploration: While introducing this station, say, *There are flours made from different types of grain here. Feel them, smell them, just don't taste them. Count how many different colors you can find in each flour. Then see if you can figure out which are whole grains and which are white flour.* Set out bowls of 4–5 distinct flours that students can touch and smell. You can write the name of each flour on a separate index card, and have students try to match the labels to the flours. Perhaps have the question, *Which is a whole grain?* written as a prompt as well.

c. White vs. Whole Wheat Products

Scavenger Hunt: While introducing this station, say, *Many products say "Made with whole grains!" on the package. The only way to know how true that is, however, is to read the Nutrition Facts. Look at each of these packaged foods, make a guess as to whether you'll find whole grains in the ingredient list, and check the list to see if you were right.* Display food packaging for different wheat products, and have students find the whole grain products versus white flour products.

d. Making Crackers: While introducing this station, say, *I've prepared a dough with whole grain flour for us to make flatbread crackers. When it's your turn at this station, you'll wash your hands and then roll out the dough as thin as you can get it and add seeds. Then we'll bake our crackers!* Set out cutting mats, rolling pins, cookie cutters,

and a couple small containers of flour for dusting. Give each student a small portion of the dough ball to roll out until it's so thin you can almost see through them. You can reroll the scraps and set them aside, or make extra if you have the extra hands and capacity. Give students the option of sprinkling seeds and/or sea salt, modeling so they don't add too much. Bake crackers for two to three minutes, until they puff up and brown, and then flip and bake them for one to two minutes more. They burn quickly and will still be pliable until they cool, so don't worry about underbaking them.

4. Tasting: Pass out crackers to each student. If students rotated within table groups, you can pass each group's crackers back to them.

(5 min.)

REFLECTION

Have students discuss the following questions in small groups, then share with the class: **(5 min.)**

Social and emotional learning

- *What was your favorite part of the activity?*
- *What was challenging about the activity?*
How could you work on that to make it better?

Check for understanding

- *What is the difference between whole grain flour and white flour?*
- *How do you make whole grain flour versus whole wheat flour?*

ADAPTATIONS

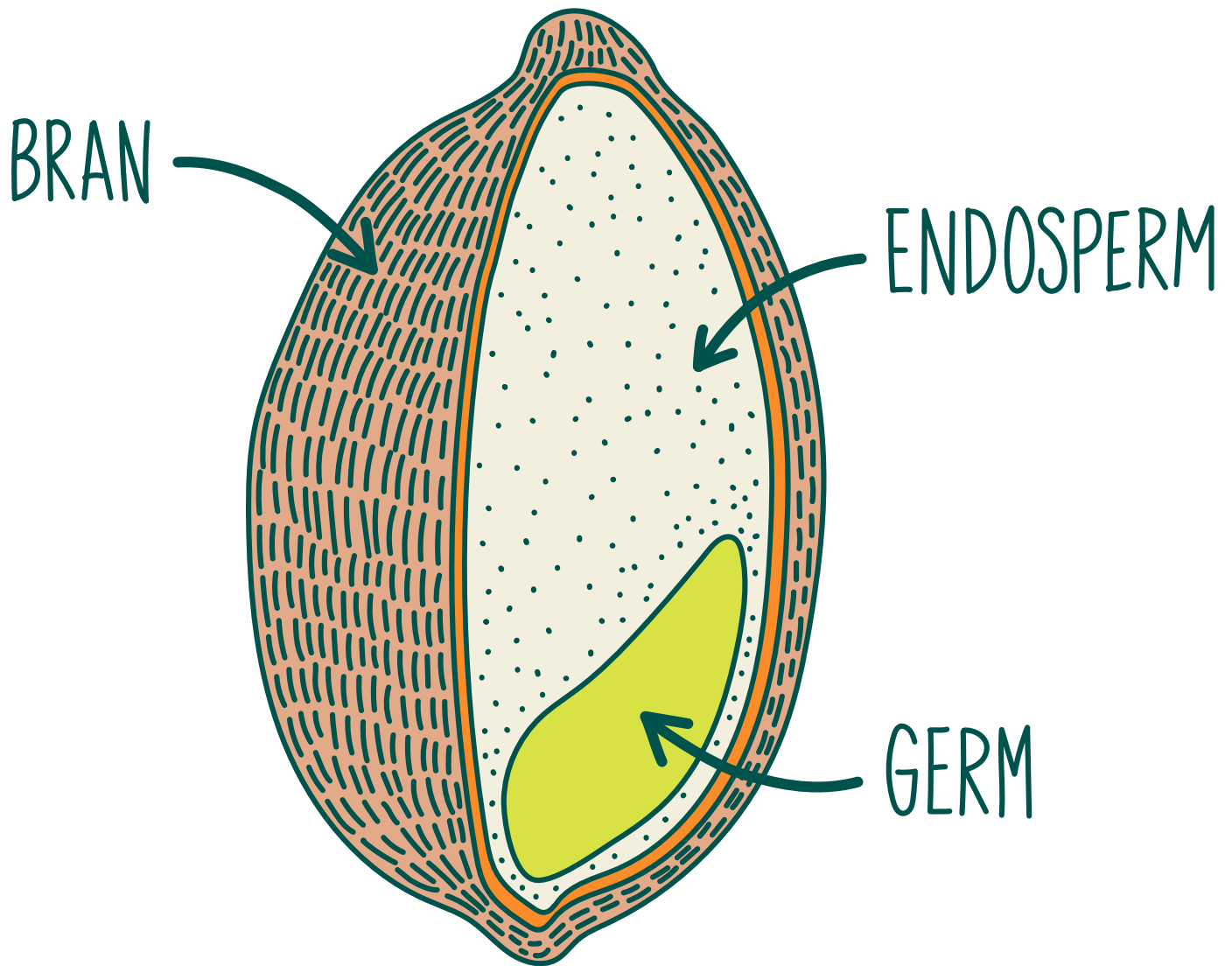
Matching Game Variation: In addition to the sensory exploration, provide students with intact whole grains to match with their corresponding flours.

Cooking Extension: If you have the time and resources, consider baking bread with students.

Science Extension: If you have access to whole wheat plants, have students dissect wheat berries from the chaff.

Classroom Extension: After this lesson, have students create a cartoon or poster showing the cycle of how bread or crackers are made.

Wheat Berry Diagram



Name: _____ Date: _____

Wheat Berry Coloring Sheet

Directions: Color and label each part of the wheat berry.

