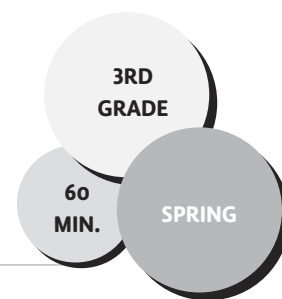


# Breaking Down Rocks, Building Up Bread

**THEME:** EXPLORING THE ECOLOGY OF FOOD



## ESSENTIAL QUESTION

*How can all the foods we eat be traced back to natural resources, including rocks?*

## LEARNING OBJECTIVE

✓ Students will be able to explain how diverse grains from around the world can be traced back to plants that grow in soil made, in part, from eroded rocks.

## CONCEPTS

erosion   grains   staple foods   whole foods

### *Engaging the Classroom Teacher*

- Prior to the lesson, ask the teacher about students' familiarity with the process of erosion.
- During Action Step 2, suggest that the teacher help coordinate students who are holding the next prop to get up and stand in the appropriate space in the line.
- During Action Step 4, suggest that the teacher circulate through the room to different groups to support them in figuring out the steps in their rocks-to-grain story.

## LESSON DESCRIPTION

In this lesson, students read a book about how bread is a staple food around the world. They then use a variety of props to explain how

bread originates from plants that grow in soil made, in part, from eroded rocks. Finally, they work in small groups to explain how different staple grains from cultures around the world can all be traced back to natural materials, including rocks. This lesson is designed to be taught in conjunction with Flatbread Crackers and Tortilla Time.

## MATERIALS

- *Bread, Bread, Bread* by Ann Morris or *Bread is for Eating* by David and Phyllis Gershator
- Rocks-to-Bread Props (in mason jar or zip lock bags)
- Rocks-to-Bread Cards (pp. 380–390)
- 5 zip lock bags (1 for each set of cards)
- Loaf of whole wheat bread, sliced (optional)

## PREPARATION

- › Gather objects for props including the following:
  - › Rock
  - › Something to represent wind (such as a folding fan that says “wind” on it or a paper cutout of something blowing in the wind)
  - › Something to represent sunlight (such as a fake tealight candle, flashlight, or paper cutout of a sun)
  - › Worm in some soil or a picture of a worm (if using a real worm, make sure to add some soil and some air holes to the jar)

- › Jar of water
- › Jar of soil
- › Jar of wheat seeds
- › Jar of wheat stalks (or any grass to represent these)
- › Jar of flour
- › Jar of yeast
- › Jar of salt
- › Copy and cut out Rocks-to-Bread Card sets, according to the amount of students and use blank cards if need be. Put each set into separate bags.
- › Slice bread to have a piece for each student, if using.

### Rocks to Bread Key

Corn Tortilla—rock, wind, sun, worm, water, farmer, soil, corn on plant, corn kernel, sprouted corn, masa mix, salt, tortilla

Oatmeal—rock, wind, sun, worm, water, soil, farmer, oat plant, oat seed, oatmeal

Rice Noodles—rock, wind, sun, worm, water, soil, farmer, rice, rice flour, rice noodles

Naan (Indian wheat flatbread)—rock, wind, sun, worm, water, soil, farmer, wheat plant, wheat flour, yeast, cow, milk, butter, salt, yogurt

Soba Noodles (Japanese buckwheat noodles) — rock, wind, sun, worm, water, soil, farmer, buckwheat plant, buckwheat flour, wheat plant, wheat flour, buckwheat noodles

## ACTION STEPS

**1. Reading:** Gather students in a circle and read a book about bread such as *Bread is for Eating*,

which introduces the idea that bread is a food around the world and discusses all that goes into making a loaf of bread. Explain, *Bread is called a staple food because people eat it regularly and get a lot of their energy from it.* Ask students, *What are other staple foods you and your family eat? (10 min.)*

**2. Rocks-to-Bread:** Ask students, *Do you know that bread comes from rocks?* Have students explain how they believe that could be, and say, *I've brought clues to show you how, but you'll have to solve it yourselves.* Ask for volunteers, and randomly pass out objects that represent each part of the process. Explain that they're going to use these props to show the different steps involved in making bread. Say, *So if bread starts with a rock, which object do you think comes next?* Have students guess and together, call up the sun, water, wind, worms, plants, and soil, putting these props together to describe the process of erosion and decomposition that builds soil. Then say, *Now we have our soil thanks to erosion! What comes next?* Continue having students guess the next step, having the student with that prop stand up in line. For the process of growing grain, have students call up the wheat seed, water, sunlight, and wheat stalk, explaining how grains grow. Finally, have students identify the bread ingredient props (wheat stalks, wheat flour, yeast, salt, and water), and use these to describe the process involved in turning those grains into flour, and, ultimately, into bread. Several of the items may be used more than once, for example water, which is part of erosion, a growing plant, and making bread. Add props as needed for the size of your group, for example, an oven and a farmer. **(10 min.)**

**3. Discussing:** Ask students to make observations of the order of steps they've created. Ask, *What other things that you eat are made from flour?* Field responses such as pasta, tortillas, cookies, cake, and then say, *All flour comes from grinding down a whole grain or seed grown from a plant. We're going to explore other staple grains that people from different cultures eat as a regular part of their diet. (5 min.)*

**4. Telling a Rocks-to-Grain Story, Small Groups:** Divide students into groups, and pass out a set of cards to each group. Ask students to work in teams to use their cards to tell a story about growing that crop, starting with rocks and ending with their final dish (i.e., a tortilla or naan). Remind students that they'll likely need to use some of the pictures in more than one place in the story. Circulate through the room while students are sorting through cards with their groups, providing guidance and support where needed. **(10 min.)**

**5. Whole-Class Sharing:** Have each group present their story to the class. Encourage students to see how water and sunlight (or heat) are used over and over again, at each stage of the process: erosion, growing the grain, and making the staple food. **(15 min.)**

**6. Tasting:** Pass out a small slice of bread to each student. As students taste the bread, have them name all the "ingredients," starting from rocks, that went into making it. **(5 min.)**

## REFLECTION

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

### Social and emotional learning

- How did your group work together to figure out the puzzle of your rocks-to-grain story?

### Check for understanding

- What is a grain? What is a staple food?
- What are some of the ingredients that had to work the hardest? Which ingredients in the process were used again and again?
- How did your group figure out how to get from soil to your staple food?

## ADAPTATIONS

**At Home:** Have students work with their caregivers to make a list of staple grains they eat at home. Then have them share these with one another or with the whole class.

**4th Grade NGSS:** This activity can be used in conjunction with a geology unit related to the following standard: NGSS: ESS2.A: Earth Materials and Systems. Rainfall helps shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soil, and sediments into smaller particles and move them around. (4-ESS2-1)

**Song:** Learn the song "Dirt Made My Lunch" by the Banana Slug String Band, and sing it with students.

**Soil Composition Extension:** Have students fill a quart jar halfway with a soil sample from your garden. Then have them fill the rest with water, tighten a lid on top, and shake vigorously until the soil clumps are broken up. After one day, the soil should settle into distinct layers of silt, sand, and clay.

**Cooking Demonstration Extension:** To help students better understand the process of making bread, consider doing this lesson over several sessions and making bread together before Action Step 4. Then students will be able to compare their staple grain food with the bread you make together as a class.

## **ACADEMIC CONNECTIONS**

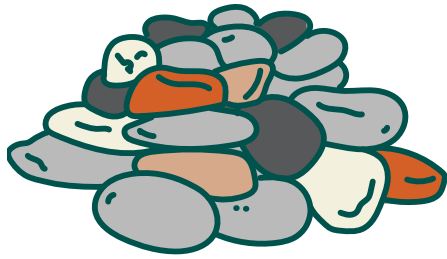
English Language Arts Common Core State Standards

### **CCSS.ELA-LITERACY.RL.3.1**

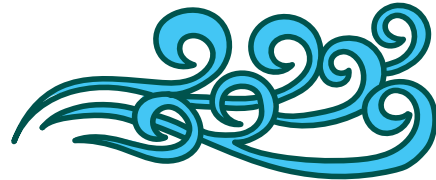
Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

# Corn Tortilla

Corn tortilla is a flatbread made in countries in Central America such as Mexico. Corn is sprouted and turned into a flour called *masa harina*. The masa flour is mixed with water or broth to make a dough. Then the dough is pressed into rounds and grilled.



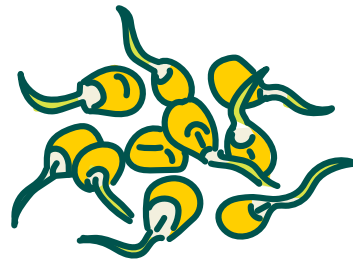
**Rocks**



**Wind**



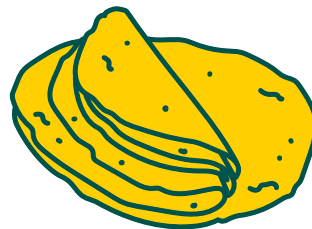
**Masa Mix**



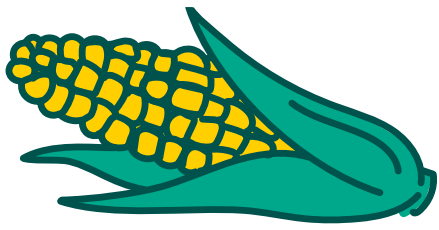
**Sprouted corn**



**Farmer**



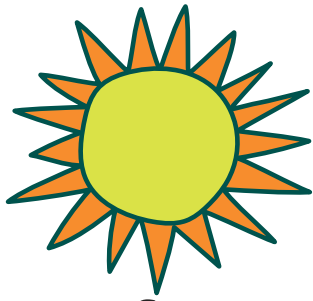
**Tortillas**



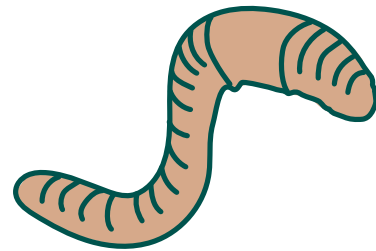
**Corn on the plant**



**Corn kernel**



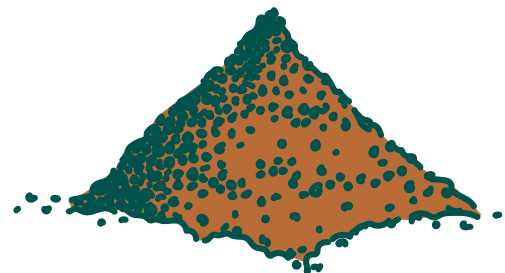
**Sun**



**Worm**



**Water**



**Soil**



**Salt**

# Oatmeal

Oatmeal is a porridge typically eaten at breakfast in places such as the US, Scotland, and Canada.

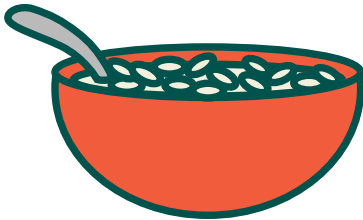
The seeds from an oat plant, known as oats, are flattened, crushed or ground, and cooked with flour or milk to make the popular breakfast food.



**Oat plant**



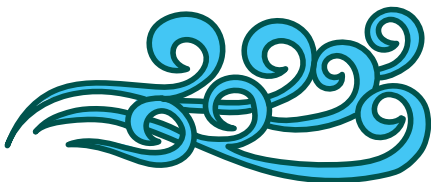
**Oat seed**



**Oatmeal**



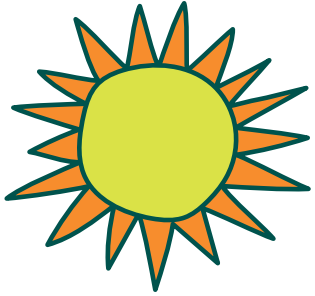
**Rocks**



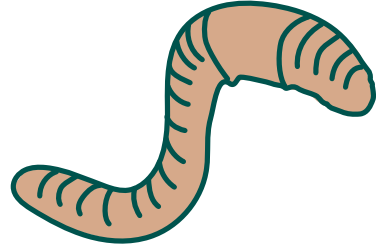
**Wind**



**Farmer**



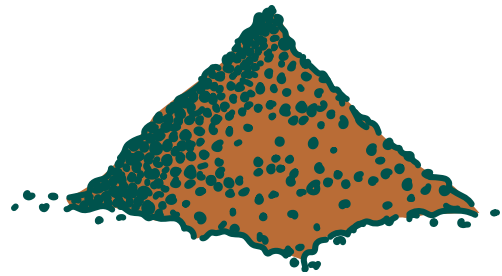
**Sun**



**Worm**



**Water**

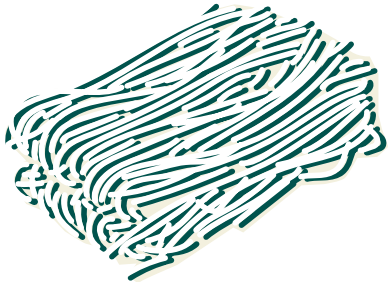


**Soil**

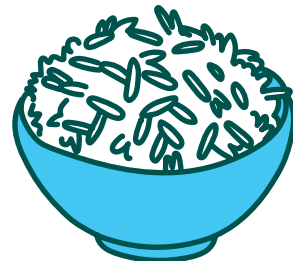


# Rice Noodles

Rice noodles are a staple in countries in East and Southeast Asia, such as Laos, Thailand, and Vietnam. Rice is ground into a flour, and then the rice flour is combined with water.



**Rice noodles**



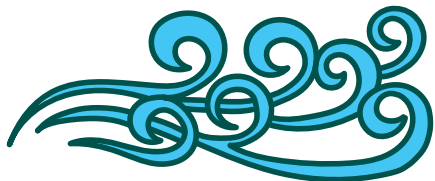
**Rice**



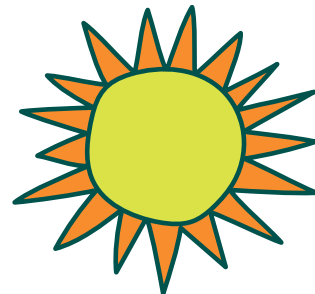
**Rice flour**



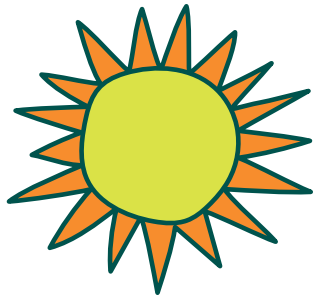
**Rocks**



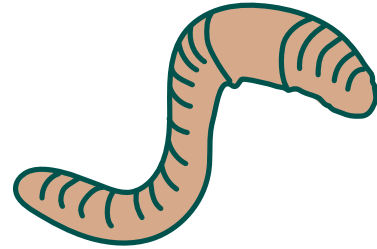
**Wind**



**Sun**



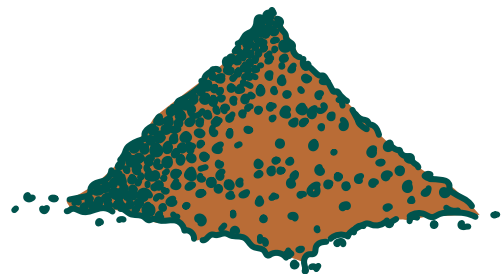
**Sun**



**Worm**



**Water**



**Soil**

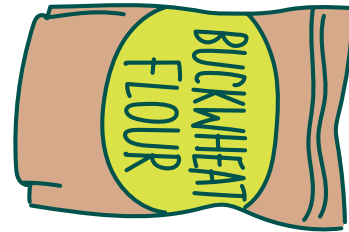


# Naan

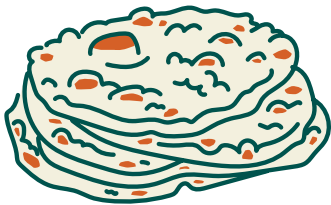
Naan is an Indian flatbread that uses yeast for leavening. Wheat flour is combined with yeast, salt, and often yogurt and butter to make the dough. The dough is rolled into rounds and often grilled in a tandoor (clay oven).



**Buckwheat noodles**



**Buckwheat flour**



**Naan**



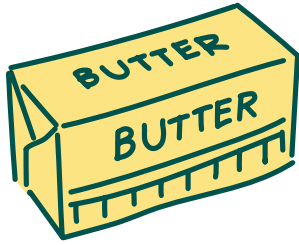
**Wheat flour**



**Wheat plant**



**Yeast**



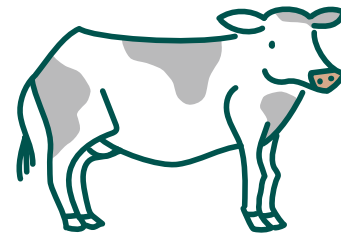
**Butter**



**Salt**



**Yogurt**



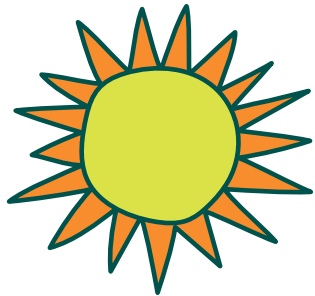
**Cow**



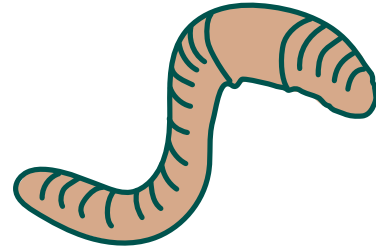
**Milk**



**Rocks**



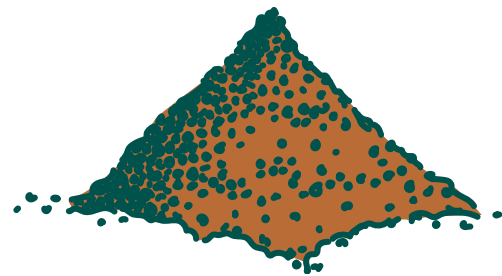
**Sun**



**Worm**



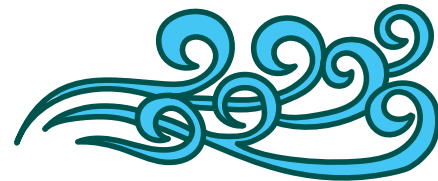
**Water**



**Soil**



**Farmer**



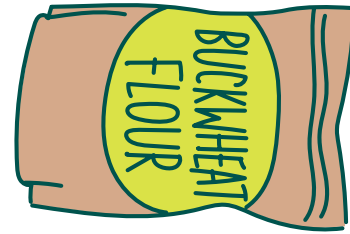
**Wind**

# Soba

Soba is the Japanese word for buckwheat, a type of plant that has a seed ground down to make a flour. Buckwheat flour is combined with water and sometimes wheat flour to make buckwheat noodles. The dough is sliced into long strands and then boiled.



**Buckwheat noodles**



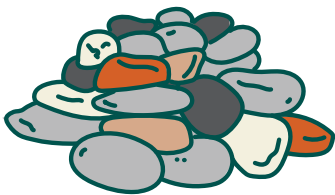
**Buckwheat flour**



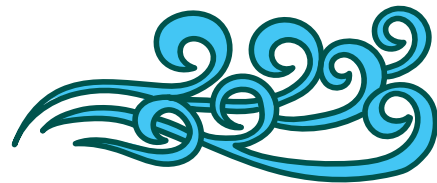
**Buckwheat plant**



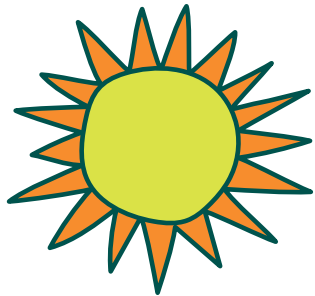
**Wheat flour**



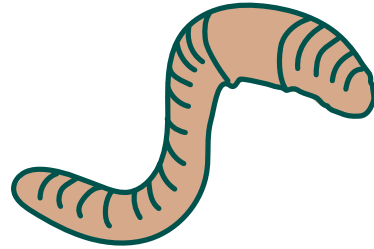
**Rocks**



**Wind**



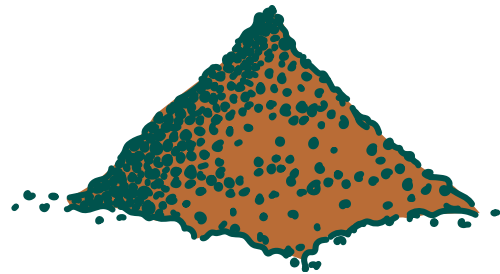
**Sun**



**Worm**



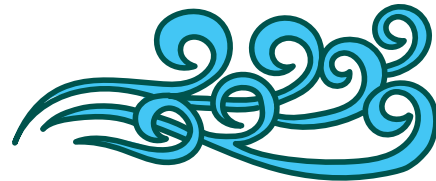
**Water**



**Soil**



**Farmer**



**Wind**