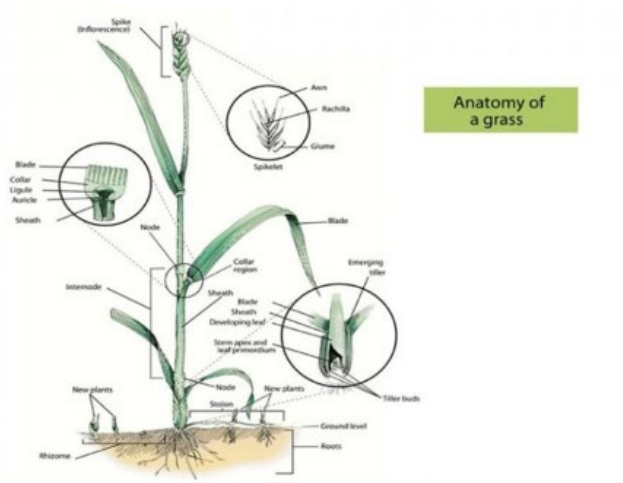
Lesson: Grains

Objective: Students understand that grains are a seed and that cereal grains are seeds from the grass family. There will be opportunity to experience multiple grains in a display and match them with their plant picture. Students will understand the difference between white and whole wheat flour and have an opportunity to make their own dough and bread sticks.

Background: Grains have been an important part of the human diet for thousands of years. See below for some facts about common grains.

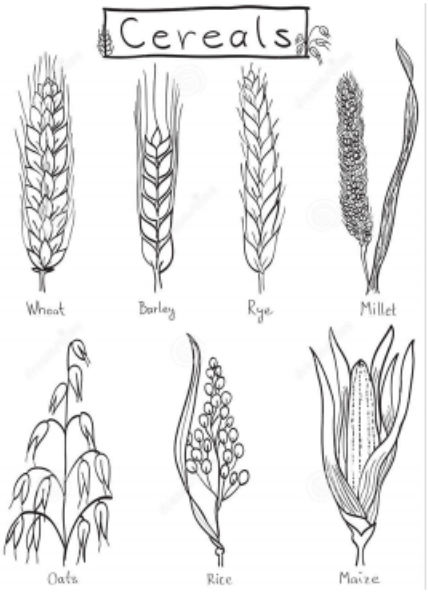
Cereal Grains are grasses

- monocotyledonous – 1 baby leaf in the seed, fibrous roots
- flowering plants
- Wind pollinated
- includes the cereal grasses (wheat, barley, oats, rye, rice, spelt, einkorn, emmer) bamboos and the grasses of natural grassland and cultivated lawns and pasture.



Quick history of grains

- Scientists have found genetic evidence that the world's four major grains-wheat, rice, corn and sorghum-evolved from a common ancestor weed that grew 65 million years ago.
- The development of wheat agriculture is credited with dividing the Stone Age from the age of civilized man.



Beginning of Agriculture - cultivation

The first domesticated crop is believed to have been einkorn wheat, a kind of nourishing grass adapted from a wild species of grass native to the Karacadag mountains near Diyarbakir in southeastern Turkey first cultivated around 11,000 years ago.

Threshing is separating the grain from the stalks. After the wheat was separated, it would be tossed into the air to separate it from the chaff known as **winnowing**. In some countries the grain was spread on the floor and threshed by animal pulled heavy sleds drawn over the grains.

Preparation:

For the Grains variety station: Gather grain seeds display with multiple types of grains in a bead box, gather or make copies of grain plants pictures, and pictures of threshing and winnowing. Gather wheat on the stalk (can be found along roadsides where harvesters missed a few plants along the edge of the field). Gather two 5 gallon buckets, baseball bat or stick and an old pillowcase.

For the flour dough station: pre make a batch of half whole wheat bread dough and bring covered. Gather three baking pans, ingredients for bread dough, measuring cups, plates for rolling out the dough, and the descriptions of the differences between whole wheat and white flour.

Action:

Divide the class into two groups for the two stations. They'll do both stations for about 20 minutes.

Grain Varieties station – ask students if they can tell you what wheat is? Ask if they eat wheat? What do they eat that is made with wheat? Is it a plant? What part of the plant is it? Humans have been eating grass seeds for tens of thousands of years. There are several types of grain besides wheat. Look at the picture descriptions of one grain at a time and give each student a chance to match it with the grain in the seed display. Afterward, show students the wheat on the stalk. Where is the stem? Where is the flower? Can you see a leaf? And where is the seed?

If you have millions of plants to harvest seed from, what is the easiest way to gather this seed? Show students the pictures of threshing and winnowing and describe how that has been accomplished by hand. Show the tools available and ask for a good listener to try separating the wheat seeds from the stalk using a stick and a pillowcase. Be sure students are safely using the stick. Don't tolerate mis use of the tools. After this has been accomplished, pour the grain from one bucket to another. Ask students if they can figure out how we can remove the chaff. Try blowing on the seeds as they are being poured. If you were to do this outside, the chaff would blow away in the wind.

Wheat dough station – start by helping students to wash their hands. Ask students if they've noticed the difference between your two different types of flour. Why is one darker than the other? Describe the processing of wheat to remove the bran and the germ and the loss in nutrition that is a result. (refer to the document and pictures describing whole grains) Why is this done? What part of the seed is being removed? What part of the seed is the germ and the bran? This process is also used with rice and other grains, but usually not with oats. Oats are eaten whole grain.

Let's make dough. Work with students, taking turns to mix ingredients for a batch of dough and take turns kneading the dough. Then use the batch brought from home to help students roll out a bread stick and place it on the pan. Bake for 10 minutes in a school oven. If no ovens are available, perhaps you could offer to bake and return them the next day.

Wrap up:

Is grain a plant part? What plant part is it? Is a whole grain better for you than one that has had its germ and bran removed? What is contained in the germ and the bran? How many types of grain are there? Are they all grasses?

If you had a field of grain, how could you remove all the seeds from the stalks and have enough grain to make your bread?