



Lesson 4: Grains

Activity Level: K-2 | Time: 45-60 minutes

PURPOSE

This lesson: Students will explore Nebraska's grain production and discover the healthy benefits from our locally produced grains.

Overview of Lesson Series: Students will explore the five food groups and what state-grown foods fit into each group. This club makes a local connection to good nutrition and a healthy lifestyle.

NEBRASKA STATE STANDARD CONNECTION

Kindergarten:

- SC.K.7.2.C Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
- PE.K.3.4 Communicates the importance of health-related fitness components and nutrition for physical activity.
- PE.K.3.4.a Recognizes that food provides energy for physical activity.

1st Grade:

- SS 1.3.5.b Match resources to their sources (e.g., food from farms, wood from trees, minerals from the ground, fish from the sea).
- PE.1.3.4.a Differentiates between healthy and unhealthy foods.

2nd Grade:

- SS 2.2.2.a List various goods and services that can be produced with the same list of resources (e.g. soil, seed, and labor used to produce animal feed, plastics, cereal, or fuel).
- SS 2.3.4.b Identify patterns of land use (e.g., agricultural, residential, industrial, commercial, educational, recreational).
- PE.2.3.4.a Recognizes the impact of nutrition on physical activity. (E)

ACTIVITY SNAPSHOT

1. Organize and Prepare Supplies
2. Read Background Information
3. Interest Approach
4. Conduct Activities 1 & 2
5. Ask follow up questions and make the connection to agriculture
 - What food group did we explore today?
 - Do Nebraska farmers grow grains? If so, what are some examples of grains we grow in Nebraska?
 - Grain is harvested and then typically processed to be used for numerous food products. What are some examples of food products we get from grain?
 - Why are grains important in our daily diet?



- How are all of these grains connected to agriculture?
- What can we share with others about what we learned today?

MATERIALS

- Computer with PowerPoint Software
- Food Matters: Grains PowerPoint
- Nebraska MyPlate Poster
- Farming in a Glove – Grains Packet, 1 per student
- Clear plastic glove, 1 per student
- Black permanent marker to label gloves, 1 per student
- Yarn, roughly 6” long, to tie glove shut, 1 per student
- Cotton balls, 4 per student
- Small cup of water to moisten cotton ball
- Four different types of grain seeds (wheat, oats, sorghum, popcorn), 1 per student

WHAT'S THE CONNECTION TO AGRICULTURE?

Grains are essential for our bodies to remain healthy. We rely on farmers to produce grains for ourselves and livestock to consume. Livestock animals eat certain grains and in return we get protein from our livestock animals. Farmers strive to be good stewards of the land to wisely produce food, fiber, and fuel. Farmers know the best time to plant crops, how to keep them healthy, how to keep pests and weeds out of the fields, and the best time to harvest crops.

PROCEDURES:

1. Organize and Prepare Supplies
See “Materials” above.
2. Background Information
Source: choosemyplate.gov and Nebraska Department of Agriculture

Nebraska produces a variety of grains across the state. Most of the corn grown in Nebraska is field corn which is fed to a majority of our livestock or used for ethanol and other by-products. Nebraska does produce food grade yellow and white corn which is turned into corn flour or corn meal to be used in a variety of different food products that fall under the grain category of MyPlate. Nebraska also is the #1 popcorn producer in the United States. Popcorn can be considered a grain and is a great healthy snack to choose. Corn is produced across the state with popcorn primarily being grown in the central part of our state. Nebraska produces some oats, rye, and barely although it isn't as common as wheat and food grade corn. Nebraska does grow sorghum which is also known as milo. Nebraska ranks eighth in the nation for sorghum production. Sorghum is gluten-free providing a dietary alternative for people who live with celiac disease.



According to the USDA Dietary Guidelines, the recommended daily grain serving is 5-6 oz for children 4 to 13 years old. Grains provide us with the essential nutrients to stay healthy. Whole grains are a great source of fiber, B vitamins, and minerals. It is recommended that half of your servings of grain should be whole wheat.

Grains contain:

- B vitamins – thiamin, riboflavin, and niacin play a key role in metabolism – they help the body release energy from protein, fat, and carbohydrates. B vitamins are also essential for a healthy nervous system. Many refined grains are enriched with these B vitamins.
- Fiber – Reduces heart disease and helps digestion.
- Iron – Is used to carry oxygen in the blood.
- Vitamin C – Encourages growth and repair of body tissues, helps heal cuts or wounds.
- Folate (folic acid) – Help develop red blood cells.
- Magnesium and Selenium – Magnesium is a mineral used in building bones and releasing energy from muscles. Selenium protects cells from oxidation. It is also important for a healthy immune system.

Grains can:

- Eating whole grains may help with weight management.
- Grains containing fiber may reduce the risk of heart disease, obesity, and type 2 diabetes.

3. Interest Approach (3-5 Minutes)

- Review with students that our food comes from the farm and that farmers and ranchers grow our food. Food comes from either a plant or an animal.
- Ask students to recall what they remember about vegetables.
 - What do vegetables give us? *Nutrients such as vitamins and minerals and can help our bodies remain healthy.*
 - Should you eat vegetables every day? *Yes, 1½ – 2 cups.*
 - Where do vegetables grow? *In fields, greenhouse, and gardens.*
 - Can farmers in Nebraska grow all kinds of vegetables? *No, some vegetables must be shipped or imported to Nebraska.*
 - Where can we buy locally grown vegetables? *Farmer's markets, produce stands, and maybe even in local grocery stores.*
- Explain that Nebraska grows several other types of plants and we call those plants, grains. These grains have a similar lifecycle to fruits and vegetables. Farmers typically plant in the spring and harvest their grains in the fall. Except for winter wheat. Winter wheat is planted in the fall and harvested in late summer.
- Today we are going to identify grains that are locally grown in Nebraska.

4. Learning Activity 1 – Growing Grains PowerPoint (15-20 Minutes)

Source: choosemyplate.gov and Nebraska Department of Agriculture and the Eat Happy Project – YouTube

- Slide 1 – Show students where grains are located on MyPlate (orange). Read the story on Nebraska's Choose MyPlate poster. Dave and Vicki Nielsen are grain farmers in Nebraska.



- b. Slide 2 – Ask students where they think grains grow. Does it grow in a garden or a field? Explain that grain is grown in fields that are planted by farmers. Grain is typically produced in large scale over several acres of land. Grains are picked or harvested and then must be transported to be cleaned and processed. Most grains are turned into flours or processed to be used as ingredients in food products.
 - c. Slide 3 – Explain that Nebraska farmers grow several crops across the state. Most of the corn grown in Nebraska is field corn which is fed to a majority of our livestock or used for ethanol and other by-products. Nebraska does produce food grade yellow and white corn which is turned into corn flour or corn meal to be used in a variety of different food products that fall under the grain category of MyPlate. Nebraska also is the #1 popcorn producer in the United States. Popcorn can be considered a grain and be a great healthy snack to choose. Corn is produced across the state with popcorn primarily being grown in the central part of our state. Nebraska produces some oats, rye, and barely although it isn't as common as wheat and food grade corn. Nebraska does grow sorghum which is also known as milo. Nebraska ranks eighth in the nation for sorghum production. Sorghum is gluten-free providing a dietary alternative for people who live with celiac disease.
 - d. Slide 4 – Examples of local grown grains. Ask students if they have ever tried any of these grains. Explain some of the food products that we can get from Nebraska grown grains. (Popcorn, bread & pasta from wheat, corn chips, tortillas, cereal, etc.)
 - e. Slide 5 – Explain that grains make up a variety of different products. Farmers plant grain in a field in the spring, it's harvested in the fall, transported to a grain elevator to be dried, cleaned, and then processed and made into different food products such as these.
 - f. Slide 6 – Here is a short video that explains how bread is made. Explain that other products made with grain such as pasta or cereal is similar in this process as well.
 - g. Slide 7 – Explain that the daily recommended serving for grains is 5-6 oz each day for kids age 4-13. Half of your daily grains should be whole grains.
 - h. Slide 8 – Explain why it is important to eat grains. Whole grains are a great source of fiber, B vitamins and minerals. The minerals found in grain help build strong bones and release energy from your muscles.
5. Learning Activity 2 - Farming Grain in a Glove (20 Minutes)
Source: Nebraska Agriculture in the Classroom – Farming in a Glove

This activity has each student create a small “farm” where they can see different seeds germinate. The “farm” is a clear plastic glove with a cotton ball in each of the fingers. A seed gets placed on the moist cotton ball and the glove gets hung in a window. The students monitor the glove to watch as the seeds germinate.

- a. Ask the students; What do you think happens when a seed gets planted into the ground? *Expected responses: grows, needs to be watered, turns into a plant, etc. We know that seeds need to be planted, watered, and given sunlight to grow, but what does it look like?* The dry seed absorbs water, the seed coat breaks open, and a small plant emerges. This is called germination. Write the word “germination” on the board and the definition.
- b. Distribute Farming in a Glove Packet to students.
- c. Distribute the supplies.



- Per student: 1 glove, 4 cotton balls, 4 seeds, 1 piece of yarn, 1 permanent marker
 - Per every 4 students: 1 small cup of water
- d. Students follow procedure on page 1, “Instruction Sheet”.
- Write their name on the thumb of the glove in permanent marker.
 - Write the name of the seeds that will be planted on each finger of the glove in permanent marker. (popcorn, wheat, oats, sorghum)
 - Carefully dip a cotton ball in water. Squeeze out the excess water and flatten it out. Do this for 4 cotton balls.
 - Place a wet cotton ball in each of the four fingers of the glove.
 - Carefully place one popcorn seed, one wheat seed, one oat seed, and one sorghum seed in the correct finger.
 - Tie the top of the glove with the piece of yarn to keep the moisture inside the glove.
 - Hang the glove in the window of the classroom or send home with students to hang in their windows.
- e. Monitor and assist students as needed. Most likely you will have to spell popcorn, wheat, oats, and sorghum on the board for the students to write on the glove.
- f. Students complete page 2, “Farming in a Glove—Worksheet”
- g. Review the four types of grain that we planted. (Popcorn, wheat, oats, and sorghum). These grains are crops that we eat. Grains provide us with the nutrition we need to be healthy and active.
- h. Optional, can be left to complete in classroom or taken home – Students complete pages 3 and 4, “Farming in a Glove—Daily Journal”, making one observation for the next 12 days.
- At the conclusion of 12 days, students complete page 5, “Farming in a Glove—What I Learned”.
6. Ask Follow Up Questions and Make the Connection to Agriculture (3 -5 Minutes)
- **What food group did we explore today?**
Grains.
 - **Do Nebraska farmers grow grains? If so, what are some examples of grains we grow in Nebraska?**
Yes, on a large scale, on many acres. We grow food grade corn, popcorn, wheat, sorghum, some barely, oats, and rye.
 - **Grain is harvested and then typically processed to be used for numerous food products. What are some examples of food products we get from grain?**
Flour, bread, pasta, oatmeal, tortillas, corn chips, cereals.
 - **Why are grains important in our daily diet?**
Grains provides us with vitamins and minerals that give us energy, support bone development, and other essential nutrients to promote a healthy lifestyle.
 - **How are all of these grains connected to agriculture?**



Grains are essential for our bodies to function properly. We rely on farmers to produce grains for us to consume as well as grains for livestock animals to eat. Livestock animals eat certain grains and in return we get protein from our livestock animals.

- **What can we share with others about what we learned today?**

Grains provide us with many different products that we enjoy to eat. Without grains we wouldn't be able to enjoy a majority of our pastas, cereals, breads.

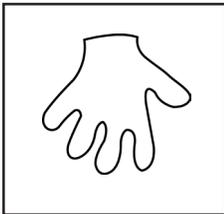


Farming in a Glove Journal

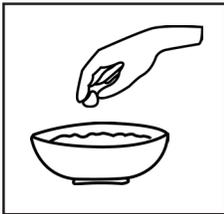
By: _____

Today is: _____

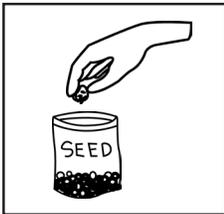
INSTRUCTION SHEET INSTRUCTION SHEET



My farm is a clear, plastic glove.
I will use 4 different seeds, such as wheat, oats, sorghum, popcorn,
food grade white or yellow corn.
I wrote the name of the seeds that I will plan on the fingers of my
glove using a permanent marker.
I wrote my name on the thumb of the glove using a permanent marker.



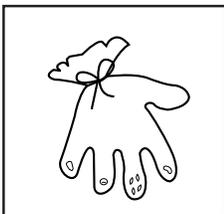
I carefully dipped a cotton ball in water. I squeezed out the excess water
and flattened it out.



Next I will place a wet cotton ball in each of the fingers.
Then I will carefully place one seed in the correct finger.



After placing the cotton ball and seeds in the glove, I tied the top of the
glove with a piece of yarn to keep the moisture inside the glove.
Then, I hung my glove in a window or special place in the classroom.



The glove will be alive with growing sprouts.
I will document each seed's growth by writing and drawing in my daily journal.



Farming in a Glove-Worksheet

I planted 4 different kinds of seeds.
They are:

1. _____
2. _____
3. _____
4. _____

I will label this glove to match mine.



My predictions are:

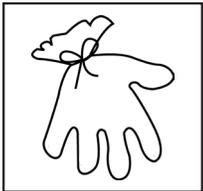
1. I think _____ seeds will start growing first.
2. I think it will take _____ days for the first seed to start growing.
3. I will draw what I predict the seeds will look like on day 12 below.





Farming in a Glove-Daily Journal

I will document each seed's growth by writing and drawing about their progress each day for 12 days.



Day #1 I planted _____ different seeds.



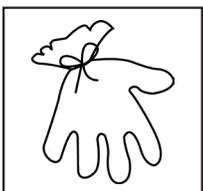
Day #2 _____



Day #3 _____



Day #4 _____



Day #5 _____



Day #6 _____



Day #7 _____



Day #8 _____



Day #9 _____



Day #10 _____



Day #11 _____



Day #12 _____



Farming in a Glove—What I Learned

By: _____

Today is: _____

Three things I learned from my Farming in a Glove are:

1. _____

2. _____

3. _____

Here is what the results looked like:

