Wisconsin Farm in a Glove: Where do foods come from?

Lesson Overview:
Students will explore where food comes from by reading a story and germinating the seeds of five different plants that are grown in Wisconsin.

Essential Question:
Where do the foods we eat come from?

Lesson Breakdown

- Read the story "How Did that Get in My Lunchbox?
- Explore how plants grow from seeds by creating a Farm in a Glove to germinate five types of seeds.
- Observe and record germination of seedlings.
- Optional: Transplant seedlings to take home or continue growing in the classroom.

Subjects

- ✓ **Science**
- ☐ Technology
- ☐ Engineering
- ☐ Math
- ☐ ELA
- ☐ Art
- ☐ SS

I CAN statements

- Explain where foods are grown and raised.
- Define key vocabulary related to seed properties.
- Explain the requirements for a seed to germinate.
- Conduct an experiment to test if soil is needed for seed germination.
- Observe differences between different types of seeds.
- Communicate my findings in a clear and concise way.

Performance Expectations/ Standards

Science

SCI.CC6.3-5 Students understand different materials have different substructures, which can sometimes be observed, and substructures have shapes and parts that serve functions.

SCI.CC7.3-5 Students measure change in terms of differences over time and observe that change may occur at different rates. They understand some systems appear stable, but over long periods of time they will eventually change.

SCI.SEP7.3-5 Construct and/or support an argument with evidence, data, or a model. Use data to evaluate claims about cause and effect. Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.

SCI.LS1.A.4 Plants and animals have both internal and external macroscopic structures that allow for growth, survival, behavior, and reproduction.
SCI.LS1.C.5 Food provides animals with the materials and energy they need for body repair, growth, warmth, and motion. Plants

acquire material for growth chiefly from air, water, and process matter, and obtain energy from sunlight, which is used to maintain conditions necessary for survival.

SCI.LS2.A.5 The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.

Teacher Background

Seeds are vital to our survival. Without seeds, the plants that provide our food, fuel, fiber, oxygen, and many other essential products would not exist. Seeds are the method by which some plants reproduce. Each seed has a **seed coat**, an **embryo**, or baby plant, and a food source in the form of either an **endosperm** or **cotyledons**.

In order for a seed to **germinate**, or sprout, it needs warmth, moisture, and air. Seeds remain **dormant** and will not germinate until the proper conditions are present. For example, in some climates the winter soil temperature may dip to below 32°F. Seeds will not sprout in these conditions. Once the ground thaws in the spring and the temperature rises to approximately 65°F, most seeds will sprout if moisture and air are also available. Most seeds germinate when the temperature is between 65-85°F.

In the germination process, moisture softens the seed's outer protective covering, called the seed coat. The embryo pushes through the softened seed coat and the new plant begins to grow. The roots push further down into the soil and a shoot, which contains the new plant's stems and leaves, pushes up towards the surface.

The germination process can be somewhat mysterious because it typically occurs underground where it cannot be observed. The clear plastic glove and cotton balls used in this activity provide an opportunity to view the germination process and the plant's beginning growth and root system.

Learning about seeds and the germination process offers a wide variety of opportunities for scientific investigations and experiments. Working with moisture, light, air, and temperature as variables, students can design experiments to discover optimal conditions for germination.

Essential Vocabulary

- **cotyledon:** an embryonic leaf in seed-bearing plants, one or more of which are the first leaves to appear from a germinating seed
- **embryo:** a human, animal, or plant in the early stages of development before it is born, hatched, sprouted, etc.
- **endosperm:** tissue formed within a seed that contains energy (starch) and protein for the germinating seed
- **germinate:** to begin to grow; sprout
- **seed coat:** the protective outer covering of a seed

Materials (per student)

- 1 plastic glove
- 1 bush bean seed
- 1 cantaloupe seed
- 1 tomato seed
- 1 wheat seed
- 1 popcorn Seed
- 5-6 cotton balls
- Permanent marker
- Water
- Tape
- Copy of the book, “How Did That Get in My Lunch Box?- The Story of Food” By Chris Butterworth

Farm in a Glove		
Time	**Materials**	**Activity**
10 mins		Begin with a discussion about where food comes from. Ask students to share where they think foods are made. Introduce and read the story, **"How Did That Get in my Lunchbox?- The Story of Food"** By Chris Butterworth
5 mins	*How Did That Get in my Lunchbox ?* by Chris Butterworth	**Reflect:** Have students reflect on the foods from the story: **"If you were a farmer growing one of the foods, or crops, from the story, how would you begin the process?"** (Answer: planting the seeds.) 1. Ask: **"What do seeds need to grow into plants that provide food for humans and animals?"** (Answer: water, air, warmth, nutrients, and light.) 2. Explain that students will **germinate their seeds** in a **Farm in a Glove** experiment.
25 mins	• 1 plastic glove • 1 bush bean seed • 1 cantaloupe seed • 1 tomato seed • 1 wheat seed • 1 popcorn Seed • 5-6 cotton balls • Permanent marker • Water • Tape • Wisconsin Farm in a Glove Student Worksheet	**Activity: Farm in a Glove** Review the procedure before allowing students to begin. **Procedure:** 1. Begin by modeling the procedure: use a **permanent marker** to label each finger and thumb of a **plastic glove** with one of each type of seed (**bush bean, popcorn, wheat, cantaloupe, tomato**). Write student names in the center of the glove. 2. Dip **five cotton balls** into water and squeeze out excess moisture. a. **Note:** For large seeds, like bush (green) beans, use **two** moistened cotton balls. 3. Place **one or two seeds** of the same type on each cotton ball. 4. Insert the cotton balls into the correctly labeled fingers of the glove. 5. Observe each seed and record your observations on the Seed Observation Chart student worksheet. 6. Fold down the opening of the glove and secure it with **tape**.

		7. Distribute materials to each student and assist them in assembling their **farm in a glove**. 8. Assist students in creating their farm in a glove. 9. Hang gloves on a **classroom bulletin board** with fingers facing downward. 10. Have the students record daily observations of their germinating seeds in a notebook. 11. After observing the seeds for two weeks, have each group share their observations and conclusions with the class.
Evaluate		After conducting these activities, review and summarize the following key concepts: • Most plants begin their life as a seed. • Seeds have seed coats, an embryo, and a food source in the form of either an endosperm or cotyledons. • In order to germinate, a seed needs moisture, air, and warmth.

This lesson was adapted by Wisconsin Agriculture in the Classroom from the lesson Farming a Glove by Minnesota Agriculture in the Classroom and National Center for Agricultural Literacy (NCAL). Authors: Sue Knott and Lynn Wallin