**Seed Germination Necklaces**

**Grade Level(s)**

4th grade

**Estimated Time**

30 minutes

**Purpose**

In this lesson, students will observe corn and soybean seeds as they germinate and compare monocots and dicots.

**Materials**

* Corn and Soybean seeds
* Jewelry sized re-sealable bags; hole punched above the seal
* Soaked Jelly BeadZ, Soil Moist, or damp cotton balls
* Yarn
* Optional: Lima bean to dissect

**Vocabulary**

* **Germination** – The process of a plant emerging from a seed and beginning to grow.
* **Embryo** - The part of a seed that develops into a plant.
* **Cotyledon –** Part of the embryo within a seed. The cotyledon(s) provide nutrients (food) for the germinating plant. In some plants, they form into the first leaves of the plant, called cotyledon or seed leaves.
* **Monocot –** A flowering plant with an embryo that has one cotyledon. Grass and corn are examples of monocots.

**Interest Approach – Engagement**

Show students corn and soybean seeds. Ask them:

* + What do they have in common?
	+ How are they different?
	+ What do seeds need to grow?

**Background - Agricultural Connections**

Farmers in Iowa are the country’s biggest producers of corn and soybeans. These plants germinate in the ground the same way they do in the seed germination necklaces. Farmers care for them from planting until harvest. Corn and soybeans are found in many items that we use every day, including plastics, corn chips, and even cake! They can also be feed to livestock and made into biofuels.

**Procedures**

1. How does the seed begin to grow? What does it need? Sun (heat- explain why), water, soil (medium to grow in) and air.
2. Define Germination (worksheet/observation sheet)
3. Today we are going to make seed germination necklaces.
4. Place moistened JellyBeadZ, soil moist, or cotton ball in into the hole-punched jewelry sized bag. If using a cotton ball, squeeze out excess water before putting it in the bag.
5. Push two corn and two soybean seeds into the bag.
6. Seal the bag and run yarn through the hole to create a necklace.
7. Ask students to wear their bags around their necks or place them in a warm place and observe them every day.
8. During the observation period, ask students to record daily journal entries using full sentences and good grammar to describe what they see.
9. After the experiment is complete, have students write a reflection paper explaining what they witnessed and what they think happened considering all the results of the experiment. Include a comparison of the corn and soybean seeds, differences in temperature and light conditions, and other observations.
10. Review worksheet



**Organization Affiliation**

Iowa Agriculture Literacy Foundation

**Agriculture Literacy Outcomes**

**T2.3-5.c** Explain how the availability of soil nutrients affects plant growth and development.

**Iowa/ Common Core** **Standards**

**4-LS1-1.** Construct an argument that plants, and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.