

MATERIALS

- Hand trowels (1 per student group)
- Yardsticks (1 per student group)
- Stirrup Hoe
- Bucket or Tub Trug
- Squash seed
- Small watering cans

PREPARATION

- Place buckets full of hand trowels and pre-filled watering can or hose by Three Sisters bed(s)

PROCEDURE

Part 1: Examine Corn and Remove Weeds

- As a class, gather around Three Sisters bed(s). “Last week, we made mounds and planted the first of the three sisters—corn. Can you see it poking through the soil? What two other plants make up the Three Sisters?”
- Divide the class into work pairs/trios and assign them each to an existing mound: “How many inches have these corn plants grown since they were planted?” Pass out rulers and have students measure each corn plant in their mound. If none have germinated in some mounds, have those students assist another group. Wait until all groups have finished measuring then ask for student responses. Remind students to listen and take note of the highest and lowest measurements. “What is our range of measurements?”
- “Corn has to be at least 4 inches tall before we can plant beans. We need to give the corn plant a head start so that it can support the climbing bean vines. Are our plants tall enough now? (No.) We’ll give the corn another week to grow before planting the beans. This week, we will plant squash. As it grows, squash will choke out competing weeds and provide a living mulch for corn and bean plants.”
- Now that students have identified the corn plants, scan the garden bed for any weeds that have popped up in the meantime. Have students remove weeds (including the roots) and place them outside of the garden bed. Select a student to collect weeds in a bucket and transport them to the compost pile. Once the larger weeds are pulled, have another student volunteer use the stirrup hoe to make sure all the smaller weeds have been killed.

Part 2: Prepare Soil and Plant Squash

- Ask students to gather around the bed(s). Consult the Three Sisters bed layout diagram to identify the location for the squash to be planted. Each group will plant one squash seed.
- Demonstrate how to use a hand trowel to loosen the soil for planting. Lightly chop the soil over a circular area about 12” in diameter. Flip a few shallow shovelfuls of soil over (like pancakes) and chop again until the soil texture is a bit finer. Distribute hand trowels to student groups and instruct them to do the same, periodically exchanging the trowel between partners. Collect trowels.
- Demonstrate how to poke holes in the soil to a depth of 1” (the distance from the tip of the thumb to the first knuckle). Have students do the same. Check work, then distribute seeds. Students plant seeds, then lightly fill the holes and gently pat soil down. Pass a watering can around the group so that each student can water the seed. Collect materials.

Planting Three Sisters Squash

Food & Technology

ENGAGE

Gather around Three Sisters bed(s). “Squash is the third and final seed to go in the ground. Squash is a member of the *Cucurbitaceae*, or Cucumber, family. Its botanical name is *Cucurbita pepo*. There are many different varieties, or *cultivars*, of squash to choose from. Today we’ll be planting a special variety of dwarf pumpkin known as ‘Wee Bee Little’”. Pass around seed for students to examine. “Squash plants normally take up plenty of space. However, this is an especially compact variety of squash, which allows us to plant more seed than normal in our garden bed.”

OBJECTIVES

- Students will be introduced to the cultural history of the Three Sisters
- Students will understand how corn, beans, and squash work together in agricultural harmony
- Students will understand the nutritional benefits of eating corn, beans, and squash
- Students will understand how to plant squash seeds

EXPLAIN

Three Sisters: Working in Agricultural and Nutritional Harmony

The Three Sisters is an ancient companion planting scheme that consists of corn, beans, and squash. This special growing system was developed by Native American farming societies and later passed onto European settlers as they arrived in the New World. Corn, beans, and squash are referred to as the “three sisters” due to the fact that they thrive when planted together, with each plant serving and benefiting the others in some way.

Under this system, the corn seed is planted first. Once the corn has reached several inches in height, the beans are planted. The growing corn plant provides a natural trellis for the bean vines. As bean vines grow up and around the corn, they return the favor by supplying it with some additional structural support. This helps to prevent the shallow-rooted corn plant from toppling over under strong winds. Squash, another shallow-rooted plant, spreads itself out over the soil surface. Not only does the squash shade out unwanted weeds, but it also provides the corn and bean plants with an all-natural mulch. This helps conserve moisture and regulate temperature. Beans are a nitrogen-fixing legume, which means that they are able to capture nitrogen from the air and “fix” it in to the soil, providing the corn and squash plants with a steady supply of nitrogen for healthy growth.

Corn, beans, and squash have been a crucial part of human survival for centuries. When consumed together, the three vegetables complement each other nutritionally. Corn provides plenty of carbohydrates and is full of amino acids. Beans are packed full of protein and provide two of the essential amino acids not found in corn. Squash contains vitamin A and its seeds contain essential fatty acids that corn and beans lack.

ADDITIONAL CONTENT INTEGRATION (see previous page)

After students examine corn and bean growth, discuss recent weather patterns. “What has the temperature been like over the past week? How many times has it rained? Did we receive any hard rainstorms or hail?” Consult max/min thermometer, if present. “Both corn and beans require temperatures between 60°F – 75°F for germination and growth. Did today’s temperatures fall within that range?” As a class, discuss how recent weather patterns might have affected corn/bean growth.

ADDITIONAL MATERIALS

- Small container of squash seed
- Max/min thermometer

EVALUATE

Journal prompt: How does squash help the corn and beans?