



## STANDARDS OF LEARNING

Science: 1.4, 2.4  
History and Social Science: 1.5, 2.5

## OBJECTIVES

**The student will be able to:**

- Identify the “Three Sisters” and describe their role in Native American life.
- Investigate seed germination.

## MATERIALS

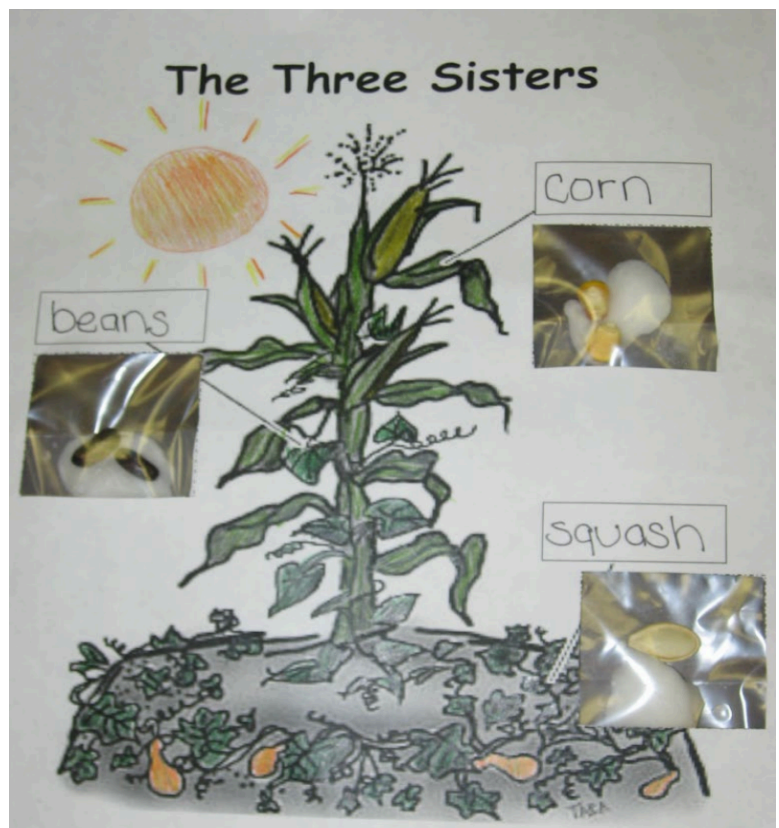
- “Three Sisters” handout (attached)
- crayons/colored pencils
- scissors
- jewelry bags
- cotton balls
- tape
- corn, bean, and squash seeds

# GROWING THE THREE SISTERS

## BACKGROUND KNOWLEDGE

Native Americans adapted to their environment and used a variety of agricultural techniques to grow food. Three principal crops of the Eastern Woodlands Native Americans were corn, beans, and squash. These “Three Sisters” were planted together because of the ways in which they benefit each other. The corn stalk serves as the pole for the beans. In turn, the beans help add nitrogen back to the soil; this is very helpful to corn, which requires a lot of nitrogen. The squash provides ground cover that helps the soil retain moisture and prevent weed growth. Thus, the Native Americans, who recognized the relationship between the plants, used the natural harmony between them to feed their communities. It is not surprising that many legends and Native American folktales reference the Three Sisters.

Modern agriculture still utilizes these same principles. A typical crop rotation in Virginia is corn, soybeans, and wheat. Crop rotation allows farmers to maintain and improve soil fertility. It can also help with pest/weed management.



# GROWING THE THREE SISTERS

## PROCEDURE

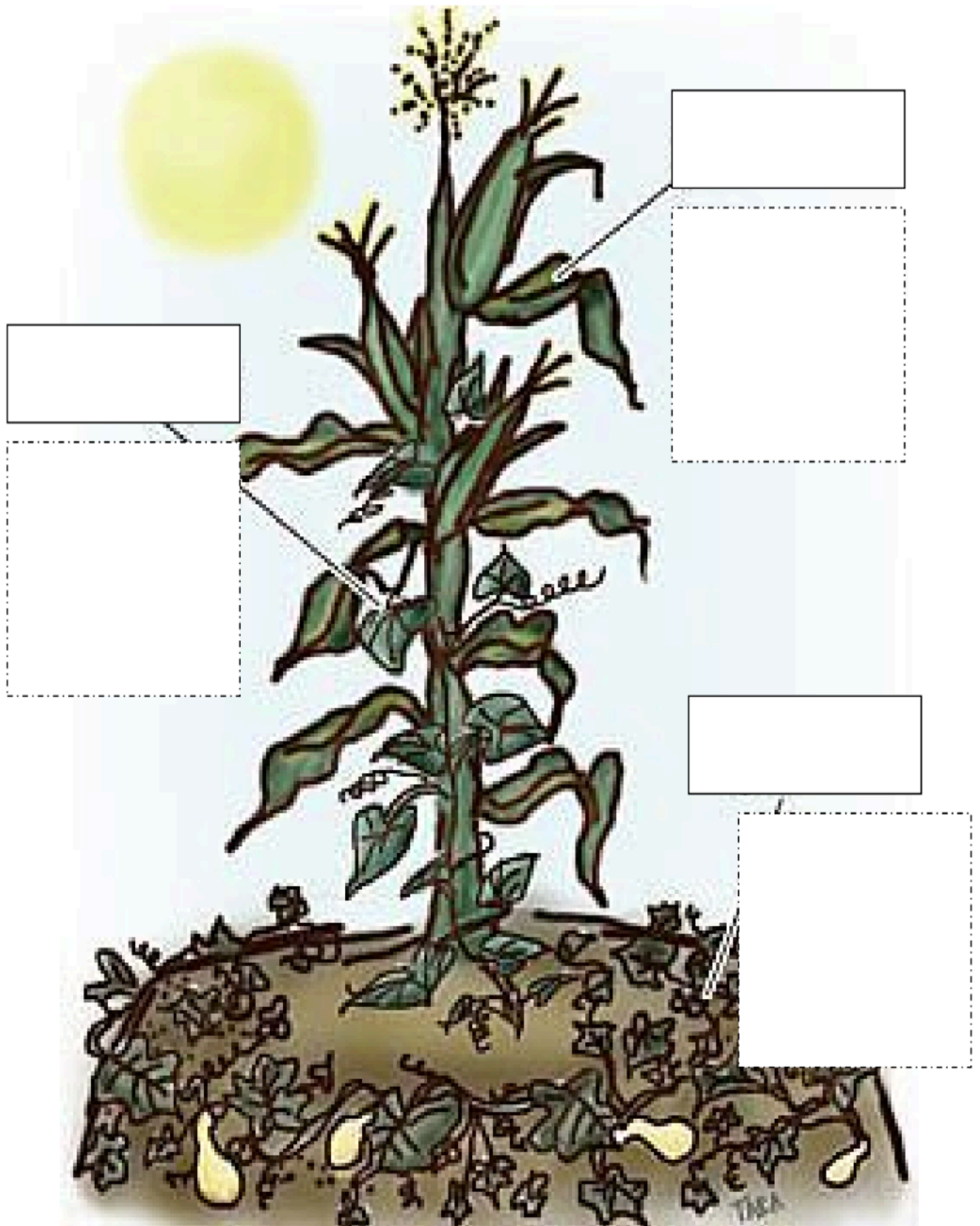
1. Begin the lesson by asking students to imagine what life would be like with no grocery stores, malls, etc. Where would they get food and clothing? Remind them that this is what life was like long ago. The Native Americans had to rely on and adapt to their environment to supply them with food, clothing, and shelter. Tell them that the three staple crops of the Eastern Woodlands Indians were corn, beans, and squash. These were harvested in the summer. The Native Americans recognized that when grown together these crops helped and assisted each other.
2. Pass out the Three Sisters handout. Have students label the rectangles with the correct "sister". Point out that the beans are using the corn as a trellis, while the squash is spread out over the ground giving it shade and preventing erosion.
3. Have students cut out the squares with the dashed lines, to make "windows."
4. Give each student 3 jewelry bags, 3 cotton balls, and one of each type of seed.
5. Place small cups with water around the room so that students can share.
6. Review the conditions necessary for seed germination: water, oxygen, and warmth.
7. Instruct students to dip their cotton balls in the water then place one in each bag.
8. Next, place a seed in each bag and close them.
9. Match the seeds with the correct labels and tape them behind the "windows."
10. Lastly, students may color the picture.
11. You may choose to hang the sheets in the window so that seeds receive the warmth of the sun. Have students observe the seed germination over the next few days.

## EXTENSION

- Students observe and record data related to the seed germination.
  - Which seed germinated first?
  - How long did each seed take to germinate?
- Measure the growth of each plant after one week. Graph the results.
- Check out this video from Henricus Historical Park:



# The Three Sisters



# GROWING THE THREE SISTERS

All Three Sisters information below is from [www.birdclan.org/threesisters.htm](http://www.birdclan.org/threesisters.htm)

## The Three Sisters

The three sisters are Corn, Beans, and Squash. They are seen as the three beautiful sisters because they grow in the same mound in the garden. The Corn provides a ladder for the Bean Vine. They together give shade to the Squash. The Cherokee till the mound three times. The Native American story of the Three Sisters varies from tribe to tribe. This story below is taken from an oral account by Lois Thomas of Cornwall Island, compiled by students at Centennial College and found in "Indian Legends of Eastern Canada."

## The Three Sisters

A long time ago there were three sisters who lived together in a field.

These sisters were quite different from one another in their size and way of dressing. The little sister was so young that she could only crawl at first, and she was dressed in green.

The second sister wore a bright yellow dress, and she had a way of running off by herself when the sun shone and the soft wind blew in her face.

The third was the eldest sister, standing always very straight and tall above the other sisters and trying to protect them. She wore a pale green shawl, and she had long, yellow hair that tossed about her head in the breeze.

There was one way the sisters were all alike, though. They loved each other dearly, and they always stayed together. This made them very strong.

One day a stranger came to the field of the Three Sisters – a Mohawk boy. He talked to the birds and other animals – this caught the attention of the three sisters.

Late that summer, the youngest and smallest sister disappeared. Her sisters were sad.

Again the Mohawk boy came to the field to gather reeds at the water's edge. The two sisters who were left watched his moccasin trail, and that night the second sister – the one in the yellow dress – disappeared as well.

Now the Elder Sister was the only one left.

She continued to stand tall in her field. When the Mohawk boy saw that she missed her sisters, he brought them all back together and they became stronger together, again.







## STANDARDS OF LEARNING

Mathematics: 3.MG.1, 4.MG.1, 5.MG.1  
History and Social Science: 1.5, 2.5

## OBJECTIVES

**The student will be able to:**

- Measure length in feet
- Measure in inches

## MATERIALS

- Green paper plates (corn and bean mounds)
- Yellow paper plates (squash mounds)
- Yellow pom-poms for the corn
- Red pom-poms for the squash
- Orange pom-poms for the beans
- Pieces of string, 10 feet long each
- Rulers

# MEASURING A THREE SISTERS GARDEN

## BACKGROUND KNOWLEDGE

There are several different ways to design a Three Sisters Garden, however, the basic set-up for growing the Three Sisters recommends using a 10' x 10' area. Each row is 10 feet long. The distance between each row is 5' in order for the corn to gain maximum pollination ability. There are typically 3 rows per 10' x 10' area; however, this lesson can be used to demonstrate only one row if desired.

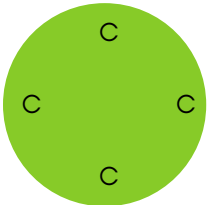
When planting the Three Sisters, corn is planted first. Once the corn stalks are approximately 4 inches tall, the squash and beans are planted in their mounds. In this garden design, squash is planted alone, and the beans are planted with the corn. The mounds are two feet apart from the center of the next mound. The squash seeds are planted as a triangle and are 4" apart from each other. The corn seeds are planted 6" apart so that they look like a compass rose (with a seed at each direction). When the bean seeds are planted, they are placed in the four corners of the mound 6" apart.

## PROCEDURE

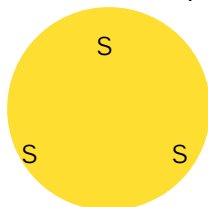
1. Cut string into 10' long pieces.
2. Group your students into groups. If you are doing 1 row, you will need 5 groups. If you are doing 2 rows, you will need 10 groups, etc.
3. Pass out green and yellow paper plates. Alternate what color the groups get (green, yellow, green, yellow, etc.)
4. Give the groups a ruler and ask them to find and mark the center of the circle. For younger students you can mark the center of the plates prior to the activity.
5. Lay one piece of 10' long string on the ground. Ask a student to measure 5' below that string. That is where the next piece of string will go. Measure 5' apart from the string for however many rows you want to do.
6. Remind students the rows are 5' apart in order to ensure proper pollination of the corn, which is pollinated by wind rather than by insects.

# MEASURING A THREE SISTERS GARDEN

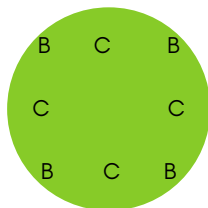
7. Next, ask a student to measure 2' increments on the strings and mark them with a piece of tape, starting at one end of the top row. There should be 5 increments marked on each piece of string.
8. Ask a squash group to place the center of their yellow paper plate on the piece of tape at the end of the top row.
9. Then ask a corn/bean group to place the center of their green paper plate on the next piece of tape 2 feet away. The next plate will be yellow, then green, then yellow.
10. Move on to the next row and begin with a green plate. Place the plates on all of the increments on your rows. The beginning of each row should be different than the row above and below it.
11. Now, pass out the pom-poms used for corn to the students that had green plates. Tell the students that you must plant corn first and wait for the stalks to be 4" high before planting the beans and squash.
12. Ask the students to plant the "seeds" on the green plates. Each seed is 6" apart and they are spaced similar to the compass rose.



13. Give the students that had yellow plates the pom-poms that represent squash. Ask them to plant their "seeds" 4" apart in an equilateral triangle.



14. Give the students that had the green plates the pom-poms that represent beans. Ask them to plant their "seeds" in the 6" apart like a square.



15. Practice adding the number of seeds in each row, using addition facts, repeated addition, or multiplication (depending on the needs of your students).

