



Growing a Native American “Three Sisters” Garden

Written by GEF Staff

Grades: 3-5

Subjects: Science, Social Studies

Time: About one hour of prep work building time plus two months of growing time



***Standards:** Students will...

Science Standard 5: Understand the structure and function of cells and organisms.

Benchmark # 1: Know that plants progress through life cycles and that the details of these life cycles are different for different plants.

Benchmark # 2: Know that living organisms have distinct structures and body systems that serve specific functions in growth, survival and reproduction.

Science Standards 6: Understand relationships among organisms and their physical environment.

Benchmark # 4: Know that changes in the environment can have different effects on different organisms (e.g., nitrogen given off by bean plants also benefit other plants in close proximity to them).

Benchmark # 5: Know that all organisms (including humans) cause change in their environments and these changes can be beneficial or detrimental (e.g., humans add compost to soil to enrich it, as squash plants grow they provide shade and weed control for other plants in close proximity to them).

Science Standard 12: Understand the nature of scientific inquiry.

Benchmark # 5: Know that scientists' explanations about what happens in the world come partly from what they observe and partly from how they interpret their observations.

History Standard 2: Understand the history of a local community and how communities in North America varied long ago.

Benchmark # 2: Know geographical settings, economic activities, food, clothing, crafts and rituals of Native American societies long ago.

Geography Standard 1: Understand the characteristics and uses of maps, globes and other geographic tools (e.g., compasses) and technologies.

No specific benchmark applies.

Objectives: Students will be able to....

- Identify and describe the basic stages in the life cycle of green plants.
- Identify characteristics of green plants (e.g., pole beans, corn and squash) that help with growth and development.
- Describe how Native Americans used their understanding of plants and the environment to grow food.
- Describe the benefits of companion planting.

Materials:

For an outdoor garden:

- Rakes and spades
- Yardstick
- Compass
- Corn seeds
- Squash or pumpkin seeds



- Bean seeds
- Plot of land that receives direct sunlight and has access to water

Overview: Many Native American groups used different planting techniques. Several used the “Three Sisters” method. This version of growing plants involves planting corn, beans and squash together. To plant a “Three Sisters” garden, the growers put the three different seeds into one hole in a large mound. As the seeds grow, they form an ecosystem, or living community. Just as people in communities rely on each other for food and shelter, the growing plants rely on each other for nourishment, support and shade. The tall, sturdy stalks of corn provide support for the small beans. The beans have colonies of bacteria that live on their roots. These bacterium take nitrogen from the air and turn it into a solid form that enriches the soil, and both the beans and corn use the nitrogen to grow. Once the squash has sprouted, it develops big, prickly leaves. These leaves act as a shade over the soil so weeds can’t grow and animals don’t eat the corn or the beans. When you plant this type of garden, it is important to start it in the spring, after the danger of frost has passed. This activity is great for summer programs. Try to select a site on campus in which the students can easily see the mound when school is not in session.

Kid's Speak: A "Three Sisters" garden is a Native American form of gardening. Corn, beans and squash are all grown together in one hole, on one mound. As plants grow, they form a living community: an ecosystem. The three plants rely on each other for food, support, shade and protection.

Eco-Fact: Save your tomatoes from white flies and mosquitoes by planting basil in your garden. The basil's strong scent will keep the pest away.

Procedures:

Before Planting "Three Sisters" Garden:

- Explain to students what a "Three Sisters" Garden is and how companion planting works.
- Before actually planting the garden, have students draw pictures of their "Three Sisters" garden mounds suggesting where seeds should be planted. Have student use different colors for the three plants.

Instructions for Planting "Three Sisters" Garden:

1. Soak four to seven corn seeds. Leave to soak overnight.
2. At your selected garden site, use your spade or trowel to break up the soil. Then rake it.
3. Using the spade, build a mound 12 inches high, between 18 inches and 3 feet in diameter. If you're in a dry area, flatten the top of the mound and make a shallow depression to keep water from running off. If you're building more than one mound, space the mounds 3 to 4 feet apart.
4. Next, take the corn seeds and plant them in the center of the mound 6 inches apart. One cultural connection to explain at this time is that the Native Americans often gave thanks and honored the “Four Directions” by planting the seeds to the north, south, east, and west. Use your compasses to do the same.
5. Over the next one to two weeks, take a daily visit to the mound to observe the progress of the corn.
6. Once the corn has reached four inches, take six pre-soaked pole bean seeds in a circle about 6 inches away from the corn.
7. Next, plant four squash or pumpkin seeds next to the mound, about a foot away from the bean seeds.



After Planting "Three Sisters" Garden:

1. As the garden grows, have students draw pictures observations for different stages of plant growth.
2. Maintain your garden. Weed around the corn plants as they grow. Place soil around the base of each stem for more support.
3. When the corn is about a foot high, and again when silks appear on the husks, "side-dress" by putting a high nitrogen fertilizer (such as aged manure or fish emulsion) on the soil surface near each plant.
4. The beans should wind their way around the corn stalks. If not, students can help by moving tendrils to the stalks.
5. Guide squash vines into walkways, garden edges, or between mounds to allow room for corn and beans to grow.
6. Once students observe young fruits, side-dress the squash plants with aged manure or compost. If you pinch off the tips of squash runners after several fruits have started to form, the plants will devote more energy to producing squash.
7. After plant growth is complete, have students write an essay that includes their observations and a conclusions to their experience growing a "Three Sisters Garden."

Adaptations:

- Visit the **Green Thumb Challenge** section for guidelines to build an indoor "Three Sisters" garden.
- Consider adding other plants on the north side of the mound (so they won't shade the plots). Choose crops based on region or history or tradition of Native American peoples from your region.

Extensions:

- Another **GEF** Lesson Plan provides instructions for planting a Colonial American garden.
- If you complete both gardens, compare and contrast the crops and planting methods on chart paper. Discuss the similarities and differences.
- Build a compost heap to help fertilize the growing beans.
- For tips on dietary guidelines and healthy eating habits visit the [USDA Food Pyramid](http://www.usda.gov/foodpyramid/).

GEF Community: Join the GEF Community online. It only takes a minute. Share your "Three Sisters" gardening experience with other GEF Community students.

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* All lessons listed on the GEF website have been aligned with the McREL Compendium of Standards and Benchmarks for K-12 Education. GEF curriculum has been developed in accordance with the McREL standards in order to reflect nationwide guidelines for learning, teaching, and assessment, and to provide continuity in the integrity of GEF curricular content from state to state. The decision to utilize McREL's standards was based upon their rigorous and extensive research, as well as their review of standards documents from a variety of professional subject matter organizations in fourteen content areas. Their result is a comprehensive database that represents what many educational institutions and departments believe to be the best standards research accomplished to date. To access the McREL standards database, or for additional information regarding the supporting documentation used in its development, please visit <http://www.mcrel.org>.