



The Book Planter

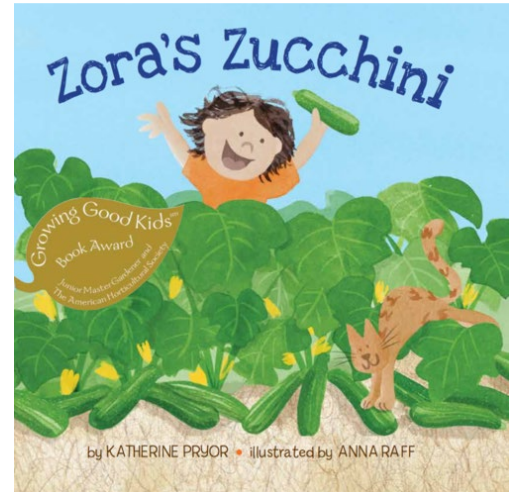


Ag in the Classroom

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July 2019: Zora's Zucchini
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The first zucchini of a summer garden is always exciting, but what happens when the plants just keep growing...and growing? Zora soon finds herself with more zucchini than her family can bake, sauté, or barbeque. Fortunately, the ever-resourceful girl comes up with the perfect plan—a garden swap! This is a story of a child who discovers not only the wonder of growing food but the satisfaction of growing a community.¹



Fun Facts

- Zucchini is the Italian word for what the French call a courgette.²
- The term 'summer squash' encompasses many varieties of fresh squash (yellow and green, straight or round on one end) harvested mostly in the summer months.²
- One medium sized zucchini has about 31 calories, and is a good source of potassium.³
- The harvest season for zucchini in North Carolina is from mid-May through September.⁴
- North Carolina ranks eighth in production of squash nationally.⁵
- A major portion of the state's production of summer squash is located in Sampson and Henderson counties, and adjoining areas.⁶
- The top grown cultivars of zucchini grown in North Carolina are Elite, Senator, and Spineless Beauty.⁶

Discussion Questions:

1. What motivated Zora to plant the zucchini garden?
2. Why did Zora think that the zucchini plants were special? (zucchini starts with a "z" just like her name)
3. What steps did Zora take to plant her zucchini? Did she have help? Could you do what Zora did?
4. What did she do to maintain her garden and the health of her plants?
5. What are some of the ways her family prepared the zucchini for eating?
6. What did she decide to do when she had too many zucchini? Did her idea work? How do you know?
7. List the fruits and vegetables she received from the garden swap.
8. If you had a garden that grew more vegetables than you and your family could eat, what would you do with your extra produce?
9. At first, Zora was bored. How does she feel at the end of the story? How can you tell?

10. What is a character trait that Zora has? What is something she does or says that shows she has this trait?

Squash for the Senses⁷

1. Give each student a small paper cup that contains a slice of crookneck squash (yellow) and a slice of zucchini.
2. Ask the students to name the five senses. List the senses on the board (sight, sound, smell, touch, and taste) and ask the students for an example of each sense when you write them on the board.
3. Explain to the students that they are going to look at the differences between a yellow squash and a zucchini.
4. Explain that as a class, they will be writing on the board the differences and similarities of the two types of squash.
5. Ask the class to tell you how the yellow squash and zucchini are different in sight, sound, smell, and touch. How are they the same?
6. At the end of the activity, discuss that even though the yellow squash and zucchini are different, they are also very similar and both are very healthy.

Parts of a Plant—What’s a Zucchini?⁸

Review the following vocabulary with the students:

Flowers: contain the parts of the plant necessary for reproductions

Fruit: the part of the plant that contains seeds

Leaves: use energy from sunlight to carry out photosynthesis

Roots: act as an anchor, holding the plant in place

Seeds: grow into new plants

Stems: provide support for leaves, flowers, and fruit

1. Ask a student volunteer to make a sketch of a plant on the board. Encourage just a simple plant with a stem, leaves, roots, and a flower.
2. Point to each part of the plant (roots, stem, leaves, and flower) and ask the students if they know the name of that portion of the plant. Label each part as you discuss it. Inform your class that they will be learning more about each of these plant parts and which portions of the plant that we eat.
3. Go through each plant part with the students and ask them to name some fruits and vegetables that fit each part. (example: broccoli is a flower, celery is a leaf, carrot is a root, asparagus is a stem, beans are seeds, strawberry is a fruit) Emphasize that fruits contain seeds.
4. Show the class a zucchini. Ask if anyone can identify what it is. Ask if anyone has eaten zucchini before.
5. Ask the class, “What plant part is a zucchini?” Some may answer correctly—fruit—but cut the zucchini open and show the seeds inside to give a clue.
6. Ask the class to name other fruits. (examples: strawberry, blueberry, raspberry, tomato, avocado). Ask the students, “What do these all have in common?” (They all have

seeds). You can use the *Plant Part Chart* (in **Links** section) for more examples of all the plant parts.

7. Summarize the following concepts with the students:
 - a. Plants have several parts. Each part has a purpose to keep the plant healthy and growing.
 - b. We eat different parts of plants such as the stem, leaf, flower, fruit, root, and seeds.
 - c. Farmers grow many types of plants to provide different kinds of fruits, vegetables, and grains for our diets.

Three Sisters Garden⁹

Background Agricultural Connections:

Native people from different parts of North America have used a wide range of agricultural techniques. Perhaps the best known is the inter-planting of corn, beans and squash – a trio often referred to as the “three sisters”. Cultivating these companions in your school garden, a small planting near your school, a large container or even indoors, can inspire studies of Native American customs, nutrition, and folklore. As students dig in, investigations of plant growth and relationships will also flourish.

In a “three sisters” planting, the three plants benefit one another. Corn provides support for beans. Beans, like other legumes, have bacteria living on their roots that help them absorb nitrogen from the air and convert it to a form that plants can use. Corn, which requires a lot of nitrogen to grow, benefits most. The large squash leaves shade the soil, prevent weed growth, and deter pests. The three sisters also complement each other nutritionally. Corn supplies carbohydrates and a variety of amino acids. Beans have protein, including two amino acids that corn lacks. Squash contributes vitamin A.

It’s hardly surprising that these crops were considered by many Native Americans to be “special gifts from the creator.” They played an important role in the agriculture and nutrition of many Native people of the Americas. Because of the sisters’ central role as sustainers of life, a host of stories, customs, celebrations and ceremonies are associated with them.

Growing your own three sisters garden or planting the crops in a small area can provide a springboard for tying in studies of Native American customs, nutrition, legends, and folklore as well as investigating plant growth and relationships. Information for planting in a garden, in a container and also a seed germination activity are included. Select the option that fits with the resources, time and expertise available in your educational setting.

In this activity, students will begin to understand a portion of the agricultural history of our nation by learning how Native Americans preserved natural resources and soil nutrients to harvest crops.

1. Ask the students if they know what a *legend* is. After students have offered their own ideas and prior knowledge, explain to your students that a legend is a way of passing stories from generation to generation. Legends are very important in many Native American cultures.
2. Explain to your class that they will be investigating the legend of the Three Sisters which focuses on the agriculture and food production techniques used by Native Americans. The three sisters refer to three crops that were commonly planted together—corn, beans, and squash.
3. Hand out the *Three Sisters Investigation* worksheet (attached to this activity sheet and in **Links** section) and facilitate a class discussion that allows students to share what they know about corn, beans, and squash. (Examples could include: Corn – tall plant, kernels that grow on ears, yellow in color, etc.) Instruct students to list the items in the chart. Feel free to share the Background Agricultural Connections section or have students research the three crops using the internet or other resources to add to their chart.
4. Divide the class into groups of 3 or 4. Give each group one of the attached *Three Sisters Legends* handout (also in **Links** section). Instruct the students to read through their legend as a group and record characteristics of each sister in their chart on the *Three Sisters Investigation* worksheet. After the groups have read and discussed in a group, have each group share the characteristics of each sister (plant) with the whole class. They should also decide which crop each sister in the legend represents.
5. As a class, discuss how the legends relate to how the three sisters can help each other when planted together. For example: Several of the legends describe the sisters “becoming stronger together” or “three sisters helping and loving each other.” Examples of how the actual crops benefit each other include the corn providing a trellis or pole for the bean to climb. The bean providing nitrogen to the soil to help the corn grow. The squash prevents weeds from growing and deters pests.

Planting a Three Sisters Garden⁹

Choose the gardening option below that best fits the gardening supplies and facilities that you have available to plant a Three Sisters garden.

School Garden:

1. Once the ground has thawed in the spring and the danger of frost has passed, select a site that has direct sunlight for at least 8 hours a day.
2. Build a small mound of soil about 12 inches high and three feet in diameter. If you have space for multiple mounds, each mound should be 3 to 4 feet apart in all directions.
3. Soak four to seven corn seeds overnight and then plant them about 6 inches apart in the center of each mound. (You’ll eventually thin to three or four seedlings). Many Native people honor the tradition of giving thanks to the “Four directions” by orientating corn seeds to the north, south, east and west.
4. After about two weeks, when the corn is at least 4 inches high, soak and then plant six pole bean seeds in a circle about 6 inches away from the corn. (You’ll eventually thin to

three or four bean plants.) At the same time plant four squash or pumpkin seeds next to the mound, about a foot away from the beans, eventually thinning to one.

5. Maintain your three sisters garden. As plants grow, gently weed around them. Make sure the soil is moist. If beans aren't winding their way around the corn, move tendrils to the corn stalk. Be sure to thin the plants once they are several inches tall – see steps 3 and 4 for the ideal number of plants.
6. Harvest any fruits that have been produced in the fall and enjoy a three sisters snack!

Container Garden:

If outdoor growing space is limited or non-existent, you can create a mini-three sisters garden in a large pot or container. Students will most likely not be able to see the crops grow to maturity, however, they should be able to observe the pole beans twine around the corn and the large leaves from the squash create a “mat”.

1. Use a large container (about 18 inches in diameter) that has holes in the bottom and fill it with soil.
2. Follow the instructions from the previous planting description but plant 3 corn seeds (thin to one), 2 bean seeds and 1 mini-pumpkin seed. Place the container where it will receive 6-8 hours of sunlight each day.
3. To know when to water this container, insert your finger up to your first knuckle in the soil. If the soil is dry, apply water to the soil until water starts to drip out the holes in the bottom on the container. If the soil feels moist do not water.

Garden in a Glove:

If you have limited space indoors or want to germinate the seeds for an outdoor three sisters garden, a garden in a glove is a good alternative to allow students to actually see the seeds sprout!

1. Instruct students to write their name on the palm section of a clear plastic glove with a permanent marker. Also label each finger with a different type of seed. (*See materials list for Three Sisters seed ideas*).
2. Dip five cotton balls in water. Give each cotton ball 3 flat squeezes to wring out excess water.
3. Place 2 seeds on a small paper plate or paper towel and pick up with a moistened cotton ball.
4. Put the cotton ball with the seeds attached into the matching labeled finger in your glove.
 - **Teacher Tip:** You may need to use a pencil to get the cotton ball all the way to the tips of the glove fingers. Also, for large seeds like squash, use only two seeds.
5. Repeat steps three and four with the additional cotton balls and seeds.
6. Tape the glove to a window, chalkboard, or wall. A clothesline can also be used with clothespins holding the gloves on the line.
7. Depending on what seeds are used, germination will take place in 3-5 days. The cotton balls should stay moist through germination. If one or more appear dry you can add a little water with an eyedropper or spray bottle. Germinated seeds can be transplanted in

1-2 weeks. Cut the tip off each finger and pull out the germinated seeds (cotton ball and all), and transplant into a container with soil.

Links

- Plant Part Chart
https://naitc-api.usu.edu/media/uploads/2015/03/02/EatingPlants_chart.pdf
- Three Sisters Investigation worksheet
https://naitc-api.usu.edu/media/uploads/2015/09/01/Three_Sisters_Investigation_Worksheet.pdf
- Three Sisters Legends handout
https://naitc-api.usu.edu/media/uploads/2015/09/01/Three_Sisters_Legends.pdf

Sources

1. <http://www.readerstoeaters.com/our-books/zoras-zucchini>
2. <https://www.thekitchn.com/whats-the-difference-between-summer-squash-and-zucchini-233337>
3. <https://snaped.fns.usda.gov/seasonal-produce-guide/summer-squash>
4. <http://www.ncagr.gov/markets/availabilitychart.pdf>
5. <https://news.ncsu.edu/2018/09/top-vegetables-in-nc/>
6. <https://content.ces.ncsu.edu/summer-squash-production>
7. <http://extension.usu.edu/fscreate/ou-files/ezplug/uploads/FK-VVibes-SummerSquash.pdf>
8. <https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=145>
9. https://www.agclassroom.org/teacher/matrix/lessonplan.cfm?lpid=297&author_state=0&search_term_lp=squash

K-5 Subject Areas

Reading, Speaking and Listening, Science, and Social Studies

Common Core/Essential Standards

Reading

- **RL.K.1** With prompting and support, ask and answer questions about key details in a text.
- **RL.1.1** Ask and answer questions about key details in a text.
- **RL.2.1** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of **key** details in a text.
- **RL.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the **basis for** the answers.
- **RL.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RL.5.1** Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RL.K.3** With prompting and support, identify characters, settings, and major events in a story.
- **RL.1.3** Describe characters, settings, and major events in a story, using key details.
- **RL.2.3** Describe how characters in a story respond to major events and challenges.
- **RL.3.3** Describe characters in a story and explain how their actions contribute to the sequence of events.
- **RL.4.3** Describe in depth a character, setting, or event in a story or drama, drawing on specific details in the text.
- **RL.5.3** Compare and contrast two or more characters, settings, or events in a story or drama, drawing on specific details in the text.

Speaking and Listening

- **SL.K.1** Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
- **SL.1.1** Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.

- **SL.2.1** Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
- **SL.3.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.4.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.5.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.K.2** Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
- **SL.1.2** Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- **SL.2.2** Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- **SL.3.2** Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **SL.4.2** Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **SL.5.2** Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- **SL.K.4** Speak audibly and express thoughts, feelings, and ideas clearly.
- **SL.1.4** Produce complete sentences to describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.
- **SL.2.4** Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent and complete sentences.
- **SL.3.4** Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly in complete sentences at an understandable pace.
- **SL.4.4** Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; adjust speech as appropriate to formal and informal discourse.
- **SL.5.4** Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; adapt speech to a variety of contexts and tasks.

Science

- **K.E.1.1** Infer that change is something that happens to many things in the environment based on observations **made** using one or more of their senses.
- **1.L.1.1** Recognize that plants and animals need air, water, light (plants only), space, food and shelter and that these may be found in their environment.
- **1.L.2.1** Summarize the basic needs of a variety of different plants (including air, water, nutrients, and light) for energy and growth.
- **3.L.2.1** Remember the function of the following structures as it relates to the survival of plants in their environments:
 - • Roots – absorb nutrients
 - • Stems – provide support
 - • Leaves – synthesize food
 - • Flowers – attract pollinators and produce seeds for reproduction
- **3.L.2.2** Explain how environmental conditions determine how well plants survive and grow.
- **3.L.2.3** Summarize the distinct stages of the life cycle of seed plants.

Social Studies

- **K.C.1.2** Explain the elements of culture (how people speak, how people dress, foods they eat, etc.).
- **1.H.1.2** Explain the importance of folklore and celebrations and their impact on local communities.
- **1.C.1.2** Use literature to help people understand diverse cultures.

- **2.G.2.1** Give examples of ways in which people depend on the physical environment and natural resources to meet basic needs.
- **2.C.1.1** Explain how artistic expressions of diverse cultures contribute to the community (stories, art, music, food, etc.).
- **2.C.1.2** Recognize the key historical figures and events that are associated with various cultural traditions.
- **3.H.1.1** Explain key historical events that occurred in the local community and regions over time.
- **3.H.1.2** Analyze the impact of contributions made by diverse historical figures in local communities and regions over time.
- **3.H.1.3** Exemplify the ideas that were significant in the development of local communities and regions.
- **3.C.1.3** Use non-fiction texts to explore how cultures borrow and share from each other (foods, languages, rules, traditions and behaviors).

Name _____

Three Sisters Investigation

List facts and characteristics that describe each of the Three Sisters Crops.

| Corn | Beans | Squash |
|------|-------|--------|
| | | |

List characteristics of each of the Three Sisters from the legend you read.

| Sister #1 | Sister #2 | Sister #3 |
|-----------|-----------|-----------|
| | | |

Which crop does each sister in your legend represent?

Sister #1 = _____ (List corn, beans or squash) Explain why you think this way.

Sister #2 = _____ (List corn, beans or squash) Why?

Sister #2 = _____ (List corn, beans or squash) Why?

In what ways does the legend describe how the three sisters support each other?

Three Sisters Legend #1

From <http://www.birdclan.org/threesisters.htm> retrieved August 14, 2014

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 stories of the Three Sisters vary 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.

Three Sisters Legend #2

From <http://blogs.cornell.edu/garden/get-activities/signature-projects/the-three-sisters-exploring-an-iroquois-garden/a-legend/> retrieved August 14, 2014

The following story, entitled "The Three Sisters," was recorded by Lois Thomas of Cornwall Island, Canada. It is one of a collection of legends compiled by students at Centennial College, Toronto, Canada. Out of respect to native culture, we ask that you share the legend in a spirit of respect.

Once upon a time very long ago, there were three sisters who lived together in a field. These sisters were quite different from one another in their size and also in their way of dressing. One of the three was a little sister, so young that she could only crawl at first, and she was dressed in green. The second of the three wore a frock of bright yellow, 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 guard them. She wore a pale green shawl, and she had long, yellow hair that tossed about her head in the breezes.

There was only one way in which the three sisters were alike. They loved one another very dearly, and they were never separated. They were sure that they would not be able to live apart.

After a while a stranger came to the field of the three sisters, a little Indian boy. He was as straight as an arrow and as fearless as the eagle that circled the sky above his head. He knew the way of talking to the birds and the small brothers of the earth, the shrew, the chipmunk, and the young foxes. And the three sisters, the one who was just able to crawl, the one in the yellow frock, and the one with the flowing hair, were very much interested in the little Indian boy. They watched him fit his arrow in his bow, saw him carve a bowl with his stone knife, and wondered where he went at night.

Late in the summer of the first coming of the Indian boy to their field, one of the three sisters disappeared. This was the youngest sister in green, the sister who could only creep. She was scarcely able to stand alone in the field unless she had a stick to which she clung. Her sisters mourned for her until the fall, but she did not return.

Once more the Indian boy came to the field of the three sisters. He came to gather reeds at the edge of a stream nearby to make arrow shafts. The two sisters who were left watched him and gazed with wonder at the prints of his moccasins in the earth that marked his trail.

That night the second of the sisters left, the one who was dressed in yellow and who always wanted to run away. She left no mark of her going, but it may have been that she set her feet in the moccasin tracks of the little Indian boy.

Now there was but one of the sisters left. Tall and straight she stood in the field not once bowing her head with sorrow, but it seemed to her that she could not live there alone. The days grew shorter and the nights were colder. Her green shawl faded and grew thin and old. Her hair, once long and golden, was tangled by the wind. Day and night she sighed for her sisters to return to her, but they did not hear her. Her voice when she tried to call to them was low and plaintive like the wind.

But one day when it was the season of the harvest, the little Indian boy heard the crying of the third sister who had been left to mourn there in the field. He felt sorry for her, and he took her in his arms and carried her to the lodge of his father and mother. Oh what a surprise awaited here there! Her two lost sisters were there in the lodge of the little Indian boy, safe and very glad to see her. They had been curious about the Indian boy, and they had gone home with him to see how and where he lived. They had liked his warm cave so well that they had decided now that winter was coming on to stay with him. And they were doing all they could to be useful.

The little sister in green, now quite grown up, was helping to keep the dinner pot full. The sister in yellow sat on the shelf drying herself, for she planned to fill the dinner pot later. The third sister joined them, ready to grind meal for the Indian boy. And the three were never separated again.

Three Sisters Legend #3

From <http://www.ncdcr.gov/Portals/7/Collateral/Database/F05.legend.three.sisters.pdf>

Legends and Myths: The "Three Sisters" as told by Shelia Wilson from Tar Heel Junior Historian 45:1 (fall 2005).

When Native people speak of the "Three Sisters," they are referring to corn, beans, and squash. Known as the "sustainers of life," these are the basic foods of sustenance. They are seen as three beautiful sisters, because they grow in the same mound in a garden. The corn provides a ladder for the bean vine. The squash vines shade the mound and hold moisture in the soil for the corn and beans. The well-being of each crop planted is said to be protected by another. Many a legend has been woven around the Three Sisters—sisters who should be planted together, eaten together, and celebrated together. Legends vary from tribe to tribe.

The legend of "Three Sisters" originated when a woman of medicine who could no longer bear the fighting among her three daughters asked the Creator to help her find a way to get them to stop. That night she had a dream, and in it each sister was a different seed. In her dream, she planted them in one mound in just the way they would have lived at home and told them that in order to grow and thrive; they would need to be different but dependent upon each other. They needed to see that each was special and each had great things to offer on her own and with the others. The next morning while cooking breakfast, she cooked each daughter an egg, but each was different: one hard-boiled, one scrambled, and one over-easy. She told her daughters of her dream and said to them, "You are like these eggs. Each is still an egg but with different textures and flavors. Each of you has a special place in the world and in my heart." The daughters started to cry and hugged each other, because now they would celebrate their differences and love one another more because of them. From that day on, Native people have planted the three crops together—Three Sisters helping and loving each other.