The Great Pumpkin Project:
The Stories and History in our Seeds

About this Lesson
Every growing season, farmers and gardeners across the world plant seeds. The seeds grow into plants that nourish, awe, and soothe us. In the bounty of a season’s harvest, we might forget that even the smallest seed we plant has millions of years of stories contained within it - stories about the environmental conditions where the wild plant evolved, what attracted human hunter gatherers to start cultivating and then domesticating them, and what it is about the appearance and taste of these particular plants (and their fruits and seeds) that we find so pleasing that we plant them in our gardens and fields, year after year.

These stories in our seeds - the human, biological, and historical - are disappearing. Through this project, we are collaborating with 4-H and NC Cooperative Extension on a community-led effort to document the agricultural history and diversity of pumpkins, squash, and gourds throughout North Carolina, and to advocate for why they are so important to save.

Summary
Each plant has a history. Like us, each plant is from a place - a place where many generations of its ancestors grew. Over millions of years, these plants evolved. They have evolved flowers full of pollen and nectar and sweet scents to attract pollinators, nutritious and beautiful fruits to attract seed dispersers, or seedpods that scattered and sent the seeds far from the mother plant. The plants contained in these seeds evolved waxy leaf coverings and toxic chemicals to defend themselves against herbivores that want to eat their leaves. The plants in these seeds may have evolved to grow quickly during the ideal growing season, either as a vine or as a stalk, in order that the plant outcompete its neighbors for light, nutrients, pollinators, and ultimately, reproduction.

Eventually, humans came to be. In Africa, this happened more than a million years ago. In Europe, it was around 100,000 years ago. In East Asia, humans arrived around 60,000 years ago. In the Americas, humans perhaps arrived between 30,000 - 40,000 years ago. To migrate around the world out of Africa, humans needed fuel, in the form of food. They ate thousands of types of seeds, tubers, fruits, insects, and mammals. What people ate depended on what was in their local environment, and therefore varied dramatically around the world.

Eventually, around 12,000 years ago, human groups in eight disparate regions of the world (Vavilovian centers of crop plant domestication) began to intentionally plant some of the seeds and fruits they were gathering. They chose fruits, seeds, or tubers from the plants for a variety of complex reasons. Perhaps a certain fruit tasted the best, a certain seed grew the fastest, a flower or fruit was the most visually attractive, or could be stored for the longest amount of time after harvest. After the earliest farmers domesticated a food plant, the good news, literally, traveled: Seeds for crop and ornamental plants were traded among groups, so that these plants traveled thousands of miles. As these seeds traveled through trade routes, crops adapted to the different places where they were being grown, resulting in a great diversity of forms. Perhaps a family in one valley selected for yellow fruit. Perhaps another family in the next valley preferred larger flowers, or better herbivore resistance, and then they saved seeds from plants with those traits. Over thousands of years, this selection followed by seed saving produced an immense amount of genetic diversity in our crop plants. We can still see this agricultural diversity in the gardens of our friends and neighbors who grow heritage fruit, vegetable, and grain varieties. The stories of these travels - where a plant came from, what insects it interacted with, what traits attracted people to it, how people used it - are all stories are passed through seeds.

In the last several decades, many of these local seeds have disappeared. Small farms have been combined into bigger farms. The seeds that farmers on small farms carefully saved over countless generations have disappeared in favor of fewer, commercialized seeds, that can be easily bought. To be commercialized, seeds must have more than a great history: They must be able to be grown in many places, and have uniform yield wherever in the world they are sold. Many great seeds - and therefore the fruits or seeds or fiber they produce - are never commercialized. Our cultural and agricultural history - as told through these seeds - is being lost.
Here we try and turn that tide, and give our heritage seeds - the ones that are still hiding in home gardens - the attention, care, and recognition that they (and the many individuals who have preserved them) deserve.

**How to Participate**

1. Identify a family member, friend, or community member who saves seeds
2. Record their story! These are some questions that will help us learn more about saved seeds:
   a. What is the lineage (history) of how these seeds were acquired?
      i. Who were they acquired from?
      ii. How were they acquired? Were they bought, or traded, or from a community garden?
      iii. How long have they been in your family?
   b. How are the plants grown and cared for in the garden, at different times in the growing season?
   c. What do the fruits look like?
   d. If possible, draw a picture of the fruit
   e. If the fruit is present, it would be great to take a picture of it!
   f. How are the fruits prepared to be eaten, stored during the winter, or used as decoration?
   g. How does the farmer choose which seeds to save?
   h. What is the process of seed preservation?
3. What kinds of insects do you observe on the flowers, leaves, and fruits of this plant?

**Materials Needed**

1. Lined paper for taking notes
2. Pen to record notes
3. A family member, friend, or community member with an agricultural story to tell
4. Camera (optional)
5. White, unlined paper and pencils or pen for drawing

**Additional Resources**

- Seed Savers Exchange
- Baker Creek Heirloom Seeds

**About the Scientists**

- Lori Shapiro
- Liz Driscoll
- Rob Dunn

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**A note about the images in this lesson:**

Dr. Lori Shapiro visited Dong Van, Vietnam in the Summer of 2017 and captured images of families collecting, drying and preserving their gourd seeds on roofs and pieces of corrugated metal resting atop motorbikes; the preservation of seeds insures that families and villages can continue to grow their crops year after year.
**The Great Pumpkin Project**

**Seed Savers: How to Participate**

- Identify a family member, friend, or community member who saves seeds
- Record their story! These are some questions that will help us learn more about saved seeds:
  1. What is the lineage (history) of how these seeds were acquired?
  2. Who were they acquired from?
  3. How were they acquired? Were they bought, or traded, or from a community garden?
  4. How long have they been in your family?
  5. How are the plants grown and cared for in the garden, at different times in the growing season?
  6. What do the fruits look like?
  7. If possible, draw a picture of the fruit or take a picture and share to social media with the hashtag #GreatPumpkinArt
  8. How are the fruits prepared to be eaten, stored during the winter, or used as decoration?
  9. How does the farmer choose which seeds to save?
  10. What is the process of seed preservation?
  11. What kinds of insects do you observe on the flowers, leaves, and fruits of this plant?

**Share your information with Dr. Lori Shapiro here:**

[go.ncsu.edu/seedsavers](http://go.ncsu.edu/seedsavers)

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