Corn and the Columbian Exchange

Grade: 4th or 5th grade

Season: Any

IGS Unit: Farms, Food Systems

Essential Questions: What is corn? Where does corn come from? How did corn affect our history? How does eating corn affect the world? What does food tell us about culture?

Objective: Students will understand the process of seed to fork through the lens of corn. Students will explore the transformation of corn over thousands of years, and how it has become the primary crop used in the U.S. today.

Materials:
- *In a World Without Corn* (cut into strips)
- *The Story of Corn* Powerpoint
- *The Creation Story of the Maya:*
  http://www.youtube.com/watch?v=Jb5GkmEcJcw
- List of Corn Products
- Teosinte (photos or artifact)
- Blue corn (photos or artifact)
- Popcorn (photos or artifact) – could also have a popper to make popcorn as a treat!
- Sweet corn (photos or artifact)
- Maps (one for each student)
- Corn seeds, soil, and trays to start corn seedlings (if in spring)

Introduction:
Ask students to raise their hand if they consumed corn in the past week.
Clarify the question, “not sweet corn, corn on the cob, but anything that contains corn.”
Clarify a final time by asking, “if you had a soft drink, ate crackers, chips, pretzels, or cookies in a box, brushed your teeth with toothpaste, used crayons or chalk, or even read a magazine, you consumed a product made of corn.”

- Corn is largest agricultural product in the US, and is found in over 80% of the products in our grocery stores.
Hand out a sentence strip from *In a World Without Corn* to each student, and invite each student to read his or her sentence out loud to the class.

So where did corn come from? And how did it become this all-encompassing crop?

**Lesson:**
*(The Story of Corn powerpoint can be used for visuals at this point)*

We are going to start our path of corn 9,000 years ago in an area in Mexico called the Central Balsas region. At this point, humans had begun transitioning from a nomadic culture to an agricultural society.

- Ask students to distinguish between nomadic vs. agricultural.
- Invite students to highlight the Central Balsas region on their map.

Hand out teosinte seeds. Invite students to make observations of this seed.

- Does this seed look edible? What are some of the differences you notice between this seed and a corn kernel?

Describe the process of domestication in plants, and how this seed transformed over thousands of years to become the corn on the cob that we know so well today.

The Mayan people are often referred to as the “people of the corn.”

Watch “The Creation Story of the Maya”:
http://www.youtube.com/watch?v=Jb5GkmEcjcw

Now, cut to 1,000 years ago, when a fully domesticated corn, or *maize*, arrived in what is now New England. Over this period of a few thousand years, it had traveled across the U.S., and made its way to the West Indies, where our European explorers came across it in their search for grain. (Students may mark the West Indies on their map)

- Corn is an Indoeuropean word meaning, “little nugget,” or “grain.” When the Europeans arrived, they were not looking for corn, but for another grain…wheat. When there was no wheat to be found, they accepted maize, or what they referred to as “corn”
- The Taíno people of the Northern Antilles, where Columbus first landed, are believed to have named the corn “maize,” which means, “source of life.”
- If it weren’t for corn, the European settlers would not have been able to survive in the New World – it was truly the “source of life.”
Colonial explorers then took the corn with them on their travels back to Europe, spreading this food source across the globe. Where did it become most used? Which countries seem to still use corn as their main source of food? Why?

In the early years of Colonial America, why do you think it was so important for the settlers to have this grain? In order to survive the winters, settlers needed a source of food that could be stored for long periods of time. What corn-based foods do you think they were eating?

- Native Americans were using corn in a variety of ways: porridge, bread, soups, pudding, corn cakes, and guided the Europeans in preparing corn in similar ways.
- The corn on the cob, with which we are so familiar, was not developed until the 1700's!
- There were also many other uses for corn: husks were used for tamales, household items, (and dolls!); silks were used for medicinal teas; stalks were used for animal fodder

Throughout history there have been thousands of varieties of corn that are used for different purposes. Over the past hundred years the diversity of corn varieties has waned. What does that say about the health of our environment? Our economy? Our society? Our personal health?

In our current food system, we have a few categories of corn:

**The Different Kinds of Corn**

- **DENT corn**, the scientific name of which is Zea mays indentata, is also called "field" corn. It is a corn variety with kernels that contain both hard and soft starch and become indented at maturity. It is a major crop used to make food, animal feed, and industrial products.

- **FLINT corn**, known by the scientific name Zea mays indurata, is a variety of corn having hard, horny, rounded or short and flat kernels with the soft and starchy endosperm completely enclosed by a hard outer layer. It is similar to dent and is used for the same purposes. Most of it is grown in South America.

- **WAXY corn** is a corn variety with grains that have a waxy appearance when cut, and that contain only branched-chain starch. It is grown to make special starches for thickening foods.
- SWEET or "green" corn is eaten fresh, canned, or frozen. It is a type of corn that is grown in many horticultural varieties. It is variously considered a distinct species (Zea saccharata or Zea rugosa), a subspecies (Zea mays rugosa) or a specific mutation of dent corn. It is distinguished by kernels containing a high percentage of sugar in the milk stage when they are suitable for table use.

- POPCORN is a variety of corn, Zea mays everta, which has small ears and small pointed or rounded kernels with very hard corneous endosperm that, on exposure to dry heat, are popped or everted by the expulsion of the contained moisture, and form a white starchy mass many times the size of the original kernel.

- INDIAN corn has white, red, purple, brown, or multicolored kernels. It was the original corn grown by the Indians, and is known by the scientific name Zea mays. It is many times seen in harvest time and Halloween decorations.

- FLOUR corn, also called "soft" corn or "squaw" corn, has kernels shaped like those of flint corn and composed almost entirely of soft starch. It is known by the scientific name Zea mays amylacea. In this country we grow small amounts of blue flour corn to make tortillas, chips, and baked goods. In South America this corn is grown in various colors to make food and beer.

Corn today:
- 9% of corn is used to produce food for humans. What is the other 91% used for?
  o 65% is used for animal feed
  o The rest is used for fuel, and plastics and other industrial products
- Invite students to take 3 minutes and list all of the products they use that they think might contain corn
- Afterwards, hand out the List of Corn Products, and see if any students have additions (or subtractions) from their list

Discussion:
- What do you think are the issues with the way corn is used in our society today? Create a pros and cons list of the mass production and consumption of corn in the USA today.
Activity:
Explain the importance of heirloom and landrace varieties of crops.
Now we are going to plant two varieties of corn in the school garden: teosinte and Narragansett White Flint Corn. Both have a deep history – teosinte is a story we know well by now.

- The Narragansett White Flint Corn is native to Rhode Island. What does that mean?
- We received this corn from an old farmer in Connecticut, whose farm is the oldest continuously active farm in the state. Whit Davis inherited the land and the seed from his ancestors, who came into the land and seed after the Pequot Massacre at Mystic in 1637. The Narragansett, Pequot, Mohegan, and Nehantic tribes used to grow this grain, but they lost it when they lost their land. Whit now grows, harvests, shells, and winnows the grain on his farm and has it ground at a neighbor’s water-driven gristmill. He shares the corn with the ancestors of the local Native American tribes, and uses it to make johnnycakes for Wigwam festivals.

Each group of students will get one teosinte seed, and a few White Flint Corn seeds to start. Once they sprout, we will transplant them in the school garden. And when they are ready to harvest (ask students, when will that be?), we will harvest and prepare the corn for ourselves and our school community.

Extension:
Lesson: Corn Botany
Lesson: Corn investigation in our food system

Assessment:
Students complete a map of the world, showing where corn originated and how it traveled around the world.
Students plant corn and create signage that explains the history and information on the varieties of corn.

Homework: Students make a list of all of the products in their home that contain corn.