

“One Nation Under Corn”

Modern Corn Uses

Age Group: 6th grade

Time: 45 minutes

Materials:

- Slideshow (PowerPoint)
- DVD of GMO clip
- Various food containers with nutrition labels (about 10)
- 2 large baskets or buckets
- Cup
- Corn vocabulary papers
- Cornstarch
- Water
- Mixing bowl
- Food coloring

Prep in advance:

- Small folded pieces of paper with one corn vocabulary word per paper.
- Gather various food containers with nutrition labels and arrange them on a table.

Description:

Students will be introduced to the modern uses of corn through a PowerPoint slide show depicting images of corn and a short video clip about GMOs. The class will then be divided into 4 groups and begin a rotation of 4 different 5-minute activities: Nutrition Label Analysis, Corn Vocabulary Hangman, Corncontroversial Issues, and Making Oobleck. After completion of the rotation activities, students will reflect on what they learned about modern uses of corn by taking a closer look at their top 10 favorite foods.

Objectives:

Students will be able to...

- Identify the many modern uses of corn.
- Understand how to read nutrition labels.
- Have a basic understanding of the main controversial issues surrounding corn as a commercial crop.

Environmental Education Guidelines:

- Questioning & Analysis
- Knowledge of environmental processes & systems
- Skills for understanding and addressing environmental issues
- Personal and Civic Responsibility

Major Life Science Themes:

- Adaptation
- Structure & Function
- Genes
- Ecosystems
- Population
- Extinction
- Diversity

Background information:

The documentary, *King Corn*, is a good, informative video to watch in order to gain a better understanding of the modern issues surrounding corn. Also, review the vocabulary listed below.

Safety:

None

Vocabulary:

- Corn gluten meal: “CGM” is a byproduct of corn processing that has been used as feed and an herbicide for farms and gardens.
- Corn oil: Is oil extracted from the germ of corn. It is used as frying oil and is also a key ingredient in margarines. It has a milder taste and is less expensive than other vegetable oils. Corn is one source of biodiesel. Other industrial uses for corn oil include soap, salve, paint, rustproofing for metal surfaces, inks, textiles, and insecticides. It is sometimes used as a carrier for drug molecules in pharmaceutical preparations.
- Corn ethanol: Ethanol produced from corn by industrial fermentation, chemical processing and distillation. It is commonly used in the U.S. as an alternative to gasoline and petroleum.
- Corn syrup: Is a syrup made from corn starch and used as a thickener, sweetener, and for its moisture-retaining properties. Corn syrup is mainly composed of glucose. **High fructose corn syrup** (HFCS) is a variant in which other enzymes are used to convert some of the glucose into fructose. The resulting syrup is sweeter and more soluble. Corn syrup and HFCS are commonly used in place of sugar in American-made processed and mass-produced foods, candies, and sodas to help control costs.
- Cornstarch: AKA corn flour, has distinctive property when mixed with water, a semi-liquid turns to solid when you push down fast on it and it is fun to play with! A mixture of 1 part water to 1.5–2 parts cornstarch is a popular classroom demonstration of a dilatant (shear-thickening) fluid, often called Oobleck. When struck, cut with a knife, or worked vigorously in the hands, it behaves like a pliable solid, but if allowed to sit for a few seconds, it flows as a viscous liquid.
- Corn silage: The fermented corn that can be fed to animals like cattle and sheep.
- Corn stover: The remaining parts of the plant, stalk, leaves and “residue stalk” (the husk and silk remains) left in a field after harvest. Not commonly utilized, but can be used for grazing, fodder, or biofuel.

Source: www.wikipedia.org

Instructional Sequence:**Journal Activity** (15 minutes)

- Instruct students to take out their journals and write their top 10 favorite things to eat.
- Present the PowerPoint slideshow “One nation under corn”, depicting the many ways corn is used.
- Video clip presentation: Genetically Modified Organisms
- Ask the students if anyone wants to look closely at what is in their lunch bag?

Food label sort (5 minutes)

- Escort students to the table set up with all kinds of products’ packaging.
- Direct students to sort the products into two baskets, one for products containing corn and those products that do not contain corn. (Ingredients can be corn, corn syrup, cornstarch, corn flour, high fructose corn syrup or any other corn ingredient).

Hangman (5 minutes)

- Escort students to the station at the blackboard, set up to play hangman with corn vocabulary.
- Direct the students to take turns leading hangman games. Each leader will pick a corn vocabulary word from out of the cup, read it to themselves, and then draw the appropriate number of lines on the board for the chosen word. For example, if “corn syrup” is chosen, the leader will draw 9 lines with a blank space in between the two words. The leader will then ask other students to guess letters, giving each student one guess until everyone has a chance. Other vocabulary can be: cornstarch, high fructose corn syrup, GMO, tassel, kernel, etc.

Discussion (5 minutes)

- Facilitate a mature discussion around one of the *controversial* issues:
 - What are GMOs?
 - Growing corn for fuel
 - Using pesticides and herbicides for mass production of corn
 - Government corn subsidies
- Wrap up the discussion by asking the students what can we do about these issues.
 - Be smart consumers?
 - Learn organic gardening methods?
 - Support local farms?
 - Ride a bike?

Cornstarch slime (5 minutes)

- Explain that many things are made out of corn starch of corn flour because of its special properties. One of its special properties is that cornstarch mixed with water will act as a liquid and as a solid.
- Guide a hands-on experiment with cornstarch. Let the students take turns playing with the “Oobleck” or “slime” mixture.
 - 1 cup water
 - 1.5-2 cups corn starch
 - A few drops of food coloring of your choice
- Instruct students to wash their hands when finished.

Journals (10 minutes)

- Review with the students the top 10 favorite foods they previously wrote in their journals.
- Ask the students to consider the ingredients in these top 10 foods. Do any of them have corn in them?
- Direct students to share how many of their favorite foods have corn in them.
- Direct each student to write a sentence about what they learned in their journals.

Assessment/Evaluation:

By directing students to write a sentence in their journals about what they learned, an assessment can be made. For further assessment, ask them to include a list of modern ways corn is used.