Corn Products and Uses

Maryland Teaching Standards:

Standard 6.0 Nutrition and Fitness
- Identify and define functions of nutrients.
- Explain the relationship between nutrition and physical activity.

Standard 3.0 Personal and Consumer Health
- Locate resources that provide valid health information concerning consumer health issues and services.

Time: 30-45 Minutes, can be modified to meet scheduling needs.

Objectives:
Students will identify:
- food products containing corn, the various uses of corn (powder, starch, syrup and oil).
- the role of corn in renewable resources, biodegradable products and biofuels.

Materials:
- Examples of corn products (food cartons or pictures)
- Bushel Basket
- Mortar and Pestle
- Corn packing peanuts and hot water (optional)
- Styrofoam packing peanuts (optional)

For Activity Option #1– Tortillas
- Griddles (x2)
- Tortilla Mix- Masa
- Tortilla Presser (x6)
- Mixing Equipment– bowls, spoons, ice cream scoop
- Tasting Supplies-napkins, small plates
- Crockpot
- Measuring Cups
- Brown rice
- Black beans
- Mild salsa

For Activity Option #2– MyPlate Salsa
- 1 can (15 oz) black beans, rinsed and drained
- 1 can (8 oz) diced peaches or crushed pineapple, in their own juices, drained
- 1 can (8 oz) yellow or white corn
- 1 cup grated low fat cheddar cheese
- 1 jar mild or medium salsa
- Whole grain tortilla chips
- Large Bowl
- Measuring Cups(1– 1Cup, 1– 1/2 cup)
- Mixing Spoons
- Small Disposable Cups
- Napkins
Lesson
Ask students:
- What foods do they enjoy that contain corn as an ingredient?
  
  *Answers may include cereals, breads, corn on the cob, chips.*
- Do we use corn to make items other than food for people?
  
  *Answer is Yes and examples may include pet food, trash bags, packing peanuts, plastics, and compost.*

Share with students:
- Today we are going to identify several food products which contain corn, and how corn is used to make the product. There are over 4,000 products in grocery stores which have corn or corn products as an ingredient.
  - Pass out pictures of corn products or cartons collected from products containing corn.
- Ask students to predict which items contain corn and to separate into groups. Have students share thoughts aloud.
- Explain each item contains corn and by reviewing the nutrition label, the students can identify the form in which the corn is used.
  - *i.e.: corn starch, corn oil, corn syrup, corn powder, etc.*
- Some products we consume contain corn and we don’t even know it. Like juices and sodas. Corn syrup or high fructose corn syrup is a sweetener in many foods and beverages. There are both advantages and disadvantages to using high fructose corn syrup.
- The form in which corn is utilized as an ingredient is determined by the processing method.

Optional Activity: Using a mortar and pestle demonstrate the grinding process to make corn powder. This process is utilized in preparing corn for flours and masa.

*Extra: Example of Mortar and Pestle if actual demonstration is not available.*

[http://www.youtube.com/results?search_query=how+to+use+a+mortar+and+pestle&oq=how+to+use+a+mortar+and+pestle&gs_l=youtube.3..0.42905.47085.48561.4.11.0.0.0.1.140.717.8j2.10.0...0.0...1ac.1.11.youtube.MGrm9PAPCCE](http://www.youtube.com/results?search_query=how+to+use+a+mortar+and+pestle&oq=how+to+use+a+mortar+and+pestle&gs_l=youtube.3..0.42905.47085.48561.4.11.0.0.0.1.140.717.8j2.10.0...0.0...1ac.1.11.youtube.MGrm9PAPCCE)

Share with students:
- When corn is not utilized for consumption by people or animals, it is used to make useful everyday products we find around our homes. Many plastics today have corn as part of the product. This allows the item to be biodegradable.

Ask students:
- What is biodegradable?
  
  *Answer is that it is capable of decaying through the action of living organisms.*
- What items in our classroom are biodegradable?
  
  *Answers may include: paper, wood, etc.*

Share with students:
- When biodegradable items break down they create less waste therefore taking up less space in our landfills.
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Optional Activity: Place corn and styrofoam packing peanuts in separate cups. Add hot water. Students observe changes in corn packing peanuts as it dissolves. Discuss changes as a group. Observation: Corn will break down, styrofoam will hold shape.

Share with students:

- In addition to biodegradable products, corn can also be used as a renewable resource just like trees. Corn reproduces quickly, similar to the production of trees. Corn grows on a stalk or stem and each stalk will grow three ears or cobs of corn. Depending on the variety or type or corn, each ear will produce approximately 800 kernels. The kernels are the part of the corn in which we eat and they are also the new seeds for the corn plant.
- Isn’t that amazing! One seed can create up to 2,400 new seeds. Farmers and agriculturalists use these kernels to feed livestock, grow new plants for the next growing season, and they are sold to food manufacturers for people to eat. As a renewable resource corn, has also been utilized for shelter, heat and household items for many years. As early as the new settlers in America, people (Pilgrims) have used corn husk (leaves) to make soft mattresses for their beds, and to make dolls for their children. Corn cobs were utilized to make hand tools, and the pilgrims burned the dried corn cobs in their fireplaces for warmth and for cooking.
- Today we also use corn to create biofuels. Biofuels are produced from raw biological materials like wood or corn. Ethanol is the biofuel produced from corn. Before biofuels were created, many fossil fuels like coal, oil, or natural gas were utilized.
- Since ethanol is made from corn we understand it is biodegradable, so it produces less waste and less pollution. Corn is also a renewable resource, so unlike fossil fuels we won’t deplete our supply in the near future.

Activity:

Option #1: Corn Tortillas (15-20 min)

- Prep: Using masa, prepare dough balls as indicated on package (use ice cream scoop for consistent size). Place dough balls in a non-zip plastic sandwich bag.
- In small bowls prep ingredients for students to add to tortillas. Rice may be prepared in a crockpot to keep warm. Refrigerate unused ingredients in between activities.
  - For large groups, masa may be prepared one day prior and refrigerated until the day of the activity. Let masa balls come to room temperature before pressing.
  - If time allows, students can mix up there own masa and roll into a ball, then place it in the bag.
- Pass out hand wipes to each student.
- After all students have washed their hands, have each student take their bag and place it in the center of the presser. Using the presser, flatten the tortilla.
- Place tortilla on a hot griddle set at 350 degrees. Do not spray griddles with cooking spray.
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- Have adults assist with the griddles—each tortilla takes one minute on each side to cook.
- Students may add black beans, brown rice, and salsa to their tortilla to taste.

Option #2: MyPlate Salsa (10 min)

- Share with students canned food items.
- Have students predict as to:
  - Item with the largest sodium content.
  - Item with the largest sugar content.
  - Item with the largest protein content.
- Have youth identify nutrition facts from the nutrition label. Include:
  - Item with the largest sodium content.
  - Item with the largest sugar content.
  - Item with the largest protein content.
- In a large bowl have students combine ingredients. While combining, have students identify the food group for each ingredient.
  - 1 can (15 oz) black beans, rinsed and drained
  - 1 can (8 oz) diced peaches in their own juices, drained
  - 1 can (8 oz) yellow or white corn
  - 1 cup grated low fat cheddar cheese
  - 1 jar mild or medium salsa
- One batch will serve 12 youth a 1/2 cup serving.
- Using a measuring cup—give each student 1 serving of whole grain tortilla chips on a napkin, and 1/2 cup serving of salsa in a disposable cup. Students can read nutrition information label for salsa and compare to individual ingredients.

Definitions

- Renewable Resource— is found in nature and is capable of regenerating itself. It can be made into something new.
- Biodegradable— can be broken down into harmless products by living things (bacteria). Bio (nature) + degradable (break apart or dissolve).
- Biofuel— an energy source (wood or ethanol) produced from raw biological materials.
- Fossil Fuels— an energy source (coal, natural gas, oil) that is formed in the earth from plant or animal remains.
- Corn Starch— a starchy flour used as a thickener in foods.
- Corn Powder— made from grinding corn, used in flour for baking.
- Corn Oil— pale yellow oil made from cooking corn.
- Corn Syrup— a liquid made from corn starch, used as a sweetener.

Resources

Link to Corn Packing Peanuts: http://www.packagingsupplies.com/Biodegradable_Cornstarch_Packing_Peanuts.html
Video Link: http://www.youtube.com/watch?v=rc2ZwhdihA8&feature=c4-overview-vl&list=PLFDC59DA41CCD9463
MyPlate Salsa

Makes 6, 1 cup servings

Ingredients

1 can (15 ounces) black beans, rinsed and drained
1 can (8 ounces) diced peaches in their own juices, drained
1 can (8 ounces) yellow or white corn
1 cup grated cheddar cheese
1 jar mild or medium salsa

Directions

1. Combine all of the above ingredients.
2. Serve with low-fat baked corn or flour tortilla chips.

Other Serving Ideas

- Heat and serve with rice
- Use as a topping on baked potatoes

Tip

Try new recipes – cooking is fun and less expensive then eating at a restaurant.