

Candy, Culture & Creativity



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Candy Ingredients



Introduction:

Candy ingredients are grown and processed around the world. Illinois agriculture accounts for many candy ingredients that may surprise you. These include: corn, soybeans, milk, sugar, eggs, and honey. For more information about the sources of candy ingredients, see the accompanying book with this unit, "Agriculture: Where Candy Comes From."

Common Core:

CCSS.ELA-Literacy.RH.6-8.4; RH.6-8.7; W.5.2; W.5.3; W.5.4; W.5.6; W.5.7; W.5.9; SL.5.4

Next Generation Science Standards:

Earth's Systems-5-ESS2-1

Engineering Design-3-5-ETS1-1; 3-5-ETS1-3

Suggested Reading:

All in Just One Cookie by Susan E. Goodman ISBN-13: 9780060090920

Candy! A Sweet Selection of Fun and Easy Recipes by Laura Dover Doran ISBN-13: 9781579901110

Sugarbush Spring by Marsha Wilson Chall ISBN-13: 9780688149079

Sugar Snow by Laura Ingalls Wilder ISBN-13: 9780064435710

Materials Needed:

- Smell/Taste Testing Materials: almonds, carob chips, carob powder, coconut, corn syrup, corn oil, corn starch, cottonseed oil, eggs, honey, maple syrup, milk, mint, molasses, peanuts, pecans, salt, soybean oil, sugar, vanilla, walnuts (Note: be sure to check for food allergies)
- Small plates
- "Candy Ingredients From Around The World" Map

Directions:

Candy Smell Test/Taste Party

1. Set up a table of candy ingredients such as nuts, oils, sugars, grains, etc. with their labels covered.
2. Ask the students to smell/taste the candy ingredients and guess what they are. Be sure to check for allergies before. You may choose to give the student who gets the most right some candy as a prize.
3. If you decide to have your students taste candy ingredients, ask them to describe them as salty, sour, bitter or sweet, and chart them. You may want to put the ingredients on small plates for them to taste. Note: Foods that taste sweet are more easily tasted on the front of the tongue. Salty or sour flavors are tasted mostly on the sides of the tongue. Bitter flavors are tasted on the back of the tongue. The students could also taste candy that has been made and describe it by it's texture (gritty, smooth, crunchy, creamy). You may want to make a chart for your students so they can record their findings about the different flavors.

Where Does My Candy Come From?

1. Ask your students to create a candy of their own. It should be something they've never seen before. (for example: pecans and cherries with honey and a white chocolate coating and sprinkles)
2. Next the students should write a recipe for their candy. What ingredients will they need?
3. Ask the students to write down what countries their ingredients come from. Then, they should use the world map included in this lesson to mark the places where their ingredients will grow. They can create a color-coded key and then color the countries as well. For example, if they need vanilla for their candy, they can make vanilla blue in the key and then color Madagascar blue since that is one place it grows. If you are studying longitude and latitude, you may want to have the students write down this information along with their candy ingredient sources.
4. Ask the students to write down how their ingredients will be transported to the United States.
5. Ask the students to draw a flow chart of the process the ingredients will go through to be made into candy.
6. Each student can give a presentation about their candy and how it is made. The entire class can vote on their favorite candy from these presentations.

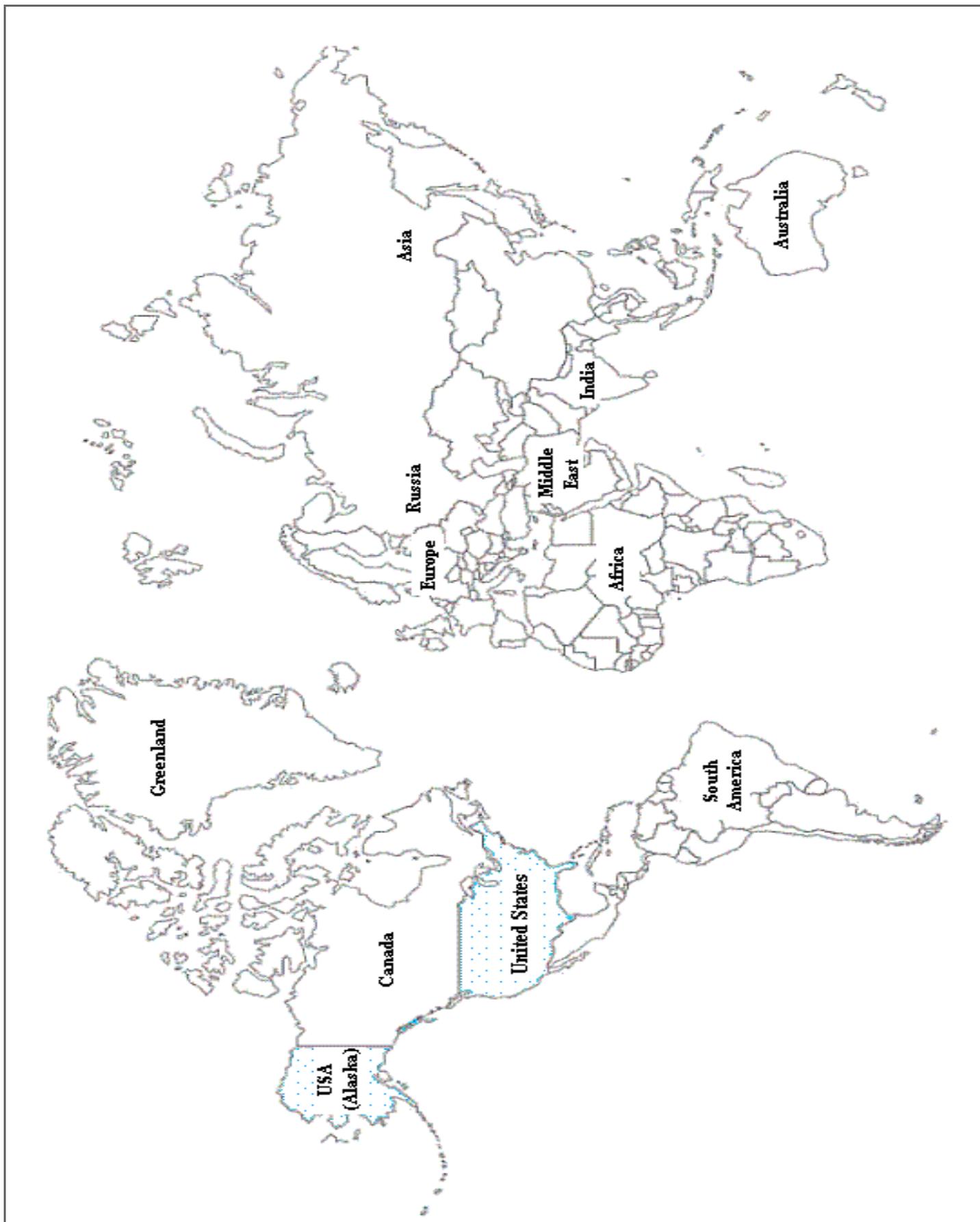
Discussion Questions:

1. How is Illinois agriculture different than agriculture in other parts of the world? (crops, climate, processing, technology)
2. What is an emulsifier? (soy lecithin)
3. Why is foreign trade important to the candy industry?
4. Name three types of nuts used in candy.
5. Name three types of oils used in candy.

Lesson Extenders:

1. Your job is to harvest vanilla trees! Write a story about it. Where would you live? How would you keep the pods from being stolen?
2. Place the following candy ingredients in the groups of the My Illinois Plate: nuts, fruits, milk, butter, cream, mint, corn syrup, molasses, honey, soybean oil, eggs, barley, wheat, rice, sorghum, chocolate.
3. Origin of crops: Ask the students to pick a candy ingredient of which they would like to learn the history. They should research the origin of the ingredient, where else it can grow, people who were involved in transporting the crop, and people who were involved in researching the crop. Ask the students to work in groups and write a short play about their candy ingredient's history. (For example, they could write a play about vanilla including the officer of Cortes who noted Aztecs using vanilla in chocolate, the Spaniards establishing factories to manufacture chocolate with vanilla flavoring, and vanilla production today.) Here is a list of ingredients and their origins to get the students started:
 - Pecans- N. America
 - Vanilla-Mexico/Central America
 - Sugarcane- Southeast Asia
 - Peanuts- Eastern Brazil/Amazon Basin
 - Chocolate- Mexico/Central America
 - Soybeans- China
 - Coconut- Southeast Asia

Candy Ingredients from Around the World



Candy and Culture



Introduction:

Candy can be eaten on many occasions: holidays, birthdays, or any day. Some families, countries, and cultures have special traditions with candy. For example, sugar skulls are made during Mexico's Day of the Dead. The skulls are to honor relatives who have passed away. Sugar skulls are made by boiling sugar, pouring it into molds, and decorating them with icing. Some other traditions with candy may be Trick-or-Treating, hitting piñatas until the candy falls out of them, searching for Peeps[®] and jelly beans at Easter, or making candy for friends at Christmas.

Here is more specific information on two holidays of which candy plays a big part:

Valentine's Day and White Day in Japan

For the Japanese, Valentine's Day is much different. Here in America on Valentine's Day, both boys and girls give candy to everyone, but in Japan only the girls give away the candy. The girls have to give candy to every boy they know. They give two types of candy, Giri choco (obligatory chocolate) and honmei choco (chocolate for the boys the girls really like). In elementary school, however, there will usually only be a few girls who will give all the boys candy. Most of the girls will only give candy to the boys they have a crush on. Then on White Day, March 14, the boys who were lucky enough to get candy from any girl return the favor and give those girls white candy (marshmallows, cookies or white chocolate) in white packaging, even if they don't feel the same way about the girl.

Day of the Dead

The Day of the Dead is a Mexican holiday held on November second, and is a way of honoring the dead. On this day, children do not go to school. The day is spent doing things to honor their dead loved ones. In the morning, the family will eat a feast featuring the Bread of the Dead. The baker of the bread will hide toy skeletons in it and whomever bites into the toy will have good luck. Families traditionally make an offering in the main room of the house. To make the offering, the family will put a thin piece of cutout paper on a table as if it were a tablecloth. Then, they put a photo of the loved one on the table in the front. The family will then put the loved one's favorite food and drink on the table. According to the tradition, the lost family member will come share in the dinner with the family. To guide the loved one, candles are lit and a path is made of Marigolds, which is considered the special flower of the dead. Also on the offering table will be candy skulls and the Bread of the Dead. On this day, people also go into the graveyards to greet and visit with their loved ones. They sing, bring flowers and food, have picnics and interact with other families in the community. Friends and family give each other gifts that consist of candy skulls and other death related items. A skull with the receiver's name printed on it is the most prized gift.

Fun Facts:

- Oliver R. Chase, of Boston, invented Necco which makes Necco wafers and conversation hearts for Valentine's Day.
- Gustav Goelitz and his brother came to America from Germany and started the Goelitz Brothers Candy Co., which made candy corn and eventually Jelly Belly® jelly beans.
- PEZ was first marketed as a compressed peppermint candy over 70 years ago in Vienna, Austria.
- M&M's® were inspired by Spanish soldiers eating pellets of chocolate encased in a sugary coating.

Common Core:

CCSS.ELA-literacy.RI.5.9; RI.5.10; SL.5.1; W.5.2; W.5.6; W.5.7; W.5.9

Suggested Reading:

Chocolate A Sweet History by Sandra Markle ISBN-13: 9780448434803

The Legend of the Candy Cane by Lori Walburg ISBN-13: 9780310730125

Materials Needed:

- Internet access
- Paper
- Pencils, crayons, markers

Directions:*Candy Legends*

Ask the students to research the legends and history behind different candies. Then, they can take the legends and rewrite them into books for younger grades. Possibilities are:

- Candy Canes. See one of the many websites about this candy.
- Peppermint Pig
See: <http://www.saratogasweets.com/peppermint-pig-tale.cfm>
- The Legend of La Befana and Epiphany in Italy
See: <http://www.qc.edu/calandra/community/commbefa.html>
- Jelly Beans. See one of the many websites about this candy.

Candy Traditions

1. Ask the students what types of candy traditions they have in their family. (piñatas for birthdays, jelly bean hunts at Easter, making peanut brittle at Christmas, sugar skulls for Mexico's Day of the Dead, building gingerbread houses, etc.)
2. Ask the students to find recipes for traditional candies of other countries. You can create a book with the recipes or try to make a few and share them with your class. You can find some traditional recipes at:
 - "Sugar Skulls"
http://www.mexicansugarskull.com/sugar_skulls/instructions.html
 - "Candy Skulls"
<http://mexicanfood.about.com/od/sweetsanddesserts/ht/candyskulls.htm>
 - "Macaroon Bars" (Scottish candy bars)
<http://londoneats.wordpress.com/2011/10/23/macaroon-bars/>
 - "Edinburgh Rock" (Scottish sweet)
<http://www.food.com/recipe/edinburgh-rock-22669>
 - "Spumetti" (Italian Chocolate-Hazelnut Meringues)
<http://allrecipes.com/recipe/spumetti/>
 - "Recipes for Saint Nicholas candy" (Dutch candy-eight recipes)
<http://www.stnicholascenter.org/pages/candy/>
 - "West Africa Omanhene Fudge"
<http://www.globalgourmet.com/destinations/westafrica/fudge.html#axzz2j2ERBHpI>
 - "Sukariyot Soomsoom" (Crunch Sesame Seed Candies of the Middle East and North Africa)
<http://homecooking.about.com/od/candyrecipes/r/bldes12.htm>

Candy Lovers from Around the World

Ask the students to complete the "Candy Lovers from Around the World" worksheet. The answers can be found throughout this candy unit. Specifically see the "Agriculture: Where Candy Comes From" packet. Emphasize to the students that without global influence, we would not have the same candy culture we have today.

Answer Key:

- Andreas Marggraf, German, Proved there was sugar in sugar beets
- George Washington Carver, African American, Researched peanuts and found over 300 uses
- Leo Hirshfield, Austrian immigrant, Began production of Tootsie Rolls® in New York
- Montezuma, Aztec, Drank chocolatl from golden cups
- Daniel Peter and Henri Nestle', Swiss, Candy maker (Daniel) and chemist (Henri) who teamed up to add milk to chocolate
- Goelitz Brothers, German immigrants, Produced candy corn and eventually Jelly Belly® jelly beans
- Oliver R. Chase, American (Boston), Inventor of Necco Candy

Discussion Questions:

1. What types of candy are eaten in other countries?
2. Why is it difficult to find the original source of some candies?

Candy Lovers from Around the World

Match each of the following names to their country/heritage and the reason for their fame with candy.

| | | |
|--------------------------------|--------------------|--|
| Andreas Marggraf | American (Boston) | Drank chocolatl in gold cups |
| Oliver R. Chase | African American | Added milk to chocolate |
| George Washington Carver | Austrian immigrant | Inventor of Necco Candy |
| Goelitz Brothers | Aztec | Produced candy corn and eventually Jelly Belly® jelly beans |
| Daniel Peter and Henri Nestle' | German | Researched peanuts and found over 300 uses |
| Leo Hirshfield | German immigrant | Proved there was sugar in sugar beets and that it could be extracted |
| Montezuma | Swiss | Began production of Tootsie Rolls® in New York City |

What's in a Tootsie Roll® Label?

*A nutritional lesson about an Illinois product



Introduction:

What is a Tootsie Roll® made of and where do these ingredients come from? If you were to look at the list of ingredients, you would find that some of them come from the United States and a few are imported from other countries. How does a company get all the ingredients to make a Tootsie Roll®?

Some ingredients found in Tootsie Rolls® are sugar, corn syrup, partially hydrogenated soybean oil, condensed skim milk, cocoa, whey, and soya lecithin. Here are the sources of those ingredients: (you can read more about the processing of these ingredients in the accompanying “Agriculture: Where Candy Comes From” reference with this unit)

- Sugar-sugar beet pulp or sugar cane
- Corn syrup-corn
- Partially hydrogenated soybean oil-soybeans (Hydrogen is infused into soybean oil at a controlled temperature. This helps solidify the soybean oil.)
- Condensed skim milk-dairy cattle
- Cocoa-cacao beans
- Whey-watery part of milk that is separated from the curd
- Soya lecithin-soybeans (It is an emulsifier-it keeps the ingredients from separating.)

In this lesson, students will research the nutrition label of a Tootsie Roll® to determine where the ingredients originated. Food labels provide the consumer with information on ingredients, nutritional values, and how the product meets our daily needs of specific vitamins and nutrients. Food labeling became a law in the United States under the Nutrition Labeling and Education Act of 1990. In 1994, the Food Safety and Inspection Service (FSIS) of the U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA) implemented regulations on nutrition labels. These regulations give specific requirements for the labels' format, nutrient values, nutrient content claims, and health claims.

Fun Tootsie Roll Facts®

- Tootsie Rolls® were first made in 1896 when Austrian immigrant, Leo Hirshfield, began producing 200 of the candies a day in New York City.
- By 1905, Tootsie Rolls® were produced in a four-story candy factory in New York City.
- A dentist in Philadelphia uses Tootsie Rolls® to make molds of patients' teeth.
- Tootsie Roll® Industries has its world headquarters in Chicago and operations in Massachusetts, New York, Tennessee, Mexico, Canada, Eastern Europe, and Pacific Rim.
- Over 49 million Tootsie Rolls® are produced each day!
- Since 1970, over 20,000 letters from children around the world have been sent to Tootsie Roll® Industries. These children believe they have solved the mystery behind how many licks it takes to get to the center of a Tootsie Pop®.

Common Core:

CCSS.ELA.Literacy.RI.5.7; RI.5.10; SL.5.1

Next Generation Science Standards:

Earth's Systems-5-ESS2-1

Suggested Reading:

From Farm to You Chocolate by Carol Jones ISBN-13: 9780791070086

Materials Needed:

- “What’s in My Tootsie Roll®?” worksheet
- Tootsie Roll® for each student
- Copies of Tootsie Roll® Nutrition Facts
- Internet and other resource books

Directions:

1. Distribute a Tootsie Roll® and a nutrition label to each student. Have the students read the ingredients on their nutrition label.
2. Discuss with the class how the ingredients are grown, transported, processed, and made into a candy bar.
3. Have students complete the “What’s in My Tootsie Roll®?” worksheet. Provide the internet and other resource books to help students complete the worksheet.

Discussion Questions:

1. What ingredients did you find on the label that you did not know were in a Tootsie Roll®?
2. How nutritional is a Tootsie Roll®?
3. Where do Tootsie Roll® ingredients come from?
4. What types of jobs are involved in the making of a Tootsie Roll®? (Remember, someone needs to grow the ingredients, transport them, make the product, sell the product and much more!)

Lesson Extenders:

1. Enlarge a world map and a United States map. Create a bulletin board so students can link where their Tootsie Roll® ingredients are from (the source) to their hometown. This will give them an idea of the size of the world and the United States and how much we use products from other places.

What's in My Tootsie Roll®?

1. Look at a nutrition fact label for a Tootsie Roll®. Find the ingredients. They are listed in order of greatest amount to the least.
What ingredient is used the most? _____
What is used the least? _____

2. Using the internet, determine what ingredients are obtained from the United States. Name the ingredients and what state or part of the United States they came from.

3. Which ingredient(s) is/are most likely to come from Illinois?

4. Which ingredients were imported from another country? Name them and the country or countries they would come from.

5. What are the possible ways the ingredients were shipped to a food processor?

6. Look at the nutrition part of the label.
How many calories are there? _____
How many calories come from fat? _____

7. Make a ratio comparing fat calories to total calories. _____
Simplify it. _____
Make it a percent. _____

8. Percent daily values on a nutrition fact label tell you what percentage of your daily allowance for fat, cholesterol, sodium, etc. one serving of this food would provide. How many Tootsie Rolls® would you have to eat to exceed 100 percent of the DV of: (remember that multiple Tootsie Rolls® make one serving)
Saturated fat? _____
Carbohydrates? _____
Dietary fiber? _____

9. Look up sodium in the dictionary. What is a synonym for it? _____

10. Using the internet, look up Calcium, Iron, Vitamin C, and Vitamin A.
Define these and name other foods that are good sources of these.
Calcium- _____
Iron- _____
Vitamin C- _____
Vitamin A- _____

Candy and Food Safety

***A look at food safety in the candy industry, agribusiness, and at home**



Introduction:

Agriculture is the growing of food and fiber. Agribusinesses are involved in food processing, storage, and distribution. Restaurants and grocery stores sell food to us; therefore, they are considered to be agribusinesses. They must follow health standards concerning food safety and are responsible for providing us with safe, quality food. Health inspectors routinely inspect these agribusinesses to make sure they are following the guidelines. If they find otherwise, they can penalize the business by closing it for a specific amount of time or perhaps indefinitely.

In the United States, we are fortunate to have a government that makes food safety a priority. In some countries food may be produced or imported, but can be spoiled by pests or microorganisms due to poor storage. Pests (insects and rodents) and microorganisms (bacteria, mold, yeast) are the two chief causes of food spoilage. Food must be transported, stored, and prepared/consumed correctly to ensure its safety. Agribusinesses that deal with food must know where their food is coming from. They must also know how their food was grown and transported.

All food will spoil if it is not preserved in some way. Some foods such as nuts and grains can be stored for a long time without spoiling. Other foods, such as bread and milk, must be consumed quickly. Foods can be preserved in many ways. Canning, freezing, and dehydrating are just a few methods. Salt is also used as a preservative. Spoilage may occur before there is a change in taste or odor. Therefore consumers should read expiration dates of food products bought from grocery stores before purchasing and eating them.

People can reduce their risk of food-borne illness by handling food properly. Eighty-five percent of all cases of food-borne illness, a sickness caused by bacteria, can be avoided with proper food handling. Keys to food safety are:

- washing hands (use warm water, apply soap, and rub hands for 20 seconds before rinsing)
- checking expiration dates
- washing surfaces and utensils with hot, soapy water
- refrigeration, heating, and freezing
- cleaning fruits and vegetables
- storing foods in proper places

According to the U.S. Food and Drug Administration (FDA), food safety hazards may crop up in candy. One example is carelessness in quality control and sanitation. This is a violation of the good manufacturing practices on which the safety of all our packaged foods depends and it could result in contamination with microorganisms that cause illness. However, in the candy industry, this only happens on rare occasions and when it does happen, most cases are discovered before the product reaches the public. Manufacturers are responsible for the safety of their candy and the FDA conducts unannounced plant inspections, taking random samples for analysis. The FDA also inspects all imported foods to be sure they contain no substances unapproved by the FDA as safe for humans to eat. Examples of this in imported candy may be certain flavors and/or coloring agents.

Common Core:

CCSS.ELA-Literacy.RL.5.10; SL.5.1; W.5.2; W.5.4; W.5.6

Next Generation Science Standards:

Engineering Design-3-5-ETS1-2; 3-5-ETS1-3

Suggested Reading:

Germs Make Me Sick! by Melvin Berger ISBN-13: 9780064451543

Materials Needed:

- “Food for Thought” worksheet
- Cooking spray or vegetable oil
- Cinnamon
- Water
- Soap

Directions:

1. Talk with the students about safe food handling practices at home. Do they thoroughly wash dishes? Do they refrigerate, freeze, and heat food properly? Do they look for expiration dates on packages? Do they wash their hands with soap and warm water?
2. Ask the students to complete the “Food for Thought” worksheet in this lesson. Through this worksheet, students will learn safe food handling practices and draw illustrations for their own safe food handling practices.
3. Use this activity to show students the importance of washing hands with soap and warm water.
 - a. Apply cooking spray or vegetable oil to each student’s hands.
 - b. Sprinkle cinnamon on the palms, backs, and in-between the fingers of each student’s hands. The cinnamon represents bacteria that gets on our hands.
 - c. Try to get rid of the cinnamon using only cold water. Discuss the results.
 - d. Try to get rid of the cinnamon using soap and cold water. Discuss the results.
 - e. Try to get rid of the cinnamon using soap and warm water. The cinnamon “germs” will rinse right off of the students’ hands and into the sink.
 - f. Ask the students why the cinnamon stayed on their hands until they used soap and warm water. How is this similar to washing bacteria off of our hands? Is it important to use soap and warm water for hand washing?

Lesson Extender:

Have the students use the following questions to type a 2 page informative paper:

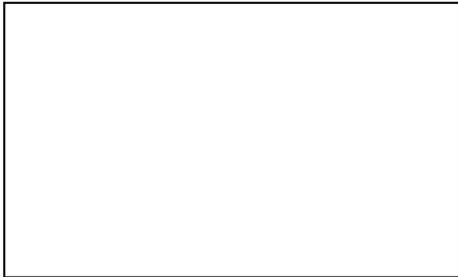
1. What are the chief causes of food spoilage?
2. What are some of the safe food handling practices that can be used in your home?
3. What are some food preservation methods that are used before foods reach the grocery store?
4. What responsibilities do agribusinesses such as grocery stores, restaurants, and candy manufacturers have?
5. Why is it important to use soap and warm water when washing your hands?
6. Visit the web site www.glogerm.com to gain more information about the importance of hand washing. You will find lesson plans, per grade level, on hand washing. Ordering information on the GloGerm™ products is also available. The various kits offered provide excellent activities to demonstrate proper hand washing and surface cleaning.

Name: _____

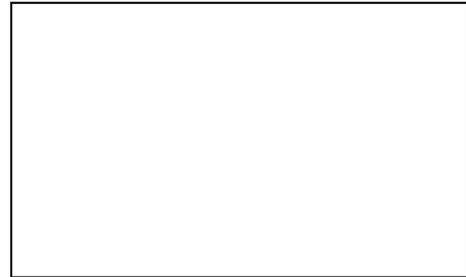
Food for Thought

Draw a picture for each statement that shows the right method and the wrong method.

1. Always wash your hands before preparing or consuming food.



Right



Wrong

2. Eat food before the expiration date on the package.



Right

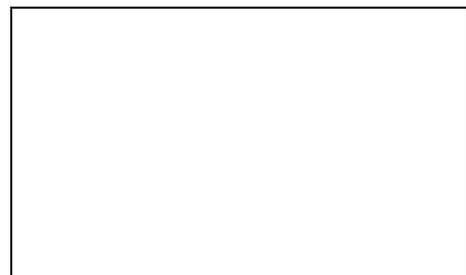


Wrong

3. Do not cut meat and vegetables on the same surface or with the same knife. Wash the surface and the knife with hot, soapy water to kill bacteria.



Right



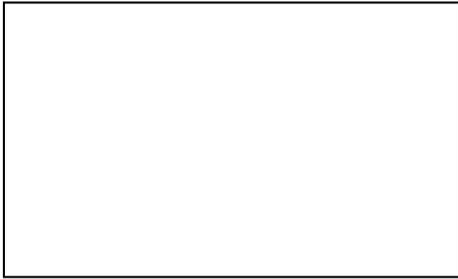
Wrong

Name: _____

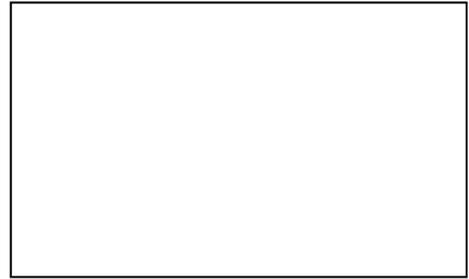
Food for Thought

Draw a picture for each statement that shows the right method and the wrong method.

4. Refrigerate or freeze foods to prevent spoilage and make sure foods are properly cooked.

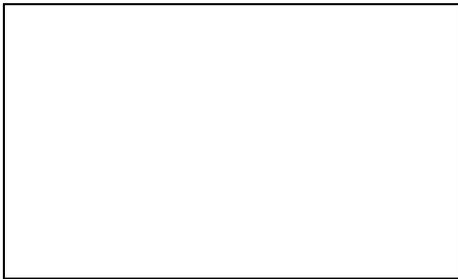


Right

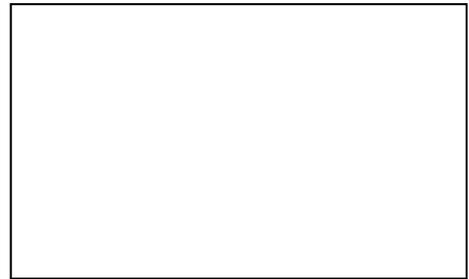


Wrong

5. Clean fruits and vegetables before eating or cooking.

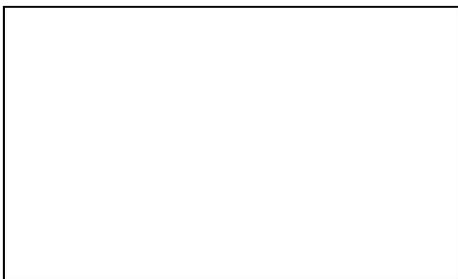


Right

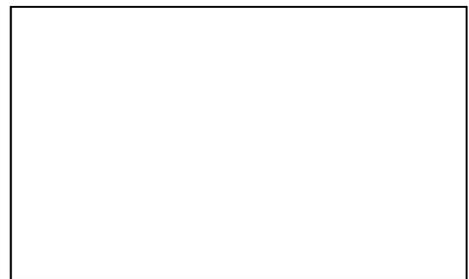


Wrong

6. What is another food safety method? Draw a right and wrong picture for this method.



Right



Wrong

Make Your Own Gumdrops



*The story of sugar

Introduction:

The average American today consumes approximately 130 pounds of sugar each year. Sugar can also be used by nonfood industries: mixing cement, tanning leather, making plastics, medicines (to disguise or enhance taste). Sugar comes from sugar cane or sugar beets.

Sugar Cane

Sugar cane is a tall grass plant that grows in tropical and semi-tropical climates. The top producers are Brazil, India, China, Thailand, and Pakistan. In Europe, during the Middle Ages, the high cost of sugar made sugar candy a delicacy available only to the wealthy. Sugar cane is harvested by chopping down the stems and leaving the roots so that it re-grows for the next harvest. Cane juice must be extracted from the cane. The cane is crushed in a series of large rollers and the juice comes out. Since the juice still has soil, small fibers, and green extracts in it, it must be cleaned with slaked lime. The juice is thickened into syrup by boiling off the water using steam and evaporation. The syrup is put into large pans for boiling. Most water is boiled off until the sugar crystals can grow. This is spun in a centrifuge to separate the crystals and mother liquor. The crystals are dried with hot air before storage. The final raw sugar looks like a sticky brown mountain, so it is usually refined when it gets to the country where it will be used.

Sugar Beets

Sugar beets originated in Ancient India. In 1747, a German chemist named Andreas Marggraf proved there was sugar in sugar beets and it could be extracted. Sugar beets grow in temperate climates. The top producers are France, the Russian Federation, United States, Germany and Turkey.

Sucrose is stored in the sugar beet's fleshy root. The tops of sugar beets are fed to livestock or used as fertilizer. Beets are harvested in autumn and early winter by digging them out of the ground. They are taken to the factory, washed, and separated from any beet leaves, stones, or trash materials that were collected with them during harvest. To extract the sucrose, the beets are sliced into thin chips. The chips are called cossettes. This increases the surface area so the sugar is easier to extract. The extraction takes place in a diffuser for about an hour with hot water. (Similar to the color and flavor of tea coming out of tea leaves in a teapot.) Next, the sugar beet slices are pressed to squeeze as much juice from them as possible. The pulp leftover from the pressing is sent to a drying plant where it is turned into pellets which are used for some animal feeds. The juice is cleaned before it is used for sugar production. This is done by growing small clumps of chalk in the juice. As the chalk forms, it collects the non-sugars and both are filtered out. The juice is then put in a multi-stage evaporator. As the water is boiled, sugar crystals grow. This mixture is spun in a centrifuge to separate the crystals and mother liquor. The crystals are dried with hot air before being packed or stored. The final sugar is white. Beet molasses is the syrupy left-over liquid from the sugar extraction process. The molasses is used as an additive in livestock feed, during the fermentation of ethanol, and is also mixed with salt or brine and used as a de-icer for roads during the winter months.

Sugar can be found in candies such as Hershey[®] bars, Snickers[®], Reese's[®] Peanut Butter Cup, Almond Joy[®], Spree[®], Starburst[®], M&M's[®], 100 Grand[®], Mars[®], Junior[®] Mints, Dots[®], York[®] Peppermint Patties, Pinwheel Mints, Licorice, Werthers[®] Originals, Candy Corn, Brachs[®] Maple Nut Goodies, Whoppers[®], Butterfinger[®], Chocolate Covered Cherries, Peanut Brittle, Gumdrops, Tolberone[®], Chocolate Orange[®], and Peeps[®].

Common Core:

CCSS.ELA-Literacy.RI.5.7; RI.5.9; W.5.2; W.5.4; W.5.7

Next Generation Science Standards:

Earth's Systems-5-ESS2-1

Engineering Design-3-5-ETS1-2; 3-5-ETS1-3

Suggested Reading:

Charlie and the Chocolate Factory by Roald Dahl ISBN-13: 9780142410318

Materials Needed:

- Jello® powder (one teaspoon per child)
- Water
- Paper Plates
- Sugar
- Eyedropper

Directions:

Make Your Own Gumdrops

1. Pour a teaspoon of Jello® powder on a paper plate.
2. Add drops of water to the powder while you mix it with your finger.
2. Roll the mixture into a ball.
4. Next roll the gumdrop in some sugar.
5. Pick it up with your fingers and enjoy!

Discussion Questions:

1. Where does sugar come from?
2. What are some non-food uses of sugar?

Lesson Extenders:

1. Ask your students to research the top five countries that eat the most sugar confectionary per capita and create a graph to represent the data found.
2. Ask the students to research the life of Andreas Marggraf and write a short biography.
3. Ask your students to research the process of making sugar in a factory and draw a flow chart on a piece of poster board showing the process.
4. Ask your students to research where sugar beets grow in the U.S. and mark the locations on a map.

Peanut Candy

***A look at peanut growth, George Washington Carver, and a peanut candy recipe**



Introduction:

Peanuts probably originated in Brazil or Peru. Explorers to South America and Mexico took peanuts back to Spain. From Spain, traders and explorers took peanuts to Africa and Asia. In Africa, the plant became common in the western tropical region. When Africans were brought to North America, peanuts came with them. In the 1700's, peanuts, then called groundnuts or ground peas, were studied by botanists and regarded as an excellent food for pigs. The first notable increase in U.S. peanut consumption came in 1860 with the outbreak of the Civil War when both southern and northern soldiers used the peanut as food. Around 1900, equipment was invented for planting, cultivating, harvesting and picking peanuts from the plants and for shelling and cleaning the kernels. Peanuts then rapidly came into demand for oil, roasted and salted nuts, peanut butter and candy.

The peanut plant is very unique. When we think of nuts, many people imagine trees like pecans or walnuts, but peanuts are grown in the ground. The peanut plant is a legume, which means that they produce an essential nutrient called nitrogen, which is very beneficial for the soil. The peanut plant actually flowers above the ground and fruits below the soil surface. The peanut plant averages about 18 inches tall. It produces a yellowish-orange flower that after blooming will create a "peg" that will grow down into the soil. After about 60-70 days the peg will mature into a peanut. Farmers take their harvested peanuts to local peanut buying stations. At this station, the peanuts are sampled and graded to determine their value. After the peanuts are purchased, they are placed in dry storage and eventually shelled or processed in the shell. Shelling peanuts is simply taking the outside covering off the peanut so that only the nut and its skin remains. Shelled peanuts are then blanched to remove the skin from the nut. Most of the blanched peanuts are eventually made into peanut butter. About 75% of peanuts grown are used domestically. The remaining are usually shipped raw to major buyers like Western Europe, Canada and Japan.

There are several types of peanut plants including the Runner, Virginia, Spanish, and Valencia. Each of these has a slightly different purpose. The runner peanut is most commonly used for making peanut butter, and accounts for 80% of all peanuts grown in the U.S. Virginias are the largest kernels and account for most of the roasted in-shell peanuts. Spanish are used for candies and salted peanuts. Valencias are unique because they usually have more than two nuts in each pod. All four types can be used for peanut butter.

While many people only think of peanuts used in peanut butter, there are many ways peanuts are processed. Over half of the edible peanuts are consumed as peanut butter. Peanuts are also crushed to make oil. Peanut oil is excellent for cooking because it is tasteless and can be heated to a very high temperature (about 405 degrees F) before it burns. The remaining peanuts are roasted or used for candy and other confections. There are even some non-food uses for peanuts. The shells can be used in making wallboard, fireplace logs, livestock feed and cat litter. The skins can be used in making paper. Peanuts are also an ingredient in many everyday materials like detergent, bleach, ink, shaving cream, soap, rubber, cosmetics, paint, shampoo, medicine and much more.

Peanuts are used in many different ways, but did you know they are also a good nutritional source? Peanuts contain about 25% protein, which is higher than eggs, dairy products and many cuts of meat. Two peanut butter sandwiches and a cup of milk meet 83% of a growing child's daily need for protein. Peanuts are also packed full of vitamins and minerals and have no cholesterol.

George Washington Carver was an agricultural researcher of the early 1900's. He is especially noted for his research with peanuts. George Washington Carver received many awards such as the Spingarn Medal from the National Association for the Advancement of Colored People and the Theodore Roosevelt Medal for his valuable contributions to science. There is a George Washington Carver National Monument on the Missouri farm where Carver was born and January 5th has been named George Washington Carver Day.

Carver's interest in plants began when he was a child. Although he was too sick to work in the fields, he kept a personal garden. Carver attended a school for black children in Neosho, Missouri, as a child and gained further education at Simpson College in Indiana, Iowa, and Iowa State College in Ames. In 1896, George Washington Carver joined the faculty of Tuskegee Institute, an industrial and agricultural school for blacks. Carver was the head of the agriculture department, the director of a state agricultural station, and later the head of Tuskegee's Department of Research. He worked hard to teach more productive agricultural practices to Southern farmers; black farmers in particular. After finding over 300 uses for peanuts, Carver lectured about the uses before a committee of Congress.

Dr. John Harvey Kellogg applied for the first patent for peanut butter in 1895. The world was introduced to peanut butter at the Universal Exposition in 1904 in St. Louis. The peanut treat sold for about six cents per pound.

**Used with permission from the American Peanut Council's "No-Nut Peanut" teachers kit for grades 3-5. (Kellogg information)*

Peanuts can be found in candies such as Snickers[®], Reese's Peanut Butter Cups[®], Brachs Maple Nut Goodies[®], Butterfinger[®], Peanut Brittle, Mr. Goodbar[®], and Pay Day[®]. Brachs Maple Nut Goodies[®] also contain peanut oil.

Common Core:

CCSS.ELA.Literacy.L.5.3; RI.5.7; RI.5.9; RI.5.10; SL.5.1; SL.5.4; SL.5.5; W.5.2; W.5.4; W.5.7

Next Generation Science Standards:

Engineering Design-3-5-ETS1-2; 3-5-ETS1-3

Suggested Reading:

In the Garden with Dr. Carver by Susan Grigsby ISBN-13: 9780807536308

Let's Go Nuts! Seeds We Eat by April Pulley Sayre ISBN-13: 9781442467286

George Washington Carver by Gene Adair ISBN-13: 9780791002346

A Pocketful of Goobers, A Story About George Washington Carver by Barbara Mitchell
ISBN-13: 9780876144741

George Washington Carver—The Peanut Scientist by Patricia & Frederick McKissak
ISBN-13: 9780766017009

Materials Needed:

- 1 pound almond bark (chocolate candy coating)
- 1 12-oz package of semi-sweet chocolate chips
- 1 20-oz can of peanuts
- Peanut seed
- Potting soil and pot
- 1 box of 10 Ziploc[®] EZ-Fill[™] Bags (gallon)
- Microwave
- Waxed paper
- Sand
- Pencils and paper

Directions:*Making Candy with Peanuts*

1. Place one pound of almond bark (chocolate candy coating) and one 12-ounce package of semi-sweet chocolate chips in a Ziploc® EZ-Fill™ bag.
2. Microwave the bag on low until the almond bark and chips are melted.
3. Add one 20-ounce can of peanuts to the bag. Seal the bag and mix with your fingers.
4. Place waxed paper on a table top.
5. Cut a corner off the bottom of the Ziploc® bag and squeeze the peanut candy in clusters onto waxed paper.
6. Let the clusters harden and enjoy a candy peanut snack! (makes 4-5 dozen)

Growing Peanuts

You can grow your own peanut plant at home. Visit your local farm supply store to obtain a peanut seed or order one from a catalog. Plant this seed in a pot allowing for a lot of growing room. Be sure to mix some sand with the potting soil to help ensure it is well drained. Next, place the planted peanut in a location that will give it plenty of light. Make certain to water the plant often, especially when it is very young. It will take the seed about a week to emerge through the soil. From planting to harvest, it will take between 120-140 days depending on the variety obtained.

**Used with permission from the Georgia Farm Bureau® Federation Ag in the Classroom Program.*

George Washington Carver

1. Read a book about George Washington Carver with your students.
2. Ask each student to write their own biography of George Washington Carver from what they have learned. For young students, this may be one picture with a sentence underneath that the teacher has written. For older students, it may be a 10-20 page book with writing and illustrations.

Discussion Questions:

1. What did George Washington Carver do for farmers; particularly black farmers?
2. What types of honors did George Washington Carver receive?
3. Where do peanuts grow?
4. How long does it take for peanuts to grow from planting to harvesting?
5. What types of candy do you like to eat with peanuts in it?

Lesson Extenders:

1. The peanut has many names: goober, groundnut, monkey nut, earthnut, and ground pea. Teach your students these names and the word for peanut in other countries:
Spain: Mani (my-knee)
Greece: Fystiki (fee-stee-kee)
France: Cacahuete (ka-ka-wet)
Germany: Erdnuss (aird-noose)
Russia: Zemlyanoy Grek (zem-ya-noy arek)
2. Have the students pretend they are Dr. John Harvey Kellogg who invented peanut butter in the 1890's. He marketed peanut butter as a health food for elderly people and introduced it at the 1904 World's Fair. Ask the students to write a musical jingle that Dr. John Harvey Kellogg may have used at his exhibit. Your students can even write the music on a piece of poster board using peanuts as the notes. Your students can be creative in how to show whole notes, half notes, quarter notes, eighth notes, rests, etc.
3. Bill Cosby once said, "Man cannot live by bread alone. He must have peanut butter." Ask your students to research Bill Cosby's life and his contribution to entertainment.

Chocolate History and Activities

*A look at how chocolate grows and the history of chocolate



Introduction

Did you know that chocolate means 'the food of the god'? Theobroma cacao is the scientific name for Americans' favorite type of candy. 'Theo' is a Greek word meaning 'god', while 'broma' means 'the food of the gods.'

Cacao beans were used in a spicy drink (called chocolatl) by the Ancient Aztecs. Aztec traders got cacao beans from the Mayan lands and hauled it to their capital. Since the beans were used for money, warriors had to accompany the traders to protect them from thieves. When Cortés and his Spanish explorers came to the Aztec capital, they saw Montezuma drinking chocolatl in gold cups. The Spanish explorers took the spicy drink back to Spain and people there loved it. Soon, travelers from other European countries took the chocolate drink back home, people added sugar to the drink, and chocolate became a favorite drink of the upper class. In the late 19th century, Rodolphe Lindt invented a conching machine. It squeezed cacao beans and made a smooth chocolate blend. In 1875, Daniel Peter teamed up with Henri Nestle' and they added milk to their chocolate recipes. The popularity of candy bars grew after World War I. By 1930, there were 40,000 different kinds of candy bars.

Chocolate is a natural product that comes from the cacao beans of the cacao trees. Cacao trees can only grow in tropical climates- 20 degrees north or south of the equator. This is referred to as the Cocoa Belt. The Ivory Coast grows more cacao trees than anywhere else; 1.4 million tons per year. Indonesia is second with 410,000 tons per year. Other leading cacao tree growing countries are Ghana, Nigeria, Brazil, Cameroon, Ecuador, Fernando Po (and Rio Muni), Dominican Republic, New Guinea, and Mexico.

Cacao flowers on the cacao trees are pollinated by midges, which are tiny flies. They live and breed in the decaying leaves and pods around cacao trees. The midges are only 2-4 millimeters long, but they beat their wings 1,000 times a second.

Cacao trees have pods, each with 20 to 40 almond-sized beans. It takes almost 400 cacao beans to make a pound of chocolate liquor. The pods are harvested with a machete and then broken apart to retrieve the cacao bean. The beans then must be fermented, dried, and shipped to chocolate factories in burlap bags. At the chocolate factory, cacao seeds are roasted, cracked, fanned, winnowed, and then ground into chocolate liquor. Chocolate liquor is used to make chocolate. Some chocolate liquor is pressed to remove cocoa butter and further processing turns it into cocoa powder.

To make chocolate, chocolate liquor is mixed with condensed milk, sugar, and extra cocoa butter till it is a coarse, brown powder. Next it is refined with steel rollers by breaking the crumb mixture into tiny cocoa, milk, and sugar particles. Then the mixture is churned into a smooth blend. Then it is tempered (cooled and warmed) for a glossy sheen and to ensure proper melting.

Chocolate manufacturers use 40 percent of the world's almonds, 20 percent of the world's peanuts and 8 percent of the world's sugar. Also, milk is a key ingredient in chocolate. 3.5 million pounds of whole milk are used every day to make chocolate.

Common Core:

CCSS.ELA-Literacy.RI.4.10; RL.4.10

CCSS.Math.Content.4.NBT.B.4

Next Generation Science Standards:

Engineering Design-3-5-ETS1-2; 3-5-ETS1-3

Suggested Reading:

Cocoa Commotion by Melissa Peterson ISBN-13: 978-0064406666

Cocoa Ice by Diana Appelbaum ISBN-13: 9780531300404

Chocolate: Riches from the Rainforest by Robert Burleigh ISBN-13: 978-0810957343

From Farm to You Chocolate by Carol Jones ISBN-13: 9780791070086

How Monkeys Make Chocolate (Foods and Medicines from the Rainforests) by Adrian Forsyth
ISBN-13: 9781895688320

Materials Needed:*For Edible Dirt!*

- 8 inch plastic or clay flower pot
- Foil
- 1 large package of Oreos®
- 3/4 pound package of gummy worms
- 1 package miniature chocolate chips
- Green colored coconut
- 4 T. butter or margarine
- 1 8 oz. package of cream cheese
- 1 cup powdered sugar
- 3 1/2 cups milk
- 2 - 3 oz. packages of vanilla pudding
- 1 - 12 oz. container of whipped topping
- Refrigerator

For Chocolate – Scented Play Dough

- 1 1/4 cup flour
- 1/2 cup cocoa powder
- 1/2 cup salt
- 1/2 T. cream of tarter
- 1 1/2 T. cooking oil
- 1 cup boiling water
- Bowls
- Mixing spoons
- Airtight container
- Plastic spoons

Directions:*Edible Dirt!*

1. Line an 8 inch plastic or clay flower pot with foil.
2. Crush one large package of Oreo cookies and set aside.
3. Put aside for later 3/4 lb. package of gummy worms, 1 package miniature chocolate chips and some green colored coconut.
4. Cream together 4 tbs. butter or margarine, 1 8 oz. package cream cheese and 1 cup powdered sugar.
5. Mix together 3 1/2 cups milk, 2 - 3 oz. packages vanilla instant pudding, and 12 oz. whipped topping.
6. Add the creamed mixture and the pudding mixture together. Mix well.
7. Place the whipped topping lid in the bottom of the flower pot.
8. *Bottom layer* (Parent Material)- Begin with a layer of crushed cookies. Then mix chocolate chips with half of the creamed pudding mixture and smooth it over the cookies.
9. *Second layer* (Subsoil)-Add more crushed cookies, than a creamed pudding layer and the gummy worms. (Save one worm for the top layer!)
10. *Top layer* (Topsoil)-Finish with a layer of crushed cookies. Sprinkle with green coconut for "grass" and poke a gummy worm through the top to peek out of your 'soil'. Refrigerate over night.
11. Enjoy the soil!

Chocolate – Scented Play Dough

Mix the dry ingredients. Add the oil and boiling water. Stir quickly, mixing well. When cool, mix with your hands. Store in an airtight container.

Trading Cocoa Beans

In Ancient Central America, people used Cacao Beans as currency. The Spanish colonists exported the beans to Spain, where they were still being traded as late as 1545. Here is a table showing how much certain items cost in cocoa beans:

| | | |
|-----------|---|------------------------------------|
| 200 beans | = | male turkey |
| 100 beans | = | daily wage of a porter |
| 100 beans | = | female turkey |
| 100 beans | = | rabbit |
| 30 beans | = | small rabbit |
| 3 beans | = | turkey egg |
| 3 beans | = | avocado |
| 3 beans | = | fish wrapped in maize (corn) husks |
| 1 bean | = | tamale |

Have students take 400 beans to market. Can they buy 1 male turkey, 1 female turkey, 3 small rabbits, one turkey egg, and one tamale? What would they decide to buy with any leftover beans?

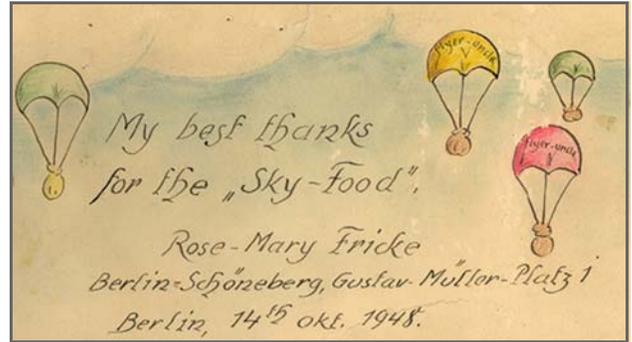
Discussion Questions:

1. How is chocolate produced?
2. What types of careers are involved in chocolate production and sales?
3. Where did chocolate originate and how did it travel to other countries?
4. Why do you think cocoa beans become a form of currency? (possibly because they're valuable, small, and easy to carry and count).

Candy Parachutes

Introduction:

Gail Halvorsen was a young pilot in the U.S. Army Air Corps. He was assigned as a cargo pilot to the Berlin Airlift, in which U.S. forces flew in supplies to a Soviet-blockaded Berlin. He noticed the German children gathering by the fences of Tempelhof Air Base and knowing that they had very little, he offered them some chewing gum. From that, he decided he would “bomb” Berlin with candy. He and his crew sent small parachutes floating down as they approached the Berlin airport. He wiggled his wings of the C-54 as a signal to the children that their anticipated cargo would soon arrive. He became well known to the children in Berlin as “Uncle Wiggly Wings” or “The Candy Bomber.” His small idea became a great symbol of hope not only to the German children but to all that yearned for freedom.



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Common Core:

CCSS.ELA-Literacy.RI.4.1; RI.4.3; RI.4.10; W.4.2; W.4.4; W.4.7

Next Generation Science Standards:

Earth’s Systems-5-ESS2-1

Engineering Design-3-5-ETS1-1; 3-5-ETS1-2; 3-5-ETS1-3

Suggested Reading:

Christmas From Heaven by Tom Brokaw ISBN-13: 9781609077006

Materials Needed:

- 1 sheet of tissue paper, 24” x 24”
- 2 pieces of string/yarn, approximately 48” long each
- 4 pieces of tape, about 2” long each
- 1 piece of candy

Directions:

1. Tape the ends of one string to opposite corners of the tissue paper.
2. Tape the ends of the second string to the remaining two corners.
3. Pull the strings together, bringing the four corners of the paper together, and find the middle of the strings. Tie an overhand knot in the middle of the strings, creating a small loop. Attach candy to loop.
4. Hold the parachute from the center top and drop.

Lesson Extender:

Have the students write a biography about Colonel Gail S. Halvorsen, “The Candy Bomber.”

Hershey Kiss Christmas Trees

Common Core:

CCSS.ELA-Literacy.RI.4.1; RI.4.3; RI.4.10

Next Generation Science Standards:

Engineering Design-3-5-ETS1-1; 3-5-ETS1-2; 3-5-ETS1-3

Suggested Reading:

Chocolate by Hershey: A story about Milton S. Hershey by Betty M. Burford
ISBN-13: 9780876146415

Chocolate Savor The Flavor by Elaine Landau ISBN-13: 9781571033369

Milton Hershey: Young Chocolatier (Childhood of Famous Americans) by M.M. Eboch
ISBN-13: 9781416955696



Materials Needed:

- 1 green foil-wrapped Hershey chocolate kiss (don't unwrap)
- 2 miniature peanut butter cups (buy holiday colors, green, red or gold) (don't unwrap)
- Multi-color non-pareils
- Spray glue

Directions:

1. Begin by reading a story about chocolate.
2. Spray a small amount of glue on the top of a gold or red-foil peanut butter cup (don't unwrap). Place an inverted (top side down) green-foil peanut butter cup on top of the first one. The bottom peanut butter cup is the pot/planter and the top peanut butter cup is the bottom/base of the tree.
3. Spray some glue on the top of the tree base. Top with a green-foil Hershey kiss.
4. Spray the tree with glue and sprinkle the non-pareils over the tree.

Caution: Do not eat the candy trees after glue has been applied.

Hershey Kiss Flowers

Common Core:

CCSS.ELA-Literacy.RI.4.1; RI.4.3; RI.4.10

Next Generation Science Standards:

Engineering Design-3-5-ETS1-1; 3-5-ETS1-2; 3-5-ETS1-3

Suggested Reading:

Chocolate Riches from the Rainforest by Robert Burleigh ISBN-13: 9780810957343



Materials Needed:

- 2 hershey kisses
- Glue
- 3'x 3' square cellophane
- Floral stick
- Floral tape
- Scissors
- Ruler

Directions:

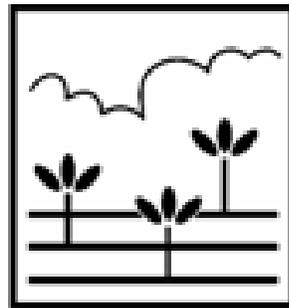
1. Begin by reading an informational book about chocolate and where it comes from.
2. Use glue to attach the kisses at the bottom.
3. Wrap the kisses with a 3' x 3' square of cellophane, and draw the edges together at the bottom.
4. Insert a floral stick into the base of the 'rose.'
5. Wrap floral tape around the stem.
6. To see an example check out:

<http://www.sunscholars.com/2011/01/hershey-kiss-rose-valentines.htm>.

Caution: Do not eat the candy after the glue has been applied. If you would like to eat the candy, use a piece of rolled tape to keep the kisses together instead of glue.

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