

Dear Educator,

Chocolate has been a delicious part of people's diets for more than 4,000 years. It's been used to appease the gods, defend against illness, show love, celebrate holidays, ward off scorpions, and sustain warriors. Today, chocolate isn't just for dessert or a snack—it can be used in a wide range of dishes, including salads and main courses!



The Story of Chocolate is provided by the National Confectioners Association's Chocolate Council in partnership with the award-winning curriculum specialists at Young Minds Inspired (YMI). Though this program is designed specifically for students in consumer sciences and culinary arts classes, the study of chocolate involves math, history, social studies and cultural awareness, and you will find many elements of these topics in the program as well.

The program's activities will instill an appreciation for the history and development of cocoa and chocolate, today's methods of sustainable growth, and the people

and cultures that produce this delicious product. Students will also learn the many different ways that cocoa and chocolate can be included in a healthy lifestyle. In addition, there is a colorful wall poster that contains valuable information about the wide varieties and uses of chocolate.

We hope you will share this worthwhile program with other teachers in your school. Although the materials are copyrighted, you may make as many copies as you need for use in your classroom and school.

Please return the enclosed reply card to let us know your opinion of this program or comment online at www.ymiclassroom.com/chocolate.html. We depend on your feedback to continue providing free educational programs that make a real difference in the classroom.

Sincerely,

Dr. Dominic Kinsley
Editor in Chief



Program Objectives

- To build student appreciation for chocolate and cocoa, its history, how it is grown, and how different types of chocolate are produced.
- To raise awareness of the health effects of chocolate and cocoa and the many ways it can be used in cooking.
- To encourage students and their families to experiment with chocolate and cocoa in different recipes.

Target Audience

This program is designed for high school students in family and consumer sciences and culinary arts classes.

National Standards Alignment

Go to www.ymiclassroom.com/chocolate.html for information on how the activities in this program align with the Family and Consumer Sciences Education National Standards.

Program Components

This six-page poster guide includes:

- Teaching suggestions.
- Four reproducible student activity sheets.
- A colorful and informative wall poster.
- *The Story of Chocolate* informational DVD.
- A reply card for your important comments, or reply online at www.ymiclassroom.com/chocolate.html.

How to Use this Program

Photocopy this teacher's guide and the reproducible activity sheets before displaying the poster in your classroom. Make a master copy of these program components to share with other teachers.

How to Use the DVD

Preview *The Story of Chocolate* DVD. Then, show segments of the DVD to students either as a preview of the activity, or as a culminating segment of the lesson.

How to Use the Poster

Display the poster in a prominent classroom location to build student interest. Refer to the information on the poster when completing the activities.

Activity 1 Check Out Chocolate

Begin by explaining that the cocoa beans used to make chocolate are actually seeds from the fruit of the cacao tree, which grows in tropical areas around the world, primarily in West Africa, Southeast Asia, and Central and South America. The cacao tree is formally known as *Theobroma cacao*—*Theobroma* translates as *food of the gods*, and the word *cacao* derives from the name for the plant in one of the indigenous Mesoamerican languages. Variations include *kakaw*, *kagaw*, and *cacahuatl*.

The cacao tree has pink or white blossoms that turn into colorful fruits called pods, which are filled with sweet juice and bitter seeds. These seeds are the basis of what we know as chocolate. Explain to students that the seeds grow inside a pod-like fruit and are covered with a white pulp. The cacao farmers harvest the pods, crack them open, and ferment the seeds before preparing them for shipment to a chocolate factory. At the factory, the seeds—now called cocoa beans—are inspected, cleaned, roasted, and ground into a paste that is melted to produce chocolate *liquor* (*liquor* means *liquid*)—the foundation for all the different kinds of chocolate, including cocoa powder.

Note that chocolate has been an enjoyable part of people's diets and has been used as medicine by various cultures throughout the ages. In recent years, scientific evidence has begun to indicate that certain nutrients found naturally in cacao seeds (called *flavanols*) may be associated with a healthy heart. When cacao beans are crushed and pressed, cocoa butter and cocoa powder are released, both of which are essential to chocolate making. Cocoa butter naturally contains saturated fat, predominately stearic acid, which research has shown may decrease or have a neutral effect on LDL blood cholesterol levels.

Provide time for students to complete the quiz and review the answers as a class.

Answer Key: 1-b *The Ancient Olmecs*; 2-b *For 4,000 years*; 3-c *West Africa*; 4-b *Cocoa beans*; 5-b *Reduced risk of cardiovascular disease*; 6-a *Creating a chocolate coating*; 7-a *Growing the cacao trees in the shade*; 8-a *One pound of chocolate*; 9-c *Small family farmers*; 10-b *By hand*

To extend the activity, have students visit *The Story of Chocolate* website (www.thestoryofchocolate.com) to learn more about the cacao tree and the history of chocolate.

Activity 2 From Tree to Treat

Today, cocoa is still grown by hand, mainly on small family-owned farms, where the whole family works together to plant seedlings, clear or thin the forest canopy, prune and watch over the cacao trees, harvest and crack the pods, ferment and dry the beans, and carry the bags of beans—often on their backs or on their heads—to buying sheds where cocoa merchants grade and weigh the beans. The money cocoa farmers receive for their beans provides an important source of income for the entire family. Family members also grow their own food and tend to their farm animals.

Thanks to modern sustainable growing practices, most cacao trees grow in the shade of native canopy trees that also help preserve the habitat of threatened plant and animal species. Cacao trees are delicate plants that live in the understory of tropical forests and require other, taller trees to shelter them from wind and sun.

Review the information about sustainable farming on the activity sheet and discuss its importance with your students. You can find more information about sustainable farming at www.thestoryofchocolate.com.

Divide your students into teams of 3-4 and provide time for them to do research and develop their presentations. Students might research sustainable techniques used to grow sugar cane, coconut palm trees, cassava, or coffee. Encourage students to be as creative as they can. They might develop a PowerPoint presentation or accompany their remarks with video clips that illustrate the main points.

To extend the activity, arrange for students to make their presentations to an environmental science class.



Activity 3 Choosing Chocolate



Explain that cocoa and chocolate are natural products that contain several basic ingredients: chocolate liquor, cocoa butter, sugar, lecithin (an emulsifier that makes the ingredients blend together), and vanilla and other flavors. It also may include milk for milk chocolate, and fruits, nuts, and other add-ins for specialty chocolates. Tell students that each type of chocolate has its own flavor and aroma, depending on the type of chocolate, its country of origin, and the percentage of cacao. That percentage number is a guide to specific flavor intensity. The higher the percentage, the more intense the flavor and less sweet the chocolate.

After your students complete the quiz, review the answers as a class. You might also point out that this information appears on the poster, and encourage students to refer to it as necessary.

Answer Key: 1-H; 2-E; 3-B; 4-F; 5-C; 6-D; 7-A; 8-G

About Tempering: Chocolate is tempered by stirring while heated, then cooled, and reheated. Tempering affects the way cocoa butter crystals form, and it determines how hard, shiny, and glossy the final chocolate will be. Tempering is required when chocolate will be used for coating and dipping, for molding fancy shapes, and for making decorations.

To extend this activity, have your students find and experiment with an easy recipe for tempering chocolate.

Activity 4 A Chocolate Challenge

Tell students that chocolate experts recommend several steps to appreciate the wide variety of types of chocolate—buy several kinds, arrange them from light to dark and from lower cacao percentages to higher, try different varieties of chocolate, notice the color, breathe in the aroma, and experience the different sensations on the tongue. Suggest students try these techniques. Then, using what they have learned about chocolate, and what they already know about nutrition and a balanced diet, ask them to plan a four-course menu where each recipe includes chocolate or cocoa as an ingredient. They can find recipes on *The Story of Chocolate* website, on the Internet, and in family cookbooks. Some students may even have a favorite family recipe that they can include. Provide time for students to share their menus, and then encourage them to prepare them at home. Or schedule time to prepare select recipes in class.

Resources

- The Story of Chocolate - www.thestoryofchocolate.com
- World Cocoa Foundation - www.worldcocoafoundation.org
- Young Minds Inspired - www.ymiclassroom.com



is the only company developing free, innovative classroom materials that is owned and directed by former teachers. Visit our website at www.ymiclassroom.com to send feedback and download more free programs. For questions contact us at 1-800-859-8005 or email us at feedback@ymiclassroom.com.

CHECK OUT CHOCOLATE!



Chocolate comes from the cacao tree, which is formally known as *Theobroma cacao* (*Theobroma* translates as *food of the gods*). There are three main types of chocolate: dark chocolate, milk chocolate, and white chocolate. Other products made from the cocoa bean include cocoa, or cocoa powder, cocoa butter, and baking, or unsweetened, chocolate.

If you're like most people, you probably love chocolate. But, have you ever really thought about it—where it comes from or how it's made?

Take this quiz to find out how much you already know and to learn more!

- 1.** Chocolate was first enjoyed by:
- The Ancient Greeks
 - The Ancient Olmecs
 - The Ancient Swiss



- 2.** People have been using and enjoying chocolate:
- Since the Industrial Revolution
 - For 4,000 years
 - Since the 17th century, when the French colonized Martinique and imported its cacao



- 3.** Today, most of the world's cacao is grown in:
- Latin America
 - Southeast Asia
 - West Africa

- 4.** Chocolate is made from:
- Cacao bark
 - Cocoa beans
 - Cocoa powder

- 5.** According to scientific research, moderate consumption of dark chocolate may be associated with:
- Increased intelligence
 - Reduced risk of cardiovascular disease
 - An overwhelming feeling of happiness



- 6.** In a chocolate factory, "enrobing" means:
- Creating a chocolate coating
 - Wrapping chocolates in paper or foil
 - Wearing an apron while working

- 7.** Sustainable cacao farming techniques include:
- Growing the cacao trees in the shade
 - Clearing more land and planting more trees
 - Working longer hours

- 8.** It takes 400 cocoa beans to make:
- One pound of chocolate
 - One large chocolate bunny
 - Six ounces of chocolate



- 9.** Most cacao farms are owned by:
- The Swiss
 - Large corporations
 - Small family farmers



- 10.** Cacao trees are generally farmed:
- Using highly automated farming techniques
 - By hand
 - On cocoa plantations



To learn more about the history and production of cacao trees, visit **The Story of Chocolate** at www.thestoryofchocolate.com.

FROM TREE TO TREAT



Chocolate Farming

The cacao tree grows in the tropics. This delicate tree lives in the understory of the tropical forest, where it is sheltered from the sun and wind by taller trees.



In the past, some cacao farmers cut down large sections of rain forest to open up new fields to grow a hybrid variety of the cacao tree without shade. In addition to destroying valuable rain forest land, farmers needed to apply chemical fertilizers and pesticides to ensure the growth of the hybrid trees.

Fortunately, most of today's cacao farms practice sustainable methods of growing cacao under the shade of taller trees. Sustainable farmers use environmentally-friendly techniques such as planting tall, beneficial, native crops such as banana, cashew, or coconut trees among the cacao trees, thus providing shade canopy. These "shade farms" provide the habitat needed to host the insects that naturally pollinate the cacao as well as those that feast on cacao pests. These types of farms also maintain the natural systems that keep the soil fertile—eliminating the need for chemical fertilizers.

Harvesting Cacao Seeds

Chocolate is made from the seeds of the cacao tree. They grow in a football-shaped fruit called a pod. Farmers harvest the pods by hand, then cut them open and scoop out the pulp and seeds, which they cover with burlap or banana leaves, or place in wooden boxes, to ferment. This process reduces the cacao's natural bitterness and begins to release the chocolate flavor. After a few days of fermentation, the seeds from the cacao pod darken into

rich brown cacao beans, which the farmer dries in the sun before taking them to a collection site for shipment to chocolate factories around the world.



There are three main varieties of cacao tree:

- ➔ **Criollo** produces a very high quality bean. It is most rare and highly prized for its flavor. It is grown mainly in Central America and the Caribbean.
- ➔ **Forastero**, cultivated in Africa and Brazil, produces a bean with a strong chocolate taste. It provides approximately 80% of the world's cacao.
- ➔ **Trinitario**, a disease-resistant and easily-cultivated cross between the Criollo and the Forastero, has smooth pods and flavorful beans. It is grown mainly in Central and South America and Asia.



Now it's time to find out more. With your team, do some research to learn more about sustainable cacao farming and how sustainable farming practices may be applied to growing other tropical crops such as sugar cane, coconut palm trees, and coffee. Present what you have learned to your classmates.

Use the space below to begin focusing your thoughts.

You can use the back of this paper to make notes.



To learn more about how cocoa is grown and chocolate is made, visit **The Story of Chocolate** at www.thestoryofchocolate.com.



✓ CHOOSING CHOCOLATE



Chocolate factories all use the same basic process to turn cocoa beans into the chocolate that we find in stores:

1. The dried beans arrive at the factory and are inspected and approved.
2. The beans are cleaned, roasted, cracked to remove the nib (the center of the bean that will become chocolate), and ground.
3. The pressure and friction from the grinding process causes the natural fat known as cocoa butter to melt. The newly liquefied nibs are called chocolate liquor. It is then poured into molds and hardens into plain, unsweetened baking chocolate.
4. If it is not packaged to be sold as baking chocolate at this point, the unsweetened chocolate can either be pressed to separate the cocoa powder and cocoa butter, or mixed with extra cocoa butter and other ingredients to make eating chocolate.

The process then varies, depending on the type of chocolate being made.



Check your chocolate knowledge by matching each of the following types of chocolate to the ingredients it contains or the process used to make it.

-  1. Baking Chocolate
-  2. Cocoa Powder
-  3. Chocolate Liquor
-  4. Milk Chocolate
-  5. White Chocolate
-  6. Dutch-Processed Cocoa
-  7. Bittersweet Chocolate
-  8. Semisweet Chocolate

- A. Often referred to as dark chocolate, this has the highest percentage of chocolate liquor and may contain extra cocoa butter.
- B. This substance is created when the nibs of the cacao bean are ground until they liquefy.
- C. This chocolate contains only cocoa butter, plus milk solids, sugar, lecithin (an emulsifier, often made from soy, that makes the ingredients blend together), and flavorings.
- D. This chocolate is treated with an alkali to neutralize its acids; it is often used in recipes that call for baking powder.
- E. This is made when chocolate liquor is pressed to remove most of the cocoa butter and the remaining solids are grated.
- F. The most common type of eating chocolate, this includes at least 12% dry milk solids.
- G. This variety of dark chocolate generally contains between 35-45% chocolate liquor.
- H. Also called unsweetened chocolate, this contains nothing but chocolate liquor.

And, finally, the bonus question:

What is tempering, and when is it important to temper chocolate?

To learn more about the many types of chocolate, visit **The Story of Chocolate** at www.thestoryofchocolate.com.



A CHOCOLATE CHALLENGE



Now it's time to put what you've learned about chocolate to the test and create a balanced four-course meal that features some form of cocoa or chocolate in each course. Be sure to include one recipe that uses cocoa and one dish that uses unsweetened chocolate, also known as baking chocolate. There are lots of recipes at www.thestoryofchocolate.com to get you started. Or use your culinary imagination to create an original recipe or two!

Recipe Name/Ingredients	Directions
Appetizer	
Salad	
Main Dish	
Dessert	

To Your Health!

Cocoa is rich in flavanols, which are potent compounds found in a wide range of plant-based foods including tea, apples, and grapes. Emerging science suggests the idea that chocolate that contains flavanols may support a healthy heart because eating flavanol-containing chocolate and cocoa products can improve the cardiovascular system's function, make platelets less prone to form clots, and lower blood pressure.



Here are some healthful tips to consider when you enjoy a chocolate treat:

Calories Count

Because chocolate is a calorie-dense food, a little goes a long way. Balance the calories in chocolate by cutting calories in other treats. By eating it slowly, you not only appreciate its flavor more fully, but you don't go overboard on calories.

Pair It

Eat chocolate with other foods, such as fruit or pretzels, to complement the flavor while enjoying smaller amounts.

Explore It

Enjoy the variety of flavor experiences from chocolate, available in a range from light to very dark, and try new and exciting flavors and fillings. To appreciate the complex flavors in chocolate, eat it slowly, and take the time to savor every bite.

Everything in Moderation

To stick to modest portions, plan ahead and buy chocolates that can be portioned or are individually wrapped. Dietary advice suggests that most of us can consume one or two small chocolate pieces daily or one or two chocolate bars per week. You might consider eating it with fruit to enjoy complementary flavors as well as moderate your chocolate consumption. In addition, buy chocolate that is individually wrapped or that can be divided, so you can stick to modest portions.

To find amazingly delicious recipes using cocoa or chocolate, visit *The Story of Chocolate* at www.thestoryofchocolate.com.



THE STORY OF CHOCOLATE



People have been enjoying chocolate for more than 4,000 years, starting with the Olmecs, Mayans, and Aztecs of Central America. Today, the cocoa beans used to produce chocolate are grown on millions of

family farms in tropical countries around the world.

Cocoa beans are actually the seeds of the fruit of the cacao tree. They grow in a football-shaped fruit called a pod. Cacao farmers remove the seeds, then ferment

and dry them, at which point they are called cocoa beans. When they arrive at the chocolate factory, the cocoa beans are processed to create a substance called chocolate liquor, which is the starting point for all forms of chocolate.



A Chef's Guide to Chocolate

The more you know about chocolate, the more you can do with it in the kitchen. Use this quick guide to boost your chocolate IQ!



Baking Chocolate: This contains nothing but chocolate liquor.

Bittersweet Chocolate: The darkest of eating chocolate, bittersweet has the highest percentage of chocolate liquor and may contain extra cocoa butter. Both bittersweet and semisweet chocolate must contain at least 35% chocolate liquor, but bittersweet usually contains at least 50% cacao. Often referred to as *dark chocolate*.

Cacao Content: Cacao content refers to the amount of the chocolate product that is made up, by weight, of the ingredients derived from the cacao bean—both the chocolate liquor and any extra cocoa butter.

Chocolate Liquor:

The center (nib) of the cocoa bean that has been ground until it liquefies. It contains no alcohol.

Cocoa Beans: These begin as seeds from the pod

of the *Theobroma cacao*, a tree that is native to Latin American tropical forests. It is now grown commercially around the world in tropical rainforests within 20° latitude of the Equator.

Cocoa Butter: The fat of the cocoa bean; this is not a dairy product.

Cocoa Powder: The cocoa solids that remain when most of the cocoa butter is pressed out of the chocolate liquor. Cocoa powder may be natural or Dutch-processed.

Conching: A process of kneading the chocolate paste that affects the final flavor and texture.

Dark Chocolate: Chocolate that contains chocolate liquor, extra cocoa butter, sugar, an emulsifier, and vanilla or other flavorings. Dark chocolate may contain milk fat to soften the texture, but it does not generally have a milky flavor.

Dutch Process (or Dutched): A treatment used during the making of cocoa powder in which nibs are treated

with an alkaline solution to neutralize acidity. This process darkens the color of the cocoa and produces a milder chocolate flavor.

Milk Chocolate: Chocolate that contains at least 10% chocolate liquor by weight, and at least 12% milk solids. This is the most common type of eating chocolate.

Nib: The center (meat) of the cocoa bean. When ground until it liquefies, the nib becomes chocolate liquor.

Organic Chocolate: Chocolate grown without agricultural chemicals that meets U.S. Department of Agriculture organic requirements.

Semisweet Chocolate: Like bittersweet chocolate, semisweet chocolate must contain at least 35% chocolate liquor. Generally, semisweet chocolate contains 35% to 45% chocolate liquor. Like bittersweet chocolate, often referred to as *dark chocolate*.

Tempering: The process of preparing chocolate that involves heating, cooling, and reheating that is used to prepare chocolate for coating and dipping. It affects the way the cocoa butter crystals form, and it determines how hard, shiny, and glossy the chocolate will be.



White Chocolate: Chocolate that contains at least 20% cocoa butter, 14% milk solids, and no more than 55% sugar. It contains no cocoa powder or chocolate liquor.



Learn more about chocolate at www.thestoryofchocolate.com.

