

NATIONAL GEOGRAPHIC EDUCATOR'S GUIDE

COMMON CORE ALIGNMENTS AND CLASSROOM ACTIVITIES



GREAT MOMENTS IN WORLD HISTORY

GLOBAL STORIES

WHERE

Chocolate

SPARKED DISCOVERY,
INNOVATION, AND

Imagination!



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Introduction	3
Where Cacao is Grown	4
The Origins of Chocolate	6
European Explorers Discover Chocolate	8
Chocolate Lands in Europe	10
Chocolate Comes to the American Colonies	12
Colonial Chocolate Making	14
Chocolate as Health Food and Medicine	16
Early American Chocolate Drinkers	18
Chocolate in the Military	20
Cacao Plantations and Trade Routes	22
Chocolate and American Explorers	24
Innovations in Chocolate Making	26
Chocolate at Earth's Extremes	28
Chocolate in Space	30

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Introduction

To Educators

Chocolate! For some 3,500 years this delicious confection has been at the center of world history, from its beginnings around 1500 B.C.E. as a ceremonial drink in the ancient Olmec, Maya, and Aztec cultures through its multifaceted forms and uses today in the 21st century. The story of chocolate leads us on an illuminating journey through time and around the world, one that is filled with adventure and risk, struggle and triumph, breakthroughs and discovery. Prepared by National Geographic in partnership with Mars, Incorporated, the Educator's Guide *Great Moments in World History: Global Stories Where Chocolate Sparked Discovery, Innovation, and Imagination!* will engage each participant to experientially learn about key people and events that fostered chocolate's expansion. Students will create a drink similar to the one that the Aztec emperor Moctezuma II (Montezuma) shared with Spanish conquistador, Hernán Cortés. Students will also create an advertisement promoting chocolate during the American Revolutionary War and be able to design the next M&M'S® Brand chocolate candies to fly into space.

Thanks to guidance from Mars, Incorporated, students will take a journey in time to see how chocolate played an integral role in world history. Students will understand how the story of chocolate played a transforming role in trade, commerce, medicine, the military, and culture. Mars, Incorporated, undertook extensive research into the history of chocolate, partnering with several historic sites as well as educators from the University of California, Davis. From the research, the AMERICAN HERITAGE® Chocolate Brand was developed to "share the delicious transformation of chocolate's flavor, texture, and format through the ages." Mars, Incorporated, provides educational discussions and presentations with hands-on learning to tell the story of America and the world, "through the unique lens of chocolate."

To formulate the lessons in this guide, the partners from Captain Jackson's Historic Chocolate Shop at the Old North Church & Historic Site, Boston; Fort Ticonderoga, New York; George Washington's Mount Vernon, Virginia; the Colonial Williamsburg Foundation, Virginia; Thomas Jefferson's Monticello, Virginia; and Old Salem Museums & Gardens, North Carolina, have been generous with their time and ideas. They've recommended chocolate-making recipes, mapping activities, shipbuilding and racing challenges with a mathematical twist, an ad campaign, creative journaling and storytelling, guidelines for inventing a new chocolate product, and so much more.

Using the Guide

Fourteen lesson plans walk educators through time, from our first known appearance of chocolate to the space age. Each lesson plan is crafted with a variety of entry points for different grade levels and interests. Although the guide focuses on grades 4 to 8, these lessons can be recast to engage younger or older groups—and we encourage you to do so!

The first page of each lesson begins with an *In this Lesson* overview and a *Warm-up* activity. Then *Share with your students ...* gives key historic information to serve as background for upcoming activities. A column listing an Essential Question, Common Core State Standards in Math and English, Objectives, and Vocabulary words summarizes each lesson's key learnings and provides information for planning.

The Common Core State Standards focus on Math and English Language Arts. Under each heading you'll find domain abbreviations, such as NF (Numbers and Operations – Fractions) and SL (Speaking and Listening), and the learning levels for which the lesson is most focused. The abbreviations and their terms include

For Common Core Math:

- NBT = Number and Operations in Base Ten
- OA = Operations and Algebraic Thinking
- MD = Measurement and Data
- EE = Expressions and Equations
- NF = Numbers and Operations - Fractions
- RPA = Ratios and Proportional Relationships

For Common Core English Language Arts:

- RI = Reading: Informational Text
- SL = Speaking and Listening
- W = Writing

On the second page of each lesson, *Activities* draw from and expand upon information on the first page and promote research and creativity. Beside each activity is the recommended grade level range, but each can be crafted to appeal to younger and older groups. Students are encouraged to dig more deeply into relevant websites and print resources—including those suggested in the *Resources* section beneath the activities—and to use their imaginations to craft stories, art, strategies, maps, and foods, to echo the adventure of chocolate through time. (You'll see that the resource weblinks sometimes flow onto the next line, so be sure to use the entire link.)

Finally, a *Time Line* features key milestones in the story of chocolate and the people who make it, enjoy it, and continue to discover the secrets and surprises that make chocolate a global superstar.



LESSON
1

WHERE Cacao IS GROWN

Warm-up

Show students a chocolate bar wrapper with “cacao” printed on it, such as “60 % cacao.” Write cacao on the board and model its pronunciation. Then ask the class what they know about it. Students might mention “cocoa” or “chocolate.” Note these words and discuss the differences. “Cacao” generally refers to the plant itself or the beans before processing. “Chocolate” refers to anything made from the beans. “Cocoa” generally refers to chocolate in a powdered form.

Share with your students . . .

Cacao trees are found in limited geographical zones. These trees grow only in hot, rainy tropical areas within 20° north and south of the Equator. They thrive in areas that receive rain almost daily and have temperatures that average 80°F year-round.

Cacao trees grow in the **understory** of tropical rain forests, in the shadow of much taller trees. Here they are protected from the hot sun while still getting the necessary moisture from the warm, humid air.

Cacao trees begin producing fruit, called pods, after about three years, though a full yield may take six or seven years. Each pod is about the size and shape of a small football. The pods grow directly on the trunk and lower branches. This allows for pods to be harvested easily by hand, which is done multiple times throughout the year.

Workers typically harvest and cut open the pods using a **machete** (upper right) to expose the beans. Each pod usually contains 30 to 50 beans. The beans and pulp are removed from the pod and placed in open boxes or on banana leaves to dry for several days. This process is called “sweating,” or **fermentation**, and is when the chocolate flavor develops in the beans. The fermented beans are then left to thoroughly dry in the sun before being transported to manufacturing facilities.

For more about the growing process of cacao trees, see www.icco.org/about-cocoa/growing-cocoa.html.



ESSENTIAL QUESTION

Where and how is cacao grown?

COMMON CORE MATH

4.NBT.A.1, 4.OA.A.3, 5.NBT.B.5

COMMON CORE ENGLISH LANGUAGE ARTS

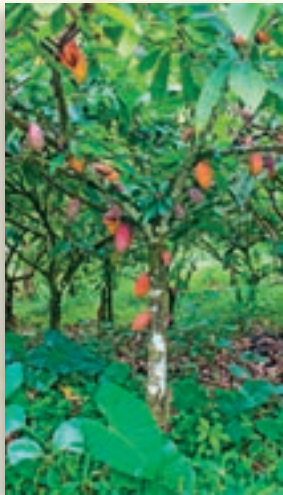
RI.4.3, RI.4.7, RI.7.4

OBJECTIVES

- 1 Identify where cacao is grown.
- 2 Identify the conditions needed for cacao to grow.

VOCABULARY

- understory
- machete
- fermentation

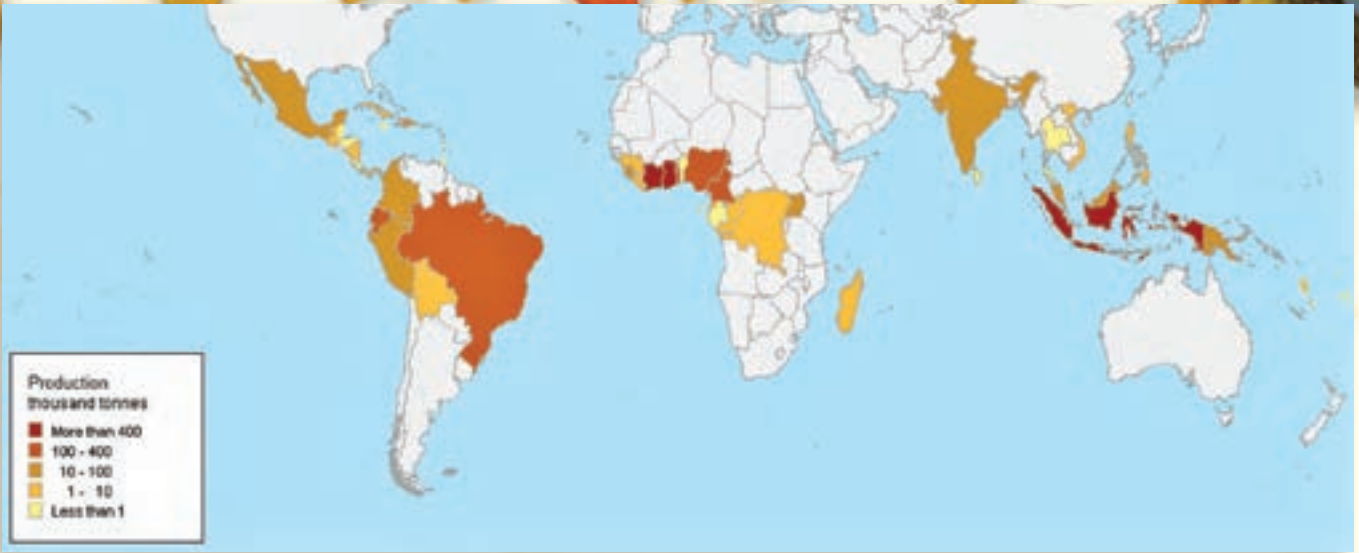


IN THIS LESSON

Students explore the regions best suited for growing cacao, as well as the specific needs of the cacao tree (above).

Fun FACT

Monkeys like cacao, too! They bite holes in the pods. Then they sink their teeth into the pulp and seeds, sucking the juice and spitting out the seeds. The discarded seeds then germinate and begin a new generation of cacao trees.



Map It! (grades 4–8)

Pass out a blank world map. Have students locate the region best suited for growing cacao trees by determining 20° north and south of the Equator. Students should label the lines of latitude and lightly shade the area in between. To see the Equator and latitude and longitude lines, use the map here: www.eduplace.com/ss/maps/pdf/world_country.pdf.

Next, have students research countries that are the top cacao producers. Then on the map, they should locate, label, and color in those countries. The current top three are: Côte d'Ivoire (Ivory Coast), Ghana, and Indonesia. Lists are available for at least the top 10 cacao producers.



Design a Mural (grades 4–8)

Have students create a mural of the rain forest understory, with a focus on the life cycle of the cacao tree. Students can show the tree at different stages: some trees with flowers budding, some with pods forming, and some sprouting from seeds on the ground. Students might also show some pods opened, exposing the seeds and pulp inside.

Students can use a large roll of mural paper if available. Or they can use poster boards and place them side by side on the wall. Materials for the mural might include paint, markers, or construction paper cutouts.

Begin by having students use classroom textbooks and online sources to research the cacao tree's life cycle. They can also research other plants, as well as animals they might want to show in the mural. Then use students' suggestions to plan out the mural, perhaps making a rough drawing on the board and then transferring the drawing to the mural. You might want to assign students to work in small groups, with each group focusing on a part of the mural, perhaps on a certain stage of the cacao tree's life cycle.



Counting Beans (grades 4–6)

Remind students that each cacao pod contains about 30 to 50 beans. For this activity, they can assume each pod contains 40 beans. Tell them that it takes about 400 dried beans to make one pound of chocolate.

Write the following question on the board: How many pods are needed to make one pound of chocolate? Students can work in pairs to find the answer. (10 pods)

Then, have students work together to create word problems and take turns solving them. For example: I went to the store and bought a two-pound box of chocolates for my mom and a half-pound box for friends. How many cacao pods were used to make the chocolates I bought? ($10 \times 2 = 20$; $10 \times 0.5 = 5$; $20 + 5 = 25$ cacao pods)

CHOCOLATE ADVENTURE

Time Line

1500 B.C.E.

The Olmec may be the first to consume chocolate.

1519 C.E.

Explorer Hernán Cortés meets Moctezuma II.

1789

George Washington enjoys chocolate at Mount Vernon.

1862

Chocolate is served at Abraham Lincoln's Inaugural Ball.

1941

M&M'S® make their debut.

1981 to Today

Chocolate flies into space.



RESOURCES Louis Evan Grivetti and Howard-Yana Shapiro, *Chocolate: History, Culture, and Heritage* (Hoboken, NJ: Wiley and Sons, 2009); AMERICAN HERITAGE® Chocolate Time Line, at www.americanheritagechocolate.com/home/history.



LESSON
2

THE ORIGINS OF

Chocolate



IN THIS LESSON

Students explore the origins of chocolate through activities that reveal the use of cacao by early cultures of the Americas: the Olmec, Maya, Toltec, and Aztec, including (above) the Aztec ruler Moctezuma II (also called Montezuma).

Warm-up

Write “chocolate” in the middle of the board and build a word web around it by asking students what words come to mind when they think of chocolate. Encourage them to consider all of their senses as they think of different descriptive words and words associated with this treat. If necessary, suggest they include products that contain chocolate, such as candy bars, cookies, cakes, ice cream, syrup, and sauces.

Then show students an almond or object of similar size and say that all of these products, sensations, and ideas are the result of the cacao bean that looks similar to the object you are holding.

Finally, review the word web for the word “bitter.” Most likely this word is absent, but point out that for most of chocolate’s long history, “bitter” was the perfect way to describe it.



ESSENTIAL QUESTION

How did early cultures of the Americas use cacao?

COMMON CORE MATH

4.MD.A.2, 6.EE.B.5

COMMON CORE ENGLISH LANGUAGE ARTS

SL.4.1, SL.4.4, SL.5.1.D, SL.7.5

OBJECTIVES

- 1 Identify early cultures of the Americas that used cacao before Europeans arrived.
- 2 Describe how cacao was important to early cultures of the Americas.

VOCABULARY

- cacao beans
- fermented
- metate
- currency

Share with your students . . .

The earliest known use of cacao traces back to the Amazon Basin in the northeast corner of present-day Ecuador. The native people in the region ate the sweet pulp that surrounds the **cacao beans** within the fruit. They may have also **fermented** the pulp to make an alcoholic drink.

The first people known to consume the cacao beans were the Olmec, who lived in what is today southern Mexico. The beans are extremely bitter, and the Olmec did not eat them as you might eat peanuts or kidney beans. Instead, they fermented, dried, and ground the beans into a chocolate paste using a stone **metate** (above right). They then mixed the paste with water and spices to create a rich—though bitter—chocolate drink.

The Olmec were followed by the Maya (of present-day Guatemala, Belize, and Yucatán Peninsula), and then the Toltec and Aztec of central Mexico. Each civilization valued the drink of the cacao bean. Called *xocolatl* by the Aztec, the prized drink was used in religious rituals and as medicine. Cacao beans even became a form of **currency**. In an Aztec market, one bean could buy a tamale or a tomato; 100 beans could buy a turkey. A copper ax cost a whopping 8,000 beans. The great wealth of the Aztec ruler Moctezuma was based on cacao currency.

Given the importance of cacao to these ancient civilizations, it’s no wonder that the scientific name of the cacao tree is *Theobroma* (“food of the gods”) cacao.

For more information about the importance of cacao in Mesoamerican tribes, see www.smithsonianmag.com/history/archaeology-chocolate-180954243.

Fun FACT

Cacao beans were so valuable that ancient counterfeiters risked making fake beans. Archaeologists have found beans in which the cacao contents had been removed and replaced with clay or wax.



Chocolate Migration (grades 4–8)

Pass out a simple map of Central America to each student. The map should also include the extreme northwest portion of South America. You can use the map here:

www.printablemaps.net/central-america-maps/maps/MEX-CAM-Countries.pdf.

Have students work in pairs to do the following tasks:

- Use a social studies book or other source to indicate on the map the location of the Olmec, Mayan, Toltec, and Aztec civilizations. Suggest students use a key to make the map easier to read.
- Use the information in the time line to the right, other information you've shared with the class, as well as other resources, including those listed below, to show the migration of cacao from South America to south central Mexico. You may wish to read the information in the time line aloud or display it for students to use.
- Have students take turns using the map to explain to a partner what they know so far about the history of chocolate. Encourage student pairs to revise their maps if they find them inadequate as a tool for explanation. Then invite all student pairs to share their maps and explanations with the class. Encourage questions. If students don't know the answers, write them down for further research and discovery.



Decorate a Cacao Glyph (grades 4–8)

Tell students that the ancient Maya had an extensive written language consisting of pictures called hieroglyphs, or glyphs. Each glyph stood for a letter, group of letters, or a concept. The glyphs were written in books called codices (singular: codex) on paper made of the inside bark of trees.

Show students the glyph decorating the pot at right, perhaps enlarging it on a screen. Although it shows a fish, it is the glyph for cacao. Have students make a sketch of it. Or you might ask a volunteer to draw it large on a sheet of paper, and then make copies for the class.

Next, invite students to decorate the glyph. They might simply color it. Or they could fill it in with different colors of beans representing cacao beans. They might place the drawing over a thin slab of clay and press over the lines to make a bas-relief. Encourage creativity. Display the finished products.

Older students may want to do research as to why the glyph for cacao is a fish, and report to the class.



What a Bean Could Buy (grades 4–8)

Remind students that cacao beans were a form of currency in Mesoamerican cultures. Using the examples from the background information on page 4, have student pairs make a list of at least 10 goods and how many cacao beans each item costs. Then, choose from these activities:

- Have pairs explain to the class why they chose the items they did and why they priced them as they did. As a class, discuss whether the items and the prices make sense based on the information they have.
- Have pairs create math problems using their prices. They can write equation problems, or make up word problems, using the math concepts they are currently learning. Pairs can exchange problems and pricing lists, and solve them.
- Invite pairs to create a skit in which one partner plays a seller and the other a buyer. Students can use dried beans to represent cacao beans, or just pretend to be exchanging beans. Encourage students to add humor to their skits. For example, they might show how the buyer and seller would haggle, or bargain, over the price of an item. Perhaps the seller is willing to go lower on a price if the buyer purchases more than one of the items.

Ask the audience to pay close attention to how the pair uses math skills, and their wits, to get a good deal. Then discuss who got the better deal.



CHOCOLATE ADVENTURE

Time Line

1500–400 B.C.E.

The Olmec tribe likely becomes the first group to consume chocolate.

250–900 C.E.

The Maya drink chocolate; it is key to their economy.

900–1200

The Toltec consume chocolate in northern Central America.

1100–1525

The Aztec grow their empire, based partly on the value of chocolate.

RESOURCES Grivetti and Shapiro, *Chocolate*; AMERICAN HERITAGE® Chocolate Time Line, at www.americanheritagechocolate.com/home/history; Josie Garthwaite, "What We Know About the Earliest History of Chocolate," at www.smithsonianmag.com/history/archaeology-chocolate-180954243.



LESSON
3

EUROPEAN EXPLORERS DISCOVER

Chocolate

Warm-up

Ask students to share their experiences with a food or drink that they didn't like the first time they tried it. Ask for specific examples. Did they eventually come to like the food or drink? Tell students that, believe it or not, many people felt the same way about chocolate.



Share with your students . . .

Christopher Columbus (left) was the first European explorer to see cacao beans. During his fourth voyage to the Americas in 1502, he came upon a native Maya trader whose canoe was filled with what Columbus first thought were almonds. Seeing that the beans were different, and that someone else thought them to be valuable, he **seized** them and brought them back to the Spanish court. But Columbus did not know what the beans were or how they were used, so the court was not impressed, and nothing came of the discovery at that time.

In 1519, Spanish **conquistador** Hernán Cortés arrived in the Aztec capital of Tenochtitlan to meet with the Aztec emperor, Moctezuma II (also called Montezuma). The emperor thought Cortés was a god and welcomed him with great ceremony. Moctezuma offered Cortés a **frothy** drink made from cacao beans and seasoned with local spices, including chili peppers (above, right). Though Cortés did not initially like the drink, calling it bitter and almost undrinkable, he grew to enjoy the new concoction. He continued to consume it as he explored the region for eight more years, and eventually conquered the Aztec.

After the Spanish conquest of the Aztec, Cortés returned to Spain in 1528. His explorers brought back stories of how a cacao drink was made, but there is no record that they brought cacao beans. In 1544, Dominican friars escorted Maya nobles to the court of Prince Philip of Spain, with cacao. The drink they made from it was bitter and flavored with unfamiliar New World spices. To make it more appealing, European spices such as nutmeg, cinnamon, and anise (opposite, bottom right) replaced the unfamiliar vanilla, annatto, and chili flavors. The drink was sweetened with sugar, and it became a royal favorite.

For more information about how early explorers introduced chocolate to Europe, see www.smithsonianmag.com/arts-culture/a-brief-history-of-chocolate-21860917.



ESSENTIAL QUESTION

How did two famous explorers introduce chocolate to western Europe?

COMMON CORE MATH

5.NF.B.3, 6.EE.A.1

COMMON CORE ENGLISH LANGUAGE ARTS

SL.8.1.A, SL.8.1.C, W.6.2.A, W.7.2

OBJECTIVES

- 1 Describe European explorers' first encounters with cacao in the New World.
- 2 Describe how cacao was introduced to western Europe.

VOCABULARY

- seized
- conquistador
- frothy

IN THIS LESSON

Students discover how two explorers, Columbus (above) and Cortés encountered chocolate in the New World and brought news of this phenomenon to western Europe.

Fun FACT

The word "chocolate" comes from the Aztec word *xocolatl* (sho koh LAH tuhl), which means "bitter water."



Taste Test (grades 4–8)



CAUTION: Check for food allergies among your students before completing this activity.

Have students describe the taste of a chocolate drink, such as hot cocoa (right) or chocolate milk. Students should write their descriptions in a comparison chart you’ve created on the board, with two to three columns for familiar chocolate drinks and one for a new drink.

Next, entice their taste buds by telling them that they will be sampling a New World chocolate drink. Prepare

the drink ahead of time in a slow cooker. You can simply make a large batch of hot chocolate using unsweetened cocoa and then add vanilla and a pinch of ground chili powder—two of the ingredients from the ancient Aztec recipe. Be sure to taste the drink ahead of time to make sure it will not be too spicy for your students.

Invite students to taste the drink. Then have them complete the chart comparing the familiar chocolate drinks to the New World chocolate drink. They might call out adjectives like “spicy.” You might want them to write a compare-and-contrast essay about the taste test.

Encourage students to try making a similar drink at home, using spices that Europeans added to make the drink more palatable to them: nutmeg, cinnamon, or anise, the star-shaped spice below. They can report back to the class with their favorite recipe.



CHOCOLATE ADVENTURE

Time Line



Journal Entry (grades 4–8)

Have students recall Christopher Columbus’s first encounter with cacao. Write or project on the board this diary entry from Columbus’s son, Ferdinand:

“... for when they were brought on board the ship together with their goods, I observed that when any of these almonds fell, they all stooped to pick it up, as if an eye had fallen.”

Discuss what this quote means and how it shows the importance of the cacao bean at the time. Then invite students to write their own journal entry, as if they were an explorer who discovered the cacao bean.

Pose these questions for their journals as well: How would you feel if you were Columbus and just brought back these very special beans, but no one cared? Why was the Spanish court more impressed with the beans Dominican friars and Maya nobles brought decades later?

1502 C.E.

Columbus and his son, Ferdinand, visit the Maya in present-day Honduras and bring the first cacao beans back to Europe.

1519

Hernán Cortés shares a bitter chocolate drink with Aztec emperor, Moctezuma II; Moctezuma is taken hostage.

1520

Cortés’s men break into Moctezuma’s warehouse and steal cacao beans; Moctezuma is killed, though cause is unknown.

1528

Cacao comes to the court of Prince Philip of Spain, from Maya nobles escorted by Dominican friars who had visited the New World.



A Fateful Meeting (grades 4–8)

Have students research more about the meeting of Cortés and Moctezuma II. Then divide the class into groups and have them create skits about the first encounter between the two men. Skits should include the presentation of the cacao drink but may also include Moctezuma’s feelings prior to the meeting (excitement of thinking that Cortés might be a god), Cortés’s initial reaction to the drink (bitter and almost undrinkable), and Moctezuma taken hostage by the Spanish.



RESOURCES Howard -Yana Shapiro, *Great Moments in Chocolate History* (Washington, D.C.: National Geographic, 2015.); Grivetti and Shapiro, *Chocolate*.



LESSON
4

Chocolate

LANDS IN EUROPE

Warm-up

Ask students to name and locate the nearest coffee shop. It might be part of a chain or an independent shop. Ask if any students have ever been inside such a shop, and if so, to describe its interior. Focus on the comfortable chairs, couches, and tables. Ask why such furnishings would be in a coffee shop (to provide a welcoming environment in which customers can have conversations and feel at home). Explain that similar kinds of shops existed hundreds of years ago, except they weren't as common, and they were chocolate shops.

Share with your students . . .

When Christopher Columbus and Hernán Cortés brought news of cacao back to Spain from the New World, they could not have predicted how chocolate would spread throughout Europe, and how important it would become in daily life. For a while, it seemed as though chocolate wouldn't spread very far at all.

The Spanish court and aristocracy consumed the chocolate themselves; it was not exported to other countries. This is likely a major reason why the rest of Europe was unaware of the cacao bean and the recipe that yielded the exotic beverage. Chocolate generally was known only to Spain and Portugal for nearly a hundred years. During this time, Spain established cacao **plantations** throughout the lands they held in the Caribbean.

Eventually, as supplies of cacao and sugar grew, the drink spread to other countries. It entered France in 1615, at the wedding of Louis XIII and Anne of Austria, King Philip III's daughter. That same year, Francesco Carletti, an Italian merchant and travel writer, visited Central America and saw how chocolate was made. His knowledge helped establish chocolate making in Italy.

In the early 1600s, the Dutch took control of the island of Curaçao, off Venezuela. They began to **import** cacao beans to Holland, which made Amsterdam a leading port in the cacao industry.

Chocolate reached England in the 1650s after the British captured Jamaica, and its cacao plantations, from Spain. Soon, chocolate houses, similar to today's coffee shops, opened to the public. Unlike our coffee shops, these houses catered to wealthy, and male, **aristocrats** and gentry. Cacao beans, sugar, and spices had to be imported from the Americas, and the chocolate drink was time-consuming to make (above, right). Thus, chocolate was an expensive drink that only the wealthy could afford.

For more information about how chocolate spread throughout Europe, see www.cadbury.com.au/about-chocolate/discovering-chocolate.aspx.



ESSENTIAL QUESTION

How did chocolate spread throughout Europe among the aristocracy?

COMMON CORE MATH

4.NBT.A.3, 4.NBT.B.4, 5.MD.B.2, 6.RP.A.3.B

COMMON CORE ENGLISH LANGUAGE ARTS

W.5.2.B, W.5.3, W.6.2.E, W.6.2.D

OBJECTIVES

- 1 Describe how chocolate spread throughout Europe.
- 2 Explain why chocolate was an expensive drink.

VOCABULARY

- plantations
- import
- aristocrats



IN THIS LESSON

Students discover how chocolate spread throughout Europe as a luxury of royalty and the wealthy, who poured it from a silver pitcher, like this one.

Fun FACT

In 1579, English pirates burned and sank a Spanish ship filled with cacao beans after they mistakenly thought the beans were sheep droppings.



European Chocolate Map (grades 4–8)

Briefly review with the students how and where cacao first entered Europe. Spend a few minutes discussing the general movement of chocolate throughout Europe.

Then pass out a copy of a map of Europe, such as the one at www.d-maps.com/carte.php?num_car=2254&lang=en. Working in pairs and using the information on page 8 and the Time Line at right, have students track chocolate’s expansion. They can use colored pencils or markers to label the country and the year chocolate was introduced there. Also, have them draw arrows to show the expansion of chocolate.



Chocolate House (grades 4–8)

In this three-part activity, students will work in small groups to create their own chocolate house, like the one in England (below).

Part 1: Design a Sign

First, have groups decide in which country their chocolate house will be located. Next, direct them to come up with a name for their establishment, possibly using the native language of the country (e.g., *chocolaterie* in France).

Project on the board some examples of Old World European signs, like the one from England, at right, to give students ideas about their own. After brainstorming designs on paper, groups can make their signs on poster board.

Display the signs in the classroom and have students vote on which sign would make them most likely to stop in for a delicious chocolate drink.

Part 2: Create a Menu

Now have groups begin the job of creating a menu for their chocolate shop. Each group should come up with a list of three to five chocolate drink items for their chocolate house. Each item should have a name and description. Menus can be created using construction paper or poster board, or on a computer.

As an extension, suggest students research the currency used in that country, determine the price of chocolate or other products at that time, and assign prices to each menu item.

Part 3: Visit a Chocolate House

As a culminating activity, have groups visit each other’s chocolate house and pretend to each purchase a drink. Students should use paper cutouts for the currency of the time and place. The keeper of the house should be able to make change. If students are learning about European history, have the group members discuss the events of the day.



CHOCOLATE ADVENTURE

Time Line

1585 C.E.

First commercial shipment of cacao beans arrives in Spain from the New World.

1591

Pope Gregory XIII, the head of the Catholic Church in Rome, Italy, declares that Catholics could drink chocolate during the holy season of Lent without breaking their fast.

1615

Chocolate enters France at the wedding of Louis XIII and Anne of Austria.

1650–1657

Chocolate reaches England; chocolate houses open.

1659

First French chocolate shop opens in Paris.



RESOURCES

C. J. Polin, *The Story of Chocolate*, (London, Dorling Kindersley, 2005); Grivetti and Shapiro, *Chocolate*; AMERICAN HERITAGE® Chocolate Time Line, at www.americanheritagechocolate.com/home/history.



LESSON
5

Chocolate

COMES TO THE AMERICAN COLONIES

Warm-up

Show students a picture of a tall-masted ship from the 17th or 18th centuries under full sail. Ask them to describe how such ships were different from today's oceangoing vessels (they were made of wood, wind-powered, and were without today's navigation equipment such as GPS, accurate maps, or radar). Discuss how, because of these characteristics, the old tall-masted ships were much more vulnerable to weather than ships today. State that this fact played a significant role in how chocolate first arrived in North America.

Share with your students . . .

Chocolate's first appearance in North America may have happened by accident. In 1641, a Spanish ship, the *Nuestra Senora del Rosario del Carmen*, was on its way from Puerto Rico to Spain when a bad storm forced it to take refuge in the port of St. Augustine, Florida (left). On board were crates of cacao beans and equipment for making chocolate. It is not known what became of this shipment of chocolate goods.

The first recorded sale and consumption of chocolate in the American Colonies came nearly 30 years later in Boston, Massachusetts. In 1670, two women opened a tavern to sell chocolate to their **patrons**. This chocolate most likely was imported from England. It came as a powder mixed with sugar and pressed into cakes about the size of a flattened hockey puck.

Chocolate production in the Colonies probably began in 1682, when the first shipment of cacao beans from Jamaica (at upper right) arrived in Boston. By importing directly from plantations in Jamaica, the Colonies avoided costs associated with extra shipping and the high **import duties** on chocolate that had to first pass through England before it came to the Colonies. Thus the chocolate drink became more affordable to people of all classes in America and was readily available in coffee houses and taverns up and down the East Coast.

Chocolate was also expanding into the American Southwest. Explorers, missionaries, soldiers, and settlers carried chocolate as they ventured north from New Spain (today's Mexico). Ground, pressed cakes of chocolate were **portable** and **resistant** to spoilage, making them ideal for long journeys.

For more information about chocolate in the American Colonies, see: www.history.org/history/teaching/eneletter/volume9/jan11/featurearticle.cfm.



ESSENTIAL QUESTION

How did chocolate become a drink of the masses in colonial America?

COMMON CORE MATH

5.MD.C.3, 5.MD.C.4, 6.RP.A.3.B

COMMON CORE ENGLISH LANGUAGE ARTS

W.7.7, W.7.8, W.8.1.A, W.8.2.A

OBJECTIVES

- 1 Explain how importing chocolate directly from Jamaica made the drink affordable to colonists other than the wealthy.
- 2 Describe how chocolate spread throughout the American Colonies.

VOCABULARY

- patrons
- import duties
- portable
- resistant



IN THIS LESSON

Students explore how chocolate spread throughout the American Colonies and how this drink, once reserved for the royal and wealthy, became available to people of all classes.

Fun FACT

In the 1770s a Moravian merchant in Salem, North Carolina, ordered pounds of chocolate to be sent from the Moravian Community Store in Bethlehem, Pennsylvania. Chocolate was a popular drink in Salem, especially at the Boys School and the Girls School.



Ship Design Challenge

(grades 4–8)

In this three-part activity, students will work in teams to design, build, and test a ship that could have been used for transporting goods, such as cacao.

Part 1: Sailing Ship Designs

Review with students the importance that ships and the proximity to water played in the growth of the American Colonies. Display a picture of a Bermuda sloop, like the one shown at right. Explain that this type of ship carried many of the goods, including cacao, from the West Indies to the Colonies along the Atlantic seaboard. Share other examples of sailing ships of this era and discuss the differences and similarities in their designs.

Part 2: Design and Build

Have students work in teams of two to four to design and build a model sailing ship. As a class, decide on design requirements. For example, the model should hold a certain number of pennies or chocolate pieces (cargo) and move swiftly in a steady breeze.

Also decide on design constraints. For example, set a limit on size and weight for the models. You may want to provide a selection of materials such as aluminum foil, paper, clay, craft sticks, straws, cloth, string, tape, and glue. Or you can leave the materials up to the teams to decide upon and purchase, and include a limit on expense of materials as one of the design constraints.

Part 3: Test and Refine

Arrange the materials needed for teams to run test trials for their designs. For example, you may want to provide a fan to produce wind and a plastic trough of water through which the wind can push the models.

Before running the trials, invite teams to explain their choice of materials and describe their design to the rest of the class. Then, let the trials begin!

You may want to run the trials as head-to-head competitions, such as two-boat races. Or trials can be run separately (for example, seeing how far a model sails in a certain amount of time or how long it takes a model to sail a certain distance).

If interest is high, allow teams to use their test results to refine their designs and retest them. Discuss why certain designs were more successful than others.



CHOCOLATE ADVENTURE

Time Line

1641 C.E.

First appearance of chocolate in North America, in St. Augustine, Florida.

1670

First recorded consumption of chocolate in American Colonies, in Boston, Massachusetts.

1682

First shipment of cacao arrives in the American Colonies, in Boston.

1687

A Jesuit missionary establishes a mission in Pimeria Alta, in today's Arizona, and offers gifts of chocolate to local Native Americans.

1690

An expedition searching for the first Spanish mission, San Pedro Creek in eastern Texas, records having chocolate among their food supplies.

1695

Settlers traveling to Santa Fe record having chocolate among their food supplies.

1712

Jesuit missionaries in the Sonora and Sinaloa regions of Mexico order chocolate and spices to prepare the chocolate drink.



Mapping Chocolate in North America

(grades 4–8)

Remind students of maps they have made in previous chocolate activities.

Discuss the importance of maps in understanding the spread and development of ideas. Then tell students that they will be adding to their portfolio of maps.

Pass out a blank map of North America to each student. Display the Chocolate Adventure Time Line for this lesson, and have students add the information to the map by locating and labeling the place in each time line entry. They should also include the date and a brief phrase noting what happened at that place and time. Be sure to have them label the top colonial ports for cacao shipping: Boston, Newport, New York, and Philadelphia. Have younger student pairs use their maps to take turns reading and explaining an event to each other.

RESOURCES A sea captain and the chocolate trade at Old North Church: oldnorth.com/historic-site/13-captain-newark-jackson-and-his-chocolate-shop; Moravian community of Old Salem: www.oldsalem.org/learn/town-of-salem.



LESSON
6

COLONIAL Chocolate MAKING

Warm-up

Bring to class a kitchen mortar and pestle (below, left). Ask students how they think it is used. Then describe how it is used to grind spices and herbs, or how pharmacists use it to grind some medicines. Explain that a similar tool was used to grind cacao beans and that they will have a chance to use the tool later.

Share with your students . . .

Although some tools changed, the process for making chocolate in early America remained relatively the same for centuries. Colonists followed a four-step process like the ancient Aztec's: roasting, winnowing, milling, and molding.

Step 1: Roasting Roasting allowed the cacao beans to reach their optimal flavor. It took a skilled chocolate maker, relying on smell and sight, to tell when the beans were "done." Roasting too much or too little left a burnt or bitter taste.

Step 2: Winnowing After the roasted beans cooled, the next step was **winnowing**. The beans were placed in baskets and thrown into the air (upper right). This loosened and removed the thin shells, leaving the naked beans, called cacao nibs.

Step 3: Milling The nibs were then placed on a hot stone called a **metate**. The chocolate maker held another stone, or **mano**, with both hands and used it to mill, or grind, the nibs against the metate (upper left). A mortar and pestle (below left), was used if a metate and mano weren't available. As the cocoa nibs melted on the hot stone, spices were added, and the combination was ground into a paste. The stone tools worked for home use but not for mass production. Efficient machinery was needed as chocolate became the colonists' choice drink.

Step 4: Molding The chocolate paste produced on the metate was scraped into molds where it was allowed to solidify into a rounded or blocky shape for sale to the public.

At home or in a chocolate house, the solidified chocolate was grated and placed into a hot liquid (water or milk) in a chocolate pot. A wooden stick called a **molinillo** was used to vigorously stir and dissolve the grated chocolate until a froth formed at the top. Then the chocolate drink and its froth were poured into a fancy cup made for the scrumptious beverage.

For more information about chocolate production, visit: www.history.org/history/teaching/enewsletter/volume9/jan11/featurearticle.cfm.



ESSENTIAL QUESTION

How did American colonists make chocolate?

COMMON CORE MATH

4.MD.B.4, 5.NF.A.1, 5.NF.B.7.C

COMMON CORE ENGLISH LANGUAGE ARTS

W.4.2.B, W.4.7, W.4.9, W.5.8

OBJECTIVES

- 1 Describe how American colonists made chocolate.
- 2 Identify and explain tools used in the chocolate-making process in colonial times.

VOCABULARY

- winnowing
- metate
- molinillo

IN THIS LESSON

Students discover how American colonists made and served chocolate, including the tools they used, like the mano and metate (above) and the mortar and pestle (below).



Fun FACT

George and Martha Washington were big fans of chocolate. Martha, however, preferred to make the beverage from cacao shells rather than from the processed nibs. She steeped the shells in hot water, as if dipping a tea bag, to make a thinner drink that was easier on her stomach than was the oily chocolate.



Milling Spices and Beans (grades 4–8)

Revisit the purpose of the metate and mano, or mortar and pestle, in the chocolate-making process. Remind students that the tools were used to grind spices to mix in with the cacao paste. Let students take turns using the mortar and pestle to grind whole spices such as cinnamon sticks or vanilla beans. They can also try grinding coffee beans—or even cacao beans, which can be purchased online—to get an idea of the work involved in grinding these beans.

Then have students write a brief paragraph about why a mortar and pestle would not be a very effective tool for making chocolate on a large scale—and show pictures of a modern cocoa press.



Make a Molinillo (grades 4–8)

Display or project some pictures of molinillos (above left). If you have not yet discussed this tool with students, ask them what they think it is used for. Some may know or guess that it was used to mix a chocolate drink. Inform the class that this was indeed the purpose of the tool and that it's called a molinillo.

Then hold up a long-handled wooden spoon or similar utensil and ask two or three volunteers to use it to demonstrate how a molinillo was used. Students will likely demonstrate a stirring motion. Show them how to hold the handle of the spoon between their palms and move their palms back and forth (above right) so that the spoon spins as if it were part of an electric beater. Next, ask why the tool is made up of different intricately carved sections. (The roughness of the carvings creates a froth better than a smooth tool would.)

Finally, provide students with modeling clay and dowels purchased at a local arts and crafts store to design their own molinillo. Students can work in pairs. Suggest they form the clay around the dowel to provide a sturdy “skeleton” for their molinillo. Encourage creativity in the sculptures and colors. Invite pairs to explain the significance of the designs they chose.



Chocolate Survey (grades 4–6)

Have students work in small groups to design and conduct a school-wide survey about chocolate. Some possible questions:

- Do you prefer hot chocolate or cold chocolate milk?
- How often do you consume chocolate?
- What is your favorite chocolate product?

Students might want to add some questions that test people's chocolate knowledge, such as:

- What plant does chocolate come from?
- What part of the plant does chocolate come from?
- Where was chocolate first made?

Students will need to record their findings and keep track of the data. Have each group produce an appropriate graph to show their findings. You may choose to display the completed graphs in the hallway or on a bulletin board. As an extension, you could have students create word problems based on the data in their graphs. Pair up students to solve each other's problems.

CHOCOLATE ADVENTURE

Time Line

1728 C.E.

Englishman Walter Churchman develops a water engine to power his mill in Bristol, England.

1737

A Boston newspaper runs an ad for a hand-operated, chocolate-making machine.

1765

James Baker begins to produce chocolate in Dorchester, Massachusetts; later his company would become famous for high-quality “Baker's” chocolate.

1770

James Watt perfects the steam-powered engine, which helps dramatically increase the production of chocolate.

RESOURCES Making chocolate at Williamsburg: www.youtube.com/watch?v=HvWTeOYJ0dA; Grivetti and Shapiro, *Chocolate*; Shapiro, *Great Moments in Chocolate History*.



LESSON
7

Chocolate

AS HEALTH FOOD AND MEDICINE

Warm-up

Ask students for examples of healthy foods. Answers will likely include fruits, vegetables, and whole grains. List the responses on the board. Ask what makes these foods good for you (vitamins, minerals, fiber). Then write the word "chocolate," and say that chocolate was long considered among the healthiest of foods.



IN THIS LESSON

Students investigate the health benefits of chocolate throughout its history, including its use as a medicine (above).

Share with your students . . .

Throughout most of its history, chocolate was believed to have numerous health benefits. In fact, it was prescribed as a medicine to cure or prevent many **ailments**.

In 1570, Spanish physician Francisco Hernandez traveled to the New World on a scientific expedition largely to study medicinal plants. He documented the use of the cacao plant by the Aztec for treating stomach pain, diarrhea, fever, cough, chest pain, hemorrhoids, fatigue, dental problems, and more. For such remedies, cacao was often mixed with other ingredients, such as various plant roots and tree barks, to create a medicinal chocolate drink.

In addition to its perceived health benefits, chocolate was long considered a food (although in liquid form) rather than a treat or dessert. As the Colonial Williamsburg Foundation points out, conquistador Girolamo Benzoni wrote, "it [cacao] satisfies and refreshes the body but does not inebriate."

Throughout the 17th and 18th centuries, doctors in Europe experimented with chocolate and concluded that it did indeed have health benefits. American colonists were also aware of these benefits. Chocolate was often sold in **apothecary** shops—early pharmacies—alongside medicines and healing balms. Visitors to Colonial Williamsburg can visit such a shop and discuss with the owner colonial remedies that included chocolate. Benjamin Franklin suggested chocolate as a cure for smallpox in a 1761 edition of his popular *Poor Richard's Almanack*.

Coincidence likely played a role in chocolate as a healing agent—patients would have recovered with or without it. However, modern science does support some of the historical claims. Cacao beans contain chemicals called flavanols. These compounds help prevent clogged arteries, promote healthy blood flow, and improve cognitive function.

For more information about the health benefits of chocolate, see: www.marscocoascience.com/about-cocoa-flavanols.



ESSENTIAL QUESTION

What were some of the perceived health benefits of chocolate throughout its history?

COMMON CORE MATH

5.NF.A.1

COMMON CORE ENGLISH LANGUAGE ARTS

W.5.6, W.5.8, W.8.1, W.8.4

OBJECTIVES

- 1 Describe how chocolate was used as a food and a medicine throughout its history.
- 2 Compare the perceived health benefits of chocolate hundreds of years ago with the benefits supported by modern science.

VOCABULARY

- ailments
- apothecary

Fun FACT

One chocolate chip provides enough energy for an adult to walk 150 feet.



A Spoonful of Chocolate ... (grades 4–8)

Explain that chocolate was often used as a means of delivery for medicines, besides being used as a medicine itself. Bad-tasting medicine was more palatable when mixed with liquid chocolate (right). Next, review some of the medicinal uses of chocolate throughout history. Then, play a recording of the *Mary Poppins* song “A Spoonful of Sugar.” Challenge students to work in pairs to write revised lyrics to the song, focusing on chocolate. Invite students to perform their song in front of the class, or they could use video technology to record their performance.



Advertisement (grades 4–8)

Bring in a few magazines with medicine advertisements to show the class. You may also project some old-fashioned medicine ads on the board for students to look at (see www.vintageadbrower.com/medicine-ads-1890s). Point out slogans, product claims, and other information as well as design elements such as font size and style, illustrations or photos, and so on.

In small groups or pairs, have students create a print or Internet ad for the medicinal use of chocolate. They should list what positive effects the use of chocolate has on the ailment and include that information in the ad. Suggest that groups design their ad on notebook paper before creating it on poster board. Remind them of the elements of the real ads they have seen as they design their made-up ads.

Display the ads around the classroom. Discuss the qualities of each and whether they think the ad successfully “sells” the product. Groups may wish to create their ad as a television commercial. If so, invite them to perform the commercial as a skit for the classroom, and discuss it afterward.



Persuasive Essay (grades 4–8)

Have students conduct more research on the positive and negative effects of eating chocolate. They could use the site on the pros and cons of chocolate in the Resources as well as other reputable sources. As a class, develop a pro/con list. Then assign half the class the pro side and half the class the con side of the issue. Students should write a persuasive essay to support their assigned point of view. Remind students to back up their argument with evidence from the lesson and their research.

As an extension, especially for older students, suggest holding a debate on the issue. Ask for volunteers to form teams of three to five students for each side of the issue. Provide time for the teams to examine their individual essays and prepare their arguments. Clarify debate rules. While the teams debate, the rest of the class should listen and take notes so as to ask questions afterward. After the question-and-answer session, have the class vote on who was most convincing in their arguments.

CHOCOLATE ADVENTURE

Time Line

1552 C.E.

A document called the *Badianus Manuscript* lists many ailments the cacao plant is used to treat.

1662

Henry Stubbe, the doctor to England’s King Charles II, writes that chocolate could treat apoplexy (stroke) and “hypochondriac melancholy.”

1685

A recipe for medicinal chocolate is seen in a French publication.

1761

Benjamin Franklin’s *Poor Richard’s Almanack* recommends chocolate for treating smallpox.

1796

Scottish physician William Buchan notes that chocolate prevents “fainting fits.”

1875

A *Gem Cookbook* is published in which chocolate is represented as “beneficial for the ill and indisposed.”

1901

Chocolate recipes are included in Helena Viola Sachse’s *How to Cook for the Sick and Convalescent*.

RESOURCES “Chocolate: Pros and Cons of This Sweet Treat,” Harvard Health Publishing, February 2014, at www.health.harvard.edu/heart-health/chocolate-pros-and-cons-of-this-sweet-treat; Grivetti and Shapiro, *Chocolate*; Mary Theobald, “A Cup of Hot Chocolate S’good for What Ails Ya,” at www.history.org/foundation/journal/winter12/chocolate.cfm.



LESSON
8

EARLY AMERICAN Chocolate DRINKERS

Warm-up

Write this quote on the board: "The superiority of chocolate both for health and nourishment will soon give it the same preference over tea and coffee in America which it has in Spain." Tell students that these words were written in a letter by one future president to another future president. See if students can name the sender (Thomas Jefferson) and recipient (John Adams). If needed, give a hint: Both men died on the 50th anniversary of the adoption of the Declaration of Independence.

Share with your students . . .

Jefferson wrote his letter to Adams from Paris in 1785, while Jefferson was serving as the U.S. ambassador to France. In France, chocolate was still an expensive drink, only for the wealthy and elite.

Not so in America. By importing cacao beans directly from the Caribbean and making their own chocolate, rather than buying it from Britain, colonists had kept the price affordable for most **budgets**.

Besides it being an affordable, nourishing, and good-tasting beverage, the colonists had another reason to drink chocolate—**patriotism**. In the 1760s, to help pay for a war against France in the Colonies, the British Parliament passed several acts, or laws, to **impose** taxes on many goods that the colonists had to import from Britain, including tea—the colonists' favorite beverage. Drinking chocolate became a patriotic act of **defiance**.

Many of the young nation's leaders enjoyed chocolate. Jefferson had a silver vessel made (at left) that was modeled after a Roman artifact called an *askos*, used to pour wine. Jefferson's family used his to pour chocolate at Monticello, his home in Virginia.

Other notable chocolate drinkers included George and Martha Washington. They often drank it for breakfast. Records indicate that George Washington regularly purchased chocolate in quantities of 1 to 50 pounds beginning in 1757 until his death in 1799.

Benjamin Franklin ran a print shop in Philadelphia from which he published the popular newspaper *Pennsylvania Gazette* and his *Poor Richard's Almanack*. Visitors to his shop could also purchase books, pencils, and fine chocolate.

For more information about the role of chocolate in the founding of America, see: www.americanfoodroots.com/features/americans-have-always-been-sweet-on-chocolate.



ESSENTIAL QUESTION

What role did chocolate play in America's struggle for freedom from Great Britain?

COMMON CORE MATH

4.MD.A.2

COMMON CORE ENGLISH LANGUAGE ARTS

W.4.2.B, W.6.2.A, W.7.3.D

OBJECTIVES

- 1 Explain why drinking chocolate was a patriotic act in the latter half of the 1700s in colonial America.
- 2 Describe the connection with chocolate for some of America's most notable founding citizens.

VOCABULARY

- budgets
- patriotism
- impose
- defiance



IN THIS LESSON

Students learn how chocolate played a role in the founding of America, including Thomas Jefferson's family use of this vessel, called an *askos*.

Fun FACT

Captain Jackson's Historic Chocolate Shop, at Old North Church & Historic Site, in Boston—the only one of its kind in New England today—serves authentic colonial drinking chocolate and gives living history demonstrations of chocolate making.



Chocolate Colonial Gazette (grades 4–8)

Show students a picture of Benjamin Franklin’s Philadelphia print shop (right). Explain that reading newspapers and pamphlets, like the ones printed in Franklin’s shop, were important ways of communicating in colonial times. These publications not only informed citizens, but also tried to sway public opinion.

Then invite the class to play the role of newspaper publisher in the colonies during the 1760s and 1770s, the period leading up to America’s war of independence. Students can break into teams to create a chocolate-themed newspaper based on one of these AMERICAN HERITAGE® Chocolate partner sites: Old North Church & Historic Site, Fort Ticonderoga, George Washington’s Mount Vernon, Colonial Williamsburg, Thomas Jefferson’s Monticello, or Old Salem Museums & Gardens. Discuss a good name. Students might choose *Chocolate Colonial Gazette* or something appropriate to the place they represent. Encourage creativity.

Teams will need to conduct research to incorporate real events into the parts of the newspaper. Different teams can work on different tasks. Here are some possibilities:

- Write articles about what is being discussed over cups of chocolate in local taverns.
- Write opinion pieces or create political cartoons, with a reference to chocolate.
- Make drawings that illustrate events and that include chocolate, such as a colonist holding a cup of chocolate as British soldiers march into Boston.
- Draw ads for Captain Jackson’s Historic Chocolate Shop, near Old North Church, or a chocolate house or apothecary at Williamsburg or Fort Ticonderoga. (See their websites in Resources.)
- Write poetry about chocolate and its connection with colonial life.

You might have students choose editors who help guide the writers. Other students might be the designers who decide where to place the articles and other parts to build the newspaper. Suggest students create the newspaper on the computer and then print out the pages, staple them, and distribute them to other classes, family, and friends. Discuss the effectiveness of each article and of other parts of the newspaper.



CHOCOLATE ADVENTURE

Time Line

1744 C.E.

A Dr. Hamilton notes in his diary: “I breakfasted upon some dirty chocolate.” “Dirty” meant mixed with other substances.

1758

George Washington places his first order of chocolate: 20 pounds from Britain.

1783

A mill in Central Falls, Rhode Island, grinds cacao beans and makes chocolate, giving the town the nickname of “Chocolateville.”

1794

Benjamin Franklin writes in an essay that one should take chocolate on a long sea voyage.

1801

Thomas Jefferson orders a silver copy made of an ancient Roman askos, later used by his family as a chocolate pot—which can be seen at Monticello.



The Great Colonial Chocolate Cooking Show (grades 7–8)

CAUTION: Check for food allergies among your students before completing this activity.

Play a video clip of a TV cooking show in which a chef or baker shows how to cook or bake. Then invite students to work in groups to create their own cooking show segment—as chocolate bakers from the 18th century.

First, students should find a recipe for a chocolate drink, pudding, pie, cake, or cookie that may have been made in a colonial kitchen. The links in the Resources section are possibilities.

Then, students should make a video of their group following the recipe. They may want to practice each step of the recipe, pretending to follow it, before taking a video of the real step. Suggest that students avoid using modern appliances as much as possible. For example, if they need to mix ingredients, they can use a spoon or whisk instead of an electric mixer. Students may want to dress up in colonial costumes for authenticity.

Afterward, hold a Colonial Chocolate Cooking Show. Students can play their videos and pass out their creations for tasting.

RESOURCES Chocolate recipes at: www.americanheritagechocolate.com/home/recipes; Captain Jackson’s Historic Chocolate Shop: chocolate.oldnorth.com; Williamsburg: www.history.org/history/index.cfm; Fort Ticonderoga: www.fortticonderoga.org/history-and-collections/history; Monticello: <http://www.monticello.org>.



LESSON
9

Chocolate

IN THE MILITARY

Warm-up

Tell students that panning is a method in which a hard sugar coating is added to candy, such as jelly beans. Then explain that in the field, soldiers eat prepackaged meals called “meals ready to eat” or MREs, introduced in the 1970s. The military doesn’t use brand names, so it describes one of the snacks in MREs as “pan-coated chocolate discs.” Can students guess what popular candy it is? (Milk Chocolate M&M’S®.) If students are stuck, tell them that another MRE snack is called “pan-coated oval/round milk chocolate with peanuts” —Peanut M&M’S®!



Share with your students . . .

Chocolate has been used as a military **ration** for centuries. Aztec warriors carried pellets and wafers of hard chocolate, which they shaved into bits and dissolved in water for drinking.

In the French and Indian War (1754–1763), Benjamin Franklin ordered **provisions** for British troops fighting the French and their Native American allies for control of much of North America. Franklin saw chocolate as a compact, energizing, and tasty food that could be easily carried and boosted morale. In his provisions list, Franklin included six pounds of chocolate per officer.

During the Revolutionary War, a chaplain happily wrote his wife from Fort Ticonderoga in 1776 that chocolate was a ration, and “as . . . at Home, my Porringer of Chocolate was brought in . . .”

Chocolate continued to play a role in the **nourishment** of American troops. In 1937, the Logan Bar, a field ration for emergencies, was developed by Army Colonel Paul Logan. High-energy, nutritious, and temperature-resistant, it was so hard that soldiers could eat it only by shaving off slices with a knife.

Tastier military chocolate came along in 1940. Forrest E. Mars, Sr., the son of the Mars, Incorporated founder, developed a button-shaped candy (upper right) made of milk chocolate with a hard sugar shell. Mars and R. Bruce Murrie, son of a former Hershey president, produced M&M’S® (Mars and Murrie) Brand Milk Chocolate Candies exclusively for U.S. military rations in WWII. The candies were packaged in tubes (see the ad on opposite page).

After the war, demand for the tasty treat from returning troops helped make M&M’S® Brand Milk Chocolate Candies the world’s most popular chocolate candy. And they are still popular in military rations.

For more information about the role of chocolate in the military, see: chocolateclass.wordpress.com/?s=an+army+marches+on+its+stomach.

ESSENTIAL QUESTION

How has chocolate been important in the American military since the 18th century?

COMMON CORE MATH

4.MD.A.2, 4.OA.A.3, 5.MD.C.4

COMMON CORE ENGLISH LANGUAGE ARTS

W.4.2, W.5.2.B, W.6.2.F, W.8.7

OBJECTIVES

- 1 Describe the benefits of chocolate as a military ration.
- 2 Compare and contrast the Logan Bar and M&M’S® as military rations.

VOCABULARY

- ration
- provisions
- nourishment

IN THIS LESSON

Students investigate the role that chocolate has played in the American military from the 18th century (as in the Revolutionary War, above) to the present.

Fun FACT

More than 400 million M&M’S® Brand Milk Chocolate Candies are produced every day in the United States.



Getting Chocolate to Troops (grades 4–8)

Tell students to imagine that they are quartermasters, in charge of getting food, clothing, and other provisions to troops during the Revolutionary War. It is the spring of 1776. General Washington has recently driven the British out of Boston. The Americans had taken Fort Ticonderoga the previous spring. As quartermasters, students must plan how to quickly and safely get chocolate from mills near Boston to Fort Ticonderoga (map at right). Tell them the quickest route may not be a straight line. (The main route was via Albany, avoiding the Green and White Mountains.) Have students work in pairs to consult maps and research travel modes of the day. Then have teams explain their routes and travel times. Invite questions.



CHOCOLATE ADVENTURE

Time Line

1755 C.E.

Benjamin Franklin secures six pounds of chocolate for each officer in General Braddock's army near the beginning of the French and Indian War.

1777

The Continental Congress imposes price controls on chocolate to keep it affordable for the military during the Revolutionary War.

1813

A commander in the British Royal Navy requests that chocolate be included in the provisions for his sailors.

1899

Three British chocolate makers, at the request of Queen Victoria, produce tin containers filled with chocolate bars for each soldier and officer fighting in the Boer War in South Africa.

1937

The Logan Bar, or D ration bar, is developed as an emergency ration for the U.S. military.

1940

Forrest Mars, Sr., of Mars, Incorporated, develops M&M'S® with the help of R. Bruce Murrie, of Hershey heritage.

1988

M&M'S® become part of the "meals ready to eat" military rations.



Rations Math (grades 4–8)

Explain that in 1779, the Continental Congress defined monthly chocolate rations for officers as follows:

- colonels and chaplains, 4 pounds
- majors and captains, 3 pounds
- lieutenants, 2 pounds

Present this problem: How many pounds of chocolate must a quartermaster secure for a fort that has one colonel, one chaplain, two majors, four captains, and six lieutenants? (Answer: 38 pounds.) Have students work in groups of four. Students should use the monthly officer rations listed to write their own math problem. Then students can exchange problems to solve. Encourage the use of word problems that incorporate historical events. For example, in 1777, the British retake Fort Ticonderoga. A captain and a major leave half their monthly ration of chocolate when they abandon the fort. How much chocolate did they leave behind? (Answer: 3 pounds.)



Chocolate Uniforms (grades 4–8)

Have students research military uniforms, from past eras to today. Then students can work individually to design and create a uniform using chocolate candy wrappers from home. Encourage creativity. Students might form groups, with each member designing and making a uniform from a different historical period. Have students present their uniforms while others try to identify the wrappers.



Operation Gratitude (grades 4–8)

Explain that Operation Gratitude is an organization that sends care packages to U.S. military personnel overseas. Have students research the organization's website to find out the kinds of items they might put in a care package. Then

they can work in pairs to make a list of items, including M&M'S®. Next to each item, they should explain why they would want to include it in the care package. Students might wish to put together and send their packages, along with letters.





LESSON
10

Cacao Plantations

AND TRADE ROUTES

Warm-up

Hand one student a wooden block, another a packet of sugar, and a third a T-shirt. Have the students form a triangle. Direct student #1 to walk the wooden block to student #2 with the sugar and exchange the items. Student #1 now walks the sugar to student #3 with the T-shirt and exchanges items. Student #1 walks back to the original spot with the T-shirt. Ask what this series of exchanges represents (Answer: ocean trade between the American Colonies and England or other Old World countries).



IN THIS LESSON

Students discover how cacao was grown and how it was part of the triangular trades that drove the colonial economies through the exchange of clothing and other goods (above and upper right).

Share with your students . . .

The Maya established the first cacao **plantations** by clearing areas of lowland rain forest on the Yucatán Peninsula and planting cacao trees. Later, Aztecs established large plantations along the Pacific coast of today's Mexico and El Salvador.

The Spanish founded cacao plantations on the islands of Cuba, Trinidad, and Hispaniola (present-day Haiti and the Dominican Republic) as well as in Ecuador and Venezuela in South America. The French established plantations on Martinique and St. Lucia. The English maintained plantations on Jamaica.

Cacao beans from these plantations were among the goods exchanged between the Old and New Worlds in what came to be called the **triangular trades**. These routes (see map, opposite) generally formed triangles across the Atlantic as ships carried goods between the Americas, Europe, and Africa.

In a typical route, ships from New England carried lumber and salted fish south along the coast, perhaps stopping in New York or Philadelphia to pick up grain and preserved meat before continuing to the **West Indies** of the Caribbean. The ships exchanged their cargo for sugar, cacao, and other goods, which then went to England. These goods were exchanged for clothing and furniture, which went back to the Colonies to be sold.

Another triangle formed as sugar was transported from the West Indies to New England for making rum. Ships carried the rum to the west coast of Africa, where it was exchanged for African slaves. The slaves were brought to the West Indies or the southern colonies and sold to work on plantations.

For more information about cacao plantations and the triangular trades, see: www.medicinehunter.com/brief-history-cocoa and www.eduplace.com/kids/socsci/books/applications/imaps/maps/g5s_u3/index.html.



ESSENTIAL QUESTION

How did Europeans and the American colonists benefit from cacao plantations?

COMMON CORE ENGLISH LANGUAGE ARTS

W.6.3.B, W.6.3.D, W.7.2, W.7.3.A, W.7.8

OBJECTIVES

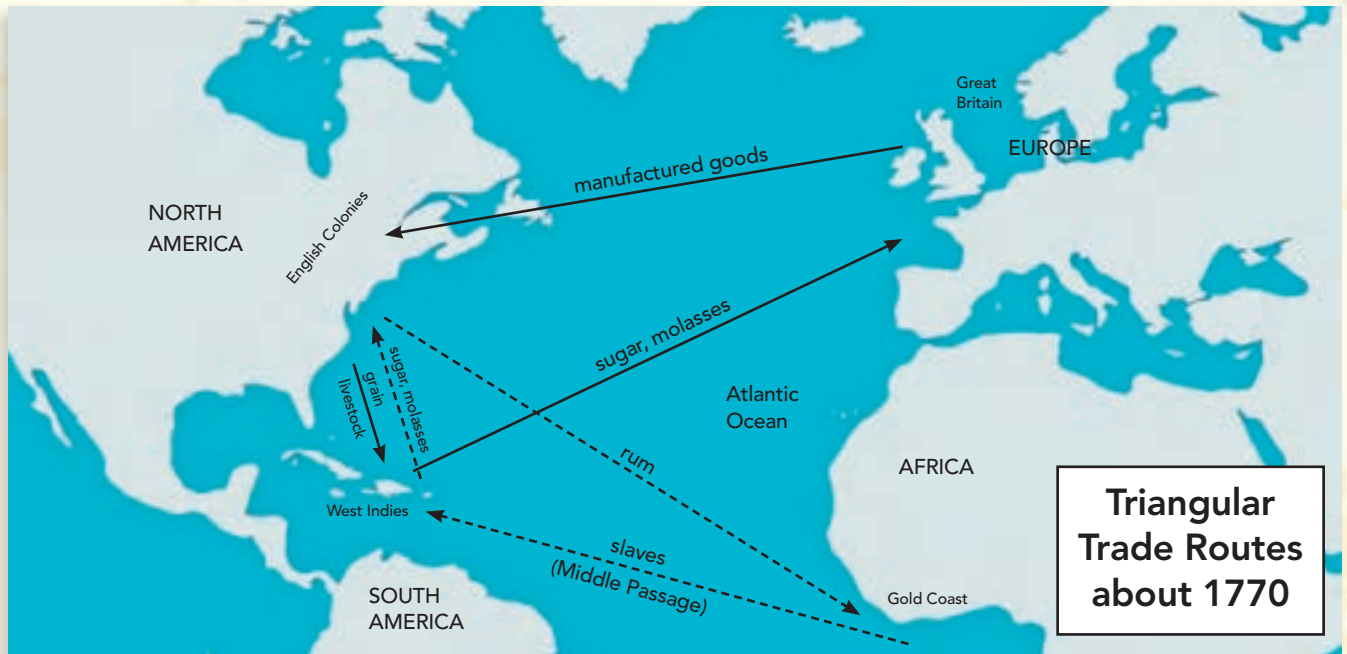
- 1 Describe how cacao was grown on plantations.
- 2 Explain how cacao was part of the triangular trades.

VOCABULARY

- plantation
- triangular trades
- West Indies

Fun FACT

Moravian Church communities such as Salem, North Carolina, had strong ties to missions established on cacao and coffee plantations in the West Indies. Their mission work was supported by shipping these goods back to their communities in the Colonies.



Triangular Trade Routes about 1770



Plantation Diorama (grades 4–8)

Have students work in pairs or small groups to construct a diorama of an 18th-century cacao plantation. Students should include representations of the cacao trees, slave quarters and other buildings, the harvest of cacao fruit (pods), the process of drying and placing the cacao beans in burlap sacks, and a means of transporting the beans, such as a waterway to the ocean.

Instead of a diorama, you might suggest the class create a large plantation mural. Groups can be in charge of researching and creating different parts of the mural, such as the landscape, the trees, the buildings, and the processing of cacao seeds. Have groups explain how they chose what to show in the dioramas or mural.



Slavery in the Chocolate Trade (grades 6–8)

Have students research and report on the role of slavery in the development of the cacao trade. Students should discover that Europeans first enslaved the native Mesoamericans to work the plantations. But when diseases from the Europeans wiped out much of the native population, slaves were brought from Africa. Encourage students to illustrate their reports with maps and drawings, perhaps showing how slaves were packed into slave ships. Invite students to present their reports to the class.



Triangular Trades Journal (grades 4–8)

Invite students to imagine that they are merchant sailors about to embark on a voyage as part of the triangular trades. Students should record journal entries, beginning in the bustling port of Boston, New York, or Philadelphia, and continuing to the West Indies to trade their goods for a shipment of cacao beans, then crossing to Europe and returning to America with a shipment of other goods. Encourage students to use creativity in their journal entries, and to convey their thoughts as well as reporting on what they see, hear, smell, taste, and feel. Suggest students write their entries in a paper journal book to be true to the times. Or they can put a modern twist on the journal and write it as a blog. Invite students to exchange their journals and/or take turns reading their entries aloud.

CHOCOLATE ADVENTURE

Time Line

1635 C.E.

Spanish friars are the first Europeans to successfully cultivate cacao trees, in Ecuador.

1650–1691

English law forbids the Colonies to manufacture goods, forcing them to buy from England.

1739–1800s

Increased demand for American crops like tobacco increases plantations' demand for slaves. Trade with Africa grows.

1807

Slavery is abolished in England; the leg of triangular trade between Africa and England stops.

Mid-1800s

To help the English economy, taxes on cacao beans are lowered so manufacturers will buy more to produce more chocolate products.

RESOURCES For more on slavery, visit www.ducksters.com/history/colonial_america/slavery.php; for colonial city life, see www.ducksters.com/history/colonial_america/daily_life_in_the_city.php.



LESSON
11

Chocolate

AND AMERICAN EXPLORERS

Warm-up

Ask students to imagine they are taking a long nature hike. What kind of food would they take along? Trail mix? Fresh fruit? What makes those foods good choices for a hike? They're high in energy and easy to carry! Then explain that throughout history, explorers brought along another high-energy, easy-to-carry food: chocolate.

Share with your students . . .

In 1803, President Thomas Jefferson purchased from France the vast territory between the Mississippi River and the Rocky Mountains, called the Louisiana Territory. This Louisiana Purchase doubled the size of the United States. Jefferson sent an **expedition**, led by his secretary, Meriwether Lewis, and a skilled frontiersman, William Clark, to establish trade with the Native American people there and to find a water route to the Pacific (map, opposite).

The expedition left St. Louis, Missouri, in spring 1804, traveled to the Pacific Ocean in the Oregon Territory, and returned to St. Louis in fall 1806. Among the provisions was chocolate, used both as food and medicine. On September 13, 1806, Clark wrote in his journal, "I felt my Self very unwell and I drank about a pint [of chocolate] and found great relief."

Many explorers ate chocolate. After serving as U.S. president, Theodore Roosevelt (upper right), co-led a 1914 expedition into the rain forests of Brazil to explore the newly discovered "River of Doubt," now named Rio Roosevelt. Rations for his team of five included a pound of chocolate once a week.

One famous explorer—and hero—who understood the value of chocolate for its nutritious, comforting, and filling qualities on long, difficult journeys was Amelia Earhart. This pioneer pushed the **frontiers of aviation** in the 1920s and 1930s. She was the first woman to fly solo across the Atlantic and to fly solo nonstop across the United States, and the first person to fly solo across the Pacific between Hawaii and California.

Amelia Earhart's flights often took 15 to 20 hours along little-known routes in planes far less safe than today's. Her adventures required endurance, skill, and courage. Earhart knew that it was **critical** to carry as little weight as possible on such long flights, so she took light, high-energy foods such as hard-boiled eggs, raisins, and—you guessed it—chocolate, in solid squares and as hot chocolate in a thermos for drinking.

For more about Amelia Earhart's in-flight foods, see: www.npr.org/sections/thesalt/2017/07/08/536024928/amelia-earharts-travel-menu-relied-on-three-rules-and-peoples-generosity.



IN THIS LESSON

Students learn how chocolate was an important part of the adventures of some famous American explorers, like Amelia Earhart (above).



ESSENTIAL QUESTION

What role did chocolate play in the expeditions of some famous American explorers?

COMMON CORE ENGLISH LANGUAGE ARTS

W.5.3, W.5.3.D, W.5.7, W.7.2.F, W.7.3, W.7.3.A

OBJECTIVES

- 1 Provide an example of how chocolate was used on the Lewis and Clark expedition.
- 2 Explain why Amelia Earhart included chocolate on many of her long-distance flights.

VOCABULARY

- expedition
- frontiers
- aviation
- critical

Fun FACT

Amelia Earhart recalled that her "brightest gastronomic memory" was drinking a cup of hot chocolate on her solo flight across the Pacific from Hawaii to California.



CHOCOLATE ADVENTURE Time Line

1769 C.E.

A list of provisions is written for Spanish missions being established throughout California. Among the items are copper pots for heating chocolate and molinillos, tools to whisk the liquid chocolate to create a foam.

1804-1806

Lewis and Clark explore the Louisiana Territory; along the way they use chocolate for both food and medicine.

1806

Zebulon Pike, who discovered Pikes Peak, explores the Rocky Mountains and is given chocolate to drink by a hospitable priest.

1914

Theodore Roosevelt explores the Brazilian wilderness, taking along chocolate as part of the expedition's rations.

1935

Amelia Earhart enjoys chocolate high above the Pacific Ocean on her historic flight from Hawaii to California.



Lewis and Clark's Route (grades 4-8)

Have students research the Lewis and Clark expedition and make a map of the route, shown on the map (above), both the outbound and homeward trips. Maps could be drawn on poster board or on a blank base map of the United States. Then write on the board or project on a whiteboard Clark's quote about his use of chocolate on September 13, 1806. Challenge students to determine where along the route this incident most likely took place and to mark the location. Provide the website in this lesson's Resources section, which shows a time line of the expedition in 1806. Ask students how they determined the location. (The incident likely took place just north of Leavenworth, Kansas, along the Missouri River, because the diary entry of the next day occurred across the river from Leavenworth.)



Journal Entry (grades 6-8)

Students interested in the Lewis and Clark expedition may enjoy finding out more about the team's adventures. Invite students to investigate the Journey Log site in this lesson's Resources section. After reading the brief introduction, students can click on a leg of the trip, follow along with the route map for that leg, and then click on Journals and Maps to read first-person accounts of the exciting adventures.

Suggest that students choose one or more of the journal entries and add a chocolate reference to it. Or they might add a separate entry or entries about an incident involving chocolate. Invite students to read their entries to the class and discuss the likelihood that such an entry would have been made on the Lewis and Clark expedition.



Chocolate at 8,000 Feet (grades 4-8)

Amelia Earhart commented on a drink of hot chocolate she had during her 1935 flight from Hawaii to California (below):

"Indeed that was the most interesting cup of chocolate I have ever had, sitting up eight thousand feet over the middle of the Pacific Ocean, quite alone." Read the quote a couple times. Then have students close their eyes and imagine being Amelia Earhart at that moment. What are the sights and sounds? How does the chocolate taste? What may be going through Earhart's mind during that moment of contentment, yet still danger? Ask students to write one to three paragraphs describing the scene. Interested students may want to read Earhart's own account of that historic flight using the link in the following Resources section.



2,400 miles

RESOURCES For more on the Lewis and Clark route: www.nps.gov/jeff/learn/historyculture/lewis-and-clark-timeline-1806.htm; Lewis and Clark Journey Log: www.nationalgeographic.com/lewisandclark/journey_intro.html; Earhart 1935 Pacific Flight: news.nationalgeographic.com/news/2014/07/140727-amelia-earhart-history-flight-airplanes-adventure-explorer.



LESSON
12

Innovations

IN CHOCOLATE MAKING

Warm-up

On the board, list Cadbury, Ghirardelli, Godiva, Hershey, Lindt, Mars, Nestlé, Tobler: Have students heard of these major chocolate companies? Bring in samples so they can link the products to each company. Most were founded long ago by chocolate makers who invented or refined processes still used to make chocolate today.

Share with your students . . .

How did chocolate go from being exclusively a drink to the candy bars, fudges, cakes, and cookies we enjoy today? The story begins in 1828. That's when Dutch chemist Coenraad van Houten, Sr., figured out how to separate fat from the cacao beans in a process called **pressing**.

The beans are ground into a liquid, then the liquid is pressed. Pressing "expresses out," or removes, most of the liquid's fat—a yellowish substance called **cocoa butter**. The cocoa butter is collected. The dry chocolate that remains is pulverized into cocoa powder. Chocolate makers then mix the different components along with sugar in different ratios to adjust the flavor and, to a degree, the texture, to make various chocolate products.

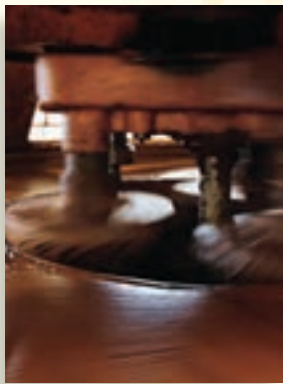
And that's just what brothers Richard, Frances, and Joseph Fry, of the English chocolate company J. S. Fry and Sons, did in 1847. They blended cocoa butter, cocoa powder, and sugar into a paste, poured the mixture into a mold, let it cool, and created the first chocolate candy bar. It was gritty but was still a hit.

The problem of grittiness was solved in 1879. Swiss chocolate maker Rodolphe Lindt invented a machine that blended the ingredients for up to three days. The process became known as **conching** because Lindt's machine (unlike today's, at left) resembled a conch seashell. Conching broke up the particle size of the ingredients, thoroughly mixed them, and took out much of the acidity that is natural in cacao beans. The result was a delicious chocolate with a smooth texture.

Another improvement in the chocolate-making process came with the invention of **tempering**. Raising and lowering the temperature of the chocolate repeatedly produced a chocolate bar with a glossy surface and a pleasing "snap" when broken.

By 1900, innovations had paved the way for chocolate today.

For more about the chocolate-making process, see equalexchange.coop/products/chocolate/steps.



IN THIS LESSON

Students learn how nearly two centuries of innovations in the chocolate-making process, such as conching (above) have led to the chocolate that we enjoy today.



ESSENTIAL QUESTION

What innovations made the manufacture of an edible, solid chocolate possible and led to the kind of chocolate candy (above) we enjoy today?

COMMON CORE MATH

5.NF.A.1, 5.NF.B.6

COMMON CORE ENGLISH LANGUAGE ARTS

W.4.6, W.4.9, W.6.3, W.6.7

OBJECTIVES

- 1 Describe the process that enabled people to eat rather than only drink chocolate.
- 2 Describe processes developed in the 19th century that improved the quality of chocolate.

VOCABULARY

- pressing
- cocoa butter
- conching
- tempering

Fun FACT

SNICKERS® Bar, from Mars, Incorporated, is the best-selling candy bar in the world.



CHOCOLATE ADVENTURE

Time Line

1861 C.E.

Cadbury Brothers creates the first heart-shaped box of chocolates, a popular gift for Valentine's Day.

1875

Henri Nestlé and Daniel Peter create milk chocolate by using Nestlé's newly invented condensed milk.

1879

Rodolphe Lindt invents the conching process for smoother chocolate.

1893.

Whitman's Chocolates creates Easter bunnies.

1900

Hershey's begins making milk chocolate bars.

1908

The Tobler candy company invents a chocolate bar in sections shaped like the Swiss Alps.

1911

Frank Mars starts a candy company, first selling butter creams.

1923

Mars introduces its first big hit, the Milky Way bar.

1926

The Draps family in Belgium sells fine chocolates named Godiva.

1930s

Ruth Wakefield invents the chocolate chip cookie.



Industrial Revolution (grades 4–8)

Have students write a brief report explaining the role the industrial revolution played in the innovations of chocolate in the 19th century. They might use this lesson's Resources section, or other resources. Have them report to the class about inventions during the industrial revolution, such as mechanization that made possible advancements in chocolate making, including mass production.



Invent a Candy Bar (grades 6–8)

Ask students to name some of their favorite chocolate candies. Refer to the samples you may have from the Warm-up, or bring in some samples to display (like those above). Discuss each candy's name and wrapper or other packaging. Are the name and packaging effective? Why or why not?

Then tell students that they will be inventing their own chocolate candies. It could be in the form of a bar or some other form, such as small pieces in a bag or box. Students should describe the product and draw a picture of it, showing what the candy looks like on the inside as well as the outside. Next, they can give the product a name and design the candy's wrapper or packaging to make the product inviting. Students should determine what information to include on the packaging, and then draw it.

Students can put their descriptions and drawings on a poster board or on the computer. Some students may wish to make a 3-D model of the product in its packaging. Encourage volunteers to explain the choices they made for their new product.



Test Kitchen Recipes (grades 4–8)

Display a variety of Mars chocolate products, including some of those shown above. Tell students to imagine that they work in the test kitchens at Mars, Incorporated. One of their jobs is to develop new recipes that use Mars products.

Then have students work in teams of two to four to create a recipe. (Emphasize that teamwork is important at Mars, Incorporated, and that it leads to the very best products.) Either provide the products or ask teams to purchase their own. They can use the Resources section for recipe ideas, including cookies and other desserts, oatmeal, pancakes, beverages such as hot chocolate, or even sauces for meats. Arrange to use the school cafeteria kitchen or have each team develop their recipe at the home of one member.

Have teams keep track of ingredients and the amounts they use, then write down the recipes and include a photo of the final product. Have a taste test and vote for the best recipe. Teams could hold a bake sale to benefit a food pantry or other charitable group.

RESOURCES For info on the industrial revolution and chocolate, see chocolateclass.wordpress.com/2015/03/12/industrial-revolution-chocolate-revolution/; for Mars Recipes: www.facebook.com/pg/mms/photos/?tab=album&album_id=10151252474531957; Shapiro, *Great Moments in Chocolate History*.



LESSON
13

Chocolate

AT EARTH'S EXTREMES

Warm-up

Show students a photo of **pemmican**—an early Native American food made by drying thinly sliced meat, grinding it into grains, and mixing the grains with melted fat. This solidified into a high-energy food that was edible for years. In the early 1900s, Arctic and Antarctic explorers relied on pemmican for expeditions that lasted three or four years. Ask what other food gave explorers energy and had a sweeter taste. Chocolate!

Share with your students . . .

Early 20th-century Arctic and Antarctic explorers initially attempted to be the first to reach the North and South Poles, then to further explore these remote places. Their names became synonymous with adventure and **heroism**: Roald Amundsen, Robert Peary, Robert Scott, Ernest Shackleton. They all carried chocolate.

For example, Robert Scott's first Antarctic expedition (1901–1904) included 3,500 pounds of chocolate in powder (for drinking) and bars. Huts along his route were stocked with it and other foods.

Since those early days, explorers have continued to depend on chocolate for energy and comfort. In 1988, Helen Thayer, at age 50, became the first woman to travel on foot solo to the North Pole. Her only companion was her dog Charlie. Thayer walked and skied 364 miles—pulling a 160-pound sled loaded with supplies, including fuel to melt snow for drinking water and to heat chocolate, which helped **replenish** the calories she burned. At one point she wrote: "I ate fast, then gulped down one cup of hot chocolate . . . Charlie and I were ready to leave."

In addition to the top and bottom of Earth, chocolate has reached the highest and deepest places, too. On May 29, 1953, Sir Edmund Hillary and his Sherpa guide Tenzing Norgay became the first to reach the **summit** of Mount Everest, the highest point on land. Hillary noted in his journal that "Tenzing made a little hole in the snow and put in some food offerings [to the gods of Everest], lollies and biscuits and chocolate."

Earth's deepest point was reached in 1960 when Jacques Piccard and Don Walsh descended 6.7 miles in the vessel *Trieste* to the bottom of the Pacific Ocean's Mariana Trench. There they ate chocolate bars to celebrate before returning to the surface.

For more information about chocolate and exploration, see www.slate.com/blogs/atlas_obscura/2014/10/16/food_in_antarctica_what_explorers_and_researchers_eat.html.



ESSENTIAL QUESTION

What role did chocolate play in some of the most daring explorations of the 20th century, such as to Mount Everest (above)?

COMMON CORE MATH

4.MD.A.2

COMMON CORE ENGLISH LANGUAGE ARTS

W.4.7, W.5.1, W.5.4, W.6.2.A

OBJECTIVES

- 1 Explain why chocolate was an important provision on polar expeditions.
- 2 Describe two examples of how the first explorers used chocolate to reach Earth's highest and deepest points.

VOCABULARY

- pemmican
- heroism
- replenish
- summit



IN THIS LESSON

Students discover that chocolate has accompanied explorers, like Edmund Hillary and Tenzing Norgay (above), to some of the most extreme places on Earth.

Fun FACT

In 2001, a bar of Cadbury's chocolate left behind on Scott's Antarctic expedition of 1901–1904 sold at auction for \$686.



CHOCOLATE ADVENTURE *Time Line*

1898 C.E.
Documents from the gold rush in Canada's Yukon indicate that chocolate should be in a miner's supplies.

1901-1904
Robert Scott leads first South Pole expedition.

1903-1906
Roald Amundsen navigates the Northwest Passage between the Atlantic and Pacific Oceans.

1909
Robert Peary leads first North Pole expedition.

1910-1912
Roald Amundsen leads first expedition to reach the South Pole.

1910-1912
In his second South Pole expedition, Robert Scott arrives five weeks after Amundsen.

1914-1917
Ernest Shackleton leads his third expedition to the Antarctic; his ship is crushed by ice.

1953
Edmund Hillary and Tenzing Norgay are the first to summit Mount Everest.

1960
Jacques Piccard and Don Walsh reach the ocean's deepest point, the Mariana Trench.

1988
Helen Thayer becomes the first woman to walk solo to the North Pole.



Sponsored by... (grades 4-8)

Tell students that companies often sponsored expeditions, either with cash donations or by donating their products. The ad (above, left) shows an example of such sponsorship. Fry's donated their chocolate products to one of Robert Scott's Antarctic expeditions, prominently displayed on the ad.

Discuss with students how they think the companies benefited from such sponsorship. Then have students choose a current chocolate candy, or the candy they "invented" in an activity in Lesson 12, to be used by explorers during an extreme adventure. Suggest they create a billboard ad that highlights the use of the product during that adventure. Students might work individually or in pairs. Invite students to present their ads and discuss the ads' effectiveness. Then display the ads around the room.



Graphic Novel (grades 4-8)

Encourage students to read more about an expedition of one of the explorers in the background information that you shared. For example, they might read more about Helen Thayer's expedition to the North Pole (above, right), using the link in the Resources section. Suggest students relate the expedition as a graphic novel. They might start by deciding which incidents they want to illustrate. Then they can map out what they want to show, how many panels to have on certain pages, when to write narration, and when to write dialogue. Suggest a limit of 4 to 10 pages depending on the ages and writing levels of your students. Remind students to include the use of chocolate in their work. Finally, plan a Book Exchange Day for students to read each other's graphic novels.



Poetry Slam (grades 4-8)

Instead of a graphic novel, some students may prefer to write a poem about the expedition they choose. Again, remind students to include at least one reference to chocolate. Schedule a poetry slam and encourage students to read their poems to the class.

RESOURCES For Fry's postcard: www.nls.uk/learning-zone/geography-and-exploration/scotts-last-expedition/frys-advertising-postcard; for more on Helen Thayer: historylink.org/File/9849.



LESSON
14

Chocolate

IN SPACE



IN THIS LESSON

Students explore the role that chocolate has played in the U.S. space program, including as an energizing snack (above).

Warm-up

Ask students what chocolate candy they think would be the most fun to eat in the **weightlessness** of space. Ask them to explain their answers. Perhaps students will mention that M&M'S® would be fun to snatch with their mouths while the candies floated in the air, like the astronaut at left is doing. Ask why M&M'S® might be a good chocolate snack in space instead of a candy bar. (M&M'S® are eaten whole, so no crumbs float around to get stuck in electronic equipment.) Tell students that M&M'S® and other chocolate treats have accompanied astronauts in space for decades.

Share with your students . . .

Before John Young and Robert Crippen piloted the first space shuttle mission in 1981, they had a special request: Could M&M'S® be included in their food rations? You bet! And these button-sized candies have been part of astronauts' rations ever since.

It wasn't the first chocolate in space. That honor goes to a tube of chocolate sauce carried by the first person in space—Russian **cosmonaut** Yuri Gagarin—in 1961. In the late 1960s and early 1970s, chocolate traveled to the moon on U.S. Apollo missions. One menu item was **dehydrated** chocolate pudding (upper right); astronauts injected water into it through an opening in the package. Hot chocolate was another Apollo favorite.

Since then, a list of chocolate items taken into space reads like a checkout display in the grocery store—with many versions of chocolate in different types, sizes, and shapes. But no candy is as popular as M&M'S®. These have traveled into space more than 130 times.

One of those times was on June 21, 2004. That's when Mike Melvill piloted SpaceShipOne on the first privately funded human spaceflight. Melvill experienced only about 3 ½ minutes of weightlessness on the brief flight, but it was enough for him to release a handful of M&M'S® into the air. He was mesmerized by how they spun and sparkled in the light. Then he ate them. Well, most of them. Some made it back to Earth, including one that sold at auction for \$1,400.

For more about chocolate in space, see www.smithsonianmag.com/science-nature/rich-and-flavorful-history-chocolate-space-180954160/#Vs2P2r68o18JWtBr.99.



ESSENTIAL QUESTION

How has chocolate played a part in space programs?

COMMON CORE ENGLISH LANGUAGE ARTS

W.4.7, W.5.1, W.5.4, W.5.7, W.6.2.A

OBJECTIVES

- 1 Provide several examples of chocolate that astronauts have eaten on space missions.
- 2 Explain why M&M'S® are special among all of the chocolate treats eaten in space.

VOCABULARY

- weightlessness
- cosmonaut
- dehydrated

Fun FACT

M&M'S® are in the Space Food Hall of Fame and are part of a food exhibit at the National Air and Space Museum in Washington, D.C.



CHOCOLATE ADVENTURE

Time Line

1961 C.E.

Yuri Gagarin becomes the first person in space and eats from a tube of chocolate sauce.

1969

Chocolate pudding travels to the moon on Apollo 11, the first manned lunar landing.

1981

M&M'S® are eaten aboard the first space shuttle mission.

2004

SpaceShipOne becomes the first privately funded spaceflight. Its pilot eats M&M'S®.

2006

Cups of vanilla ice cream with chocolate swirls are sent to the International Space Station.

2011

Specially designed M&M'S® are aboard the space shuttle's last flight.



Chocolate Meteorites (grades 4–8)

Have students use a variety of candy bars or homemade chocolate treats to model the composition of meteorites. You can use the NASA activity in this lesson's Resources section as is, or adjust it to your classroom needs. **Caution:**

Be sure to check student records for food allergies, especially nut allergies, before doing this activity. Or adjust it to exclude the allergens.



Design a Bag of M&M'S® (grades 4–8)

Tell students that people who watched the flights of SpaceShipOne (above, left), in person were treated to a commemorative bag of M&M'S® made especially for the occasion. As shown in the photo (above, right), the M&M'S® were gray, white, and light blue and had the word "Go" on one side and a rocket on the other.

Ask students to think of a special spaceflight, either one from the past or an imagined flight from the future. What color might a commemorative mix of M&M'S® have for the occasion? What design might the students create for the two sides of the candies? Invite students to design and draw their M&M'S® mix along with a description of the event it would commemorate. Encourage students to present their designs to the class. See if students can guess the significance of each design before being told.



What Would You Take? (grades 4–8)

Explain that every six months, "bonus containers" of food items are sent to the International Space Station (ISS) to supplement the balanced meals that are planned for their time in space. Ask students to imagine they were on the ISS for several months and a spacecraft with bonus containers was being sent up. What are five items they would request be included? Have students write a letter as if they are "putting in a request" to NASA for their items, explaining why they are requesting them. The items do not have to be chocolate, or even sweet treats of any kind. Encourage volunteers to read their letters aloud.

RESOURCES For more on the chocolate meteorites activity: www.nasa.gov/centers/jpl/education/ediblerocks.html; International Space Station: www.nasa.gov/mission_pages/station/main/index.html; SpaceShipOne: airandspace.si.edu/collection-objects/spaceshipone.

GREAT MOMENTS IN WORLD HISTORY
GLOBAL STORIES
WHERE
Chocolate

SPARKED DISCOVERY, INNOVATION, AND
Imagination!

READY . . . SET . . . OPEN these pages to:

- Discover how the story of chocolate is our story . . .
- Share with students how people, places, and events through history connect to chocolate's growth and influence . . .
- Involve students in exercises that expand their language arts, math, and critical thinking skills . . .
- Ignite learning that is fun and challenging by engaging students in one-on-one discussions and group activities that foster collaboration . . .
- Promote curiosity and creativity through assignments that require students to find and use key resources . . .
- Inspire imagination through fun facts and time lines that show how chocolate informs the past and promises to be a player in our future!



Mars, Incorporated, and National Geographic Partners combine their missions to educate and inspire through 14 fact-and-fun-packed lessons in the Educator's Guide *Great Moments in World History: Global Stories Where Chocolate Sparked Discovery, Innovation, and Imagination*. It's a chocolate-filled adventure of little-known facts, colorful illustrations and maps, and activities that promote creative thinking, collaboration, and action. Working individually, in pairs, and in teams, students explore print and online resources and develop projects in which they discover chocolate's influence through intriguing people and world events.

DID YOU KNOW:

- That cacao beans were so valuable that ancient counterfeiters made fake beans?
- That in the 1700s chocolate was sold in apothecary shops as medicine?
- That Amelia Earhart enjoyed a memorable cup of hot chocolate while flying 8,000 feet above the Pacific Ocean?
- That 400 million M&M'S® are produced every day in the United States?



DIP IN...and discover the awesome story of chocolate.

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