Cocoa

- Graphic Resource: “A closer look at this confectionery”
- Discussion Questions: Chocolate’s Reputation and Reality
Bitter or sweet, cocoa has many connections to cultures, economies and health. Commercials in the coldest months feature children happily sipping hot chocolate. Visitors to Madrid are sure to include at least one cup of Chocolate Caliente and churros, part of the heritage of Spain from the New World. Halloween trick-or-treaters know which chocolate candy bars they want.

In this resource guide, teachers are provided with a chart and personal narrative to distinguish dark, milk and white chocolate as well as the possible health benefits of each. This should provide opportunity to discuss eating for pleasure, eating for survival and eating for health improvement.

Cocoa bean planting and harvesting can be the launching pad for student inquiry into the origins of foods that are part of their diets. Give students “From Plate to Soil: Who, What, Where, When, Why and How of Your Meals.” They are asked to research the story of their meals.
A closer look at this confectionery

Here’s your basic chocolate analysis.

All chocolate bars, and syrup, are made from the cocoa bean, also called cacao, which is the dried and fermented seed of *Theobroma cacao*, which consists of cocoa solids and butter. Chocolate is made from cocoa beans, which if you’ve ever bitten into one, you know it’s bitter. Very bitter.

When it comes to labeling chocolate, it’s done with a percentage such as “45 percent cocoa,” or “70 percent cocoa.”

In a 70 percent bar, which is a dark chocolate, more than two-thirds of the contents is derived from the beans, the nibs to be precise, with the remainder consisting of sugar, cocoa butter or vegetable oil. That makes dark chocolates taste less sweet to our palates than the milk chocolates, but also makes them less unhealthy (which is not the same as healthy).

By contrast, milk chocolate has a smaller percentage of cocoa beans than dark — and a higher percentage of cocoa butter and sugar — along with milk powder or condensed milk. White chocolate usually contains no cocoa powder — but lots of butter/oils, sugar and milk — which is why many people rightfully claim that white “chocolate” is an oxymoron.

It’s those cocoa beans in chocolate that provide tiny doses of flavanols, which have some health benefits. So how much chocolate do we need to consume to get that benefit?

There is no official U.S. recommended daily amount of flavanols, but one of the largest trials looking at their benefits used 750 mg a day with study participants. For the rest of us to get that same amount, we’d need to consume 4¾ ounces of dark chocolate, or 750 calories a day, and 2½ pounds of milk chocolate, or 5,850 calories daily. That’s a mouthful.
I’m pretty sure I won’t have any friends left once they’ve read this. That’s because no matter how you break that candy bar, and no matter how many headlines you’ve seen about the health benefits of chocolate, the scientific evidence remains pretty slim.

Sure, you probably know that “white chocolate” (which doesn’t contain any chocolate at all) and milk chocolate (which is loaded with sugar and fat) are not healthy choices. But while dark chocolate is a better choice, it’s not a healthy one. I’m sorry, trick-or-treaters.

In the spirit of full disclosure, I’m a chocoholic myself, so I’m not happy about this either. While I’ve never deluded myself into thinking of chocolate as a health food, say like antioxidant-rich kale, I believed — thanks to many published studies — that even one square of dark chocolate definitely had some health benefits.

When I did an Internet search, I found plenty of articles saying just that, including Healthline’s “7 Proven Benefits of Chocolate” and the Cleveland Clinic’s “Heart Healthy Benefits of Chocolate.” Articles like these (and many more) report that chocolate may lower the risk of certain cancers, lower blood pressure and reduce the risks of diabetes, stroke and heart disease.

I even read that dark chocolate lowers the risk of depression and that it’s counted — along with nuts, avocados and blueberries — as a “superfood.”

Mucking up things, though, were other studies that suggest chocolate may increase our risk for other cancers, and we’d be fools not to know that eating too much can lead to obesity (and the troublesome health conditions that follow in its wake).

As a journalist, I know better than to believe everything I read, especially if it’s melting in my mouth. So I did a little investigating to get to the bottom of the question: Is chocolate healthy?

The top Google result for that question was a report (“Can chocolate be good for my health?”) on the Mayo Clinic website. To help me fact-
check it, I called Marion Nestle, the much-respected professor of food and nutrition studies at New York University, who has extensively studied the chocolate industry (most recently in her book *Unsavory Truth: How Food Companies Skew the Science of What We Eat*).

I read Nestle (who is no relation to the candy maker) the article’s lead paragraph, which states, in part, “chocolate’s reputation is on the rise, as a growing number of studies suggest that it can be a heart-healthy choice.”

She stopped me right there to note that it’s not chocolate but the flavanols in chocolate that might have potential benefits. Flavanols are abundant in cocoa beans, which yield cocoa powder, which is then used to make chocolate, she said.

To be fair, despite its enticing headline, the Mayo article in fact does focus on the benefits of flavanols, not chocolate, notably their “antioxidant effects that reduce cell damage implicated in heart disease . . . [and] also help lower blood pressure and improve vascular function.” But will readers understand that the amount of flavanols in a chocolate bar is not nearly enough to affect their health? No, Nestle said with obvious exasperation: “You’d have to eat an awful lot of chocolate to make a difference.”

Nestle told me that if I eat more chocolate to up my flavanol intake, I’m consuming a lot more calories and fat, as well — which will be bad for my health. That’s because flavanol-rich cocoa has a bitter taste, so candy manufacturers add lots of fats and sugars to create commercial — delicious-tasting — chocolate.

One recent study reported that “higher levels of chocolate consumption might be associated with a one-third reduction in the risk of developing cardiovascular disease.” That sounds like great news, but the study authors point out that those benefits would require “excessive consumption,” with the probable side effect of “weight gain, a risk factor for hypertension, diabetes, and dyslipidaemia,” which increases the chance of clogged arteries and heart attacks, stroke, or other circulatory concerns, especially in smokers. Not so great.

Alice Lichtenstein, a professor of nutrition science and policy at Tufts University, also said “the data don’t support using [chocolate] as a health food.” Why do so many think it is? “It sounds great so I think people like repeating it,” she said.

Lichtenstein is critical of many of the studies, which she reminded me tend to come out right before Valentine’s Day — our National Day of Chocolate. They “lack plausibility” and are mostly “observational,” she said, which means they can show that two variables are related to each other but can’t prove cause and effect.

As an example, Lichtenstein pointed to a study published in the *New England Journal of Medicine* that showed “a very strong correlation between per capita chocolate intake and the number of Nobel prizes awarded in any country. Does that mean the more chocolate you eat, the more likely you are to win a Nobel Prize?”

I certainly hoped so, but Lichtenstein quashed my dream: “Obviously not.” Correlation is not causation, she said, a fallacy many people fail to understand. Eating more chocolate will not make you smarter or boost your chances of winning a Nobel Prize. Sorry.

Further dashing my hopes, Lichtenstein said that there is some research “suggesting biological effects, but those studies were done at high concentrations” of flavanols. To make her point, she told me about a study in the journal *Nature Neuroscience* that concluded people who consumed a high dose of cocoa flavanols performed much better on a memory test than those on a low-flavanol mixture. Wow, I thought. But then she added that a person would have to eat about “seven average-sized bars” daily to consume enough flavanol for this possible benefit.

That study, it turned out, had other issues, notably that it had partial funding from Mars, the chocolate company.

Marion Nestle said this isn’t an isolated incident. Chocolate makers have long funded studies seeking to determine the health benefits of chocolate. A 2018 Vox report on more than 100 Mars-funded studies found overwhelmingly glowing conclusions about cocoa and chocolate — promoting everything from chocolate’s heart health benefits to cocoa’s ability to fight disease.
“I’m not impressed by the research that shows this [when] it is industry funded,” Nestle said. “It’s very hard to take seriously.” So take these studies with a grain of salt — but maybe not another square of chocolate.

To wrap up my “investigation,” I spoke to Katherine Zeratsky, a registered dietitian and licensed nutritionist at the Mayo Clinic and the author of “Can chocolate be good for my health?”

Is it, I asked? “I think it possibly can be,” she said. “It’s like so many other foods, it probably depends on how it’s consumed, how much is consumed. …” From there, she moved quickly to the important difference between cocoa beans and chocolate, pointing out as Nestle had earlier that it’s the flavanol-rich cocoa beans that “are potentially health promoting” — not chocolate. (A Mayo Clinic representative told me that their “content is not influenced in any way by benefactors and donations to Mayo Clinic.”)

There’s that problem again: With every delectable mouthful, the cocoa beans in chocolate offer tiny additional doses offlavanols — which are good for you — but far more additional fat, sugar and calories — which are bad. It’s not a healthy trade-off.

So what’s a chocoholic to do? First, stop thinking of chocolate as “healthy.” Nestle said she eats dark chocolate with nuts, but she’s clear it’s a treat. “It’s a candy, and candy has a place in American diets,” she said.

“That place is moderation.” Zeratsky urged people to look for chocolate that is 65 percent or higher made from cocoa, “where we may see some health benefits.” That means only dark chocolate since milk chocolate doesn’t have that much cocoa, which is how we measure “dark.”

She also recommended that we keep our chocolate intake to the American Heart Association’s limit for discretionary calories — about 100 calories a day, or one square of dark chocolate. That yields about 140 milligrams offlavanols, below the level where you’ll likely get any health benefits. Enjoy it, like I do, but know it’s a treat.

Okay, you can unfriend me now.
Chocolate’s Reputation and Reality

There are some people who do not like chocolate. And some who only eat white chocolate, unless they are savoring a cup of hot chocolate on a chilly day. The Washington Post’s HEALTH & SCIENCE section (October 29, 2019) took a closer look at the different forms of chocolate available for consumption in candy, beverages and desserts to examine the health benefit.

Begin by reviewing “A closer look at this confectionery.”

1. Cocoa beans in their natural state are (a) sweet, (b) bitter, (c) spicy
2. (a) Dark, (b) milk, (c) white chocolate has the highest percentage of cocoa.
3. What is the source of the health benefit in chocolate?
   (a) vanilla extract, (b) flavanols, (c) sugar
4. How much milk chocolate should be consumed per day to be considered healthy?
   (a) 4.5 ounces, (b) 750 mg, (c) 2.5 pounds
5. Which sentence is the correct use of “confectionery”?
   (a) Fudge and hand-made chocolates are made daily in the confectionery.
   (b) That was a lie, a confectionery of his imagination.
   (c) The chef’s soups and salads are marvelous confectioneries.

Read “Is chocolate healthy? My bitter answer.”

6. What are the possible benefits of eating chocolate?

7. What are the possible ill results of eating chocolate?

8. Explain what flavanol is and how it benefits the body.

9. Several experts are quoted in the article. Select one of them.
   (a) Name the expert and her credentials. Is she a credible source?
   (b) What additional perspective does the expert provide?
   (c) What do you conclude from this expert’s information?

10. Petrow begins the article with the question: Is chocolate healthy? What is the answer?

**BONUS:** Post reporter Steven Petrow also reminds readers to be aware of the funding source for studies of chocolate’s benefits. Explain how this may be a factor?
From Plate to Soil: Who, What, Where, When, Why and How of Your Meals

You are being asked to think about your meals — not for their calories or nutritional value — but for the sources of the ingredients. Which ingredients are locally grown and which are imported? Which items are protected by government regulations and international agreements? Which involve child laborers to harvest the beans, pods, vegetables and fruit?

Make a List of Favorite Foods or Select a Recent Meal

Select a breakfast, lunch or dinner. From this meal select one item: cereal, fish, beef dish, casserole or dessert. If cereal, what grain is the primary ingredient or source of the brown sugar? If fish, was it from a fish farm, off-shore fishing boat, Chile or Alaska? If beef, what company processed it, and what ranch in which country fed it? If a dessert, from where did the lemon, lime, chocolate or vanilla come?

Begin the Search for the Origins of This Part of Your Meal

Your grocer or market from which the finished product or ingredients were purchased might help you start your search. What does the label indicate? Check out the website of the manufacturer. Talk to the person at the farmers market. Was that honey from bees on their farm or imported?

Check out websites of organizations and government agencies that watch over the integrity of the foods you eat and the well being of laborers.

Some of the Considerations You Need to Make as You Follow an Ingredient Found on Your Plate to the Soil in Which it Grew or Was Raised

1. What Potential for Injury Exists?
   Are machetes, ladders or heavy harvest bags used? In what weather conditions do harvests take place? How hazardous are overall conditions? If workers have cuts, insect bits or other health concerns is medical aid available on-site or nearby?
2. When — If — Pesticides are Used
   Is this organic produce? Or do workers come in contact with pesticides? What are the regulations regarding the use of pesticides? Do you want fruit and vegetables that have perfect color with no blemishes or only that they taste good?

3. Where Is Food Harvested?
   Are workers in fields bending over, off-shore fishing, in wooded or swampy areas? From what countries do these ingredients come? How does travel time influence harvest conditions?

4. Who Are the Workers?
   What qualifications are required for employment? How many are found in offices with air conditioning or heating? How many “middle men” are involved in getting the product to you? Are children under 18 years employed to do the labor? If younger workers are involved, who oversees their needs, salaries, housing and education?

   According to the Department of Labor and the Bureau of International Labor Affairs, there is “reason to believe these foods may be produced by child labor”: cocoa, bananas, rice, cattle, coffee, sugar cane. How likely are these items to be found in your grocery bag?

5. How Well Are Basic Needs Provided?
   Do workers have access to water, shade and healthy meals? Are breaks in a day’s schedule? Do workers have housing provided or do they come to work from home? Are toilets and sanitary needs on-site?

6. Why Should We Care?

**Prepare an Informational Graphic To Tell the Story of a Food You Consume**

We are so used to taking a picture of our meals, especially those that are part of celebrations, meals in restaurants or those that are pretty on the plate. Begin with such a photograph that highlights the dish and the ingredient whose story you will tell.

What are the steps taken to get the selected ingredient from the soil to your plate?

Anyone looking at your informational graphic will have enough details in words and visuals to understand the basic steps and people involved.

**Write an Article to Inform Others of What and Who are Involved in getting food on your plate, Where, When and How. Conclude with Why We Should Care.**