

ABUNDANT CALIFORNIA

THE TOMATO SALSA CHALLENGE

OVERVIEW

Tomatoes—whether fresh or cooked with other foods—are one of the most popular vegetables around. In this lesson, students read some surprising facts about tomatoes, conduct a comparison tasting of different locally grown tomato varieties, and invent tomato salsa recipes using an assortment of possible ingredients.

GRADE LEVEL: 3-5



CENTER FOR ECOLITERACY



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CALIFORNIA FOOD FOR CALIFORNIA KIDS® downloadable resource

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Learning in the Real World®

Learning in the Real World is a publishing imprint of the Center for Ecoliteracy, a not-for-profit, tax-exempt organization. Created in 1997, Learning in the Real World offers resources to support schooling for sustainability, stories of school communities, and the ecological framework that informs the work of the Center.



THE TOMATO SALSA CHALLENGE

FOOD AND CULTURE OVERVIEW

Although most people are aware that food provides nourishment, we rarely consider the geographic, historical, and cultural conditions that have influenced what we eat and how we procure, prepare, and serve it. By exploring food through a prism of culture, time, and place, we build a deeper appreciation of how regional characteristics have shaped our global food system.

LESSON OVERVIEW

There's nothing quite as delightful as a freshly picked, ripe tomato. Bite into one and notice how sweet, sour, and savory flavors come together in a complex, yet balanced, medley that explodes in the mouth.

Tomatoes—whether fresh or cooked in other foods—are one of the most popular vegetables around. Americans eat an average of 30 pounds of tomatoes per person a year. California grows nearly one-third of the nation's fresh tomatoes and is the world's leading producer of “processing tomatoes” used for tomato sauce and other products.

In this lesson, students read some surprising facts about tomatoes, conduct a comparison tasting of different locally grown tomato varieties, and invent tomato salsa recipes using an assortment of possible ingredients.

Plan to conduct this lesson in summer or fall when fresh, local tomatoes are available. If you have a school garden, you may opt to use garden tomatoes for the taste test, the salsa challenge, or both.

GRADE LEVEL

3-5

LENGTH

One to two 50-minute periods

LEARNING OBJECTIVES

Students will:

- Recognize the unique qualities of tomatoes.
- Compare the tastes and textures of different tomato varieties grown in California.
- Invent and test a recipe using tomatoes.

STANDARDS CONNECTIONS

NEXT GENERATION SCIENCE STANDARDS

Performance Expectations:

- 3-5-ETS1-1. Define a simple design problem reflecting a need or want that includes specified criteria for success and constraints on materials, time, or cost.

Science and Engineering Practices:

- Engaging in Argument from Evidence – Make a claim about the merit of a solution to a problem by citing the relevant evidence about how it meets the criteria and constraints of the problem.

Crosscutting Concepts:

- Scale Proportion and Quantity – Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.

**CA HISTORY-SOCIAL SCIENCE CONTENT STANDARDS FOR CALIFORNIA
PUBLIC SCHOOLS. KINDERGARTEN THROUGH GRADE 12**

- 3.5. Students demonstrate basic economic reasoning skills and an understanding of the economy of the local region.
- 3.5.1. Describe the ways in which local producers have used and are using natural resources, human resources, and capital resources to produce goods and services in the past and the present.

COMMON CORE STATE STANDARDS-ENGLISH LANGUAGE ARTS

- RI.3.2. Determine the main idea of a text; recount the key details and explain how they support the main idea. RI.4.2. Determine the main idea of a text and explain how it is supported by key details; summarize the text. RI.5.2. Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
- W.3.4. With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. W.4.4, W.5.4. Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

VOCABULARY

- **Fresh** - not cooked, frozen, or canned.
- **Heirloom** - handed down from one generation to the next.
- **In season** - available fresh and locally at a certain time of year.
- **Plant variety** - a group of plants within a species that have similar characteristics.
- **Salsa** - a spicy tomato sauce that can be flavored with peppers and onions.
- **Tomato** - a red, juicy fruit eaten as a vegetable either raw or cooked.

- **Warm-season crop** – a plant that requires warm soil and high temperatures to grow steadily and produce a crop. Warm-season crops include tomatoes and other traditional summer crops such as corn, cucumbers, melons, peppers, summer squash, and snap beans.

MATERIALS

- Copies of “10 Surprising Facts about Tomatoes” and “Tomato Salsa Challenge” student handouts
- Copies of “Taste Test” and “Fruit and Vegetable Adjectives” student handouts from *Savoring California: A Comparative Tasting of California Fruits and Vegetables* (<http://www.ecoliteracy.org/CA-Thursdays-Tasting-Lesson>)
- Several different tomato varieties (see Preparation)
- Tortilla chips and salsa ingredients (see Preparation)
- Pieces of cardstock for making signs (see Preparation)
- Sharp knife and cutting board
- Serving trays
- Toothpicks
- Napkins or paper towels
- For each group: sturdy plastic plate, plastic spoons, plastic knives, cutting board, measuring spoons and cups, small mixing bowl
- Blender (optional, see Safety Note)
- Waste bucket for collecting vegetable scraps

PREPARATION

- 1 Make copies of the student handouts. For the “Fruit and Vegetable Adjectives” student handout, you may make one copy for each small group or table, or project it onto a screen for the whole class to see.

- 2 If possible, arrange with your school's food service manager to prepare and serve the winning salsa recipe in the cafeteria, using ingredients from the school garden or grown locally. Consider inviting the manager, lunch staff, or a local restaurateur to the salsa tasting to provide a professional perspective.

For Taste Test:

- Purchase several different varieties of California-grown tomatoes, or use produce from your school garden. Depending on the size of the tomatoes, you will need at least two of each variety: one to keep whole and one or more to cut up.
- Wash the tomatoes. For each variety, leave one tomato whole and cut the other(s) into bite-size pieces. Place the whole tomato and pieces on a serving tray. Provide toothpicks for picking up samples.
- Read over the *Savoring California: A Comparative Tasting of California Fruits and Vegetables* lesson (<http://www.ecoliteracy.org/CA-Thursdays-Tasting-Lesson>).

For Salsa Challenge:

- Select and purchase tortilla chips and salsa ingredients. Possible ingredients include:
 - o Tomatoes (from the taste test)
 - o Bell pepper (any color)
 - o Canned black beans
 - o Fresh or frozen corn kernels
 - o Garlic
 - o Onion
 - o Lime

- o Cilantro
 - o Salt
 - o Any additional ingredients you choose
- Prepare the ingredients. Cut up whole tomatoes and mix with any cut tomato left over from the taste test. Wash and cut up the remaining ingredients and display on serving trays.
 - Using cardstock, make a table sign for each of the salsa ingredients.
 - You may choose to have a blender available so that students can make a smooth salsa. If so, have an adult helper on hand, and be sure to read the Safety Notes.

SAFETY NOTES

Have students wash their hands thoroughly before preparing their recipe. Also, make sure they know to use a clean spoon each time they taste their salsa: they should never dip dirty utensils into the salsa.

Blenders can be extremely dangerous, because they combine sharp blades, high speed, and electricity. An adult must directly supervise blender use at all times. Ask a parent volunteer or other adult helper to assist students with the blender. Never add anything into the blender when it is on.

DIRECTIONS

- 1 Ask students whether they have ever eaten fresh, uncooked tomatoes. Ask, “Do you think a tomato is a vegetable or a fruit?” and discuss students’ responses, encouraging them to provide evidence for their views.
- 2 Direct students to read the “10 Surprising Facts about Tomatoes” student handout. Ask them to summarize what they read. Invite students to share any additional facts they know about tomatoes, creating a class list on the board.

- 3 Show students the tomatoes you have prepared for the taste test. Conduct a comparison tasting of the tomatoes, following the suggestions in the *Savoring California: A Comparative Tasting of California Fruits and Vegetables* lesson (<http://www.ecoliteracy.org/CA-Thursdays-Tasting-Lesson>). Encourage students to use descriptive terms for the tomatoes, with the “Fruit and Vegetable Adjectives” student handout as a guide.
- 4 Challenge students to invent a recipe for a delicious tomato salsa. Explain that they will work in small groups to make their recipe. The groups will decide which and how much of the ingredients to include. Point out that they may use no more than six ingredients in their recipe, that their recipe must include tomatoes, and that students must measure their ingredients so others can make the recipe. Groups should also choose a Recorder to ensure that they write down what they use and how.
- 5 Divide the class into small groups and give them copies of the “Tomato Salsa Challenge” student handout. Direct students to decide within their group which ingredients they want to use in their recipe, creating a “shopping” list. Encourage them to think about flavors they enjoy and what would complement the tomato.
- 6 Have groups bring you their shopping lists. Fill their orders by placing the requested ingredients on a plastic plate to take back to their tables.
- 7 Allow groups time to measure their ingredients, mix ingredients together, taste the salsa, and then adjust the recipe.
- 8 When they are happy with the results, groups should come up with a name for their salsa and complete the recipe card portion of the student handout. Encourage creativity in naming the salsas.
- 9 Invite groups to present their recipe to the rest of the class, explaining how and why they chose their ingredients and sharing the name and description of their salsa.
- 10 After all groups have presented, conduct a taste test of the different salsas, using tortilla chips to sample each one. Have students vote to choose their

favorite salsa. To avoid the problem of everyone just voting for their own, you might have students vote for their top two.

EXTENDED LEARNING

- As a class, read about California entrepreneur David Tran, who introduced sriracha to the American public (see Resources). Ask students to identify the marketing and design decisions Tran made that helped lead to sriracha's popularity.
- Choose a tomato-based recipe from *California Tastes Amazing* (<http://www.ecoliteracy.org/California-Tastes-Amazing>) to make with students. Use tomatoes left over from the lesson to prepare Chorizo Penne, Jambalaya, or Sloppy Joes.
- Use Harvest of the Month materials to explore other aspects of tomatoes (see Resources).
- Visit a local farm or farmer's market to learn about other tomato varieties grown in your area. (See Resources to locate a farmer's market near you.)

RESOURCES

- "Sriracha Hot Sauce Purveyor Turns up the Heat" by Frank Shyong. Los Angeles Times. April 12, 2013. <http://articles.latimes.com/2013/apr/12/business/la-fi-himi-tran-20130414>
- Harvest of the Month: Tomatoes. http://harvestofthemonth.cdph.ca.gov/documents/Fall/21712/Ed_News_Tomatoes.pdf
- National Farmers Market Directory. <https://www.ams.usda.gov/local-food-directories/farmersmarkets>
- "A Passion for Tomatoes" by Arthur Allen. Smithsonian magazine. August 2008. <http://www.smithsonianmag.com/ist/?next=/science-nature/a-passion-for-tomatoes-947254/>

ASSESSMENT

Provide students with the prices of the salsa ingredients you used in the lesson, and have students determine how much their salsa cost to make (you might also have them include a value for their labor). Have them compare this cost with the cost of salsa from a grocery store ad in the local paper. Ask, “In addition to cost, what are the pluses and minuses of the homemade salsa and the store-bought salsa?”

BACKGROUND

Tomatoes are a fruit with glossy, thin, smooth skin and a juicy flesh containing soft, edible seeds. Botanically speaking, a fruit is the part of a plant that contains seeds, which would make tomatoes a fruit. But in 1893, the U.S. Supreme Court had to decide whether they are fruits or vegetables.

At that time, the Port Authority of New York classified them as vegetables, which were subject to a 10 percent import tax. But a fruit importer argued that tomatoes were fruits, which were not taxed. In their decision, the judges ruled that while tomatoes are botanically fruits, people use them as a vegetable. So under customs law, at least, tomatoes counted as vegetables.

HISTORY OF TOMATOES

Tomatoes are originally from the Andes region of South America, where wild tomato plants still grow today. It is not clear how they made their way to Central America, but that is where Spanish conquistadores first encountered tomatoes in the 1500s.

The English word “tomato” comes from *tomatl*, its name in Nahuatl, the language of the Aztecs. Central Americans used the *tomatl* in various sauces and dishes, and even mixed it with pepper and salt—perhaps the precursor of the modern salsa.

The Spanish distributed the tomato throughout most of the Caribbean colonies, and introduced it to Europe, the Philippines, and Southeast Asia. The first variety to reach Europe was most likely yellow in color, since in Spain and later in Italy they were known as *pomi d'oro* or golden apples. Initially, Europeans didn't eat them, but used them only as ornamental plants. The French referred to tomatoes as *pommes d'amour*, or love apples, for their supposed aphrodisiacal properties.

The Spanish, Catalan, and Occitan people of northwestern Italy were the first Europeans to embrace the tomato and cultivate it for food. They fried it with eggplants, squash, and onions to use as a condiment. (The typically Italian tomato dishes—like pasta sauce and pizza—wouldn't come until much later, in the late 1800s.)

Because tomatoes belong to the same family as deadly nightshade, many people thought they were poisonous. In the 1600s, upper-class English and English colonists shunned their use.

By the late 1700s, tomatoes had become more common in North America. Thomas Jefferson was purported to both grow and eat tomatoes from his estate. In 1897, Joseph Campbell introduced a condensed tomato soup, which helped seal the tomato's popularity in culture.

Today, tomatoes are the second-most-popular vegetable in the United States, after potatoes. Americans eat an average of 30 pounds of tomatoes per person a year.

CALIFORNIA TOMATO CROP

California is the leading producer of tomatoes in the United States. Tomatoes are grown either for fresh eating or for processing (canned tomato sauce or diced tomatoes), with different varieties suited for different uses.

California produces a third of the country's fresh market tomatoes. These tomatoes are grown from spring through fall, picked by hand, and packed into

25-pound lugs. In the spring and fall, San Diego County is the leading producer, while Fresno County dominates summer production. Most fresh tomatoes sold in the winter are imported from Mexico.

California's processing tomatoes account for over 90 percent of the United States production and 35 percent worldwide. All processing tomatoes are harvested mechanically and trucked to the processing plant directly from the field.

The tomato harvester was invented in the 1950s by two seed specialists at the University of California, Davis. Their challenge was to build a machine that wouldn't squash the delicate fruit. They solved the problem by developing a special type of tomato, nicknamed the "square tomato," that had thick skin and firm fruit able to withstand the rough handling of the machine.

HEALTH BENEFITS OF TOMATOES

One medium tomato contains 40 percent of the recommended daily allowance of Vitamin C and 20 percent for Vitamin A, as well as a number of nutrients (including niacin and folate) that may help reduce heart disease. Tomatoes are also rich in lycopene, the substance that gives them their red color and may help to prevent certain cancers.

SELECTING TOMATOES

Tomatoes are a warm-season crop, which means that they thrive with lots of sun and warm temperatures. In California, they are grown from spring through fall. If you see tomatoes at the store in the winter, they are likely from Mexico or other tropical locations.

When selecting tomatoes for this lesson, take advantage of the wide array available at farmer's markets, home gardens, or your local grocer's. You may find cherry tomatoes, slicing tomatoes, or sauce tomatoes. Heirloom tomatoes come in a range of sizes and colors, including red, yellow, orange, and even green-striped varieties.

10 AMAZING facts about tomatoes

1. Tomatoes

first came from **South America**, where many wild tomato types still grow.



2. OVER 1000

years ago, the **Aztecs** in Mexico invented a mixture of tomatoes, peppers, and salt—perhaps the first “salsa.”



3. In the 1500s, the Spanish brought tomatoes from Central America to Spain and from there to Italy. **The Italians called tomatoes *pomi d'oro*** (golden apples) because they were yellow.

4. **The tomato has been called both a fruit and a vegetable.** A fruit is the part of a plant that contains its seeds, so tomatoes are fruits. But in 1893, the U.S. Supreme Court ruled that tomatoes are also vegetables, since we eat them like a vegetable.



Fruits, like tomatoes and apples, have seeds.

5. There are two main types of tomatoes grown in California: **processing tomatoes and fresh market tomatoes.**

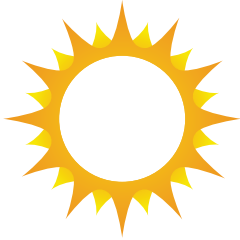
Processing tomatoes are made into canned tomato sauce and canned diced tomatoes for pizza and other foods.

6. **Many people used to think that tomatoes are poisonous.** That's because tomatoes are related to a plant called **deadly nightshade**, that really *is* poisonous.



Deadly Nightshade

10 AMAZING facts about tomatoes (cont.)



7. As a warm-season crop, **tomatoes thrive in sunny, warm weather.** In California, they grow from spring through fall. If you buy tomatoes in winter, they are likely from Mexico or other tropical places.

9. Store-bought tomatoes today often have thick skin and firm fruit so that they can withstand traveling long distances in large trucks—but they are fairly bland. **Old-fashioned heirloom varieties** are becoming popular, because they have more flavor.

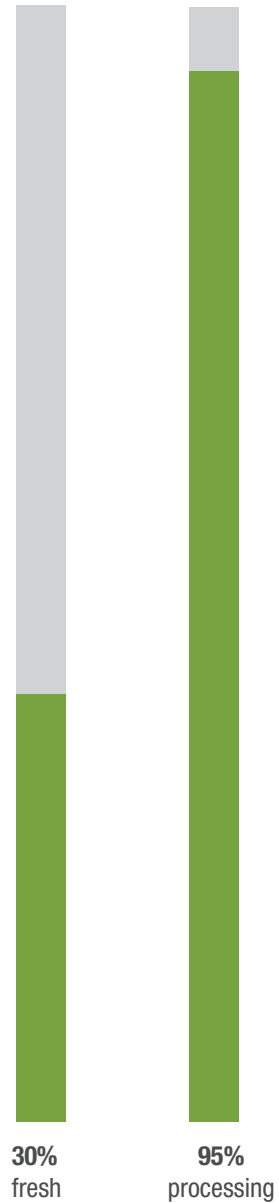


Examples of colorful heirloom tomatoes

8. All of California's processing tomatoes are harvested by machine. The tomato harvester moves slowly through a field, cutting down whole tomato plants. It separates out the tomatoes and spits them directly into truck beds for transport.



10. California grows more tomatoes than any other state in the United States. It produces more than 95 percent of the country's processing tomatoes and 30 percent of its fresh market tomatoes.



TOMATO SALSA CHALLENGE

Your challenge is to make the most delicious tomato salsa using no more than six of the ingredients provided. Of course, your recipe must use tomatoes, or it wouldn't be tomato salsa!

- 1 What ingredients will you use in your recipe? Create a shopping list by writing your ingredients in the chart below.

Ingredient	How much you add at first	How much you add after tasting	Total amount

- 2 Make your salsa. Measure how much of each ingredient you add to the mix. Write the amount under "How much you add at first."
- 3 Taste your salsa using a clean spoon. Decide whether your recipe needs more of something.
- 4 Adjust your recipe. Measure each ingredient you add. Write the new amounts under "How much you add after tasting." Add the amounts together to get the total.
- 5 Describe your salsa using several different adjectives or descriptive terms.
- 6 Name your salsa.
- 7 Complete a recipe card for your salsa. For each ingredient, put how much is needed. Write the recipe steps.

TOMATO SALSA CHALLENGE

Recipe: _____

Created by: _____

Description: _____

Ingredients:

How to make the salsa:



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ABOUT THE CENTER FOR ECOLITERACY

The Center for Ecoliteracy is an internationally recognized leader in systems change innovations in education for sustainable living. Since 1995, the Center has engaged with thousands of educators from across the United States and six continents. The Center offers publications, seminars, academic program audits, coaching for teaching and learning, in-depth curriculum development, keynote presentations, and technical assistance. Books authored or coauthored by the Center for Ecoliteracy include *Ecoliterate: How Educators Are Cultivating Emotional, Social, and Ecological Intelligence* (Jossey-Bass, 2012); *Smart by Nature: Schooling for Sustainability* (Watershed Media, 2009); and *Ecological Literacy Educating Our Children for a Sustainable World* (Sierra Club Books, 2005).

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