

Taste and Teach

September - Tomatoes



Five **Fun Facts** About Tomatoes!

- Processed tomatoes (used to make sauces, soups and more!) have thicker skins than fresh market tomatoes. For best flavor, fresh tomatoes should be eaten at room temperature.
- 96% of all processed tomato products eaten in the US come from California.
- Scientifically, tomatoes are considered a fruit. However, the Supreme Court declared them a vegetable because of the way in which people commonly eat them.
- There are more than 2,750 varieties of fresh market and processing tomatoes.
- The first tomatoes were the size of cherries!

Four **Fun Teaching Ideas!**

- Watch this video on tomatoes from the Tomato Wellness Council: <https://youtu.be/koZ1QCh8aRY>
- Brainstorm common meals that have tomatoes in them. Who can name the most?
- Have students complete a tomato-themed page from the *What's Growin' On?* student newspaper.
- Draw a tomato! Tomatoes come in many shapes, colors and sizes. Have students research and draw a tomato variety. Then, students can discuss and compare their drawings with a partner.

Explore all the great tomato resources in this section!



Processing Tomatoes

Information compiled by the California Tomato Growers Association, Inc.

How Produced – Tomato plants are planted in the field as seeds or as young plants, called seedlings. If sowing seeds directly into the ground, the producer sows seeds in late January or early February. If planting by seedling, plants are grown in greenhouses until they are hardy enough to be planted outside in the spring.

Tomatoes are ready for harvest between early July and mid-October. Mechanical harvesters move through the fields picking the entire tomato plant and shaking the tomatoes off the vine. Specially designed electronic sensors on the harvesters sort the ripe, red tomatoes from the vine and transfer them into a gondola pulled by a tractor following alongside. The tomatoes are immediately transported from the fields by trucks, which can hold approximately 50,000 pounds of tomatoes. Trucks haul the crop to a nearby state-controlled grading station to be graded, then on to a tomato processing plant where they are peeled, sliced, diced, or sauced into the familiar canned tomato products seen on store shelves.

History – The first tomatoes can be traced to the South American Andes Mountains where they grew wild as cherry-sized berries. Padres following the Spanish conquistadors most likely sent the first seeds to Spain in the early 1500s. The fruit gained little attention in Spain, but soon traveled to Italy—a country that embraced tomatoes with great passion and developed numerous recipes which are still popular today. By the mid-sixteenth century, tomatoes made their return to America via English colonists. They did not become an important part of the American diet, however, until after World War I. Today, tomatoes are grown in every state except Alaska.

Varieties – There are more than 2,750 genetic varieties of fresh market and processing tomatoes at the Tomato Genetics Stock Center at the University of California, Davis. These varieties have been developed to suit the various growing conditions around the state, taking into account soil type, climate, and disease. Processing tomatoes have been selectively bred for more than 60 years to differ from fresh market tomatoes. The varieties designated for processing have a thicker skin and firmer consistency than fresh market tomatoes. These qualities enable the mechanical harvester to pick the fruit when it is ripe without damaging the fruit and

ensure tomatoes can survive transportation. The processors prefer the “meatier” character of the processing tomatoes because it provides consumers with more of the tomatoes’ essence.



Commodity Value – California is the nation’s leading producer of processing tomatoes. In 2019, California’s processing tomato growers grew approximately 11.2 million tons on 235,000 acres throughout the state. The state’s crop value reached \$840 million in 2019.

Top Producing Counties – As of 2019, Fresno County leads production followed by Yolo, San Joaquin, Kings, and Merced counties. However, nearly the entire state is involved in producing processing tomatoes, with some being grown as far south as Kern County and as far north as Colusa County.

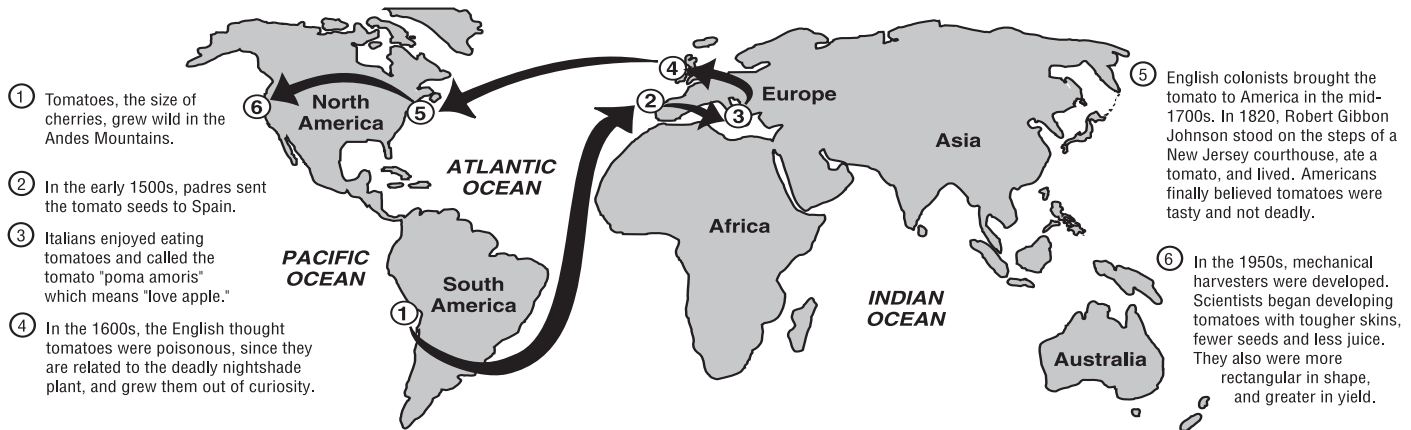
Nutritional Value – Processing tomatoes are a nutrient dense food. One, four-ounce tomato supplies about one-third of the recommended daily allowance for vitamin C, plus contains beta-carotene, potassium, folic acid, and other B vitamins, iron, and fiber. Tomatoes are a naturally low-calorie food.

Studies show processing tomatoes are the leading source of lycopene in the American diet. Lycopene, the ingredient that makes tomatoes red, is an antioxidant that blocks cellular damage and is highly effective in preventing cancers. Tomatoes do not lose their health benefits as they are processed and cooked. In fact, lycopene in cooked and processed tomatoes (sauce, paste, salsa, canned tomatoes) is more easily absorbed than fresh tomatoes. This fact, along with their popularity, makes tomatoes a leading nutritional source in the American diet.

For additional information:
California Tomato Growers Association, Inc.
(916) 925-0225
www.ctga.org

Processing Tomato Activity Sheet

The Tomato's Journey to North America



Lesson Ideas

- Label and color the top seven counties in California for processing tomato production.
- Make a collage from labels of various processed tomato products.
- Make a Venn diagram which compares processing tomatoes to fresh market tomatoes.
- Find out why a tomato is scientifically a fruit but is also known as a vegetable.
- Create a class cookbook which includes favorite student recipes using a tomato product.
- Research the Spanish exploration movement of the 1500s. What other "treasures" came from the New World?
- Locate your nearest tomato processor. Where do the tomatoes they process come from?

Fantastic Facts

1. California leads the nation in processing tomato production.
2. Processing tomatoes are harvested by machines.
3. Processing tomatoes have thicker skins than fresh market tomatoes so they can be mechanically harvested and successfully transported.
4. There are 2,750 different varieties of tomatoes.
5. Tomatoes were once thought to be poisonous.
6. Processing tomatoes are rich in vitamin A, vitamin C, potassium, folic acid, beta-carotene, iron, B vitamins, and fiber.
7. The first tomatoes originated in the South American Andes and were berries the size of cherries.

Lesson Plan: pH Perfection

Introduction: When food is preserved, the microorganisms causing food spoilage are destroyed or slowed down. This is done by using extreme temperatures, changing the moisture level, or altering the acidity of the foods. The temperature of canning is extremely important for safety reasons. Foods with a pH higher than 4.6 must be canned at 240°F or greater. Foods that are more acidic, having pH measurements less than 4.6, may be preserved at 212°F. This difference in temperature can affect food taste and cost.

Objective: Students will conduct an experiment to determine the ideal temperature for canning tomatoes.

California Standards: NGSS: 5-PS1-3, MS-PS1-4

Materials: Lemon, pear, carrot and tomato juice, litmus paper which shows varying pHs, six paper cups or test tubes, forceps.

Procedure:

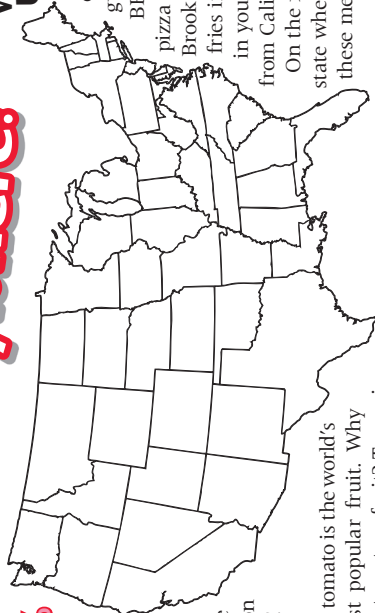
1. Discuss reasons and ways people preserve food. Talk about the importance of acidity and heat in canning.

2. Explain what pH is and how scientists determine the pH of a substance. Talk about the indicator litmus and how it will be used.
3. Pour an equal amount of each substance to be tested into a cup or test tube.
4. Using the forceps, have the students dip one piece of litmus into one substance and record its pH. Repeat this procedure for each juice.
5. Discuss which foods could be preserved at the lower temperature and which need to be canned at the higher temperature. Where do tomatoes fall in this test?
6. What could be done to the foods to change their pHs? When do you think scientists should check the pH of the item to be canned?

of all **processed** tomato products eaten in the US come from California. California also leads the world in the production of processing tomatoes!

Did You Know?

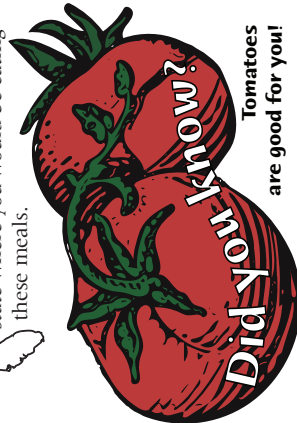
Did You Know? The tomato is the world's most popular fruit. Why is a tomato a fruit? To a scientist, tomatoes are fruits because they have seeds in them. So cucumbers, pumpkins, and also considered fruits. Vegetables are any part of a plant that is not a fruit: roots (carrots, beets), stems (asparagus, leeks, spinach), and flowers (broccoli, cauliflower). A grocer or a chef, a tomato would be considered a vegetable because how it is used in cooking.



Where in the US?

Whether you are eating a taco in Sedona, gumbo in New Orleans, BBQ in Kansas City, pizza in Chicago, spaghetti in Brooklyn or a hamburger and fries in Boise, the tomatoes in your meal most likely came from California.

On the map, find and mark the state where you would be eating these meals.



Tomatoes
are good for you!

STEM ACTIVITY: Transportation Math

Processed tomatoes have to get from California to states all over the country. Pretend you are a truck driver, starting out in Sacramento, California, and have six cities throughout the country to deliver to. Using information from the table, calculate the following:

- How many miles is it round trip to deliver your load? Please fill in the table.
- How long will it take you to get to each city along the route if you are traveling at 60 mph? Round to the nearest hour, fill in the table.
- If your truck gets 5 mpg in diesel, how many gallons of diesel will you use? Round to the nearest tenths place, fill in the table.
- Using an average diesel cost of \$3.25 per gallon, how much will you spend on your trip in diesel? Fill in the table.
- Total all of your columns: mileage, hours driven, gallons used, and \$ spent on diesel
- CHALLENGE: How many days will it take you to go round trip (return to Sacramento)?

Destination: city to city	Mileage (in miles)	Hours Driven (nearest hour)	Gallons used (round to tenths)	\$ spent on diesel (round to hundredths)
Sacramento- Boise	555			
Boise- Sedona	878			
Sedona- Kansas City	1,138			
Kansas City- New Orleans	845			
New Orleans- Chicago	926			
Chicago- Brooklyn	799			
Brooklyn- Sacramento	2,833			
Totals				

you to go round trip (return to Sacramento)? You can only drive 11 hours per day and only 60 hours per week.

\$ on diesel: \$5183.10, 6. It takes 132 hours of driving time. Since you can only drive 60 hours per week, it will take you two weeks plus 2 days or 16 total days.

CA Standards: E1.4 CCSS: B1.3-5.1 7 W.3-5.2 B1.6-8.1 B1.6.7 W.6-8.2 W.6-8.9 BH.6-8.7 Math CCSS: 5.NBT.5 6.NS.3 7.NS.2

Sources: <http://learnaboutag.org/resources/fact/tomatoes.pdf>; www.transportation.gov

Career Spotlight

Career: Truck Driver



Chris Eck, Core-Mark, West Sacramento, CA

What is the training for truck driving?

Training requires classes through the Department of Transportation or a private company to get your permit. Then you have to pass a DMV test to get your Class A license.

What do you haul? I haul many products.

Some examples are tomatoes, milk, candy, and lemons.

What are some facts about truck driving?

My truck gets between 4-6 miles per gallon depending on the weight of the **freight**. I can drive 11 hours per day but need 10 hours of downtime between shifts. I can drive 60 hours per week. If you see a truck pulled off the freeway, they may be taking a required break.

What is a tip you have for us about truck

drivers? Always give truck drivers time, we can't always see you and don't stop fast!

Did You Know? For best flavor, tomatoes should be eaten at room temperature.



Tomatoes Everywhere

Create a newspaper advertisement promoting tomatoes that includes reasons why people should buy them. Use information from this page.

Extension: Why do you think tomatoes are so popular? Write a persuasive essay about tomatoes explaining why you think they are so popular. Use evidence from this page and do some of your own research.

The Tomato Trek

The Journey to California

The first tomatoes can be traced to the South American Andes Mountains where they grew wild as cherry-sized berries. Padres following the Spanish conquistadors likely sent the first seeds to Spain in the early 1500s. The fruit gained little attention in Spain, but soon traveled to Italy—a country that embraced tomatoes with great passion. By the mid-sixteenth century, English colonists brought tomatoes back to the Americas, settling in the northeastern part of the country. Tomatoes likely reached California by the late 1700s, as Spanish missions were established throughout the state.



Tomatoes on Trial

In 1893, the U.S. Supreme Court heard a case to determine whether the tomato was a fruit or a vegetable. In the case of “Nix v. Hedden,” the tomato was declared a vegetable, along with cucumbers, squash, beans, and peas.

Use the historical report from the trial (case.law.lp.findlaw.com/cgi-bin/getcase.pl?court=US&vol=149&invo=304) to record at least three arguments as to why tomatoes should be classified as a fruit or a vegetable. Use your findings to support your stance in an oral debate.

The Great Debate

Fruit	Vegetable
1.	1.
2.	2.
3.	3.

Standards: Science – Grade 3: 5b; Grade 7: 5f; ELA – Grade 3: Reading Informational Text (RIT) 2, Writing 1b, Speaking and Listening (SL) 1; Grade 4: RIT 2, Writing 1b, SL 1; Grade 5: RIT 2, Writing 1b, SL 1; Grade 6: 1b, SL 1; Grade 7: 1b, SL 1; Grade 8: 1b, SL 1; History-Social Science – Grades 6-8: Research, Evidence, and Point of View 3, 4; Historical Interpretation 2, 3

Sources: California Tomato Growers Association (www.ctga.org)



Standards: ELA – Grades 6-8: Reading Informational Text 3, 7; History-Social Science – Grades K-5: Chronological and Spatial Thinking 1, 4; Grades 6-8: 1, 3

Tomato Vine Timeline

Use the information on this page to create a timeline featuring significant events in tomato history. Include the date and description of each event, in chronological order.

Standards: ELA – Grades 3-5: Reading Informational Text 9; Grades 6-8: Reading Informational Text 9; History-Social Science – Grades 6-8: Chronological and Spatial Thinking 2

Did You Know?

The mechanical tomato harvester was developed in California in the 1950s.