

# Taste and Teach

## May - Berries



### Five **Fun Facts** About Blueberries!

- Blueberry is America's favorite flavor of muffin!
- The average strawberry has 200 seeds.
- Unripe blackberries are actually red!
- The strawberry belongs to the genus *Fragaria*, which makes it a close relative to the rose.
- Blueberries grow on shrubs that live all year long.

### Four **Fun Teaching Ideas**!

- Watch this video on berries from California Bountiful:
- <https://www.youtube.com/watch?v=Qd8BaYN2vkg>
- Match the berries! Students will learn how different types of berries grow and what they look like in the *What's Growin' On?* student newspaper.
- Brainstorm! Think of all the ways berries can be eaten throughout the day (breakfast, lunch, dinner, snacks and dessert). Work in teams and then compare to see which team comes up with the most unique ways to eat berries.
- Design a colorful plate of food! Use paper plates and clippings from grocery store ads to create a balanced and healthful meal. See the Colorful Fruits and Veggies page from the *What's Growin' On?* student newspaper.

*Explore all the great berry resources in this section!*

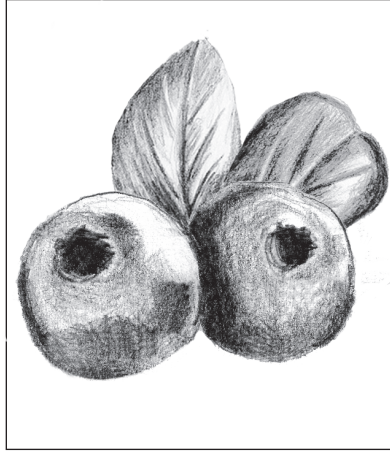


# Blueberries

Information compiled by California Blueberry Commission

**How Produced** – Blueberries are part of the Ericaceae plant family, which includes the flowering azalea and heather plants. They grow best in acidic soil with plenty of water and good drainage. Highbush blueberries—the ones you find in grocery stores—grow on bushes planted in long rows. The bushes can grow up to 12 feet tall, but most peak at about 6 feet. In the spring, clusters of white blossoms pop up all over the bushes and are pollinated by bees. Each blossom eventually becomes a berry—first hard and green, then reddish purple, and finally blue.

California blueberries are harvested from May through July. For the fresh market, blueberries are mainly picked by hand. For other markets, blueberries are gathered with large machines that gently shake each bush so ripe berries fall into a catching frame.



Berries are gathered in large bins and transported by truck or tractor from the field to a packing plant, where they are sorted, cleaned, and packaged in clear clamshell containers. These containers are stored in large refrigerated rooms until they're taken to market.

**History** – When Europeans arrived on the continent, Native Americans were already using wild blueberries year-round. They dried blueberries in the sun and added them whole to soups, stews and meat, or crushed them into a powder which was rubbed into meat as a preservative. The Native Americans also used blueberries for medicinal purposes. They called blueberries “star berries” because the blossom end of each berry, the calyx, forms a perfect five-pointed star.

Native Americans developed one of the first blueberry baked goods, a simple pudding made with blueberries, cracked corn, and water. Many historians believe it was part of the first Thanksgiving feast.

During the 20th century, people didn't think wild blueberries could be domesticated. In 1908, Frederick Coville, a USDA botanist, began breeding wild blueberry plants with superior genetic traits. In 1912, with the help of Elizabeth White, the daughter of a New Jersey farmer, Coville successfully harvested a crop of plump and flavorful berries like those we enjoy today. The team sold the first commercial crop of blueberries in 1916.

Today, blueberries are found in nearly 4,000 products including pet food and cosmetics.

**Varieties** – With California's numerous micro-climates, many different blueberry varieties can thrive in the state. There are hundreds of varieties, but only about a dozen are sold commercially. Farmers usually grow several varieties at a time. When blueberries are harvested, the varieties are combined which gives a batch of blueberries its varied colors, textures, and levels of sweetness. Each variety is unique in its size, shape, color, and taste.

**Commodity Value** – Over the past five years, blueberry production and consumption has almost tripled. California is one of the top six blueberry producing states in North America. In 2018-2019, blueberry growers received an average of \$4.05/pound. California moved 71 million pounds of blueberries into domestic and export markets. Most of the state's crop stays in California, with some transported to other states. About 12 to 15% is exported, with Canada, Japan, and Southeast Asia being the top international markets.

**Top Producing Counties** – With 80 individual producers, blueberries are grown throughout California. In the most recent season, California farmers produced blueberries in 28 counties on nearly 9,000 acres. The greatest blueberry acreage can be found in Tulare County, where blueberries are grown on roughly 2,400 acres. San Joaquin, Kern, and Fresno counties follow Tulare County in total acreage for blueberry production.

**Nutritional Value** – Blueberries are low in fat, a good source of fiber, and an excellent source of manganese. A one-cup serving of blueberries contains 80 calories and virtually no fat. One serving helps satisfy recommended daily fiber intake. Dietary fiber is important in maintaining digestive health and reducing the risk of heart disease. A single serving of blueberries delivers almost 25% of one's requirement of vitamin C, which helps the body maintain a healthy immune system. Blueberries are high in manganese. Manganese plays an important role in bone development and converting proteins, carbohydrates, and fats into energy.

**For additional information:**

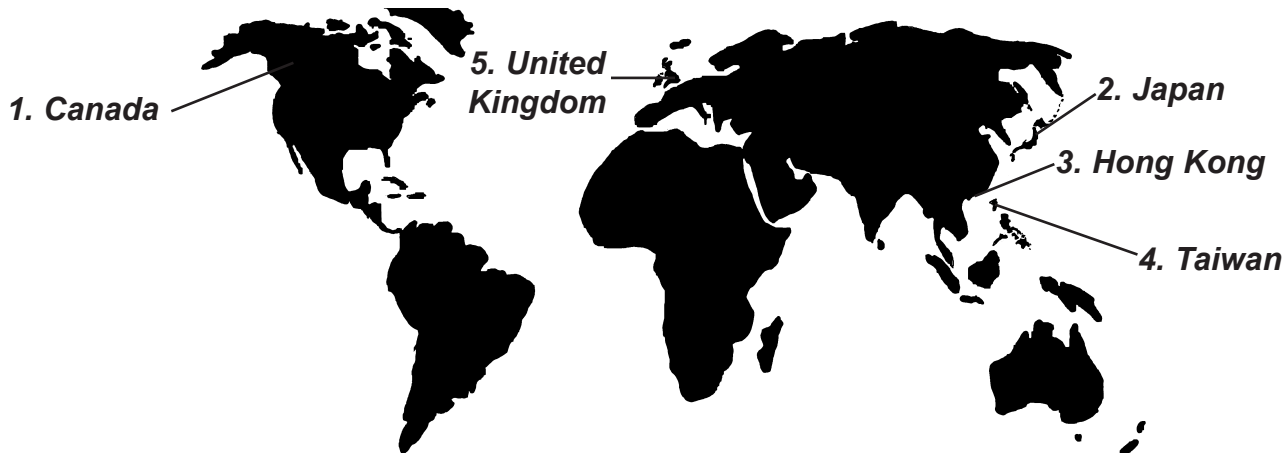
California Blueberry Commission  
(559) 221-1800  
Website: [www.calblueberry.org](http://www.calblueberry.org)

U.S. Highbush Blueberry Council  
[www.blueberry.org](http://www.blueberry.org)



# Blueberry Activity Sheet

Where are California's top 5 blueberry destinations?



## Lesson Ideas

- Make a family tree showing several subfamilies, genera, and species related to the Ericaceae plant family.
- Write an expository paragraph highlighting different ways Native Americans used blueberries for medicinal purposes.
- Investigate the history of fruit crate labels. Create a vintage-looking fruit crate label for California grown blueberries.
- Visit [www.calblueberry.org](http://www.calblueberry.org) and rewrite one of the recipes to serve your entire class.
- Create a bar graph comparing the vitamin C content of a variety of fruits and vegetables, including blueberries.
- Early American colonists made blue paint by boiling blueberries in milk. Experiment with making different shades of blue before painting a masterpiece.
- Compare the cost per pound of fresh, frozen, and canned blueberries. Make a bar graph highlighting your findings. Track the cost over time and create a line graph.

## Fantastic Facts

1. Blueberry bushes can grow up to 12 feet tall.
2. Blueberries are stored in large refrigerated rooms until they're taken to market.
3. The first commercial crop of blueberries was harvested in 1916.
4. Canada imports more California blueberries than any other country.
5. Tulare County has the greatest blueberry acreage.
6. One serving of blueberries provides the recommended amount of daily fiber.
7. Native Americans used wild blueberries for food and medicinal purposes.
8. Blueberry bushes grow best in acidic soil.
9. Fresh market blueberries are harvested by hand, while other markets (frozen, dried, canned) use machines.

## Lesson Plan: Testing Soil pH

**Introduction:** Blueberries require acidic soils. UC Cooperative Extension recommends a soil pH between 4.8 and 5.5. If you plant blueberries in neutral or alkaline soils (soil pH 7 or higher) the plants will yellow and grow poorly, if at all.

**Objective:** Students will test soil pH and determine if it is adequate for growing blueberries. Students may amend the soil to attain the proper pH requirements.

**California Standards:** ELA CC: RST.6-10.3, 7; NGSS: MS-LS1-5

**Materials:** pH test strips (available at most garden centers), hand trowel, distilled water

1. Brainstorm with the class what plants need to grow. Record ideas. Be sure to include space, water, air, soil, light, and nutrients. Explain that when we talk about soil, there are minimum requirements the soil must meet. One of these requirements is the pH, or acidity, of the soil.
2. Collect a soil sample from a potential planting site. The soil should be collected from approximately 5-10 centimeters below the soil's surface.

3. Place the soil in a bowl. Pour distilled water into the bowl until the soil has the consistency of a milkshake. Stir the mixture to ensure the water is fully incorporated.
4. Hold a pH test strip at the non-reading end and dip the strip into the dirt mixture for 20-30 seconds. Lift the pH strip from the water and dip it briefly in distilled water to clean off the dirt.
5. Use the color-coded key included in your pH test kit to read the pH of your soil.
6. Test the soil pH of several different sites around your home or school. Plot your data on a map. Provide a site recommendation based on evidence for planting blueberry bushes.
7. If your sites tested above pH 7, add acidifying material such as sulfur and ammonium-based fertilizers. Retest the soil. Add additional acidifying material, testing as necessary, until you reach the desired level. Continue to add material periodically to maintain a low pH.

## Commodity Fact Sheet

# Strawberries

Information compiled by the California Strawberry Commission

**How Produced** – Strawberries thrive along California's coast because western ocean exposure and Pacific winds insulate the fields from extreme temperatures and weather, providing the ideal conditions for growing strawberries almost year-round. Strawberry plants are grown in stock nurseries and then transplanted into fields where they grow for another three months before they begin producing fruit. Strawberries are grown all year long in California, with the peak strawberry season occurring in April, May, and June when volume rises from about a million trays per week to eight million trays. That is about 72 million pounds per week.

All strawberries are picked, sorted, and packed in the field by hand. Trays of strawberries are then rushed to shipping facilities where they are cooled to 32°F. Within 24 hours of harvest, fresh market strawberries are loaded on refrigerated trucks for delivery across the country. This unique and sophisticated distribution system ensures this highly perishable fruit reaches consumers in fresh-from-the-field condition.

**History** – This luscious fruit can be traced back as far as the Romans, and perhaps even the Greeks. Medieval stonemasons carved strawberry designs on alters and around the tops of pillars in churches and cathedrals, symbolizing perfection and righteousness. During the same time period, strawberries were served at important state occasions and festivals to ensure peace and prosperity.

The most common explanation for how the strawberry got its name is that children in the nineteenth century threaded the berries onto straw and offered them for sale. Fresh strawberries began to flourish in California in the 1950s due to improved cultural technologies.

California strawberry growers are leading research in ways to conserve water, protect the soil, and reduce fertilizer and pesticide use. One of the first agricultural groups to adopt drip irrigation technology to conserve water, they continue to invest millions of dollars in non-chemical farming methods. Progressive and sustainable farming practices include innovative integrated pest management (IPM) strategies that work with nature to control pests, advanced irrigation management practices, and new strawberry varieties that resist pests and diseases.

**Varieties** – Different varieties are suited to particular climates and growing regions. Southern California varieties are adapted for warmer temperatures and shorter daylight hours for early fruit production. Northern varieties have been selected for a longer production cycle, which extends through the fall. For more than 65 years, commercial varieties have been developed by pomologists at the University of California. Successes include the development of new commercial strawberry varieties now grown throughout the world and precedent-setting solutions to disease and pest control.



**Commodity Value** – Strawberries are among the top five most frequently consumed fruits, and consumption is steadily increasing. One in five families

reported eating more strawberries in the past year than previous years. In 2015, strawberries produced in California accounted for 88 percent of the U.S. strawberry production. Nearly 32,000 acres are devoted to strawberry production in California. Canada, Mexico, and Japan are primary export markets for fresh and frozen California strawberries. Today, strawberries represent a \$2.3 billion industry in California.

**Top Producing Counties** – California harvests more than two billion pounds of fruit annually. The leading counties in strawberry production include Santa Barbara, Orange, Ventura, San Diego, Monterey, Santa Cruz, and San Luis Obispo.

**Nutritional Value** – California strawberries are an excellent source of vitamin C, providing more than 100 percent of the recommended daily value, and are a source of potassium, folate, and fiber. Naturally low in sugar, a one cup serving of strawberries has only 45 calories. Research shows eating eight strawberries a day may improve memory, and reduce the risk of heart disease and some cancers.

### For additional information:

California Strawberry Commission  
(831) 724-1301

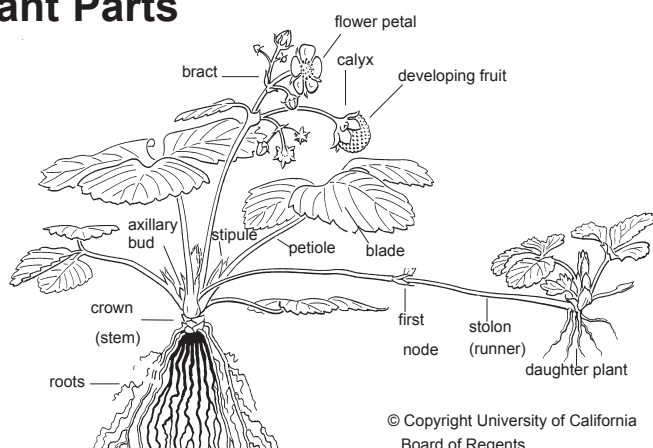
Website: [www.californiastrawberries.com](http://www.californiastrawberries.com)

CALIFORNIA  
**STRAWBERRY**  
COMMISSION



# Strawberry Activity Sheet

## Plant Parts



## Growing Season and Peak Production

		JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC
CENTRAL COAST and SANTA MARIA VALLEY*	Winter Plantings (short-day)												
	Winter Plantings (day-neutral)												
	Summer Plantings												
	Second Year												
SOUTHERN CALIFORNIA and OXNARD PLAIN*	Winter Plantings												
	Summer Plantings												

\* Strawberries are also grown in the San Joaquin and Central Valleys.

## Lesson Ideas

- Create a map of California highlighting the major counties where strawberries are grown.
- Estimate the number of seeds on a strawberry and devise a simple method for determining the number of seeds.
- Calculate the surface area and volume of a strawberry.
- Discuss different pests that affect strawberry production and methods for controlling these pests.
- Devise a method of estimating the quantity of strawberries produced on an acre of land.
- Write a paper entitled, "California—The Strawberry Capitol of the United States." Use [www.calstrawberry.com](http://www.calstrawberry.com) for your research.
- Discuss the advantages and disadvantages of hand and machine harvesting. Invent a machine to harvest strawberries.
- Analyze the economic impact export markets have on the California strawberry industry.

## Fantastic Facts

1. The average strawberry has 200 seeds.
2. Strawberries are harvested by hand.
3. Strawberries are typically propagated using vegetative reproduction.
4. One serving of strawberries contains more than 100 percent of the recommended daily value for vitamin C.
5. Strawberries do not continue to ripen after harvesting.
6. During California's peak production, 72 million pounds of strawberries can be picked in one week.
7. An average acre of California farmland can produce 21 to 27 tons of strawberries.
8. Strawberries are perennial plants, but are often planted annually.
9. California grown strawberries account for 88 percent of the nation's production.

## Lesson Plan: Make Your Own Strawberry Leather

**Introduction:** Strawberries can be used to make several tasty and nutritious snack foods.

**Objective:** Students will demonstrate measuring, food processing, and food safety skills as they make a strawberry treat.

**California Standards:** CC ELA: RI.3-5.3, 4; RST.6-12.3, 4  
CC Math: 3-4.MD.2, 5.MD.3

**Materials:** Strawberries (1½ cups per group of 4 students), light corn syrup, lemon juice, jelly roll pan, blender or food processor, masking tape, processor, plastic wrap.

### Procedure:

1. Place 1½ cups of clean strawberries in a blender or food processor and process until smooth.
2. Stir in ½ teaspoon lemon juice and 1½ teaspoons light corn syrup.
3. Line a jelly roll pan with heavy-duty plastic wrap, taping the plastic wrap to the corners of the pan with masking tape.

4. Pour the strawberry mixture into the pan, spreading evenly. Leave at least a one-inch margin on each side.
5. Dry in an oven at 150°F for seven to eight hours or until the surface is dry and no longer sticky.
6. Remove the leather and plastic wrap from the pan while still warm (hands must be clean and dry) and roll up in a jelly roll fashion. Cut into logs and store in plastic wrap for a maximum of five days. Have the students take their strawberry leather home or enjoy it as a class snack.
7. Math extension: Write the cooking measurements in standard units, such as milliliters, liters, or cubic units.

# Have a Berry Special Day!

**M**ixed berries are popular **super foods**. What makes them so super? They are packed with vital nutrients, such as **antioxidants**, that are important for good health. Examples of berries include blueberries, blackberries, raspberries, and strawberries.

**Blueberries** are **perennial, deciduous shrubs**. They are commonly grown as free standing shrubs. When the berry is a deep








blue color they are carefully hand-picked and rushed to nearby packing houses and then delivered fresh to the grocery store.

**Blueberries are an excellent source of antioxidants!**

**Blackberry** and **raspberry** plants start flowering in the spring and berries ripen in the summer. Some varieties are vine-like and are grown on trellises. When ready for harvest the blackberry will have a solid center while the raspberry is hollow.

Commercially, **strawberries** grow on plastic covered beds, close to the ground. On average, it takes 30 days for the fruit to ripen before being picked. When the strawberries are ready to be harvested they are hand-picked, placed in **clamshells** or other packaging, transported to a cooler, and delivered to stores or restaurants.

**Activity**  
Match the berries below to how they are grown and what they look like.

How they are grown	Type of Berry	What it looks like
	Strawberry	
	Blueberry	
	Blackberry	
	Raspberry	

Standards: ELA: Grade 3: Reading 2.1, 2.3, 2.6; Grade 4: Reading 2.2; Grade 5: Reading 2.1; Grade 6: Reading 2.1

**Activity**  
You and your family visit a local U-pick farm to pick fresh berries. They have three varieties in season: raspberries, blueberries, and strawberries. The raspberries and blueberries are \$3.25 per pound and strawberries are \$2.99 per pound. Calculate the cost of purchasing  $\frac{1}{2}$  a pound of raspberries,  $\frac{1}{4}$  pound of blueberries, and  $1\frac{3}{4}$  pounds of strawberries. Round to the nearest cent.

**Did You Know?**  
A bramble is a plant belonging to the genus Rubus, and includes raspberries, blackberries, and hybrids such as boysenberries.  
The strawberry got its name in the 19th century when children strung the berries onto straw and offered them for sale. Hence the name straw-berry.

**Standards:** Mathematics – Grade 3: Number Sense (NS) 3.3, 3.4, Algebra and Functions 2.1, Mathematical Reasoning (MR) 1.0; Grade 4: NS 1.3, 1.5, MR 1.2; Grade 5: NS 2.4, 2.5, MR 1.0; Grade 6: NS 2.3, 2.4, MR 1.0; Grade 7: NS 1.2, MR 1.0  
Sources: Highbush Berry Council www.blueberry.org, California Strawberry Commission www.calstrawberry.org, Network for a Healthy California Harvest of the Month www.harvestthemonth.com



# Strawberries Strategies

Californians love their berries. Strawberries grow especially well in our state because of the **temperate** climate from the coast. Here is a story of the many strategies people use to take extra care to grow scrumptious strawberries.



Photo by Neil Palmer (CIAT)

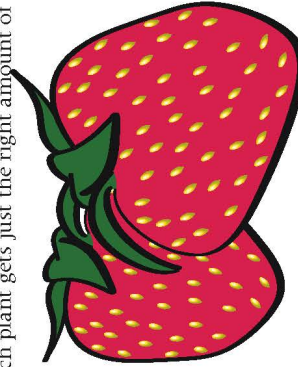
## Breeding

Growing strawberries starts even before they are planted. Scientists look for ways to make healthy strawberry plants by making them more **resistant** to pests and diseases.



## Growing

Strawberries grow in rows of raised beds, which makes them easier to harvest. The beds are covered in colored or clear plastic to help retain moisture, keep berries from the dirt, and maintain the shape of the bed for the long season. Drip irrigation is used to make sure each plant gets just the right amount of water.



**CA Standards:** ELA CC: RI.3-6.7, RI.3-5.8, SL.3-8.1, NGSS: MS-LS1-1, 2, 5-PS1-1, 4. **Sources:** California Strawberry Commission, [www.californiastrawberries.com](http://www.californiastrawberries.com); National Human Genome Research Institute, [www.genome.gov](http://www.genome.gov); ©2016 California Foundation for Agriculture in the Classroom. All Rights Reserved.



Photo courtesy Drecollis

## Planting

Virtually all strawberry plants in California start as runners trimmed from mother plants, grown at high-elevation nurseries in Northern California. Once strong and healthy, they are shipped to farms across the state, where they are planted by hand.



Photo by Holger Hubbs

## Harvesting

All strawberries are picked by hand. Strawberry harvesting teams work hard to pick each berry and pack it inside a **clamshell** container. The containers are placed inside trays that are quickly transported to shipping facilities where they are cooled.



Photo by Rusty Clark

## Selling and Shipping

Within 24 hours of being picked, the berries are loaded into refrigerated trucks and transported across the country and the world. 88% of the berries grown in the United States come from California. Berries are sold as fresh or frozen, or they are used as ingredients in other products.

## CAREER: Plant Pathologist



Cecilia Wilson,  
Plant Pathologist,  
Bayer CropScience,  
West Sacramento, CA

**What do you do in your job?** I run tests on plants to see how I can help them fight against pests and disease.

**What training did you need for your job?** I needed a bachelor's degree and lab experience. Much of my training was on the job.

**What is an interesting thing that you've learned in your job?** I've learned that plants can be plagued by multiple diseases at the same time.

**Anything else you'd like to add?** Everything looks so different at the microscopic level! I love that being a scientist can help farmers grow food to feed the world!

## Activity

### True/False

1. Strawberries have lots of Vitamin C. T/F
2. Strawberries each have about 50 seeds. T/F
3. California produces about 88% of our country's strawberries. T/F
4. Strawberries grow on trees. T/F
5. The country of Belgium has a strawberry museum. T/F

## Class Connection

Go to a grocery store produce section. Check strawberry labels or ask where the strawberries were grown. Mark the location on a map. Compare locations with other students' findings.

## STEM Activity: Strawberry DNA

Using common household items, you can separate and observe strawberry DNA. This experiment can be done in class, for a science fair, or even just for fun! Go to the website: [www.genome.gov/Pages/Education/Modules/StrawberryExtractionInstructions.pdf](http://www.genome.gov/Pages/Education/Modules/StrawberryExtractionInstructions.pdf)

Or visit [LearnAboutAg.org](http://LearnAboutAg.org) for another version in *Extra! Extra! Classroom Extensions*.

**Answers:** 1. True 2. False, strawberries have 200 seeds. 3. True, 4. False, strawberries grow on plants in fields. 5. True



# Colorful Fruits and Veggies

Many red fruits and vegetables contain important nutrients and **phytonutrients** that help to keep your heart healthy. Examples of red fruits and vegetables with high contents of vitamin C and/or fiber are listed.

**Red bell peppers, guavas, radishes, papayas, raspberries, pomegranates, and tomatoes.**

Some orange fruits and vegetables

are known for having beta carotene. Beta carotene is converted to vitamin A in your body, which is important for your vision, immune system, and skin. These listed are sources of beta carotene.

**Pumpkins, apricots, carrots, oranges, cantaloupes, sweet potatoes, and mangoes.**

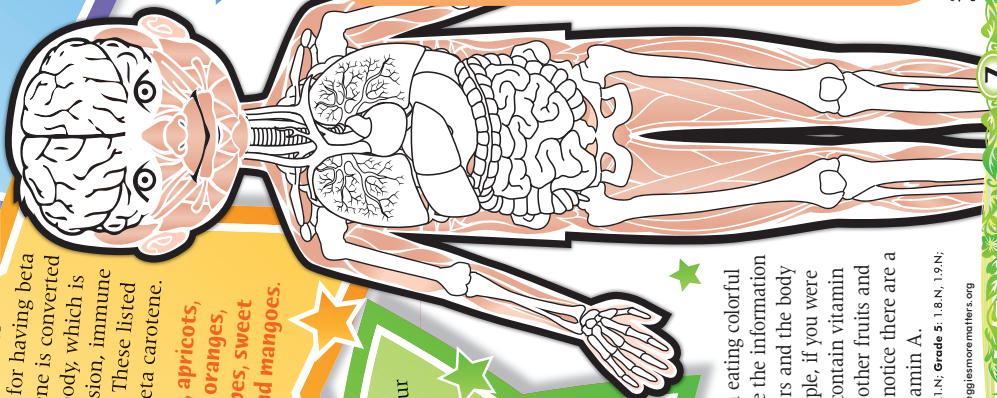
Several green vegetables

and fruits can be a good source of potassium, fiber and/or calcium. Potassium helps your heart beat correctly and assists your muscles in contracting. Fiber helps with digestion and calcium helps build strong bones.

**Broccoli, kale, artichokes, collard greens, spinach, pears, and kiwifruit.**

Many blue and purple fruits and vegetables contain phytonutrients that protect against cancer. These fruits and vegetables can improve memory and keep your heart healthy. These fruits and vegetables are a good source for vitamin C.

**Blackberries, plums, purple asparagus, purple onions, and blueberries.**



## Activity

Our bodies benefit from eating colorful fruits and vegetables! Use the information located in the colorful stars and the body at right to illustrate each of these benefits. For example, if you were to eat carrots, color the eyes orange because carrots contain vitamin A which supports healthy eyes and vision. Research other fruits and vegetables to find out what nutrients they contain – notice there are a variety of colors that can also be a good source of vitamin A.

**Standards:** Science – Grade 3: 3a; Nutrition and Physical Activity – Grade 4: 1.1.N; Grade 5: 1.8.N, 1.9.N; Grade 7 and 8: 1.2.N, 1.7.N  
Sources: MyPlate [www.myplate.gov](http://www.myplate.gov); Fruits and Veggies: More Matters [www.fruitsandveggiesmatters.org](http://www.fruitsandveggiesmatters.org)



## Design Your Meal Activity

**Materials:**

- Newspaper ads
- Paper plate
- Magazine
- Scissors
- Glue

The MyPlate food icon shows us how to create a healthy meal, including specific proportions of the five food groups: fruits, vegetables, protein, grain, and dairy. Fill half your plate with a colorful rainbow of fruits and vegetables. Using a grocery store ad, cut out healthy foods you like from each of the food groups. Glue the food onto the plate in the appropriate place to create YourPlate!

**Dig Deeper:** Calculate the total cost of your meal using the advertised price. Visit [www.foodapedia.gov](http://www.foodapedia.gov) to calculate the nutritional value of the meal.

**Standards:** Health Education – Grade 4: 1.2.N, 7.3.N; Grade 5: 1.1.N, 5.1.N

## Activity

### Class Survey

Survey your class to determine food preferences. First, select one of the five food groups: fruits, vegetables, protein, dairy, grains. The food group you select will determine the theme for your survey. Next, think of at least five different foods that are in your selected food group. For example, if you chose fruits you might list peach, cherry, mango, grapes, and kiwifruit. Survey your classmates, asking which of these five foods they prefer. Create a bar graph in the space provided to illustrate your results.

Survey

(Write in the food group you selected.)


**Standards:** Mathematics – Grade 4: Statistics, Data and Probability 1.3, Mathematical Reasoning 2.3; Grade 5: Statistics, Data and Probability 1.2; Mathematical Reasoning 2.3; Grade 6: Statistics, Data and Probability 2.1, 2.2, Mathematical Reasoning 2.3  
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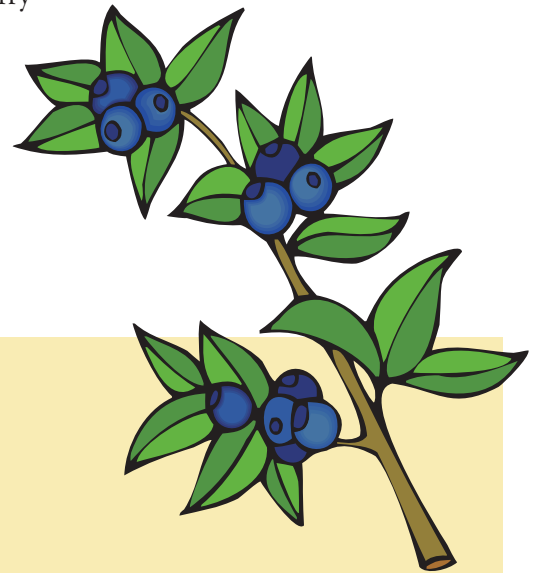
**The Facts**

Blueberries are one of the most versatile fruits that can be found in more than 4,000 different food products including pet food and cosmetics. A single serving, one cup, of fresh blueberries (approximately 75 to 80 berries) delivers a variety of vitamins and minerals, including 25% of the daily recommendation of Vitamin C. A serving of blueberries also offers the daily recommended amount of manganese, that plays an important role converting proteins, carbohydrates, and fats into energy. **Which blueberry snack fuels you with energy?**

**Nutritious Blueberries Examination**

1. Examine the 5 provided blueberry nutrition labels or use 5 labels from real blueberry products to analyze which snack option fuels you with energy.
  - a. Make sure to write down your initial claims in case they change.
2. Comparing the 5 blueberry nutrition labels, identify similarities and differences between the nutrition labels. Focus on the protein, fats, and carbohydrates.
3. Work with a partner to circle which food label you determine to be the healthiest choice for you and provides the body the most energy.
4. Write a Claim Evidence Reasoning (CER)\* about why the selected blueberry food label provides a healthy snack option for a quick burst of energy and is the healthier option when compared to other choices.
5. Have students present their snack choice to the class and allow them to respond to feedback from their peers that may have chosen another blueberry food item.

\* Claim Evidence Reasoning (CER): To do a proper CER make a claim, provide evidence that supports your claim. Then provide reasoning to defend your claim.

**Materials**

- Download a copy of the **Blueberry Nutrition Labels** for each group at [LearnAboutAg.org/agbites](http://LearnAboutAg.org/agbites). (Five real blueberry product labels can be used in place of the worksheets.)
- Download a copy of the CER worksheet for each student at [LearnAboutAg.org/agbites](http://LearnAboutAg.org/agbites).

**Tip**

When examining the nutritional label, always note the serving size per package or container.

**Classroom Activities**

- Determine which snack would provide the most energy using a conversion rate of carbohydrates, proteins, and fats.
- Research the pH level needed to grow blueberries and how it ties to where they are grown in California.
- Research the origin of blueberries using the Blueberry Fact and Activity Sheet at [LearnAboutAg.org/resources/fact](http://LearnAboutAg.org/resources/fact).
- Compare and contrast the appearance, growing methods, and market for organic and conventionally grown blueberries. Display the information in a graphic organizer.
- Use blueberries as a natural dye to make cloth art.
- Determine what percentage of the class likes each blueberry product provided. Create a graph with the class results.

**California Standards****Grade 5**

Health Education Content:  
1.2.N, 1.6.N, 7.1.N

**Grade 6**

NGSS: MS-LS1-6  
ELA CC: RST.6-8.1

**Grades 7-8**

Health Education Content:  
1.2.N, 1.6.N, 5.1.N  
ELA CC: RST.6-8.1

Using strawberries to learn about the pH scale.

### The Facts

From the baking soda we add to cookie dough to the slightly acidic soil we grow strawberries in, pH is all around us. The pH scale is how we quantify how acidic or basic something is. Today we will determine where strawberries fall on the pH scale.

### Activity

1. Place the strawberries in a large bowl and mash.
2. Label three cups: puree, puree with lemon, and puree with baking soda. Equally divide the puree into the three cups.
3. Add nothing to the cup labeled puree. Stir one tablespoon of lemon juice into the cup labeled puree with lemon. Stir  $\frac{1}{4}$  teaspoon of baking soda into the cup labeled puree with baking soda.
4. Dip one pH test strip halfway into each cup. Immediately remove the strips and place them onto a piece of copy paper. After a few seconds, record the pH level. Use the pH scale in the sidebar to compare the three strawberry solutions.
5. Taste the strawberry solutions and share observations. Invite students to use the claim, evidence, reasoning (CER) model to analyze each mixture.
6. To learn more about strawberry production, growing challenges, and nutritional benefits, download Ag in the Classroom's Strawberry Fact Sheet from [learnaboutag.org/resources/fact](http://learnaboutag.org/resources/fact).



### Classroom Activities

#### Nutrition

- Use food labels to compare the nutritional value between frozen, fresh, or dried strawberries. Is there a difference?

#### Math

- Research the price of strawberries at different times of year. Create a graph to show the price differences and construct a CER argument as to why the price fluctuates throughout the year.

#### Science

- Identify ways that agriculturists can change the pH of the soil to maximize plant health.
- Research the parts of a strawberry plant. Dissect the fruit and label the different parts using online resources as a guide.
- Prepare and test the pH value of other fruits and vegetables by first creating a puree and then measuring the pH. Illustrate your results with a color-coded spectrum similar to the one in the sidebar.

### California Standards

#### Grade 6-8

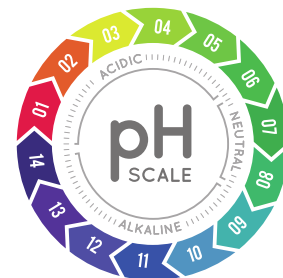
NGSS: MS-PS1-2

ELA CC: RST.6-8.1

### Materials

- 1 (16 oz) carton of fresh strawberries or (thawed) frozen strawberries
- 1 tablespoon lemon juice
- $\frac{1}{4}$  teaspoon baking soda
- pH test strips
- Blender or large fork to mash
- Three 8-ounce cups
- Spoons
- Large bowl
- Stir sticks or spoons
- Copy paper

### Tip



Examples:

Stomach Acid (1)

Lemons or Limes (2)

Strawberries (3)

Tomatoes (4)

Artichokes (5)

Milk (6)

Distilled Water (7)

Sea Water (8)

Baking Soda (9)

Milk of Magnesia (10)

Ammonia (11)

Hand soap (12)

Household Bleach (13)

Drain Cleaner (14)

# Imagine This...



## The Strawberry Owner

By Valerie Nava

2020 *Imagine this...* Story Writing Contest Winner

4th Grade, Ronald Reagan Elementary

Chris Lavagnino, Teacher

Madera County

**L**illian and her family grew lots of strawberries in the fields around their house in Chowchilla, California. On her 10th birthday, she asked for something she really, really wanted: a pet dog. “Can I please get a pet today?” Lillian asked. “No, I don’t think you’ve earned that kind of responsibility,” said her mom. “But it’s my birthday,” Lillian whined. “Since you don’t do your chores, you have not shown how responsible you can be,” said her dad. “Remember, strawberries are our livelihood. We need to have our patches ready for harvest each day during the springtime in the Central Valley.” “But Dad, I learned at school that most California strawberries are grown in coastal regions, like Monterey and other coastal counties. Why is our patch so important?” “Mija, Central Valley strawberries are just as important – and delicious – to the people who live here,” explained Dad.

Lillian barely heard his answer, because she was already starting her chores. One Saturday morning, one of her chores was to pick strawberries by hand. As she picked them one by one, she knew that she needed to put the ripe ones in her basket immediately; otherwise she might be tempted to eat them all! As she worked, she heard a small sound from the ground. “Hi,” said a sweet voice. “Who said that?” questioned Lillian. “Mmmm me,” was the whispered response. “Whooo?” questioned Lillian. “Where are you?” “I’m down here,” whispered the strawberry. Lillian looked down and saw a strawberry rolling around in the small patch by her foot. “Am I seeing things?” said Lillian. “Nope,” said the strawberry. “Okay, I think I am going to faint,” explained Lillian. “Please don’t fall on me,” said the strawberry. “I don’t want to become jam!” After a moment, the strawberry asked, “I was just wondering: What is that stuff on your face? It looks like you got rained on, but the sun is shining!” “I’ve been crying. But maybe you can help me! I really want to get a pet, but my parents won’t let me,” said Lillian. “Why won’t they? You seem berry responsible to me. I watched how careful you were at picking my cousins and how gently you placed them in your basket,” said the strawberry. “They said that I am not responsible and that I do not do my chores,” said Lillian. “Well, is that true?” asked the inquisitive berry. “Well, I guess I have been kind of lazy lately,” considered the girl. “But it is important for everyone to do their part on the family farm. I sure don’t want my mama and papa having to do extra work because of me.”



Lillian thought about all the long hours her parents worked on the farm each day. “Yeah, I really do need to start helping more.” “That is a great idea! Then they will see how responsible you really are,” said the strawberry excitedly. Lillian began to brainstorm all the extra things she could do around the property. During the morning, she and the berry talked about the history of strawberries and how they got their names. As she was packing things away for the day, she had one final question for her little red friend. “I’ve always wondered: How many seeds do you have?” “Well, I’m not sure. I was told by my great-grandberry that we sometimes have as many as 200 seeds.” “Wow, imagine how many new berries might grow from you!” The strawberry blushed.

For the next several weeks, Lillian did all of her chores and a few extra things to help out her parents around the farm. Her parents noticed. “We are very proud of you, Lillian. You have been much better with your chores,” said her dad. “Oh my – you did all your work. I think you deserve a pet,” said Lillian’s mom. “Thank you so much! I really appreciate it,” said Lillian in excitement. And later that day, Lillian got to go to the pet store to choose her puppy.

Now each day when her chores are done, the three friends take afternoon walks together. Lillian’s parents often look out from the house admiring the change in their daughter’s attitude and of her maturing attitude about daily living on a farm. But no matter how much they try, her parents can still not figure out what the little red bump on the dog’s back really is.

**Learn more about the “Imagine this.. Story Writing Contest”  
by visiting [LearnAboutAg.org/imaginethis](http://LearnAboutAg.org/imaginethis) !**

