

Harvest of the Month



Network for a Healthy California

Health and Learning Success Go Hand-In-Hand

With Standardized Testing and Reporting (STAR) taking place in the spring, it is important for students to eat nutritious meals and snacks and get at least 60 minutes of physical activity every day. Studies show that students who eat less fruits and vegetables show decreased performance in the classroom. Studies also show that physical activity is correlated with improved academic performance. *Harvest of the Month* connects with academic standards to help students learn about the importance of eating fruits and vegetables and being active every day.

Exploring California Strawberries: Taste Testing

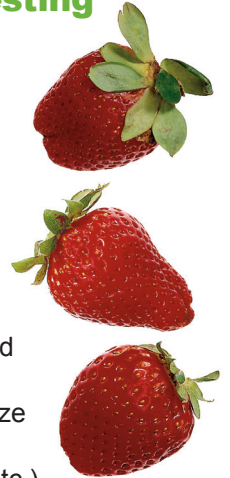
What You Will Need (per group of 6 students):

- 6 small strawberries and 6 large strawberries
- Printed Nutrition Facts label for strawberries*
- Paper and colored pencils

*Download label from www.harvestofthemonth.com.

Activity:

- Make two columns on a sheet of paper.
- Explore and taste the large strawberries; note in the first column the color, texture, smell, and flavor.
- Repeat with the small berries, noting characteristics in the second column.
- Compare and contrast the large and small strawberries; which size was sweeter?
- Discuss what may affect the taste and size (variety, sun, water, etc.).
- Review Nutrition Facts label and talk about the health benefits of eating strawberries (refer to *Reasons to Eat* below). Have students write down what they like best about strawberries and their favorite ways to eat them.



Nutrition Facts

Serving Size: ½ cup strawberries, sliced (83g)	
Calories 27	Calories from Fat 0
% Daily Value	
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 1mg	0%
Total Carbohydrate 6g	2%
Dietary Fiber 2g	7%
Sugars 4g	
Protein 1g	
Vitamin A 0%	Calcium 1%
Vitamin C 81%	Iron 2%

STRAWBERRIES

Cooking in Class: Strawberry Smoothie

Makes 24 tastes at ¼ cup each

Ingredients:

- 1 cup 100% orange juice
- 2 large bananas, peeled and sliced
- 2 cups fresh or frozen strawberries, thawed
- 2 cups lowfat vanilla yogurt
- 10 ice cubes
- Blender
- Paper cups

1. Combine orange juice, banana, and half the strawberries into a blender container. Blend until smooth.
2. Add yogurt, remaining strawberries, and ice cubes. Blend until smooth.
3. Serve immediately in cups.

Hint: You may need to prepare in two batches.

Nutrition information per serving:

Calories 38, Carbohydrate 8 g, Dietary Fiber 1 g, Protein 1 g, Total Fat 0 g, Saturated Fat 0 g, Trans Fat 0 g, Cholesterol 1 mg, Sodium 19 mg

Adapted from: *Soulful Recipes: Building Healthy Traditions*, Network for a Healthy California, 2008.

Reasons to Eat Strawberries

A ½ cup of sliced strawberries (about 4 large strawberries) provides:

- An excellent source of vitamin C* – more than 80% of the recommended Daily Value.

- A source of fiber and folate.

*Learn about vitamin C on page 2.

Champion Sources of Vitamin C*:

- Bell peppers
- Broccoli
- Citrus fruit
- Cantaloupe
- Cauliflower
- Kiwifruit
- Leafy greens
- Strawberries

*Champion sources provide an excellent source of vitamin C (at least 20% Daily Value).

For more information, visit:

www.nal.usda.gov/fnic/foodcomp/search/ (NDB No.: 09316)

What is Vitamin C?

- Vitamin C acts as an antioxidant, meaning it helps reduce damage to cells caused by oxidation. Cellular damage can lead to certain diseases.
- The role of vitamin C (ascorbic acid) may be linked to its prevention of degenerative diseases, certain cancers, and cardiovascular diseases.
- Humans do not have the ability to produce vitamin C. We must obtain it through the foods we eat in our diet.
- Vitamin C is sensitive to air, heat, and water and can be lost when exposed in excess. To prevent loss of vitamin C in fresh fruits and vegetables, avoid prolonged storage, over-cooking, and processing.

Sources:

<http://jn.nutrition.org>
<http://lpi.oregonstate.edu>

How Do Strawberries Grow?

Strawberries grow on small, low growing perennials that prefer well-drained, sandy soil. The plants need plenty of water, warm days, and cool nights.

Many strawberry plant varieties produce stolons that spread out from the base and take root to form new plants. The plants produce white or pink flowers. After flowering, strawberry plants require pollination by bees or other insects. Factors such as cool or wet weather, which discourages bee activity, can have a damaging affect on fruit production. Growing conditions also affect the time required to produce fruit. On average it takes about 30 days for flowers to develop into fruit. The first crop can be harvested the year following planting.

There are three basic types of strawberry plants:

- **June-bearing plants** produce a single crop each year, usually lasting three to five weeks in late spring.
- **Day-neutral plants** produce fruit the same year in which they are planted and can produce berries throughout their year-long growing season since they are not dependent on day length to produce flower buds.
- **Ever-bearing plants** produce fruit twice per year, usually in late June to early July and again in late August. Because they produce few berries, they are rarely used for commercial production.

While strawberry plants can survive and produce fruit for many years, commercial strawberry plants are replaced every two to four years.

Strawberries are delicate and must be picked by hand when ripe. They are then taken to cooling facilities to help them last longer.

See the *School Garden* activity (page 3) to grow your own strawberry patch.

For more information, visit:
www.calstrawberry.com

Botanical Facts

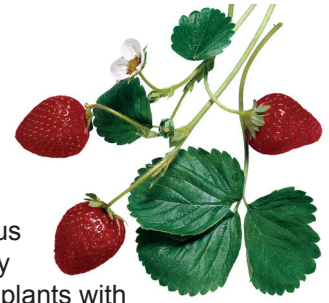
Pronunciation: strô´bĕrĕ

Spanish name: fresa

Family: Rosaceae

Genus: *Fragaria*

Species: *Fragaria virginiana*



Strawberries belong to the genus *Fragaria* in the rose family. They are low, herbaceous, perennial plants with edible fruits that are called an “accessory fruit.” This means the fleshy part is not derived from the plant ovaries, but from the peg of the hypanthium that holds the ovaries.

There are about 12 species of strawberry plants. The common wild strawberry, *Fragaria vesca*, is believed to have been the first species cultivated in the early 17th century. Botanists then found other garden varieties: *Fragaria elatior*, a European species and the parent of *Fragaria virginiana* from the United States. About this time, *Fragaria chiloensis* was discovered on an island off the coast of Chile. Today, nearly all varieties can be linked to these four species.

California has several strawberry varieties in commercial production, each with its own characteristics, advantages, and harvest time. Some varieties include Aromas, Camarosa, Camino Real, Diamante, and Ventana.

For more information, visit:

www.urbanext.uiuc.edu/strawberries/

How Much Do I Need?

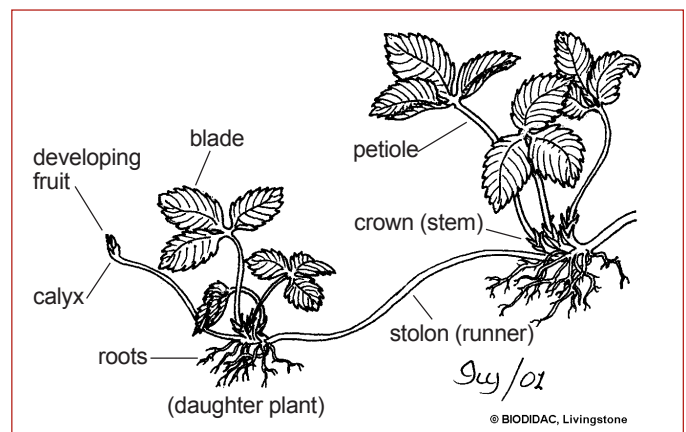
A ½ cup of sliced strawberries is about four large strawberries or one cupped handful. The amount of fruits and vegetables each person needs depends on age, gender, and physical activity level. Have students visit www.mypyramid.gov/kids to find out how much they need to eat. Encourage them to eat a variety of colorful fruits and vegetables – fresh, frozen, canned, and dried – in meals and snacks to help them reach their goals.

Recommended Daily Amount of Fruits and Vegetables*

	Kids, Ages 5-12	Teens and Adults, Ages 13 and up
Males	2½ - 5 cups per day	4½ - 6½ cups per day
Females	2½ - 5 cups per day	3½ - 5 cups per day

*If you are active, eat the higher number of cups per day.

Visit www.mypyramid.gov to learn more.



School Garden: Plant a Strawberry Patch

If your school has a garden, here is an activity you may want to implement. Look for donations to cover the cost of seeds, tools, irrigation systems, electric pumps, and any salary incurred by garden educators or others.

Growing strawberries in a school environment is easy and an enjoyable learning experience for students. To get started, all you need are strawberry plants and a growing area that gets at least six hours of sunlight every day*.

Growing Tips:

- Plant strawberries on a cloudy day or in the late afternoon.
- Strawberries prefer a well-drained soil, rich in organic matter.
- Set the strawberry plant in the soil so that the soil is just covering the tops of the roots. Do not cover the crown.
- Plants should be set 18 to 30 inches apart in rows of three to four feet apart. This will allow daughter plants to root freely and to become a matted row.
- Do not plant strawberries where peppers, tomatoes, eggplant, and potatoes have been grown. These plants could harbor verticillium wilt, a major strawberry disease.
- Strawberry plants need about one inch of water per week.
- After four or five weeks, plants will produce runners and new daughter plants.

*Refer to *How Do Strawberries Grow?* on page 2 for plant varieties.

Adapted from: www.urbanext.uiuc.edu/strawberries/growing.html

For more ideas, visit:
www.kidsgardening.com/teachers.asp

Student Sleuths

- 1 What is the recommended daily amount for vitamin C, folate, and fiber? For each of these three nutrients, how much (in % Daily Value) does a ½ cup of strawberries provide?
- 2 How does vitamin C work as an antioxidant? What are the best food sources of vitamin C?
- 3 Describe the role vitamin C plays in the human immune system.
- 4 Research the different theories on the origins of how the strawberry got its name. Which theory do you think is most plausible?
- 5 What does the red color of strawberry flesh tell you?
- 6 Identify four factors that can influence the flavor of a strawberry.
- 7 Map the various regions in California where strawberries are grown. Identify their growing season and main varieties produced. Compare the regions — why does each region grow a different variety? What factors affect when and what variety of strawberries are grown? Hypothesize why California is the nation's leading strawberry producer.

For information, visit:
www.calstrawberry.com
www.cfaic.org/factsheets/pdf/Strawberries.pdf

A Slice of Strawberry History

Strawberries have a history that goes back more than 2,000 years. They are indigenous to both the northern and southern hemispheres. Strawberries grew wild in Italy where the first mention of strawberries occurred in the writings of Cato, a Roman Senator.

European explorers discovered strawberries in North America in 1588 when they landed on the shores of the state of Virginia. The explorers found tiny, sweet, deep red, wild strawberries. Early settlers in Massachusetts enjoyed eating strawberries grown by local American Indians who cultivated them as early as 1643.

The first "refrigerated" shipping across the United States occurred in 1843 when innovative growers in Cincinnati, Ohio spread ice on top of the strawberry boxes and sent them by train. By the middle of the 1800s many regions were cultivating strawberries. Strawberries have been grown in California since the early 1900s.

For more information, visit:
www.ba.ars.usda.gov/fruit/services/strawhist.html

Home Grown Facts

- California is the largest producer of domestically grown strawberries, supplying almost 90% of the strawberries grown in the United States*.
- On average, more than 30,000 acres produce over one billion pounds of fresh and frozen strawberries.
- If all the strawberries produced in California this year were laid berry to berry, they would wrap around the world 15 times – enough to provide every household in the United States with 12 one-pint baskets.
- There are four main growing regions for strawberries in California (see map), each with different growing periods.

*2008 Data

For more information, visit:
www.cdffa.ca.gov



Adventurous Activities

Creative Writing:

- Discuss the advantages and disadvantages of hand and machine harvesting fruits and vegetables.

History Exploration:

- Trace the history of the cross-pollination of the Virginia and Chilean berries.
- Research some medicinal uses of strawberries.

Science Investigation:

- Without cross-pollination, we would not have the strawberry genotypes available today. Explain what a genotype is. Explain the cross-pollination process versus self-pollination.

For more ideas, visit:

www.cafarmtoschool.org

www.nal.usda.gov/kids



Just the Facts

- Strawberries are usually the first fruit to ripen in the spring.
- The seeds of the strawberry are really the fruit while the red fleshy part is the receptacle that holds the parts of the flower together.
- On average, there are 200 tiny seeds on every strawberry.
- Strawberries are the most popular berry in the United States.
- Ninety-four percent of American households consume strawberries.
- On average, Americans eat more than three pounds of fresh strawberries each year plus another almost two pounds of frozen strawberries.

Cafeteria Connections

Partner with school nutrition staff to conduct a contest over several days in the cafeteria. Use questions based on information contained in this newsletter. For example:

- Why is it important to eat foods containing vitamin C?
- What is the average number of seeds on a strawberry?
- What is the Spanish word for strawberry?
- What is the botanical name for strawberry?

You can also create your own questions or have older students develop questions and then find the answers. Post questions on the cafeteria bulletin board at the beginning of the week. Then post the answers on Friday. Draw names of the “winners” and have a Strawberry Smoothie* Party.

*Refer to recipe on page 1.

For more ideas, reference:

Fruits and Vegetables Galore, USDA, 2004.

Physical Activity Corner

Students who get regular physical activity have demonstrated better performance on academic tests. During spring testing, help your students get at least 60 minutes of physical activity every day, in addition to encouraging them to make healthy eating choices. Complete the following activity in conjunction with the *What's on a Label?* activity*.

What You Will Need:

- 4 cones or 2 long pieces of yarn/rope to make a “start” and “finish” line about 20 paces apart

Activity:

- Students line up along start line.
- Read off the name of a food, nutrient, or activity.
- Students decide if they should eat more or less of the food or nutrient, or do more or less of the activity.
- If decide to get more, take two jumps forward. If decide to get less, take one jump backward.
- As game progresses, switch the locomotor skill to move forward/backward (running, hopping, skipping, crawling).

*This activity can be found in the *School Idea & Resource Kits* (Activity 8, 4th Grade and Activity 9, 5th Grade). Download kits from <http://www.cdph.ca.gov/programs/cpns/Pages/PowerPlayResources.aspx>.

Adapted from: *Power Up for Learning, Network for a Healthy California—Children's Power Play! Campaign*, 2009.

Student Champions

Since strawberries are easy to grow, have students design “Strawberry Instructions” packs that include strawberry seeds, nutrition facts, history, and fun illustrations. Send to local elder care centers, after-school programs, or youth activity centers, and offer to help plant the seeds. Or, have students distribute to families at your school's Open House.

Literature Links

- **Primary:** *From Seed to Plant* by Gail Gibbons, *Berries, Nuts and Seeds* by Diane Burns, *Gabe's Grocery List* by Heidi Shelton Jenck, and *Farmer's Market Rounding* by Julie Dalton.
- **Secondary:** *The Reason for a Flower* by Ruth Heller, *Strawberry Girl* by Lois Lenski, and *Sell What You Sow* by Eric Gibson.

For more ideas, visit:

www.cfaitc.org/books



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