

Taste and Teach

March - Asparagus



Five **Fun Facts** About Asparagus!

- Asparagus can continue to grow after being cut!
- Typically, one bunch of asparagus contains 10 to 12 spears.
- Asparagus is harvested by hand.
- Typically, the thicker, greener spears of asparagus are more tender.
- The lily flower is related to asparagus.

Three **Fun Teaching Ideas!**

- Measure and calculate the diameter of asparagus spears. Determine whether each one would be classified as standard, large, extra large or jumbo. See the *Asparagus Ag-Bite* activity and its supplemental worksheet.
- Science experiment: place cut asparagus in a jar with water, along with tulips or daffodils. Measure any growth that occurs.
- Take a poll! Have students raise their hands to show whether or not they have ever eaten asparagus before. Determine which students like or dislike asparagus. Graph and compare the findings.

Explore all the great asparagus resources in this section!

Commodity Fact Sheet

Asparagus

Information compiled by the California Asparagus Commission

How Produced – Asparagus is the growing shoot of a perennial plant raised in furrowed fields. Commercial plantings take two or more years to grow from seed to crowns. As the crowns grow, they develop buds that push up as asparagus spears every spring. The number of buds on a crown increases each year of production. A typical commercial crown is harvested for 10 to 15 years.

Individual spears with compact, tight heads, and vivid green color are harvested when they are about nine inches long. Each day, workers walk the furrows selecting choice spears and cut them by hand. An individual crown produces different sized spears. Earlier in the season, the plants produce thicker spears, which are the most tender.

While the harvest season lasts only 60 to 90 days in each production area, California's wide range of microclimates allows for fresh asparagus to be available from January through May with a small amount in September and October.

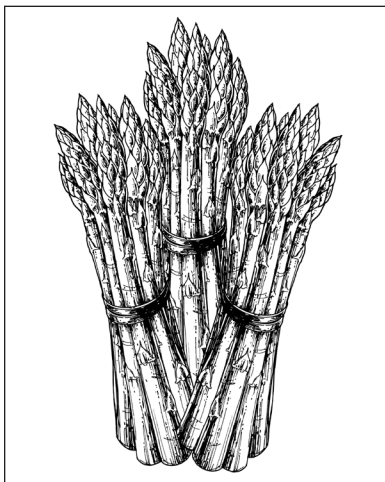
The asparagus is graded and packed in sheds located near the fields to assure maximum freshness. Spears are typically bundled into one-pound bunches, containing 10 to 12 spears, and placed into 30 pound crates specially designed for safe transport. A moist, absorbent fiber pad is placed at the bottom of the crates to prevent drying. Space is left at the top to allow for elongation of spears, which continue to grow. The boxed asparagus is rapidly cooled to a temperature of 34°F to 37°F. Careful handling at every stage of transit is the key to retaining superior flavor, texture, and nutritional content.

History – Asparagus is a member of the lily family (Liliaceae). Its name comes from the Greek language meaning "sprout" or "shoot." Cultivation began more than 2,000 years ago in the eastern Mediterranean. Ancient Greeks and Romans prized asparagus for its unique flavor, texture, and medicinal qualities. It was eaten fresh when in season and dried for winter use.

In the sixteenth century, asparagus gained popularity in France and England. From there, the early colonists brought it to America. Asparagus was first planted in California during the 1850s in the San Joaquin Delta. In addition to the Delta, today's production is centered in the Central Coast, Southern California desert, and Central Valley.

Varieties – Asparagus is available in a variety of sizes; however, size has no bearing on flavor, texture or tenderness.

Today, 98 percent of California's asparagus production is marketed as a fresh green product with the remaining two percent used for processing.



The most common variety is University of California 157 (UC157), which is adapted for warm temperatures and moist soils. Other green-colored varieties include Brock and Ida Lea. The University of California has developed a new variety, UC115, which will soon be in commercial production. It has a longer green stock and tighter tip than current, commercial varieties. Asparagus is also available in white and purple. White asparagus, which grows from the same crown as green asparagus, is shielded from the sun by straw or dirt to prevent the plant from developing chlorophyll, a photosynthetic green substance. Purple Passion produces purple spears which turn green when cooked.

Commodity Value – California produces approximately 70 percent of the nation's supply of fresh asparagus. The value of this California crop has declined because of increased foreign competition. California currently produces about 30 million pounds of asparagus yearly on 11,500 acres. Growers export nearly 20 percent of their production to countries including Canada, Japan, and Switzerland.

Top Producing Counties – Asparagus producing counties include Imperial, Monterey, Fresno, Contra Costa, Kern, Sutter, Kings, Merced, Sacramento, and San Joaquin.

Nutritional Value – Asparagus is low in calories, contains no sodium or fat, and is an excellent source of potassium, folic acid, and dietary fiber. One five-spear serving contains 20 calories and two grams of protein. Asparagus contains antioxidants which are beneficial in the prevention of certain cancers and is a significant source of vitamin C, vitamin B₆, and thiamin.

For additional information:

California Asparagus Commission
(916) 690-3911
Website: www.calasparagus.com



Asparagus Activity Sheet

History of California Asparagus Production



◀ #1

1850s-Migrant families started growing asparagus in the Stockton/Sacramento Delta. Harvested by hand, farmers also used horse and plow to work the fields.



◀ #2

1930s-Asparagus was taken to the docks by truck and then loaded on to ferries where they found their way to San Francisco or Sacramento—the product was then loaded on to railcars and shipped by rail all over the U.S.



◀ #3

1950s-Farmers began producing more green than white asparagus because consumers liked it more. Both were usually processed in cans.



◀ #4

1970s- Another change in consumer preferences led the industry to produce and ship fresh asparagus to grocery stores rather than a canned or frozen product. This change resulted in the need for faster transport to the marketplace. Farmers began to use semi-trucks and airplanes to get their product to market.

1980s- Asparagus was first shipped in refrigerated containers aboard airplanes to destinations all over the world.



◀ #5

Today-Fresh asparagus is still harvested and packed all by hand—just as it was 150 years ago. But, today's asparagus farmer uses tractors rather than horses and ships fresh green asparagus to consumers all over the world.

Lesson Ideas

- Asparagus is measured one inch above the bottom of the stem. Using various sizes of asparagus, determine the circumference, radius, and diameter at this point.
- Bring in a unique asparagus recipe to share. Convert the ingredient measurements in order to provide enough servings to feed the whole class.
- Place cut asparagus spears, tulips, and daffodils in a glass of water. Calculate any growth that occurs.
- Calculate the number of standard crates needed by a grocer who wants to stock 200 lbs. of asparagus.
- On a map, locate California's primary asparagus production regions.

Fantastic Facts

1. The lily, a type of flower, is related to the asparagus plant.
2. Asparagus contains protein, potassium, fiber, vitamin C, vitamin B6, and antioxidants.
3. There are 10 to 12 spears in a typical one-pound bunch of asparagus.
4. White asparagus is green asparagus that has not been exposed to the sun.
5. Asparagus is harvested by hand.
6. Labor accounts for 75 percent of the cost of growing asparagus.
7. Asparagus can continue to grow after it is cut.

Lesson Plan: Asparagus! It's All About Teamwork!

Introduction: It is important to understand that both cooperation and competition are valuable yet challenging components of the business world. This is especially true in asparagus production. More than 75 percent of asparagus production costs are associated with labor including planting, harvesting, packaging, and shipping. Additionally, in recent years the value of California asparagus production has declined due to international competition in places where labor costs are lower.

Objective: Students will plan, perform, and compare methods for harvesting asparagus in this classroom simulation.

California Standards: NGSS: 3-5-ETS1-1, 3-5-ETS1-2, MS-ETS1-1, MS-ETS1-2, HS-ETS1-3

Materials: Green construction paper, scissors, shoe boxes, rubber bands.

Procedure:

1. Divide the students into teams of five or six students.
2. Designate one area "the field" where you place 10 sheets of green construction paper and two pairs of scissors for each group.

3. Designate another area, at least 25 feet away, as "the end of the field row." Place 20 rubber bands and a shoe box at this end for each group.
4. Explain that the green construction paper represents asparagus growing in a field. They are to cut 1-inch strips of paper, get it to the end of the row, bundle it into bunches of 10 with a rubber band, and then neatly place it in a packing crate (the shoe box). The first team to do this is the winner.
5. Model the activity and then have the students perform the activity several times, making changes as needed to become more efficient. Discuss potential impacts on people and the environment that might limit possible solutions. After clean-up, discuss how cooperation and competition were involved in the activity. Was competition a useful tool? How about cooperation? How did competition and cooperation affect quality?





Asparagus

Encourage students to explore asparagus production in California.

Activity

Asparagus is one of the few perennial vegetables grown in California. As a perennial, asparagus plants will produce spears year after year. Asparagus has a short 90-day growing season and is primarily grown in California's Central Valley, Salinas Valley, and the Delta. California asparagus can be purchased at grocery stores, farmers markets, and produce stands in different sizes based on diameter: standard ($\frac{3}{16}$ in.), large ($\frac{7}{16}$ in.), extra large ($\frac{10}{16}$ in.), and jumbo ($\frac{13}{16}$ in.). The asparagus plant produces all sizes all season long. Contrary to popular belief, the thicker spears are more tender. Tenderness also relates to color—the more green, the more tender. The following activity will introduce students to the size scale used to sort asparagus prior to shipping it in the grocery store.

Measuring Asparagus

1. Have students research the origin of asparagus and identify its growing region on a map of California.
2. When harvested, asparagus is measured one inch above the bottom of the stem. Collect various sizes of fresh asparagus, or download and print copies of the measuring worksheet.
3. Measure the asparagus both in standard and metric systems. Practice converting between larger and smaller units.
4. Determine the diameter, circumference, radius and estimate the volume of each asparagus spear. Identify if the size is standard, large, extra large, or jumbo.
5. Have students create an infographic to represent their findings.

Materials

- California-grown asparagus in various sizes or measuring worksheet from *LearnAboutAg.org/agbites*
- California map
- Ruler

Tip

Ask a local produce specialist to be a guest speaker and talk to the students about asparagus.



Classroom Activities

Science

- Compare and contrast the appearance, growing methods, and market for white and green asparagus. Display the information in a graphic organizer.

English Language Arts

- Learn about the history of asparagus production, investigating where it was first cultivated and how it arrived in California. Use online tools to create a digital timeline. Share your timeline in an oral presentation.
- Identify and learn more about the costs and benefits of asparagus production. Write a market report that include predictions for future production and value. Cite evidence to support your predictions.

California Standards

Grade 4

ELA CC: RI.4.3; SL.4.4, 5
Math CC: 4.MD.1, 4

Grade 5

ELA CC: RI.5.3; SL.5.4, 5
Math CC: 5.MD.1, 2, 5

Grade 6

ELA CC: RI.6.1; SL.6.4, 5
Math CC: 6.G.1, 2



Asparagus Measuring Worksheet

Assume each spear was cut one inch from the bottom.



Diameter _____
Radius _____
Circumference _____
Size _____



Diameter _____
Radius _____
Circumference _____
Size _____



Diameter _____
Radius _____
Circumference _____
Size _____



Diameter _____
Radius _____
Circumference _____
Size _____



Diameter _____
Radius _____
Circumference _____
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Diameter _____
Radius _____
Circumference _____
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