Taste and Teach
October - Table Grapes

Five **Fun Facts** About Table Grapes!

- In California, table grapes are harvested from late June through the fall, making fresh tables grapes available through January.
- California farmers produce about 99% of the table grapes grown in the US.
- Viticulture first began in the late 1700s when Spanish friars arrived to establish Catholic missions.
- California produces more than 2 billion pounds of table grapes each year.
- Table grapes are grouped into three color classifications: green, black and red.

Four **Fun Teaching Ideas!**

- Watch this video on grapes from California Bountiful: https://www.youtube.com/watch?v=mANHxuIBwAA
- Watch more videos about California table grapes at **GrapesFromCalifornia.com**. Have students write down five facts they learned about table grapes, and then share and discuss their facts with a partner.
- Have students research the distribution of table grapes over time and map their findings on a world map.
- Take a poll! Have students taste black, green and red table grapes and raise their hands on which ones they like best. Graph and compare the findings.

Explore all the great table grape resources in this section!

Commodity Fact Sheet

Table Grapes

Information compiled by the California Table Grape Commission

How Produced – Growing fresh market grapes is a year round job. Growers vigorously prune the vines in the winter. In the spring, buds appear, shoots emerge and grow, cluster florets develop and flowers begin to bloom when daytime temperatures reach about 68°F. As the flowers die, fruit set follicles and tiny green berries appear. These will eventually grow and ripen into mature clusters of grapes. In late spring, the farmers girdle the vines of many varieties, stripping a small ring of bark from the shoots, canes, or trunks. This forces nutrients from the vines and roots into the fruit, resulting in larger berries.

When grape berries achieve the correct size, sugar content, and color, clusters are harvested by hand with special clippers. Harvest usually occurs in late spring to mid-July in the warm desert area of the Coachella Valley. In the San Joaquin Valley, harvest begins in late June continues through late fall.

At harvest, the clusters are trimmed and inspected, packed into shipping boxes, palletized, and transported to a cold storage facility to quickly cool the grapes. Grapes that are not immediately shipped to market are maintained in a controlled climate storage facility between 30°F to 32°F with 90 to 95% relative humidity. This storage process allows consumers to enjoy California table grapes through January.

History – Viticulture, or the science, production and study of grapes, first began in California in the late 1700s when Spanish friars arrived to establish Catholic missions. Because the native grapes were sour and made poor wine, the friars brought over grapes from Europe and planted their own vineyards to make sacramental wine.

In the mid-1800s, prospectors poured into California. They came looking for gold until some discovered that there might be more money in grapes. Shortly after the Gold Rush, California's fledgling agricultural society declared, "Capital put into vineyards would bring greater rewards than... fluming rivers for golden treasures." Their instincts were good. California's warm, dry climate turned out to be ideal for growing grapes. Today, more than 700,000 acres across California are planted with fresh grape, wine and raisin vineyards.

Varieties – California produced just under 2 billion pounds of table grapes in 2019. To give an idea of the total crop production, the 2019 season of California table grapes provided 6.4 pounds per person. There are 80 varieties of table grapes grouped into three color classifications: green, black, and red. The numerous varieties enable consumers to have fresh California table grapes from May through January.

Commodity Value – In 2019, the total crop value of fresh grapes in California is 2.14 billion dollars. Typically, 30-40% of California's table grapes are exported to countries around the world. The top five export markets by volume include Canada, Mexico, Japan, South Korea, and Taiwan.

Top Producing Counties – California produces 99% of the nation's commercially grown table grapes. California's table grapes are produced in the Coachella and San Joaquin Valleys, which include Fresno, Kern, Kings, Madera, Riverside, and Tulare counties.

Nutritional Value – Grapes of all colors make a healthy snack. A serving of grapes ($^3/_4$ cup) is just 90 calories, has no fat or cholesterol and virtually no sodium. Grapes are an excellent source of vitamin K, and contain 7% of the recommended daily intake for potassium. Fresh grapes are also a natural source of beneficial antioxidants and other polyphenols. Research shows that grape polyphenols may help maintain a healthy heart. It is recommended that people consume a "rainbow" of naturally colorful, whole fruits and vegetables; eating a variety of fresh grapes helps achieve this goal and is a great start to a healthy lifestyle. Eat them fresh by the bunch, tossed into salads, yogurt, and more. Frozen grapes also make a refreshing snack on a hot day.

For additional information:
California Table Grape Commission
(559) 447-8350
Website: www.grapesfromcalifornia.com
Facebook: www.facebook.com/GrapesFromCalifornia
Twitter: www.twitter.com/GrapesFromCA
Pinterest: www.pinterest.com/GrapesFromCA
Instagram: www.instagram.com/grapesfromca

06/20 LearnAboutAg

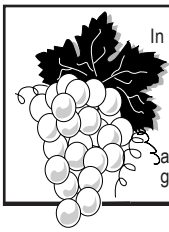
This is one in a series of fact sheets composed by the California Foundation for Agriculture in the Classroom (CFAITC). For additional educational materials: CFAITC, 2600 River Plaza Drive, Suite 220, Sacramento, CA 95833-3293 • (916) 561-5625 • (800) 700-AITC • Fax: (916) 561-5697
Email: info@learnaboutag.org • Website: LearnAboutAg.org

Table Grape Activity Sheet

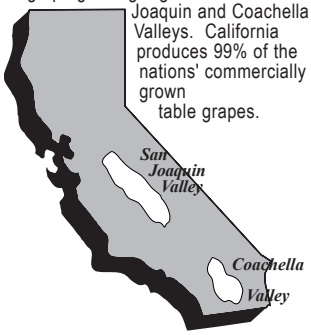
A Little Bit of History

William Wolfskill, a former trapper from Kentucky, planted the first table grape vineyard in 1839. It was located in a Mexican colonial pueblo now known as Los Angeles.

In the 1860s, William Thompson, an English settler, first planted a popular Eastern Mediterranean grape in Yuba City. It is now known as the Thompson Seedless grape.

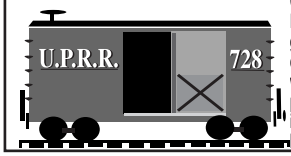


Today, the major California table grape growing regions are the San Joaquin and Coachella Valleys. California produces 99% of the nations' commercially grown table grapes.



In the mid-1800s, Colonel Agoston Haraszthy personally brought 100,000 table grape cuttings to California and planted them to provide fruit to the miners of the California Gold Rush.

In 1869, R.B. Blowers pioneered the transport of fresh table grapes to eastern markets. The first load was shipped by freight train to Chicago. Each grape cluster was wrapped in paper bags, in 22-pound boxes.



Lesson Ideas

- Make a mural depicting the lifecycle of a grapevine.
- Research the role of phloem, xylem, and cambium in plants and relate it to the girdling process done on grapevines.
- Use a world map to trace the distribution of grapes over time.
- Compare the latitudes and longitudes of major grape-growing countries and grape-importing countries.
- Compare and sort various grape varieties by color, shape, or size.
- Research the Phoenicians and their importance in the ancient world.
- Use frozen grapes as ice cubes in a favorite drink.
- Compare the etymology of the French word “grape” and the English word “grapple.”

Fantastic Facts

1. Growers harvest grapes when they are fully ripe.
2. The two valleys in California that produce the most fresh market grapes are Coachella and San Joaquin.
3. California produces 99% of the nation’s commercially grown table grapes.
4. There are over 80 varieties of table grapes grown in California.
5. Fresh California table grapes are available from May through January.
6. The three colors of table grapes are green, black, and red.
7. A serving size of grapes is 3/4 cup.

Lesson Plan: To Market! To Market!

Introduction: Since 1970, the United States per capita consumption of table grapes has grown from two pounds to close to 9 pounds per year. Many factors contributed to this rise, including improved marketing techniques. Developing new marketing techniques relies heavily on research such as surveys and taste tests. In this activity, your students will conduct a survey, analyze the results, and produce a magazine advertisement to sell table grapes.

Objective: Students will conduct a survey, analyze the results, and create an advertisement.

California Standards: CC ELA: W.3-12.4, 7; WHST.6-12.4, 7; SL.3-12.1, 3-12 Visual Arts Content 5.0

Materials: *Table Grape Fact Sheet,* supermarket advertisements for grapes, magazine food advertisements, and red, green and black grapes.

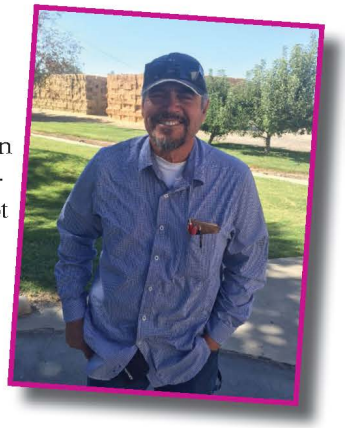
Procedure:

1. Discuss how advertising and product presentation affect the sale of foods. Have students bring in samples of food advertisements from magazine and grocery ads.
2. Discuss the various marketing strategies used to persuade a consumer to purchase a product. Examples may include low prices, convenience, healthy eating, or appealing to the senses. Have the students analyze what strategies are used in the ads brought to class.
3. Have students gather information on grapes by examining and tasting fresh grapes, writing down words that describe the grapes, looking at the cash register receipt from the grape purchase, and reading the *Table Grape Fact Sheet* and other literature you have on grapes.
4. Have the students develop and administer a survey designed to find out what consumers are looking for when buying fresh fruit, in particular, fresh grapes. Possible questions may include: “Who eats grapes in your home?,” “Does price matter in your fruit choice?” and “What color of grapes do you prefer?”
5. After conducting their survey and analyzing results, have students write magazine or grocery ads to promote their products.

06/20 Learn About Ag

This Fact and Activity Sheet was developed by California Foundation for Agriculture in the Classroom in conjunction with California educators and meets the required education standards of the California Department of Education.

California, a GRAPE State!



Grapes are a Top-Ten commodity in California, bringing in $5.6 billion dollars per year. Grapes have been an important part of agriculture for more than 300 years. Grapes are not only consumed as fresh table grapes, but also as raisins, and in wine. Read on to learn about how GREAT GRAPES are!

Career Spotlight

CAREER: Ranch Foreman

Luis Navarro, Ranch Foreman,
Wilson Farms, Clarksburg, CA

What is your training for the job? I've had over 30 years of on-the-job training.

What do you do in your job? I started working for Wilson Farms as an irrigator and quickly moved on to operating equipment. Eventually, I was put in charge of operating and organizing all of the labor for **irrigation**. I've operated everything from ground preparation equipment to planting and harvesting equipment. I've also run the service truck that fuels equipment, and I have done routine maintenance on all the equipment on the ranch.

Anything else you'd like to add? Over the years, I've been directly involved in every operation on the ranch from ground preparation, to irrigation, to the harvest of every crop. I currently organize all of the labor operations on the ranch. I direct and move people when and where they need to be through the day.

Wilson Farms' owners say, "When the ranch needs something to get done, Luis makes it happen."

STEM Activity

Grape Structures

Be an engineer using only grapes and toothpicks. Alone or in groups, create the tallest structure you can. Talk about which structures are strongest and tallest. What made them work so well? Try a new design with what you learned! Then, eat your creation!

Recipe

Try this Great Grape Smoothie!

1 cup seedless grapes

½ cup frozen strawberries and cherries

½ orange, peeled and sliced

½ banana, peeled and sliced

Combine all ingredients in a blender. Pour into glasses. Enjoy!

Why are grapes never lonely?

Because they come in bunches!

Activity Word Search

VINEYARD	ANTIOXIDANT
IRRIGATION	CLUSTER
GRAPES	HARVEST
SEEDLESS	TABLE
COMMODITY	CALIFORNIA
RAISINS	

I	E	I	R	R	I	G	A	T	I	O	N	R	I	R
S	O	Y	U	T	X	W	Y	Q	X	Y	O	U	Y	E
V	M	D	Y	H	N	C	Q	H	E	E	L	B	A	T
N	C	Q	Q	Y	S	A	B	G	Y	Z	Z	W	P	S
Y	S	A	M	M	N	L	D	I	R	O	X	W	A	U
U	S	D	X	X	I	I	N	I	D	N	W	W	S	L
I	E	Y	T	Z	S	F	H	X	X	Q	Y	W	M	C
E	L	T	K	N	I	O	Z	N	Q	O	M	B	U	T
A	D	I	D	P	A	R	N	C	R	X	I	S	T	K
I	E	D	P	Z	R	N	I	B	M	F	P	T	S	Y
U	E	O	V	I	U	I	H	O	K	D	Q	M	N	T
Y	S	M	P	L	X	A	F	F	Q	U	Z	Y	X	A
R	D	M	A	V	I	N	E	Y	A	R	D	P	I	A
Z	E	O	G	P	H	A	R	V	E	S	T	U	R	R
M	G	C	T	Z	C	S	A	S	G	R	A	P	E	S

RED or GREEN

Take a classroom opinion survey of which are considered the best; red grapes or green grapes. Compare your chart with other classmates. Create a bar graph showing your results.

Grape	Tallies
Red	
Green	

CA Standards: Math CCSS: 3.0A, 3.MD.3, 4.0A, 5.NBT.5; NGSS: 3-5-ETS1-1, 2, 3, MS-ETS1-1, 2, 3, MS-ETS1.A, B, C

Source: www.californiaagriculture.ucanr.org, www.grapesfromcalifornia.com

Harvest of the Month

Network for a Healthy California

Health and Learning Success Go Hand-In-Hand

School is a place where children develop many lifelong habits and preferences. Studies have shown that school-based nutrition education promoting healthful eating and physical activity can improve academic performance. *Harvest of the Month* supports academic content standards and gives students the chance to explore, taste, and learn about the importance of eating fruits and vegetables. It links the classroom, cafeteria, home, and community to motivate and support students to make healthy food choices and be physically active every day.

Exploring California Grapes: Taste Testing

What You Will Need (per group of 6-8 students):

- 1 small bunch each of red, green, and blue/black varieties of seedless California grapes*
- Enough bunches to allow students to try each variety
- Graph paper and colored pencils

*See *Botanical Facts* (page 2) for varieties.

Activity:

- Make three columns on graph paper labeled red, green, and blue/black; make five rows labeled appearance, texture, sound, smell, and flavor.
- Taste red grape variety and describe in appropriate column and row.
- Repeat activity for green and blue/black varieties.
- Compare and contrast the three grape varieties; discuss as a class.
- Discuss the factors that contribute to the different characteristics in each variety (e.g., environment, harvest time, climate).
- Take a poll to determine the students' favorite grape variety.

For more ideas, reference:
School Foodservice Guide – Successful Implementation Models for Increased Fruit and Vegetable Consumption, Produce for Better Health Foundation, 2005, pp. 39-42.

Cooking in Class: Grape Tea Sandwich

Makes 36 servings at ¼ sandwich per serving

Ingredients:

- 1 pound red grapes, washed, halved
- 1 (8-ounce) container lowfat cream cheese
- 18 slices whole wheat bread
- Paper plates and napkins

1. Lightly spread 2 teaspoons of cream cheese on each slice of bread.
2. Place eight grape halves on top of the cream cheese for each slice of bread.
3. Put sandwiches together and slice into quarters.
4. Serve immediately.

Nutrition information per serving:
Calories 56, Carbohydrate 9 g, Dietary Fiber 1 g, Protein 2 g, Total Fat 1 g, Saturated Fat 1 g, Trans Fat 0 g, Cholesterol 3 mg, Sodium 96 mg

Adapted from: *Tasting Trio Team, Network for a Healthy California,* 2010.

For more ideas, reference:
Kids Cook Farm-Fresh Food, CDE, 2002.

Reasons to Eat Grapes

A ½ cup of red or green grapes is:

- A good source of vitamin C and vitamin K.
- A source of carbohydrates, mostly in the form of simple sugars*.

*Learn about sugars on page 2.

Champion Sources of Vitamin C*:

- Bell peppers
- Berries
- Broccoli
- Green beans
- Leafy greens
- Melons
- Potatoes

*Champion sources provide a good or excellent source of vitamin C (at least 10% Daily Value).

For more information, visit:
www.nal.usda.gov/fnic/foodcomp/search/
(NDB No.: 09132)

Nutrition Facts

Serving Size: ½ cup grapes (76g)
Calories 52 Calories from Fat 0

	% Daily Value
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 2mg	0%
Total Carbohydrate 14g	5%
Dietary Fiber 1g	3%
Sugars 12g	
Protein 1g	

Vitamin A 1% Calcium 1%
Vitamin C 14% Iron 2%

GRAPES

What Are Sugars?

- Sugars are classified as simple or complex carbohydrates. This depends on their chemical structure and how quickly the body breaks them down and absorbs them. Simple sugars break down faster.
- Carbohydrates are the body's main source of energy.
- An enzyme called amylase works to break down carbohydrates into glucose (blood sugar); this is what our bodies use for energy.
- Simple carbohydrates provide quick energy and are found naturally in foods like fruits, vegetables, and milk.
- Some simple carbohydrates, such as white or brown sugar, high fructose corn syrup, molasses, or honey, are often added to foods.
- One gram of carbohydrate – simple or complex – has four calories.
- Carbohydrates deliver vitamins, minerals, fiber, and a host of important phytochemicals to the body.

For more information, visit:
www.nlm.nih.gov/medlineplus/ency/article/002469.htm

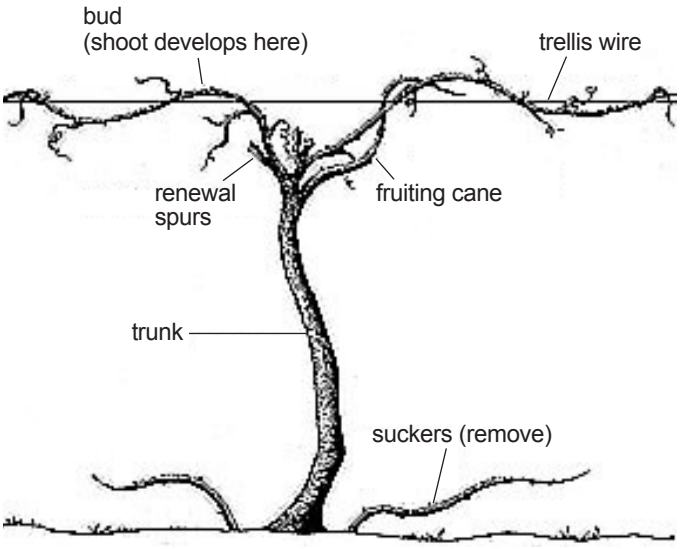
How Much Do I Need?

A ½ cup of grapes is about one cupped handful. The amount of fruits and vegetables that each person needs depends on age, gender, and physical activity level. All forms count toward the daily amount – fresh, frozen, canned, and dried. Remind students of their goals to eat a variety of colorful fruits and vegetables and get at least 60 minutes of physical activity every day.

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.



Download botanical image from **www.harvestofthemonth.com**.

Source: http://pods.dasnr.okstate.edu

Botanical Facts

Pronunciation: grāp
Spanish name: uva
Family: Vitaceae
Genus: *Vitis*
Species: *V. labrusca*

Grapes are the fruit of the vine in the family Vitaceae. The word *grape* was derived from the Old French term *grap,* meaning bunch or cluster, and is also the term for a long hook used to harvest these clustered fruits. *Vitis labrusca* is the most common species, known mainly as table grapes, and can be found in North America. In addition to being used for food products and juice, *V. labrusca* is used in the production of wine. *V. vinifera* was also the first Old World species to be planted in California in the late 18th century.

Grape color	*V. labrusca* varieties
Red	Flame Seedless, Red Globe, Ruby Seedless, Christmas Rose, Emperor, Rouge, Crimson Seedless
Green	Perlette, Sugarone, Thompson Seedless, Calmeria
Blue/black	Beauty Seedless, Autumn Royal, Ribier, Fantasy Seedless, Marroo Seedless, Niabell

For more information, visit:
www.uga.edu/fruit/grape.html

How Do Grapes Grow?

Grapes grow on climbing, woody vines. Grapes can be grown in most temperate climates, but thrive in tropical and subtropical regions with average annual temperatures above 50 F. Grapevines are grown from cuttings or grafted onto existing rootstocks. The vines need to grow two years before the first grapes are ready to harvest. As they grow, the vines need to be supported on trellises.

Grape growing, or viticulture, is a year-round job beginning with pruning in the winter. In early spring, growers "girdle" the vines, meaning they strip a small ring of bark from the trunk to force nutrients to the vine roots, resulting in larger berries. The third stage is called "bud break," followed by a burst in leaf growth. In the fourth stage, branches, or caneshoots, grow rapidly and flower clusters emerge. In the final stage, blooming occurs when temperatures reach at least 68 F and young "berries" (grapes) appear in place of flowers and ripen into clusters.

Like most fruit, grapes develop sugar as they ripen, but they neither ripen nor sweeten after being harvested. Harvested by hand, grape bunches are trimmed, inspected, packed into shipping containers, and then transported to a cold storage facility for cooling. Grapes are not immediately shipped to market, but maintained in a controlled climate storage facility.

For more information, visit:
www.freshcaliforniagrapes.com

School Garden: Solar Cooker

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.

Fruits and vegetables need the sun's energy to grow. Have students explore ways in which the sun helps people through solar energy. The sun can help cook a meal, dry clothes, dry fruits and vegetables, make fruit leather, and even heat water.

What You Will Need:

- Poster board (will need to trim)
- Foil
- Shoe box
- Wire hanger, straightened

How to Make a Solar Cooker:

- Cover poster board with foil.
- Roll into a U-shape and place in shoe box.
- Insert straightened hanger through box like a skewer.

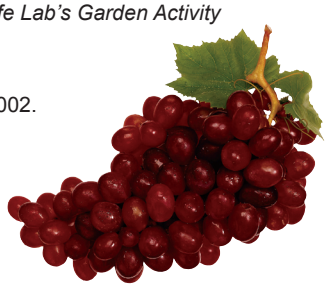
Experimenting With a Solar Cooker:

Note: Must be a warm, sunny day.

- Spear a piece of food (preferably a fruit or vegetable).
- Take cooker outside and aim at the sun.
- See how hot the piece of food gets and if it cooks.
- If cooked, note the temperature and time it took.

Adapted from: *Gardening Tips from Life Lab's Garden Activity Calendar,* **www.lifelab.org**

For more ideas, reference:
A Child's Garden of Standards, CDE, 2002.



Just the Facts

- Grapes are actually berries.
- On average, there are over 100 grapes in a bunch.
- Americans today eat about eight pounds of grapes annually, up from 2.5 pounds in 1970*.
- Concord grapes are one of only three fruits native to North America.
- Grapes are about 80% water.

*2008 Data

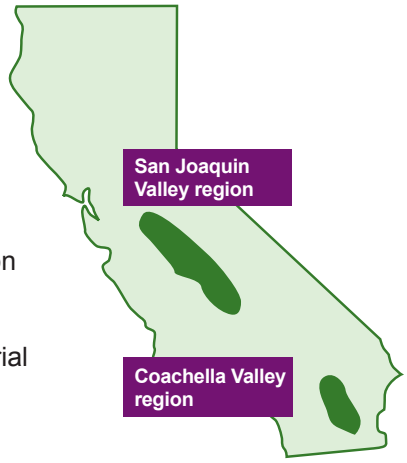
Student Sleuths

1. Where are most phytochemicals found in grapes?
2. Name three health benefits of iron. What happens if you consume too much iron? Too little?
3. There are two different descriptions of sugars. How are they classified? Why are they different?
4. What does the color of a grape's skin indicate about the environment where it was grown?
5. Map the origin of grapes and the various geographical regions in California where grapes are grown.
6. List the different uses (e.g., fresh, juice, dried) for which grapes are harvested in California. Rank them in order of use from greatest to least use.

For information, visit:
www.fruitsandveggiesmatter.gov/month/grapes.html
www.ipmcenters.org/cropprofiles/docs/cagrapes-table.html
www.fas.usda.gov/htp/horticulture/grapes.html

Home Grown Facts

- Ninety-seven percent of the grapes consumed in the United States are grown in California.
- Currently there are more than 50 varieties of table grapes grown in California, 18 of which are considered major varieties. Thompson Seedless and Flame Seedless are the two dominant varieties produced in California, followed by Red Globe, Ruby Seedless, Crimson Seedless, and Perlette.
- Grapes are the number two ranked commodity in California, following dairy production.
- Nearly 80% of California's table grapes are sold as fresh, while the remainder are processed.
- Most of California's table grape production is in the southern San Joaquin Valley region, with the Coachella Valley region accounting for the bulk of the remaining production.
- Major grape-producing counties include Kern, Tulare, Riverside, and Fresno. Smaller production occurs in Madera, San Joaquin, San Bernardino, Kings, Merced, and Imperial counties.



For more information, visit:
www.freshcaliforniagrapes.com

A Bunch of Grape History

Grapes are one of the oldest cultivated fruits dating back to about 8,000 years ago. Hieroglyphics show that Egyptians were involved in grape and wine production, and the early Romans were known to have developed many varieties.

Grapes have been grown in California for more than 200 years. The tradition of viticulture began in 1769 when Spanish friars established missions throughout the region. Padres planted a European grape variety known as the "Mission" in order to make sacramental wine. Native American wild grapes of the variety *Vitis girdiana* grew along California stream banks, but these grapes were sour and of little use for winemaking.

In California, grapes planted for fresh consumption began in the early 1800s when settlers recognized the untapped agricultural possibilities of the then-Mexican territory. William Wolfskill, a former trapper (and also founder of California's citrus industry) planted the first table grape vineyard in 1839 near present-day Los Angeles.

By the 1850s, the United States had officially acquired California from Mexico and 80,000 gold prospectors had moved to the region, a few of them recognizing that grapes were an important commodity in which to invest. Today, California wine, table grapes, and raisins are all important agricultural commodities.

For more information, visit:
www.freshcaliforniagrapes.com

Adventurous Activities

Science Investigation:

Objective: Explore the effects of water loss in fruits
Materials: Raisins and fresh fruits including grapes, apricots, apple slices; large paper bags

Getting Started:

- Discuss how raisins are dried grapes; ask students to note the differences between the two.
- Ask why raisins are smaller in size than grapes.
- Discuss how living things are made up of cells and how each cell contains water.

Activity:

- Cut open a paper bag and lay flat.
- Spread fresh pieces of fruit on bag.
- Place bag in full sunlight (no shade).
- Trace around each piece of fruit.
- Record the date and observations about each piece of fruit (e.g., size, shape, color, texture).
- Check fruits and record observations every other day.
- At end of two weeks, compare the differences in size, appearance, smell, and texture. Draw conclusions about how this process happens and why.

Adapted from: www.dole5aday.com/Teachers/T_Index.jsp

For more ideas, visit:
www.freshcaliforniagrapes.com/lessonplans.php

Student Champions

Since 1970, Americans' annual consumption of table grapes has grown from two pounds to more than eight pounds. Many factors contributed to this rise, including improved marketing techniques. Marketing today relies heavily on research, including customer surveys and taste tests. Have students conduct a survey of what type of grapes their classmates prefer, analyze the results, and produce a magazine advertisement to sell grapes. Work with your school's newspaper or the PTA to place the ad in their next publication. Or, have students work with a local retailer to promote grapes in their stores.

For more ideas, visit:
www.cfaitc.org/factsheets/pdf/TableGrapes.pdf

Physical Activity Corner

Being active, in addition to eating healthy, can improve the way students perform in the classroom.

Grape Tag:

Designate a playing area large enough for students to run safely.

- Ask for two volunteers and assign both of them to be "it." They link elbows to become a bunch of grapes, or the "Grape Bunch."
- When play begins, the Grape Bunch moves, keeping elbows linked, trying to tag the rest of the students, who are "loose grapes."
- When students get tagged, they link elbows and become part of the Grape Bunch.
- Once four students are tagged, the Grape Bunch separates into two separate bunches (two players detach creating two separate Grape Bunches).
- Play continues until all students are part of a Grape Bunch.

Source: Physical Activity Specialist, Northcoast Region, *Network for a Healthy California,* 2011.

For more ideas, visit:
www.kidsfitnesschallenge.com

Cafeteria Connections

School nutrition staff can support your nutrition education efforts. Adults working together, providing the same healthy messages, sends a powerful message to students. Invite school nutrition staff to:

- Talk with students about the school meal program.
- Describe proper food safety and handling techniques during a classroom cooking activity.
- Have an open discussion with students about the importance of nutrition to help reinforce the messages they receive in the classroom.

For more ideas, reference:
Fruits and Vegetables Galore, USDA, 2004.

Literature Links

- **Elementary:** *California Grapes* by Karen Adler, *Making Raisins* by Marvin Buckley, and *Table Grapes* by the California Table Group Commission (K-12).
- **Secondary:** *Agriculture and Environment,* American Farm Bureau Foundation for Agriculture, *The Vineyard* by Idwal Jones, and *Table Grapes* by the California Table Group Commission (K-12).

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CDPH California Department of PublicHealth

CHAMPIONS for CHANGE
Network for a Healthy California

— Table Grapes —

Agriculture surrounds us in California and it all starts with the sun. Today, 99 percent of U.S. table grapes are produced in California's warm, dry climate that is ideal for grape growing. The energy from the sun captured by the vines is converted and used for growth and production. California's table grapes are cultivated, picked, packed, and transported with the greatest care to ensure the berries you enjoy arrive in just-picked condition. There is much more to the story, but the sun is where it all begins on the journey from **Farm to You!**

Learn About Ag®
California Foundation for Agriculture in the Classroom

From Farm to You: TABLE GRAPES

1 DORMANCY & PRUNING: In winter months, growth and development stop temporarily and the vine rests. This stage is called dormancy. During dormancy, growers prune and train the vine—deciding how much and which parts of the previous season's growth to remove in order to produce quality grapes and the best possible yield.

2 BUD BREAK & SHOOT DEVELOPMENT: Tiny buds on the vine start to swell and green leaves begin to appear. Powered by energy from the sun stored within the vine during dormancy, the first shoots start to grow. Growth is slow at first, but as temperatures rise, shoots can grow one inch or more per day.

3 FLOWERING & FRUIT SET: In spring, grapevine flowers begin to bloom in clusters. Flowers have both male (stamens) and female (carpels) parts. Immediately prior to blooming, the pollen sacs open and self-pollination occurs. The fertilized flower begins to develop a seed surrounded by the grape berry flesh. Most California table grape varieties are seedless—soon after fertilization the seed stops developing.

4 BERRY DEVELOPMENT: As berries develop, they become larger and change in color. All immature berries are green. Some varieties turn black or red, while green varieties become more translucent. Fruit flavor becomes sweeter and less acidic.

5 HARVESTING: Unlike many fresh fruits, grapes are harvested fully ripe. When grape berries achieve the correct size, sugar content, and color, clusters are packed by hand into shipping containers.

6 ARRIVING IN THE MARKET: Shortly after picking and packing, the field heat is removed from the fruit in cold storage facilities. California table grapes will be maintained in a carefully regulated environment to assure they arrive in just-picked condition at retail stores and food service operations in markets around the world.

7 YOU: Consumers can enjoy California table grapes from May through January. Whether consumed in a restaurant, at school, at home, or on the go, grapes are a healthy source of vitamins and nutrients.

TABLE GRAPES

Lesson Plan: Hanging High

Introduction: Grapevines are climbing plants that can grow far and fast in a single season. Tendrils attach to nearby structures to support the plant. Grape growers use man-made structures called trellises to support the vines. Trellises raise the shoots and fruit off the ground, allowing sunlight in evenly, and separate clusters.

Objective: Using the available materials, students will design and build a model of a trellis system that achieves the desired outcomes listed above.

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

Materials (For Each Group): 50 wooden craft sticks, white glue, ruler, paper and pencil, computer with internet connectivity, binder clips (used to clamp together craft sticks while drying), 20 chenille stems (to represent the vine), 5 twist ties cut in half (to represent tendrils), 30 pony beads (to represent grape clusters).

Procedure:

1. ***Show students several different images of trellis systems used in table grape production***. Point out the common use of triangles, which increase stability in structural design. Explain desired outcomes and permitted materials. The overall goal of the project is to design a trellis system that raises the vines and fruit off the ground, allows sunlight in evenly, and separates clusters. The craft sticks may be cut to any length and arranged in any way to meet the desired outcomes.
2. ***Direct teams to research online, examining real-life trellis examples for ideas***. Have each team member brainstorm and sketch a possible trellis design, including estimated dimensions. Have teams discuss, compare, and select their preferred design.
3. ***Build a prototype***. Use the provided materials to build a trellis. Use binder clips to clamp together craft sticks as they dry. Once trellises are completed, have teams re-sketch, measure, and label their final prototype.
4. ***Test and evaluate the prototype***. Distribute the chenille stems, twist ties, and pony beads. Instruct students to use all the materials to model a grape vine and evaluate whether their trellis achieves the desired outcomes.
5. ***Challenge students to reflect on their experience***. Give groups the opportunity to determine structural weaknesses and identify areas for improvement.

Activity: Grape Berry Smoosh

Introduction: The structure of the grape berry may be divided into three main tissue types: skin, flesh, and seed. How will smooshing grapes affect structure and mass?

Objective: In this lesson, students will test the Law of Conservation of Mass after applying a physical change to berry structure.

California Standards: 5-PS-1-2

Materials (For Each Group): Balance scale, 20 grape berries, sealable plastic freezer bag.

Directions:

1. ***Provide each group with 20 grape berries in a sealable plastic bag.*** Students should verify the bag is completely sealed, without any air inside. Instruct students to measure the total mass of the sample using a balance scale. Record the mass.
2. ***Time to smoosh***! Students can choose any method of smooshing their grapes. It is essential that their bags remain sealed, and no liquid leaks out.
3. ***After the grapes have been adequately smooshed, students should record the mass again.*** Reflect on the physical changes that occurred. Identify which attributes changed (appearance, volume) and which stayed the same (mass). Explain the Law of Conservation of Mass and think of other real life examples that prove this scientific law.

For more information about table grapes, visit:
LearnAboutAg.org

GRAPES FROM CALIFORNIA