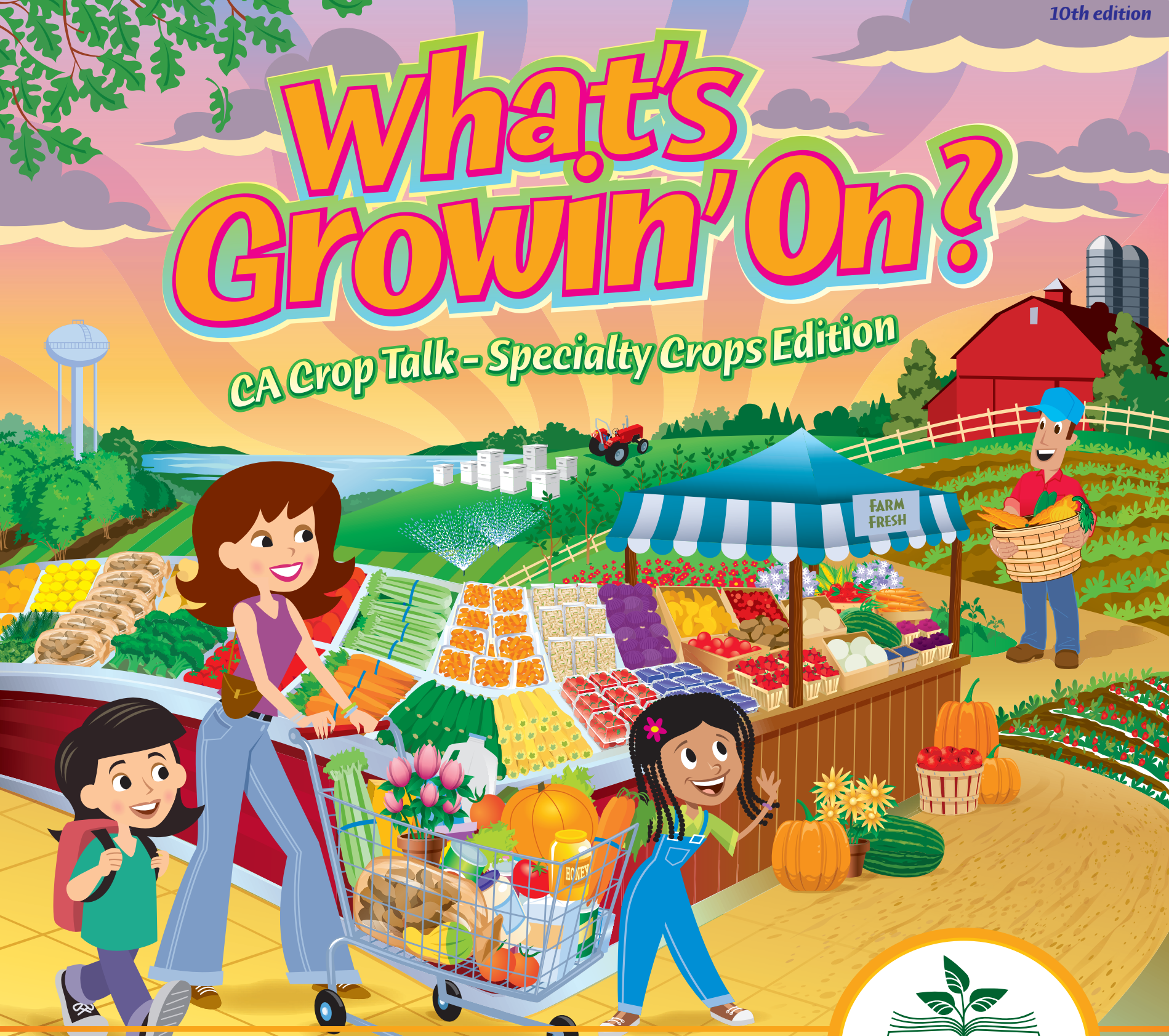


What's Growin' On?

CA Crop Talk - Specialty Crops Edition



A  NEWSPAPERS IN EDUCATION SUPPLEMENT

For accompanying ^{EXTRA!} _{EXTRA!} Extensions, visit www.LearnAboutAg.org/wgo or call (800) 700-AITC.



California Foundation for
Agriculture in the Classroom

California Specialty Crops

What makes specialty crops so special? Specialty crops are fruits and tree nuts, vegetables, herbs and spices, nursery, floriculture, and horticulture crops. They're the ones that are not considered **staple foods**. It's the almonds and carrots in your school lunch, the mushrooms on your pizza, the garlic and ginger that flavors your dinner, the cut flowers in the holiday centerpiece, the trees in the park, and the herbs in your medicine. California produces more than 400 different commodities, many of which are specialty crops. They're all around us!

Nearly half of the fruits, nuts, and vegetables consumed in the United States are produced right here in our state. From the southern California deserts to the mountains in the north, California is home to a variety of soil and climate types that allow the state to produce a wide variety of specialty crops. California produces 99 percent or more of 14 commodities that are enjoyed throughout the United States, including artichokes, dates, kiwifruit, olives, pomegranates, and pistachios.

Inside this newspaper, you will discover the many ways we use specialty crops and learn how agriculture impacts your life daily.

Specialty Crop Categories

Here are a few examples of specialty crops in each category:

Fruit and Tree Nuts

Almonds, blackberries, figs, grapes, lemons, oranges, pears, pecans, pistachios, walnuts.



Vegetables

Asparagus, broccoli, Brussels sprouts, carrots, celery, eggplant, garlic, mushrooms, squash, tomatoes.



Culinary Herbs and Spices

Basil, cilantro, cloves, ginger, lavender, nutmeg, oregano, sage, thyme, vanilla.



Medicinal Herbs

Boldo, foxglove, marshmallow, passion flower, pennyroyal, pokeweed, senna, tansy, witch hazel, yarrow.



Nursery, Floriculture and Horticulture Crops

Christmas trees, ferns, holly, magnolia trees, marigolds, oak trees, pansies, poinsettias, roses, tulips.



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A message for teachers...

For the past ten years, the California Foundation for Agriculture in the Classroom (CFAITC) has produced **What's Growin' On?** to help students discover how agriculture regularly impacts their lives. This year's edition, focusing on California specialty crops, is inspired by the farmers and ranchers who provide these crops to our society on a daily basis. Specialty crops are crops that are grown and used by people for food, medicinal purposes, and/or aesthetic gratification. Many of these crops are grown in California.

The articles, activities, and Web resources featured in **What's Growin' On?** will help connect your classroom to the specialty crops of California in a unique way. As a teacher you have the opportunity to introduce your students to the fascinating world around them—including agriculture!

All of CFAITC's resources are developed and reviewed by educators and agriculture industry experts to ensure accurate and factual information about each topic. The activities on the following pages meet Content Standards for California Public Schools for grades three through eight, while encouraging students to gain an appreciation for where their food comes from and to connect them with the world of agriculture.

Pumpkins & Squash

Treasures of the New World

Pumpkins and Squash are members of the “Cucurbita” family. This family also includes cucumbers, gourds, and zucchini. These **annual** plants grow on vines and are native to the Americas. Pumpkins and squash can be used to make soups, breads, and pies. Pumpkins and gourds are also grown for **ornamental** purposes, and for feeding livestock.

Activity Using the word bank, identify the parts of the pumpkin by filling in the numbered blanks.

Blossom end – The scar at the bottom of the pumpkin that was once a flower that was pollinated and developed into fruit.

Brain – The slimy and mushy mass of string and seeds inside a pumpkin.

Leaves - Absorb light energy from the sun for **photosynthesis**.

Pulp – The edible inner layer of the skin, also called the “meat.”

Ribs – Indented ridges running from top to bottom on the outside of the pumpkin.

Seed – The beginning of a new pumpkin that can be planted or roasted and eaten as a tasty snack.

Seed coat – The outer layer of the seed.

Shell – The skin and the pulp of the pumpkin.

Stem – Located on top of the pumpkin, the stem is attached to the vine to transport nutrients to grow the pumpkin.

Tendrils – Attached to the stem or vine, tendrils twist around objects to anchor and protect the plant.

Standards: ELA - Grade 3-8: Reading 2.0; Grade 3: Reading Comprehension 2.3

What Will the Squash Look Like?

Solve the **Punnett square** to determine the genotypes and phenotypes for the color of the offspring when a female Onyx (dark green) squash and male Gold Rush (yellow) squash cross. Dark green is the dominant color. When two different varieties cross, their offspring are called **hybrids**.

How a person, animal, flower, plant, and/or fruit looks depends on the **genes** inherited from the parent. Each parent plant gives one gene to the offspring. Two genes determine the genotype (genetic makeup) and the phenotype (a **trait** or characteristic).

Onyx (dark green) = Bb Heterozygous

Gold Rush (yellow) = bb Recessive Homozygous

How many of the offspring are dark green? _____

What is the percentage of dark green offspring? _____

Convert the percentage into: Fractions: _____ Decimals: _____

How many of the offspring are yellow? _____

What is the percentage of yellow offspring? _____

Convert the percentage into: Fractions: _____ Decimals: _____

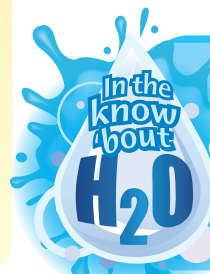


On a pumpkin plant, there are separate female and male flowers. The fertilized female flower becomes a pumpkin.

Female

Male

Sources: University of California Division of Agriculture and Natural Resources www.ucanr.org, Purdue University www.hort.purdue.edu



It is best to water pumpkin and squash plants at the roots rather than sprinkling from the top. Drip systems deliver water straight to the roots.

Pistachios are Nut-tastic

Did You Know?

It takes six years for a pistachio tree to produce its first fruit and 20 years to reach full production! If well-cared for, pistachio trees can produce nuts for more than a century.

California produces 98 percent of commercial pistachios in the United States.

Recipe Pistachio Butter

2 cups roasted pistachios
½ tsp salt
3 tbsp sugar
Vegetable oil

Place nuts, salt, and sugar in a food processor and blend until you have a rough clump. Add 1 teaspoon of oil at a time and process until it reaches the creamy texture you want.



Practical Pistachio Production

Pistachios are native to Afghanistan, Iran, and Turkey because of the low mountains and barren, dry foothills in the elevated deserts. To produce at maximum capacity, trees need long, hot, dry summers and moderately cold winters.

Activity

Taste Test

Roasted Pistachio Nuts vs. Pistachio Nut Butter

How do roasted pistachios, like you buy in the store, and pistachio butter taste different? Observe and taste a sample of roasted pistachio nuts. Make a list of adjectives to describe the taste. Repeat with a sample of pistachio butter. Compare and contrast the roasted pistachios to the pistachio butter. How can you use pistachio butter?

Standards: ELA – Grade 3: Writing 2.2; Written and Oral English Language Conventions (WOLC) 1.2; Grade 4: Writing 1.3; WOLC 1.1,1.2; Grade 5: WOLC 1.1; Grade 6: WOLC 1.1,1.4

Activity Nutrition

Convert the tally chart into a double bar graph using one color for fiber and another color for protein.

	Protein	Fiber
Almonds		
Pistachios		
Walnuts		

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

Imagine this...

Learn more about pistachios by reading the award-winning story "Peter's Journey" by Brook Jensen. Brook received statewide recognition for her short story about growing and harvesting the practically perfect protein. To learn more, visit www.LearnAboutAg.org/imaginethis/pistachio.

The California Delta is the largest estuary in North America. It supplies clean water to 25 million people and more than 3 million acres of farmland in California.

In the know about H₂O

1929

William E. Whitehouse entered Persia (Iran) to obtain pistachio seeds.

1929-1930

Whitehouse explored Persia and collected 20 pounds of individually selected pistachio seeds, which he planted in Chico, CA.

1930-1950

3,000 trees grew from 20 pounds of seed. However, only one tree proved to be useful.

1950s

The successful pistachio tree seed was named Kerman for the famous carpet-making city near Rafsanjan in Iran.

Fancy Free, Florally

Greenhouses, cut flowers, **bedding plants**, house plants, and **foliage** are all part of an agriculture industry in California called floriculture. More than 250 cut flower growers from San Diego to the Oregon border make California the top flower-producing state in the country! Careers in the floral industry include farming and growing, transporting, designing, and landscaping.

Egyptian Period (2800 – 28 B.C.) – In ancient Egypt, cut flowers were used for symbolic purposes. Egyptian floral designs were simple, orderly, and featured alternating patterns.

Greek and Roman Periods (600 B.C. – 325 A.D.) – Ancient Greeks and Romans used flowers and herbs for decoration, beautification, and to represent victory. Floral designs were garlands, wreaths, and flowers thrown on the ground.

Renaissance Period (1400 – 1600 A.D.) – Flower symbolism was important during this period. Flower arranging blossomed adding ribbons, fruit, and vegetables to the massive symmetrical arrangements.

Victorian Period (1837 – 1901 A.D.) – The first rules for arranging flowers were made during this era. Designs were made using ornate containers, overflowing with many different types of flowers using cool colors and an abundance of white.

Activity

Plot each significant event in the history of floriculture on a timeline. For each event plotted, add at least one additional important historical event from the same era.

Standards: : History-Social Sciences – **Grade 3:** 3.1; **Grade 6:** 6.2, 6.4; **Grade 7:** 7.8; **Grade 8:** 8.10



Greenhouse **climates** are controlled by fans and heaters, creating an environment that allows for year-round production of plants and flowers. Although the “season” is artificially produced, greenhouse plants are still considered in-season.

Some flower varieties grow better in open fields. These varieties, such as sunflowers, ranunculus, begonias, carnations and chrysanthemums, are grown in fields and prefer direct sunlight and low **humidity**. Hydrangeas are grown in **shade houses** which restrict light, allowing the plant to grow slowly, producing a more impressive bloom.



Pressed Flowers

Pressed flowers can be used to decorate note cards, bookmarks, candles, and more. They can even be framed as natural art.

1. Pick your flowers when they still look fresh. Make sure they are free from moisture or dew.
2. Place flowers between two sheets of paper. Place the paper and flowers inside a heavy book.
3. Leave at least 25 pages between each pressing. Weigh the book down and wait 2-3 weeks.

Did You Know?

75 percent of cut flowers grown in the United States come from California.

Tech Check

Flowers for every occasion

Visit www.cffc.org to research different types of flowers and refer to the flower guide book. Select at least three different types of flowers to give to someone. Use the color wheel to select a color scheme that is attractive and pleasing to the eye. Draw or paint your arrangement.

Flowers: _____ Colors: _____

Standards: Visual Arts – **Grade 3:** Artistic Expression 1.3, 1.5; **Grade 7:** Artistic Expression 2.0

Mmmarvelous Melons

Melons are a summer favorite, but can be enjoyed throughout the year because they can be grown almost anywhere in California, due to the variety in climates. Thump the **rind** to check for ripeness and quality before slicing the melon open to see the beautiful colors inside.

Honeydew melons are a variety of muskmelon. Its botanical name is *Cucumis melo*. These melons have a waxy smooth rind that is creamy white to yellow in color. Inside, the flesh is green. The average honeydew melon weighs between four and eight pounds.

The scientific **botanical** name for cantaloupe is *Cucumis melo*. Cantaloupes were named after the Roman town of Cantalupo. Columbus brought cantaloupe seeds to the New World on his second voyage and reported their cultivation on his return. California produces approximately 75 percent of the nation's cantaloupes. The melon has a netted rind, which means it has a hard rind with deep grooves.

A ½ cup serving contains 50 calories and is high in vitamins A and C.

Watermelons, known botanically as *Citrullus lanatus*, are related to cucumbers, pumpkins, and squash, and are grown in more than 96 countries worldwide. The first watermelon originated in the Kalahari Desert of Africa. Seedless watermelons are a hybrid variety and were developed in the 1940s by a Japanese scientist. A field of watermelons can produce up to 40 tons per acre.

A ½ cup serving contains 23 calories and contains vitamins A, C, potassium, and B6.

Some melons, such as watermelons, are 90 percent water.

Activity

Look in your local newspaper for grocery advertisements.

How many varieties of melons can you find? List them.

Compare and contrast prices of honeydew melons, cantaloupe, watermelons, and others.

Standards: ELA – Grade 4: Reading 2.1; Grade 5: Reading 2.1; Grade 8: Reading 2.1. Mathematics – Grade 4: Number Sense (NS) 1.2, 2.1; Grade 5: NS 1.2, 2.2

Activity

Melon Haiku

Look at a melon of your choice and write down what you see.

Write a haiku describing the melon.

A haiku is a 3-line poem consisting of 17 syllables.

Line 1 – 5 syllables
Line 2 – 7 syllables
Line 3 – 5 syllables

Example:

A happy melon
Basking in the bright warm sun
Growing like a weed

Standards: ELA – Grade 3: Writing Applications 2.2; Grade 4: Written and Oral 1.2; Grade 5: Writing Strategies 1.2, Written and Oral 1.3

Recipe Corner

Watermelon Lemonade

6 cups watermelon, cubed
1 cup water
⅓ cup sugar
½ cup lemon juice

Place watermelon and water in blender. Blend until smooth. Pour into a pitcher. Add lemon juice and sugar, stir until sugar is dissolved. Chill and serve over ice. Melon and water mixture may be strained. Serves 8

Activity

- To serve your entire class, how much of each ingredient do you need?
- How many times will you need to repeat the recipe steps?
- Did you have any leftovers? How many servings remained?
- What nutrients are in your watermelon lemonade?



Standards: Mathematics – Grade 3: Number Sense 2.4, 3.2; Grade 5: Number Sense 2.2, 2.3, 2.4, 2.5; Grade 6: Number Sense 2.1, 2.2, 2.3 Health Education – Grade 5: 5.1.N

Sources: National Watermelon Promotion Board www.watermelon.org, Western Growers www.producepedia.com, California Bountiful www.californiabountiful.com, University of California Division of Agriculture and Natural Resources www.ucanr.org

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.

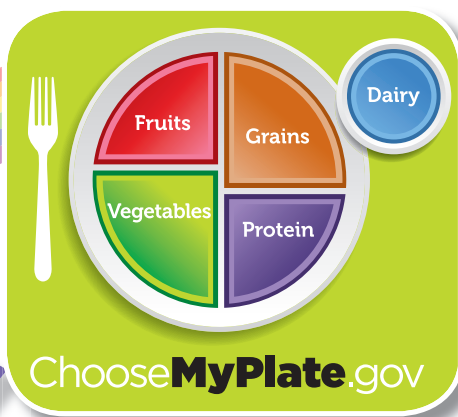
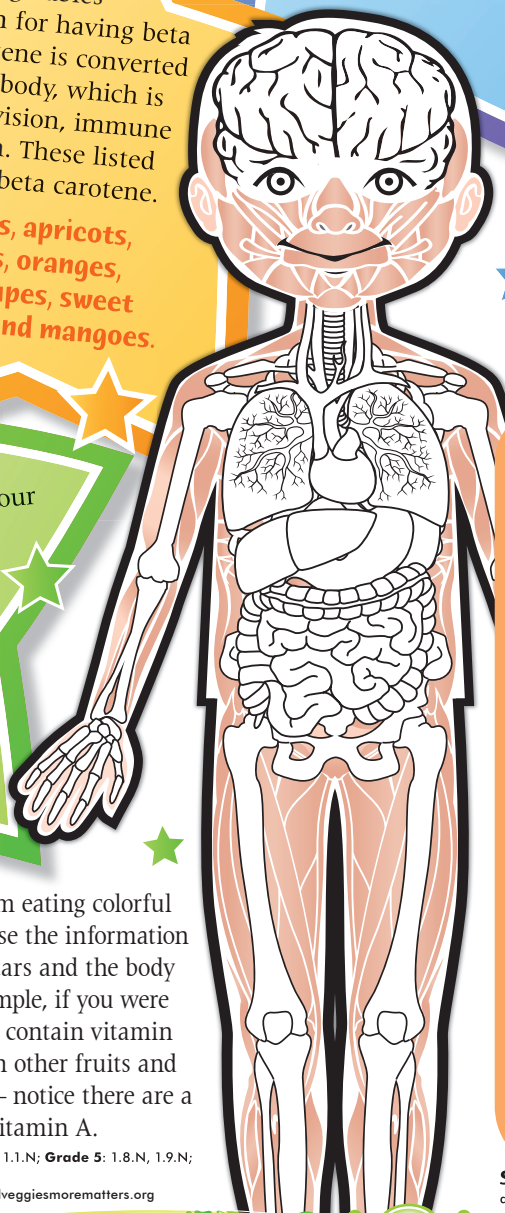
Pumpkins, apricots, carrots, oranges, cantaloupes, sweet potatoes, and mangoes.

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.



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!

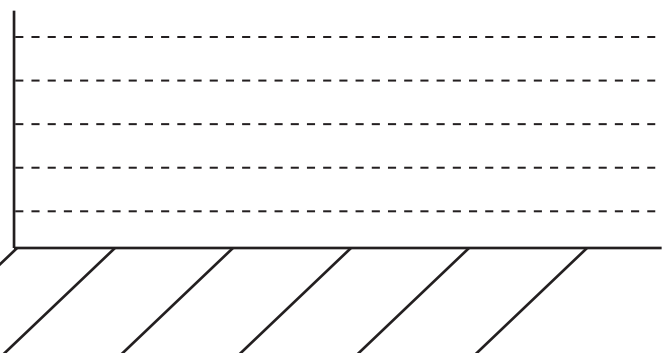
Dig Deeper: Calculate the total cost of your meal using the advertised price. Visit www.foodapedia.gov to calculate the nutritional value of the meal.

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

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, Fruits and Veggies More Matters www.fruitsandveggiesmorematters.org

California Grows...

California is the leading agricultural state in the nation producing more than 400 commodities, with a value of more than \$37 billion. Many of the crops grown are fruits and tree nuts, vegetables, herbs and spices, flowers, and horticulture crops which are recognized as specialty crops by the United States Department of Agriculture (USDA). Specialty crops make up a majority of the commodities grown in California – \$23 billion worth! You can say that California is pretty special!

Top 3 Commodities

Specialty crops are bold

Alameda Winegrapes, **Woody Ornamentals**, Cattle & Calves

Alpine Cattle & Calves, Pasture & Range, Pasture

Amador Winegrapes, Cattle & Calves, Pasture & Range

Butte Rice, **Walnuts**, **Almonds**

Calaveras Cattle & Calves, Poultry, Pasture & Range

Colusa Rice, **Almonds**, **Vegetable Seeds**

Contra Costa Cattle & Calves, **Sweet Corn**, **Vegetable Crops**

Del Norte Cows, Milk, **Lily Bulbs**

El Dorado Apples, Cattle & Calves, **Winegrapes**

Fresno Almonds, Poultry, **Raisin Grapes**

Glenn Rice, **Almonds**, **Walnuts**

Humboldt Timber, **Nursery Products**, Milk

Imperial Steers & Heifers, **Leaf Lettuce**, Alfalfa Hay

Inyo Steers, Heifers, Alfalfa Hay

Kern Almonds, **Table Grapes**, **Pistachios**

Kings Milk, Cotton, **Processing Tomatoes**

Lake Winegrapes, **Bartlett Pears**, **Nursery Products**

Lassen Hay, Alfalfa Hay, **Strawberry Plants**

Los Angeles **Woody Ornamentals**, **Bedding Plants**, **Vegetable Crops**

Madera Almonds, **Pistachios**, Milk

Marin Milk, Cattle & Calves, Poultry

Mariposa Cattle & Calves, Pasture & Range, **Livestock Products**

Mendocino Winegrapes, **Timber**, **Bartlett Pears**

Merced Milk, **Almonds**, **Broiler Chickens**

Modoc Alfalfa Hay, Cattle & Calves, **Potatoes**

Mono Alfalfa Hay, **Stockers & Feeders**, **Steers**

Monterey **Strawberries**, **Head Lettuce**, **Romaine Lettuce**

Napa Winegrapes, Cattle & Calves, **Nursery Products**

Nevada Cattle, Pasture, Pasture & Range

Orange **Woody Ornamentals**, **Strawberries**, **Vegetable Crops**

Placer Rice, Cattle & Calves, **Nursery Products**

Plumas **Stockers & Feeders**, **Timber**, Pasture

Riverside Milk, **Woody Ornamentals**, **Table Grapes**

Sacramento Winegrapes, Milk, **Bartlett Pears**

San Benito **Vegetable Crops**, **Salad Lettuce**, **Bell Peppers**

San Bernardino Milk, Eggs, Milk Cows

San Diego **Woody Ornamentals**, **Foliage Plants**, **Bedding Plants**

San Francisco **Cut Flowers**, Alfalfa & Bean Sprouts

San Joaquin Milk, **Winegrapes**, **Walnuts**

San Luis Obispo Winegrapes, **Strawberries**, **Broccoli**

San Mateo **Potted Plants**, **Nursery Products**, **Brussels Sprouts**

Santa Barbara **Strawberries**, **Broccoli**, **Vegetable Crops**

Santa Clara **Mushrooms**, **Bedding Plants**, **Nursery Products**

Santa Cruz **Strawberries**, **Raspberries**, **Cut Flowers**

Shasta **Forest Products**, **Timber**, Hay

Sierra **Stockers & Feeders**, **Timber**, Pasture

Siskiyou **Strawberry Plants**, Alfalfa Hay, **Timber**

Solano **Processing Tomatoes**, **Walnuts**, **Vegetable Crops**

Sonoma Winegrapes, Milk, Poultry

Stanislaus Milk, **Almonds**, **Chickens**

Sutter Rice, **Walnuts**, **Dried Plums**

Tehama **Walnuts**, **Almonds**, **Olives**

Trinity **Firewood**, **Timber**, Cattle & Calves

Tulare Milk, **Navel Oranges**, Cattle & Calves

Tuolumne **Livestock**, Cattle & Calves, Pasture & Range

Ventura **Strawberries**, **Celery**, **Lemons**

Yolo **Processing Tomatoes**, Rice, **Winegrapes**

Yuba Rice, **Walnuts**, **Dried Plums**

Activity

On the map, locate and label major lakes, rivers, mountains, and deserts. Identify the four climate regions (Mountain, Central Valley, Pacific, Desert). Include a map legend and compass. Identify the top four crops grown in each region and write them in the chart.

Hint: Count how many times a commodity is listed in that region. Some counties span multiple regions and the commodity will be counted more than once.

Climate region:

The top four crops grown:

1. _____ 2. _____
3. _____ 4. _____

Climate region:

The top four crops grown:

1. _____ 2. _____
3. _____ 4. _____

Climate region:

The top four crops grown:

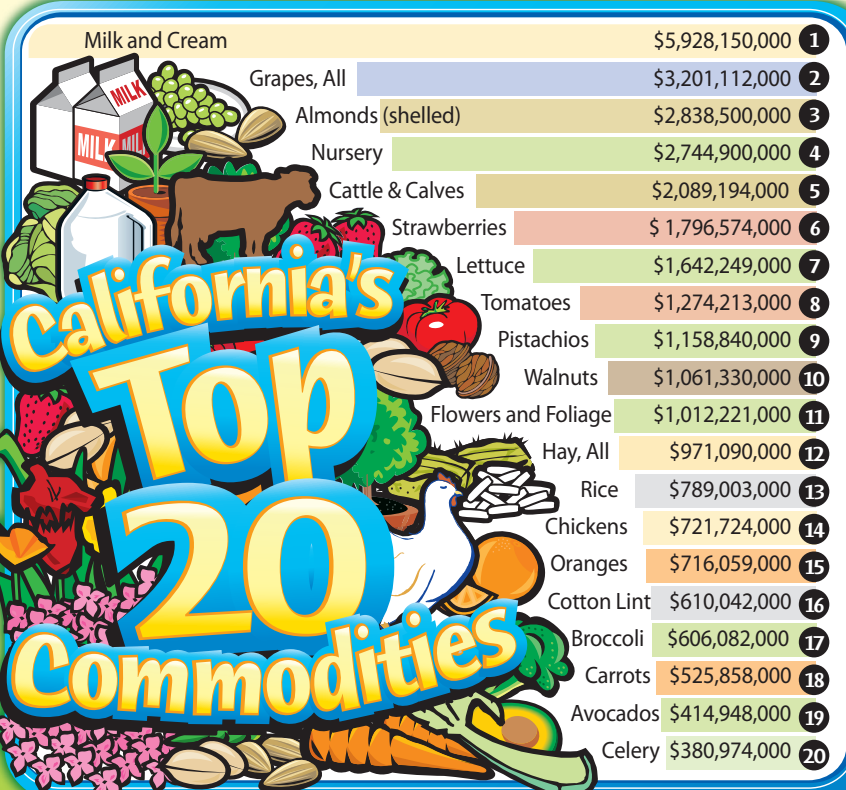
1. _____ 2. _____
3. _____ 4. _____

Climate region:

The top four crops grown:

1. _____ 2. _____
3. _____ 4. _____

Standards: History-Social Science – Grade 3: 3.1.1; Grade 4: 4.1.3, 4.1.4, 4.1.5; Science – Grade 6: 2.a, 2.b



Which of California's top 20 commodities are specialty crops? Circle those that are specialty crops. What is their combined value? What percent of the top 20 are specialty crops?

Standards: Mathematics – Grade 5: Number Sense 1.1, 1.2; Grade 6: Number Sense 2.1, 2.3; Grade 7: Mathematical Reasoning 2.1

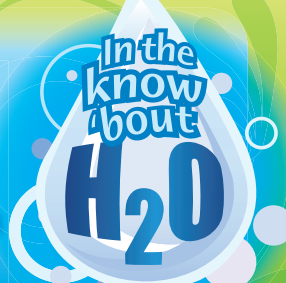
What makes California able to produce so many different commodities? One reason is the climate: California has a Mediterranean climate with mild winters and warm summers that provide optimal conditions to grow specialty crops. California also has many micro-climates that allow farmers to grow specific crops in certain areas.



In the local newspaper, check the weather section. On a chart, record the daily temperature for a week. From the chart calculate the mean, mode, and median. Make a graph of the daily temperatures.

Standards: Mathematics – Grade 4: Statistics 1.1; Grade 5: Statistics & Probability 1.2

Most rainfall and water is in Northern California. It is transported to the Central Valley and Southern California by the California Aqueduct.



Source: National Agricultural Statistics Service www.nass.usda.gov

The Garden Center

Water Wise Plants

A native plant is one that occurs naturally in a region or habitat without human intervention. Gardening with native and water wise plants from around the world, can bring beauty into your own landscape while also receiving numerous benefits.

Landscaping with native and water wise plants provides numerous benefits including requiring little-to-no fertilizer or pesticides, less water usage, and less pruning. These plants can provide a low-maintenance and budget-friendly landscape.

Activity

Use an agriculture publication, such as Ag Alert® (www.agalert.com) or your local newspaper, to find articles about water wise plants or local water issues. Use a separate sheet of paper and write a summary paragraph explaining how to conserve water and why it's important.

Standards: ELA – Grade 3: Writing 1.0, Reading 1.0; Grade 4: Writing 1.0, 2.4, Reading 2.0; Grade 5: Writing 1.0, Reading 2.0; Grade 6: Reading 2.0; Grade 7: Writing 2.5, Reading 2.0

Over watering or under watering can dramatically damage plants.



Did You Know?

A garden center is a place with knowledgeable staff, where you can purchase a diversity of plants, and support products that will help you be successful with your landscape or garden.

Scientific Names versus Common Names

Plants have scientific and common names. The **scientific name** is Latin and consists of two parts: the first, which is always capitalized, indicates the **genus** and the second word, in lowercase, is the **species**. Common names are more like nicknames, and can be one word or several. Some plants may have multiple common names.

Draw a line to match the scientific name to the common name. Hint: Often a variation of the common name can be found within the scientific name.

Scientific Name	Common Name
1. Juniperus chinensis 'Aurea'	a. Flowering Pear
2. Myrsine africana	b. Chinese (Tropical) Hibiscus
3. Pyrus calleryana	c. Canary Island Pine
4. Pinus canariensis	d. Gold Coast Juniper
5. Hibiscus rosa-sinensis	e. African Boxwood

Standards: Science – Grade 5: 6a; Grade 7: 3a, 5a

Sources – Arbor Day Foundation www.arborday.org, USDA Natural Resources Conservation Service plants.usda.gov

Irreplaceable Irrigation

Every living thing needs water to survive. Since water is a natural resource, it is limited, and everyone must do their part to conserve it.

Farmers are careful to conserve water when irrigating plants and crops. They want to make sure the plants get enough water to thrive and produce crops without being wasteful.

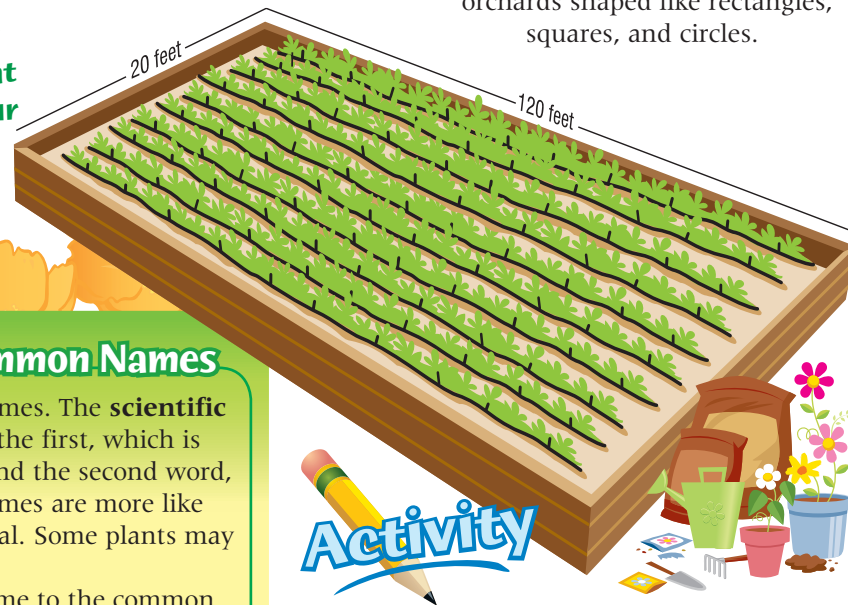
Drip irrigation – Water is delivered to plants through small tubes. Each tube has many pin-sized holes which direct the water close to the roots. This method uses less water than

overhead sprinklers and less evaporation occurs.

Sub-irrigation – Used in commercial greenhouses, this method of irrigation is used for potted plants. Water is delivered from below the plant and absorbed upwards. The excess water can be recycled.

Hand watering – Water travels through a hose and is sprayed from a nozzle in rain-size droplets.

Sprinkler – Large sprinklers spray water from overhead. This method covers a large area and works best in fields and orchards shaped like rectangles, squares, and circles.



Activity

You decide to conserve water by installing **drip irrigation** in your garden. Your garden measures 20 feet by 120 feet. You plant 10 rows of plants that run the entire length of the garden. You will use one piece of irrigation tubing for each row.

1. Determine the square area ($A = l \times w$) of your garden. _____
2. How many feet of irrigation tubing will you need to irrigate all 10 rows? _____
3. What will the total cost be if the irrigation tubing costs \$0.05 per foot? _____

Standards: Mathematics – Grade 3: Measurement and Geometry 1.2; Grade 4: Measurement and Geometry 1.1; Grade 5: Measurement and Geometry 1.1

Have a Berry Special Day

Mixed 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.

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

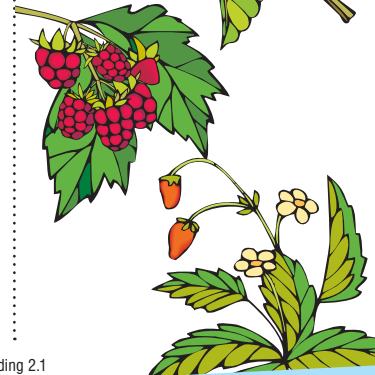
Strawberry

Blueberry

Blackberry

Raspberry

What it looks like



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

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**.

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.

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

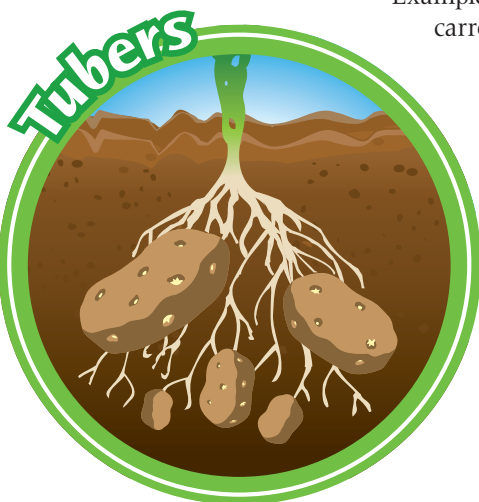
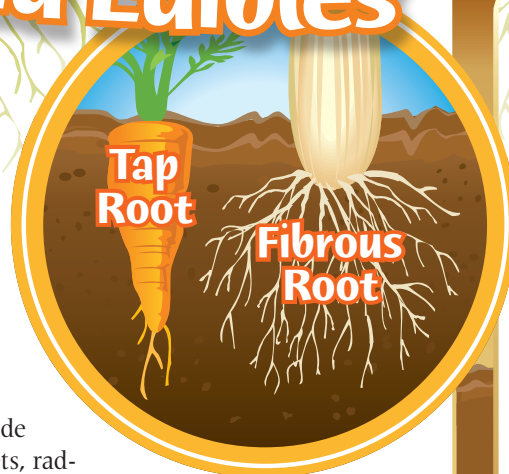
Sources: Highbush Berry Council www.blueberry.org, California Strawberry Commission www.calstrawberry.org, Network for a Healthy California Harvest of the Month www.harvestofthemonth.com

Underground Edibles

Roots, tubers, and bulbs are three examples of specialty crops that are grown underground. Each underground edible acts as a storage unit that provides the plant with the nutrients it needs to grow and bloom.

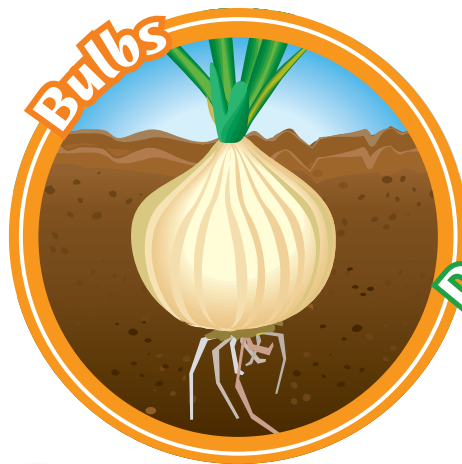
Roots: There are two different types of root systems: fibrous and tap. Fibrous roots are those that have many branches of the same size. Tap roots have a single large root. The tap root is the most common part of the plant that we eat.

Examples include carrots, beets, radishes, and turnips.



Tubers are underground plant structures that are enlarged to store plant nutrients. They are used by plants to survive the winter or dry months and provide energy and nutrients for re-growth during the growing season. Tubers have leathery skin and growing points where new plants can develop. Potatoes, yams, sweet potatoes, and Jerusalem artichokes are tubers.

Bulbs are planted in the ground and act as an underground storehouse. In the center of the bulb is a bud, ready to sprout when the environment is right. If you were to dissect the bulb, the bud inside looks like a miniature flower! The bud is surrounded by scales that contain nutrients the bulb will need to flower. Examples of bulbs are onions, garlic, green onions, and fennel.



Underground Fun Facts:

In California, we grow more sweet potatoes than russet, red, white, and gold potatoes.

The majority of garlic grown in the United States comes from California.

Sulfuric compounds are what irritate your eyes and cause you to cry when cutting onions.

Activity

It grows in soil, but can I eat it? There are many underground edibles that are a part of our diets! Rearrange the circled letters in the facts below to learn more about underground edibles.

The first food ever grown in outer space.

Used in the 1700s to provide feed for cattle during the winter.

Since the 1700s, it has been used as a natural dye.

Originally purple in color, this vegetable originated in central Asia.

Nutritional Values:

These specialty crops are high in:

Carrots	Beta carotene and fiber
Garlic	Vitamins B6 and C
Radishes	Vitamin C and calcium
Beets	Vitamin A, vitamin C, calcium, and iron

Did You Know?

Baby carrots are regular carrots cut into two inch pieces.

Activity

Can you grow a carrot using only the top ¼ inch of a carrot root? Form a hypothesis and develop an experiment. Take measurements and record your observations over time.

Standards: Science – Grade 3: 3a, 3d, 5a, 5c, 5d, 5e; Grade 4: 3b, 6b, 6c; Grade 5: 2a, 6c, 6f; Grade 6: 7a, 7b; Grade 7: 5a, 7c; Grade 8: 9a

Square Roots

If you have a garden space of 4.5 ft. x 4.5 ft., how many onion seeds can you plant? Determine the perimeter and area for the garden space.

Space requirements: Allow 2 inches between each seed and 18 inches between rows.

Standards: Mathematics – Grade 3: Measurement and Geometry 1.2, 1.4; Mathematical Reasoning 1.2, 3.1, 3.2, Grade 4: Measurement and Geometry 1.1, 1.4

In the know about H₂O

An aquifer is an underground bed or layer of permeable rock saturated with water that farmers can use.

Food Safety is a Team Effort

Food safety practices are important in every stage of food production, preparation, and consumption. Good agricultural practices have been developed by agriculture, and government agencies, and each step in the process is inspected or monitored. It takes teamwork to ensure the safe and abundant food supply we enjoy!

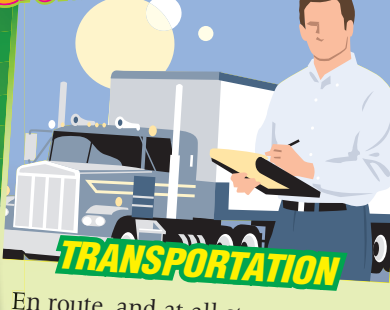
What's Growin' On? FOOD SAFETY TEAM



PRODUCTION

At the farm, soil and water are tested for **pathogens** and monitored to prevent **contaminants**.

What's Growin' On? FOOD SAFETY TEAM



TRANSPORTATION

En route, and at all stages, produce is kept at its ideal temperature. If refrigerated, the cold chain cannot be broken at any point.

What's Growin' On? FOOD SAFETY TEAM



PROCESSING

Sanitary conditions continue with equipment sterilization, and maintained during washing, pasteurization, cooking, freezing, and/or packaging.

What's Growin' On? FOOD SAFETY TEAM



DISTRIBUTION

Employees at grocery stores and restaurants follow rules and procedures during food handling and preparation.

Activity

Career Presentation

Research a career in agriculture and present it to your class or family. Include a description of the career, required education, and projected income. Visit agriculture.purdue.edu/USDA/careers for ideas.

Standards ELA – Grade 3: Writing 2.2; Listening & Speaking (LS) 1.5; Grade 4-6: Writing 2.3; LS 2.2; Grade 7: Writing 1.2, 1.4; LS 2.3; Grade 8: Writing 1.4, 2.3; LS 2.3



Consumer

Wash all fruits and vegetables in clean, running water before eating them—including produce with rinds. Use clean knives and cutting surfaces, and wash your hands prior to handling food.

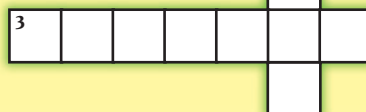
Tracking with Technology

Sophisticated data collection is available to track specific products from the field where they were grown to your local market. Produce in more than 35 million clamshells have been tracked with codes since 2007! Scan the following containers to find out where the produce came from or enter the codes at kids.learnaboutag.org/wgo10/foodsafety.



Activity

Use facts from this page, and the word bank, to complete the crossword.

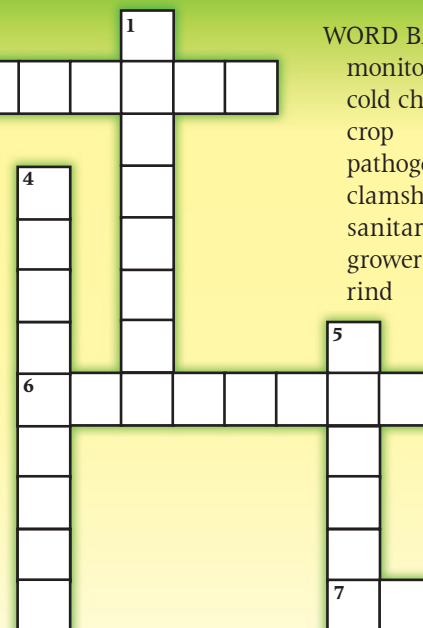


ACROSS:

2. Harvests kept cold continuously
3. To continuously check
6. Free from contaminants
7. Thick outer skin

DOWN:

1. An organism that causes harm
2. Produce grown by a farmer
4. Plastic hinged container
5. One who produces plants



WORD BANK:

monitor
cold chain
crop
pathogen
clamshell
sanitary
grower
rind

Superb Herbs

An Herb by Any Other Name

Herbs: The Spice of Life

An herb is a plant or plant part used for its scent, flavor, or **therapeutic** properties. Herbs can be used to enhance the taste of food and as a source of phytochemicals for health benefits. Herbs, spices, botanicals, and medicinals are a special part of California agriculture.

Activity

How do herbs affect the smell and taste of food? Compare culinary herbs from your family's kitchen. Select an herb and record its name, how it smells, and what dishes it could be used in.

Herb/Spice

What does it smell like?

What do you use it in?

Standards: ELA – Grade 3: Reading 2.7; Written and Oral English Language Conventions (WOLC) 1.2; Grade 4: Reading 2.7. Science – Grade 3: Investigation & Experimentation 5a; Grade 4: Investigation & Experimentation 6a; Grade 5: Investigative & Experimentation 6b, 6c, 6g

Bonus Activity

Find your favorite recipe in a cookbook from the library or on the Internet (www.californiabountiful.com/recipes). Do the ingredients include herbs? How do you imagine it would taste without the herbs? Try making a new dish each week for a month to find new flavors that you like.

Medicinal Herbs Word Search



Fenugreek

Foxglove

Ginkgo biloba

Ginseng

Witch hazel

Horsetail

Wormwood

Lavender

Yarrow

Licorice

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

Herbs can either be used fresh cut, straight from the garden or farm, or dried. A general guideline when using fresh herbs in a recipe is to use three times as much as you would use of a dried herb.

Activity

A recipe you're using calls for the following dried herbs. Convert the ingredients from tablespoons to cups to represent the amount of fresh herbs needed. One cup equals 16 tablespoons. Express your answer using cup equivalents.

4 tablespoons dried oregano = _____ cup fresh oregano

1 1/3 tablespoons dried thyme = _____ cup fresh thyme

8 tablespoons dried basil = _____ cups fresh basil

Standards: Mathematics – Grade 3: Number Sense 3.1, Algebra and Functions 1.1, 1.2, 1.4; Grade 4: Number Sense 1.5, Algebra and Functions 1.4; Grade 5: Number Sense 2.3; Grade 6: Algebra and Functions 2.1; Grade 7: Measurement and Geometry 1.1

Did You Know?

Both the leaves (cilantro) and seeds (coriander) are from the *Coriandrum sativum* plant.

Specialty Words

Annual: A plant that flowers, produces seed, and completes its life cycle in one growing season.

Antioxidant: A substance that reduces damage by preventing oxidation.

Aqueduct: A pipe or channel designed to transport water from a remote source, usually by gravity.

Bedding plants: A plant suitable for planting in a flower bed for one season's display.

Botanical: Relating to plants, especially to the scientific study of plants.

Clamshell: A container with two hinges that holds produce for consumers to buy.

Climate: The general atmospheric conditions for a location; including rainfall, temperature, and humidity.

Contaminants: Foreign matter that makes something impure, unclear, or polluted.

Deciduous: Trees and bushes that shed their leaves in the fall.

Family: A taxonomic category of related organisms, ranking below an order and above a genus.

Foliage: A cluster of leaves.

Gene: A segment of a chromosome. Some genes direct the syntheses of proteins, while others have regulatory functions.

Genus: A category in the taxonomic classification of related organisms, comprising of one or more species.

Greenhouse: A building for growing plants under controlled conditions made of glass or plastic.

Humidity: Dampness, especially of the air.

Hybrid: A plant or animal resulting from a cross between parents that are genetically different.

Irrigation: The application of water to the land used in agriculture to help crops grow.

Micro-climate: A local atmospheric zone where the climate differs from the surrounding area.

Native: Originating, growing, or produced in a certain place or region; indigenous.

Ornamental: Plants typically used for flower gardens, house plants, landscaping, or cut flowers.

Pathogen: A biological agent that causes disease or illness to its host, also known as germs.

Perennial: A plant that lasts for more than one growing season, either dying back after each season or growing continuously.

Photosynthesis: The process of converting light energy to chemical energy and storing it in the form of food for the plant.

Phytonutrients: Naturally occurring compounds found in plants that function as antioxidants, promote immunity, increase communication with cells in the body, and help repair damage to DNA. Also known as phytochemicals.

Punnett Square: A diagram that is used to predict an outcome of a particular cross or breeding experiment. Used by biologists to determine the probability of an offspring's having a particular genotype.

Rind: A thin, shiny outer layer of the produce, also known as the skin. This is a protective layer to keep disease and insects out of the fruit.

Scientific Name: The recognized Latin name given to an organism, consisting of a genus and species.

Shade House: A building used to help plants that do better in shady conditions grow, or to help those that were started in a greenhouse adjust to the outdoor environment.

Species: A group of organisms with common characteristics.

Staple Foods: Food regularly consumed and in such quantities that it constitutes a dominant portion of a diet. Examples include wheat, fish, peanuts, and rice.

Super Foods: Foods that are rich in vitamins, minerals, and other nutrients.

Therapeutic: An item used to maintain or improve health.

Trait: A genetically determined characteristic or condition.



Resources:

American Pistachio Growers
www.thegreennut.org

Arbor Day Foundation
www.arborday.org

California Cut Flower Commission
www.cffc.org

California Department of Food and Agriculture
www.cdffa.ca.gov

California Strawberry Commission
www.calstrawberry.org

Fruits and Veggies More Matters
www.fruitsandveggiesmorematters.org

Highbush Berry Council
www.blueberry.org

Iowa State University Cooperative Extension
www.extension.iastate.edu

MyPlate
www.myplate.gov

National Watermelon Promotion Board
www.watermelon.org

Network for a Healthy California
www.harvestofthemonth.com

Purdue University
www.hort.purdue.edu

UC Division of Agriculture and Natural Resources
www.ucanr.org

United States Department of Agriculture
www.usda.gov

Water Education Foundation
www.watereducation.org

To request a free **What's Growin' On?** extra extra Extensions to enhance the use of this newspaper, or for answer key, visit www.LearnAboutAg.org/wgo or call (800) 700-AITC(2482).



In complete sentences and in your own words, use what you learned in this newspaper tab to define specialty crops. List three examples.



For a fast-paced, entertaining introduction to the farmers who grow specialty crops and the people who help bring those crops to you, watch the California Bountiful television program. Find the broadcast schedule for your area. www.californiabountiful.com.

Fun Facts!

There are more than 7,000 varieties of apples grown in the world, and about 2,500 varieties are grown in the United States.

In the first week, a Christmas tree displayed in your home will consume as much as a quart of water each day.

Oranges do not ripen after they are picked

...but lemons do.

An apiary is a place where hives of honey bees are kept. Honey is considered a specialty crop. Besides giving us honey, research other ways that bees help farmers and ranchers.

Acknowledgements



California Foundation for Agriculture in the Classroom

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www.LearnAboutAg.org

California Foundation for Agriculture in the Classroom (CFAITC) is a 501(c)(3) not-for-profit organization dedicated to increasing the awareness of and appreciation for the safe, fresh and abundant agricultural products we are fortunate to enjoy in California. The Foundation provides free and low cost standards-based resources, training opportunities and K-12 classroom materials that enhance regular classroom instruction.

Contact CFAITC or visit www.LearnAboutAg.org for:

- Kids' Corner (kids.LearnAboutAg.org)
- Resources and lesson plans
- *What's Growin' On?* Teacher's Supplement
- Story-writing contest
- Upcoming conferences
- *Cream of the Crop* monthly e-newsletters

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