Agriculture and You!

Welcome to California Agriculture!

California is like a patchwork quilt—some squares are full of green forests and alfalfa fields; others are golden rangelands and drying wheat fields. Waterways connect this unique landscape, which is appliquéd with cities that cover more than 1/3 of the state... and all of these people depend on agriculture. If you were to make a quilt of all of California’s agricultural commodities, you would need over 350 squares. Agriculture is a part of your life, more than you can imagine!

This newspaper was created and reviewed by educators to bring the awareness of agriculture into the lives of us all. Through minds-on reading and hands-on investigations, What’s Growin’ On? provides opportunities to learn about agriculture.

Each reading is accompanied by an activity. The fourth through eighth grade Content Standards for California Public Schools are emphasized and listed for each activity.

So take a moment... relax and read... and then dig into some fascinating activities that teach about one of California’s leading industries.

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Imagine a Day Without Agriculture!

Have you ever wondered what it would be like if there were no agriculture? How would you get your food? Your clothes? Your home? Your yard and houseplants? All of these are products of agriculture. Check out what award-winning student author Eva Healy has to say in her story titled "No Agriculture." You can find it at www.cfaitc.org/imaginethis/noag.

Activity

Read Sierra’s journal. Find and circle at least 15 items that agriculture helped to create. Check out the answers at kids.cfaitc.org/wgo4/journal.

Activity

Read and cut out an article in your local paper. Underline at least five words that you need defined. Create a glossary for the article. Make sure you alphabetize the words and write a definition for each. Do any of these words relate to agriculture?

Get a Clue!

This newspaper may use terms that are new to you. The words in bold are defined in the glossary on page 15.
Tasty Plants!

So... have you ever chomped on a stem?
How about devoured a luscious green leaf? Sounds kind of strange when you first think about it— but you probably have! That is if you have eaten celery and lettuce! All fruits, vegetables, nuts and grains are parts of plants.

Plant Basics

- Roots anchor the plant in the soil, absorb water and minerals, and in some plants, store food that has been made in the leaves. Radishes, beets, jicama, sweet potatoes and carrots are a few examples of edible roots.
- The first carrots were long skinny purple roots that had a branch-like shape. Carrots are grown throughout California where soils are light and water is plentiful. California produces 80% of the nation’s fresh carrots.

- Stems support the leaves and flowers of plants. They transport water from the roots to the leaves and flowers and carry sugar and starches made in the leaves to other parts of the plant. Examples of edible stems are rhubarb, asparagus, cinnamon and celery.
- The first celery grew in the marshes in the eastern Mediterranean. The word “celery” comes from the Latin word “celer,” which means “quick acting.” Celery was first used to cure stomach ailments. The U.S. produces over 2 billion pounds of this edible stem each year.

- Leaves make food for the plant from carbon dioxide and water, using light for energy. This is called photosynthesis. Cabbage, nopales (cactus pads), spinach and collards are some leaves we eat.
- Heart of Romaine lettuce is grown along the Central Coast of California. Workers cut the lettuce, place it into plastic bags and seal the bags with a machine. Believe it or not, this is all done right in California. Workers cut the lettuce, place it into plastic bags and seal the bags with a machine. Believe it or not, this is all done right in California.

- Flowers contain the reproductive parts of a plant. Colorful and fragrant flowers attract insects, which pollinate the flowers that then form seeds. Examples of edible flowers are cauliflower, broccoli and artichokes.
- Cauliflower, a member of the cabbage family, got its name from the Latin words “caulis,” meaning “stalk,” and “floris” meaning “flower.” As the head forms, the crown of leaves surrounding it shelter it from the sun, preventing chlorophyll from developing and turning it green. Cauliflower is grown along the coast.

- Seeds are produced when a flower is pollinated and fertilized. If conditions are right, the seeds develop into new plants. Examples of edible seeds are popcorn, black pepper, sunflower seeds and peas.
- Popcorn is a cereal grain that originated from a wild grass. The ears of corn dry on the stalk and then are harvested with a combine. Once the kernels contain only 16% - 20% moisture, the plants are harvested. Although California grows lots of corn, most popcorn is grown in the Midwest.

- A fruit is a soft structure, normally found around a seed. Examples of fruits are lemons, apples and plums.
- Lemons grown in this state are usually eaten fresh. Those grown in Florida and Arizona are often processed into products like lemonade and lemon juice. Some growers put copper rings around the tree trunks so that snails will not climb up and eat the leaves and fruit. The snails avoid the copper since their slime reacts with the copper and give the snails an uncomfortable electrical shock.

Source: California Farm Bureau Federation
Cherries originated in the land between the Black and Caspian seas of Asia Minor. It is thought that birds were the first to carry cherries to Europe. The Romans planted trees along roadsides. Both the wood and fruit were valued, just like they are today. Sweet cherries came to the U.S. with the English colonists in 1629 and then were introduced to California by the Spanish missionaries.

Crossing Over

There are five main types of cherries grown in California—Bing, Rainier, Tulare, Brooks, and Garnet. All are sweet and are eaten fresh. For cherries to form, pollen from one type of cherry tree must enter the blossom of another variety. This is called cross-pollination. So, farmers have at least two kinds of cherry trees growing in their orchards.

Weather it Out!

Cherries are sensitive to the weather and farmers have learned lots about this over the years. They know that their best crops are on years when there are 1,000-1,200 hours of temperatures below 45°F. Weather tracking systems keep track of these “chill hours.” One tracking system is called CIMIS. Farmers sign onto the Web site and get the weather reports they need. Then they make predictions and adjust their work so the cherry harvest will be the best it can be.

Air Blasting!

Did you know that some farmers use large fans and even helicopters to whoosh away rainwater from ripening fruit? Too much rain can make cherries bust right out of their skins. This is called “rain crack.” Next time you blow-dry your hair, remember the cherry farmers. They use blow dryers too!

Standards:
Grade 4
Science 1.0
Grade 5
Science 1.0
Grade 6
Science 1.0

Activity

Alex saw a cherry tree in May, full of ripe cherries. “Gee,” he said. “I wonder how many cherry pies I could make from the fruit on that tree?” He quickly estimated that the tree had about 7,000 cherries on it and that it took 50 cherries to make a cherry pie. So… how many pies can be made from that cherry tree? Check your answer on page 15.

Standards:
Grade 4
Math: Number Sense 1.0, Mathematical Reasoning 1.0
Grade 6
Math: Number Sense 1.0, Mathematical Reasoning 1.0, 1.3
Avocados

It’s All Done by Hand

Next time you go to the grocery store and pick out a fresh avocado, think about the person who picked it for you! Imagine climbing up a 30-foot ladder holding a 14-foot pole in one hand. You must maneuver the special shears, called clippers, on the edge of this pole to slice the fruit off the tree. You place it in your picking bag you have hanging over your shoulders and continue doing this until your bag has about 40 pounds of fruit in it. You climb down the ladder, pick another good spot and do this again. If you were an avocado picker, that is what you would do! Now, how’s that for your exercise for the day?

Quit Bugging Me!

On a nice summer evening, have you ever been bitten by a pesky mosquito? Those small insects can be quite bothersome. Avocados have some pesky insects that bother them too!

Growers need to watch out for three tiny insects—the persea mite, avocado thrips and the avocado lace bug. These little critters have found their way from the avocado’s native habitat in Mexico to California’s avocado groves. You can do your part to stop their damage by not transporting fruits and vegetables from other countries into California.

Disease Control and Dogs on Patrol

Dogs on patrol at airports and post offices? That’s right! The United States Department of Agriculture (USDA) and the California Department of Food and Agriculture (CDFA) have hired dog handlers and their dogs to protect California’s agriculture. Why? Because most pests and diseases that attack the commodities grown in California are brought here from other countries.

Dogs, with their keen sense of smell, can be trained to sniff suitcases and parcels to locate fruits, vegetables, plant products and meat. When they smell one of these items, they sit next to the package until the handler checks out the smell. Imagine having that job…

Avocado Lace Bugs

Live in colonies on the underside of leaves consuming the tree’s valuable energy. This causes the leaves to drop and the fruit to be small.

Avocado Thrips

Creates a rust-like coloring on the fruit’s skin.

Persea Mites

Cause spotting on the leaves which then fall off, allowing exposed fruit to get sunburned.

Avocados are native to Central America where they grow on trees in the understory of tropical rainforest environments. On an average tree, 1,000,000 tiny flowers form at the tips of buds. However, less than one in 3,000 will develop into avocados. With proper care, soil and weather, the avocados will be ready for harvest in 10 to 12 months. Avocados won’t ripen until they are removed from the tree.

Nicaraguans stuff them with cheese, cover them with batter and bake them.

Japanese enjoy them in sushi rolls.

Taiwanese eat them with milk and sugar.

The French fill them with shrimp.

Koreans use them in facial creams.

Brazilians add avocados to ice cream.

Mexicans use them as a tasty butter.

Unscramble the bolded letters to find out on what day Americans eat the most avocados.

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‘Our economy is based on ag. If a lot of our food gets damaged by insects, that will impact our economy. Then we’ll have to come up with something else for income or we’ll have to learn to live with less money.’

Brianna Edlund

8th grader

Los Angeles County

Just the Facts

Activity

How Do You Like Your Avocados?

Eighth grader Brianna Edlund wrote the story “Doggie Duties.” She entered her story in the Imagine this… story writing contest and won! Check out her story and learn how to enter this writing contest at www.cfake.org/imaginatorthis/doggie.

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Check your answer on page 13.

Activity

Dogs are all different. Those that work at airports sniffing for food need not be of a specific breed. Rather, they must be able to work around lots of people and mind their handler. Find five dog sale ads in the “Classified” section of your local newspaper. Cut them out and glue them on a sheet of paper. Find the mean (average) cost of the dogs. Now, write a “for sale” ad for a dog that might be a good airport or postal inspection dog. Be sure to list the characteristics the dog should have.

Standards: Grade 4 Math: Statistics, Data Analysis and Probability 1.0, 1.2; Language Arts: Writing 1.7, 1.8

Grade 5 Math: Statistics, Data Analysis and Probability 1.0, 1.2; Language Arts: Writing 1.1

Grade 6 Math: Statistics, Data Analysis and Probability 1.0, 1.1; Language Arts: Writing 1.1

Answer to Page 12 Question: 59 dozen eggs
Going Nuts!

According to scientific research, 

**Did you know?**

Eating nuts can reduce the risk of heart disease, some types of cancer, and other diseases. They can also help reduce the bad (LDL) cholesterol, increase the good (HDL) cholesterol, and contribute protein to your diet.

**On Shaky Ground**

Almonds, walnuts, and pistachios are harvested mechanically. Imagine a shaker wrapping its claw-like arm around the base of each tree trunk and then shaking it, causing the nuts to fall. Almonds and walnuts fall directly on the ground and then are swept into rows by a mechanical sweeper. A third machine picks up the nuts and transports them to carts, which are towed to a huller, where the outer hull is removed. Pistachios are more delicate, so they fall onto a canvas catching frame, that moves the nuts directly into bins.

Pistachios must be taken off plants with the hand. If allowed to fall, they would break and be wasted. Pistachio nuts are formed when pollen from a male tree reaches the female flowers of another tree. No bees need apply for work on this tree crop. Pistachio pollen is wind-borne.

Pistachio nuts grow in grape-like clusters on trees. Each pistachio is encased in a fleshy hull that turns rosy when ripe. Inside the hull, the shell splits naturally while on the tree. Pistachio kernels get their green color from chlorophyll, the same pigment that makes leaves green.

It's a dry fruit with one seed whose outer wall becomes very hard. In cooking, the word "nut" is used more loosely and is associated with any kernel that has a hard outer shell. Let's learn about common nuts people eat!

Almonds

Two kinds of almond trees are planted in alternate rows. As bees work gathering nectar for their hives, they carry pollen from one type of almond tree to another. This cross-pollination is needed to grow the almonds we eat.

The fuzzy hull, which covers the growing almond, eventually hardens and splits, telling the farmer it's time for harvest.

The fuzzy almond hulls don't go to waste. They are fed to dairy cattle.

Pistachios

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Walnuts

Walnut trees are self-pollinating trees. That means that the pollen from one part of the tree must reach its flower. Each tree contains both the pollen and the flower and requires the swish of the wind to transfer the pollen.

You won't see beautiful blossoms on walnut trees; rather, gangly tassel-like pollen baskets appear. Walnut shells are used in sandblasting.

Nutty About a Healthy You!

Nuts can be part of a healthy diet. Take a look at MyPyramid. Nuts are part of the "Meat and Beans" section. Check out mypyramid.gov and determine how much of each type of food you should eat each day.

**Grains**

Make half your grains whole

Start smart with breakfast.

Look for whole-grain cereals.

Just because bread is brown doesn't mean it's whole-grain. Search the ingredients list to make sure the first word is "whole" like "whole wheat".

**Vegetables**

Eat 1 1/2 cups every day

Eat 2 1/2 cups every day

Eat 3 cups every day

Eat 5 oz. every day

**Fruits**

Focus on fruits

Eat 1 1/2 cups every day

Eat 2 cups every day

Eat 3 cups every day

Eat 5 oz. every day

**Milk**

Get your calcium-rich foods

**Meat & Beans**

Go lean with protein

Sources: Almond Board of California, California Pistachio Commission, United States Department of Agriculture, and Walnut Marketing Board

**Try This Activity**

Make a nutty butter sandwich. "Nutty" butter by grinding 1 cup of your favorite nut with 1/4 teaspoon salt in a food processor. Blend in one tablespoon of vegetable oil and 1 tablespoon of salt. Blend at a time until the butter is of spreading consistency. Write clear directions on how to make a "nutty butter sandwich." Next, follow your instructions exactly and see what kind of afternoon snack you have made. How would you change your directions to get a better product?
People have had refrigerators for less than 100 years. Before that time, people had to be creative on how they would store the food they worked so hard to gather or grow. Some would use salt to cure meats and vegetables. Others would “can” their foods. Some people had iceboxes, a special container that stored ice and perishable food—similar to the ice chests of today. Some stored food in basements where it was cool. The oldest known method of food preservation was dehydration, where the water was removed from the food preventing the growth of harmful microorganisms. These food preservation methods are still used today.

Figs
- It is thought that figs originated in ancient Babylonia. The fig tree was held sacred in all countries of southwestern Asia, Egypt, Greece and Italy and was a part of most ancient cultures.
- Figs were used as a training food by the early Olympic athletes and are still used in that way today. They are high in potassium. The first Olympic “medals” were laurels of figs.

Source: California Fig Advisory Board

Raisins
- The first raisins were discovered when humans happened upon grapes drying on the vine. One can find historical references to sun-dried grapes and raisins as early as 1490 B.C. The first were established between 120 and 900 B.C. Native to the Mediterranean regions, raisins were grown primarily in Greece and Spain and traded by the Phoenicians.
- The first California raisin crop was produced by nature when a heat wave hit the Central Valley in 1873 drying the grapes before farmers could harvest them.

Source: California Raisin Marketing Board

Dates
- Date palm orchards flourished near the Tigris and Euphrates Rivers in ancient Mesopotamia, now known as Iraq, before 3000 B.C. Ancient Egyptians created date palm hieroglyphs. In fact, dates were found buried with King Tutankhamen. The Hebrews called the date palm “the tree of life.”
- In 1904, date palms were planted in Southern California. Today 30 million pounds of dates are produced each year in the Coachella Valley.

Source: California Date Administrative Committee

Dried Plums
• Dried plums originated in Western Asia then found their way into Europe and the Balkans. Louis Pellier began growing dried plums in the Santa Clara Valley after failing to make money gold mining.
• In 1905, Martin Seely, a California farmer, tried to use monkeys to pick his prunes. It didn’t work too well—the monkeys picked them okay, but they ate them too!

Source: California Dried Plum Board

Using a newspaper U.S. weather map and data chart, locate a state whose weather would be ideal for dehydrating fruit today. If you were to look at a weather map in about three months, would your answer most likely be the same? Explain your reasoning to the class.
Horticulture... As Diverse as our State!

Horticulture is the growing and caring for gardens and orchards, flowers, shrubs and trees. Let’s read about some horticulturists and see what they do!

So What’s a Nursery Product?
Take a look around you. You see houseplants, flowers, arrangements, soccer fields, fruit trees, the fruits and vegetables in the grocery store and the lawn and garden landscape around your home. All these products are nursery products, which can make your life greener!

“Find a way to do what you love. Every day I get to see nature in action and find it rewarding to work with people who respect and love plants and our planet.”

-Chris Rowe Martinez
GARDEN MANAGER, DREAMTREES NURSERY & FLOWER, INC., LAMONTE
Ms. Rowe-Martinez is responsible for making sure her retail nursery is in working order. She manages employees, orders plants and provides her employees with the equipment they need like forklifts that move material and water tanks used to water the plants in the garden center. Her 2.5 years of college and her California Certified Nursery Professional certification help her to make decisions that keep her operation running smoothly.

“I think it is important for children to understand how horticulture impacts their lives. I want them to know and appreciate the roles plants and trees play in our existence.”

-Russ Satake
PRESIDENT, SATAKE NURSERY, INC., MORGAN HILL
Mr. Satake operates his family-owned business in one of California’s most populated areas — the Bay Area! He is responsible for the production and selling of millions of plants and six-pack flowers, produced each year. You may find him driving an electric cart checking inventory or moving supplies. From determining what to plant to getting the items to the market, Mr. Satake handles paperwork and publicity for his company. He sells his plants to stores that then sell them to you. Mr. Satake's bachelor of arts degree from UC Berkeley provided him with the knowledge he needs to keep his business successful.

“Learn how to study. It takes work but once you develop good study habits learning becomes easier.”

-Steve Atwood
SALES MANAGER, CAPITAL NURSERY, SACRAMENTO
Mr. Atwood delivers plants. Each day he performs a pre-trip inspection of his truck or semi tractor-trailer and prepares for direction on how to get the items to the market. He checks his travel route, drives safely, and then unloads his plants at their final destination. Mr. Sanchez takes pride in the displays he creates at the retail outlets where the flowers are sold.

“Listen to your heart, follow your dreams and listen to your elders for direction on how to achieve your goals.”

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COO/OWNER, SOON RUSK SEED COMPANY, INC., CASTRO VALLEY
Mr. Sanchez’s company produces red flower seeds—from Shasta Daisies to Red California Poppies. His degrees in business, economics, accounting and statistics help him track many accounting details. Mr. Atwood is a good listener and an innovative businessman. One such innovation is the use of plastic sparrow hawks, fake birds that flutter from a string in the wind. They keep sparrows and other small birds away from the fields.

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ASSISTANT DIRECTOR, DIVISION OF PLANT HEALTH AND POST-PHASE SERVICES, CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE, SACRAMENTO
Mr. Posadas might be in Washington D.C. learning about exotic pests such as the Mediterranean fruit fly, in his California office reviewing reports, or in Mexico sharing his knowledge with other experts. He depends on his cell phone and handheld “blackberry” to keep in touch during his travels. After being a firefighter for the US Forest Service, Mr. Posadas used his college degree in biology to help control pests in California.

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-Steve Atwood

COO/President, Pacific Berry Seed Company, Inc., Castro Valley

Mr. Atwood’s company produces redflower seed—from Shasta Daisies to Red California Poppies. His degrees in business, economics, accounting and statistics help him track many accounting details. Mr. Atwood is a good listener and an innovative businessman. One such innovation is the use of plastic sparrow hawks, fake birds that flutter from a string in the wind. They keep sparrows and other small birds away from the fields.
So what’s for dinner? Is it chicken and rice? How about sushi or a rice bowl? It could be red beans and rice or paella or risotto. Chances are one of your meals this week will include rice. In fact, it may be the main ingredient in your morning cereal. Rice is the most widely consumed grain in the world.

California’s rice fields are wildlife habitats for hundreds of species of birds, mammals and amphibians. They are one of the favorite viewing areas for millions of birds that use these wetlands for their annual migration from north to south. One might see Snowy and Great Egrets roaming the waters, or Red-tailed hawks soaring over the fields looking for snakes or gophers that live along the water’s edge. A Bald Eagle may even be sighted.

Once a pesky by-product that was burned or tilled back into the soil, rice straw is now finding its way into the consumer world. You might see it on the sides of roads as wattles, long tubular structures placed to control soil erosion. It can be made into fiberboard used to build walls. Mushroom growers use it to produce their delicacies, while others use rice straw to make specialty papers and newsprint. Rice straw buildings require less heating and air-conditioning than conventional homes. These uses not only help the farmers make money, but they also help the environment.

It might seem like rice needs a lot of water in order to grow. It does, but no more than many other crops. It takes about 25 gallons of water to produce one serving of rice. That’s about the same amount of water it takes to produce one orange or a handful of cherries. Water use is just more noticeable with rice. Farmers monitor the water they use and work to make the water they return to the rivers cleaner than the water they take from them. Rice farmers use a high tech, water conserving process called “laser-leveling” to make fields as flat as a table top. It takes teamwork—scientists, engineers, inspectors and farmers working together.

Most of California’s rice is grown in the Sacramento Valley. In April and May, airplanes spread rice seed over fields flooded with about 4” to 6” of water. The seeds sink to the ground, take root and grow upward. In September and October, when the rice stalks are full-grown, most of the rice is harvested with a machine called a combine.
We Share the Air!

Take a Deep Breath!

Nothing is more refreshing than breathing the crisp clean air after a rainstorm.

Why? The air has been washed of pollutants.
The pollutants we can see are called particulate matter. But most air pollution is a kind we cannot see. These pollutants are gases that come from different sources.

Air Quality

Air Quality Index

Good  Moderate  Unhealthy for sensitive groups  Unhealthy  Very unhealthy  Hazardous

0  50  100  150  200  300  500

Each day, scientists gather information from air quality stations throughout the nation. These stations record the amount of pollutants in the air.

The Environmental Protection Agency (EPA) requires that air quality data is gathered and made available to the public. You can find a chart like this in the weather section of your newspaper as well as on the Internet. Your local news also reports the air quality.

The Air Quality Index values range from zero to 500. The smaller the number, the cleaner the air.

Good air quality ranges from zero to 50.

Let’s All Clean the Air!

Agriculturalists know clean air is important. After all, the plants they grow and the animals they raise need clean air to survive. However, our air has become dirtier over the years. More cars and trucks on the road, an increase in industry and some agricultural practices are just some of the contributors to increased air pollution. Each year, the San Joaquin Valley suffers more than $150 million in crop damage due to air pollution. That’s a lot of money!

Here are a few things that agriculturalists can do to help improve the air:

• Engines of all types are used in agriculture – to move water, operate tractors and trucks, and run heating and cooling systems in greenhouses and poultry houses. Replacing diesel engines with engines that emit less pollution is a benefit to us all!

• The amount of dust can be reduced by quickly re-planting fields after harvest, tilling the soil on less windy days, and using equipment that produces less dust.

• Burning less waste reduces particulate matter in the air. Some almond growers, for example, chip their prunings and sell it as animal bedding. This actually becomes a commodity from which they can earn money!

Here are five pollutants that are measured regularly by scientists. Look at the chart to learn more about these pollutants.

<table>
<thead>
<tr>
<th>Pollutant (O₃)</th>
<th>Description</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone (O₃)</td>
<td>A colorless gas made of three oxygen atoms</td>
<td>• Formed when vehicle exhaust and other fumes combine with other substances in the presence of sunlight</td>
</tr>
<tr>
<td>Particulate Matter</td>
<td>Very small particles such as dust, soot or droplets of liquid</td>
<td>• Power plants • Wind-blown dust • Diesel engines • Wood fires/stoves</td>
</tr>
<tr>
<td>Carbon Monoxide (CO)</td>
<td>A colorless and odorless gas made of one carbon and one oxygen atom</td>
<td>• Power plants • Natural gas appliances</td>
</tr>
<tr>
<td>Nitrogen Oxides</td>
<td>Gaseous compounds made of nitrogen and various amounts of oxygen</td>
<td>• Vehicles • Power plants that burn fossil fuels</td>
</tr>
<tr>
<td>Sulfur Dioxide (SO₂)</td>
<td>Gas made of one sulfur atom for every two oxygen atoms</td>
<td>• Power plants and factories burning coal • Charcoal barbeques • Oil refineries</td>
</tr>
</tbody>
</table>

Source: airnow.gov

Activity

What Can You Do?

Take a deep breath and think of three ways you can help reduce air pollution. List them here:

1) _______________________________________
2) _______________________________________
3) _______________________________________

In the space below, draw a cartoon that shows you doing one of these activities. Be sure to include at least one sentence in your cartoon.

Comic title: _____________________________ by: _____________________________

Read this page on air quality and then find the “air quality” report in the “weather” section of your newspaper. At home tonight or tomorrow, discuss with your family what you have learned.

Standards: Grade 4 English Language Arts: Written and Oral English Language Conventions 1.0, Grade 5 English Language Arts: Written and Oral English Language Conventions 1.0, Physical Sciences 1.1, Life Sciences 20 English Language Arts: Written and Oral English Language Conventions 1.0, Science Resources 50 Grade 7 English Language Arts: Written and Oral English Language Conventions 1.0, Grade 8 English Language Arts: Written and Oral English Language Conventions 1.0, Grade 9 English Language Arts: Written and Oral English Language Conventions 1.0.
The Chicken and the Egg

What’s Inside an Egg?

Eggs are a great source of protein and contain 14 minerals and 11 vitamins. But when you eat an egg, have you ever looked at it closely? Let’s take a look…

Shell

outer covering of egg composed mostly of calcium carbonate

Shell Membranes

two paper-like membranes that keep in moisture and protect the egg

Yolk

yellow part of the egg, which is a major source of vitamins, minerals and fat

Air Cell

usually forms on the large end of egg between the two shell membranes; the older the egg, the larger the air cell

Chalazae

these whitish strings hold the yolk in place; the fresher the egg, the more noticeable

Albumen

also known as the egg-white; this clear-like substance is a major source of riboflavin and protein

Figure This!

Eggs are often sold by the dozen. If you worked at a restaurant and on average sold 350 two-egg breakfasts each day, how many dozen eggs would you need to have on hand each day?

Check your answer on page 5 or learn how to solve it at kids.cfaitc.org/wgo4/eggproblem.

Activity

Bring in your favorite family recipe that uses chicken or eggs. Price the ingredients in the grocery ads of your newspaper. Estimate the prices for the ingredients for which you cannot find prices. Determine the price per serving by dividing the total cost of the meal by the number of people it will serve.

Try This Activity

Did you know that an egg can bounce?

WAIT A MINUTE…don’t use a raw or cooked egg! Instead make your bouncing egg by following the procedure at kids.cfaitc.org/wgo4/bouncingegg

Chicken Nuggets

Spanish explorers brought the first chickens to North and South America in the 1500s.

Chickens raised for meat are called “fryer” chickens.

The Single Comb White Leghorn is the most common breed used for the production of white shell table eggs.

A rooster is not needed for a hen to lay an egg, just an egg that will grow into a chick.

One laying hen lays about 240 eggs per year… that’s almost one a day.

Americans eat about 80 pounds of chicken per person per year. In 1960 the average consumption was 30 pounds per year.

Sources: American Egg Board and California Poultry Federation
Your warm sweater or coat may come from sheep wool. Wool is the hair of sheep. Like human hair, it is made of a protein called keratin. Sheep are sheared once a year. The shearsers are skilled and know how to hold the wooly ruminants so the skin is tight and the fleece cut long. The longer the wool fibers, the more the rancher gets for the fleece. Most shearsers wear special burlap moccasins that are specially designed to prevent the crew from slipping on floors slick with the lanolin which is the natural oil in the wool. Next time you wear a wool sweater or use lotion, think of the sheep who provided you with these items.

The cashmere sweater that keeps you warm may have gotten its start on a California goat farm. The U.S. cashmere business began about 1990 and has now grown to approximately 100 goat ranchers in the country.

Linen is made from the fibers of flax plants. It is woven and makes fabrics used for tablecloths and clothing. Flax seed is becoming a popular grain that people eat to increase fiber in their diets.

Your warm sweater or coat may come from sheep wool. Wool is the hair of sheep. Like human hair, it is made of a protein called keratin. Sheep are sheared once a year. The shearsers are skilled and know how to hold the wooly ruminants so the skin is tight and the fleece cut long. The longer the wool fibers, the more the rancher gets for the fleece. Most shearsers wear special burlap moccasins that are specially designed to prevent the crew from slipping on floors slick with the lanolin which is the natural oil in the wool. Next time you wear a wool sweater or use lotion, think of the sheep who provided you with these items.

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Sources: American Sheep Industry Association and California Farm Bureau Federation

Next time you eat peanut butter and celery, check out the long fibers on the celery stalk. Those are cellulose fibers. Fiber is a part of all fruits and vegetables. It keeps your digestive tract working properly.

Look through your local newspaper and read a few articles that interest you. Do they mention items that are made from plant or animal fibers? What would your life be like without these items? Discuss your thoughts with a partner.

**Standards**

*Grade 4*
Reading 2.0; Life Science 3c

*Grade 5*
Reading 2.0

*Grade 6*
Reading 2.0 Science: Resources 6c

---

**Activity**

Use the information on this page to solve this crossword puzzle.

**ACROSS**
1. a baby sheep
2. the fiber from which the first blue jeans were made
3. the plant from which linen fibers come
4. the part of the plant from which cotton fibers and seeds form
5. what cotton grows on
6. the protein found in animal fur or hair

**DOWN**
1. forms the walls of plant cells
2. the fiber from which the first blue jeans were made
3. the plant from which linen fibers come
4. the part of the plant from which cotton fibers and seeds form
5. what cotton grows on
6. the coat of wool that comes from a sheep
8. a natural oil found in sheep wool

---

**Answer to Page 5 Activity:**

Americans eat the most avocados on Super Bowl Sunday.

---

**Crossword Answers: ACROSS - 2.) cotton 3.) flax 4.) boll 5.) plant 7.) fleece 8.) lanolin**

**DOWN - 1.) lamb 2.) cellulose 6.) keratin**
On the Farm

Del Rio Botanical owner and grower Suzanne Peabody Ashworth lives along the Sacramento River in Yolo County. She grows rare fruits and vegetables on her 200-acre ranch. She has saved seeds from over 1,500 varieties of rare produce and herbs including specialty basils, tomatoes and peppers. Ashworth lets local restaurants know what she has available.

On the Road
Once Ashworth receives an order, Ashworth and her work crew harvest the order, pack it and then quickly place it into refrigerator trucks. Within an hour, the food reaches its destination—the restaurant.

At the Restaurant

Chef Gene Moana of Lucca Restaurant in Sacramento puts together his menu for the day. How does he plan it? He finds out what fresh produce is available, plans his menu, estimates how many people he will serve that day, and then places his order. Within hours the food is delivered to his doorstep. Chef Moana takes pride in his delectable dishes.

Try This Activity

Tomato Mozzarella Salad

- 5 slices fresh mozzarella cheese
- 8 cherry tomatoes sliced in half
- ½ yellow tomato sliced into wedges
- 1 cup arugula or romaine lettuce leaves
- ½ ounce red wine vinegar
- 1 ounce extra virgin olive oil
- Salt and pepper to taste

Did you ever wonder where basil for pesto comes from? How about the lemongrass used in Thai food? Many farmers grow specialty items, providing you with lots of choices that impact your senses.

Nothing tastes better than farm fresh food. Consumers can enjoy a sensory experience of smells, colors and tastes at local farmers’ markets. To find a farmers’ market in your area check out www.cafarmersmarkets.com.

Some farmers produce food that is “organic.” They are called “organic farmers.” As with any farmer, organic growers must keep their plants healthy and productive. Organic farmers can use natural chemicals such as manures, sulfur and mulches to keep the crops healthy. Other times beneficial insects are put into fields so they will eat other little critters that are enjoying the farmers’ plants.

The USDA has a certified organic program which requires organic growers to follow certain regulations. Their products can display this symbol. Nearly 1% of California farms and 2% of the nation’s farms produce food that carry this symbol.

Community-supported agriculture is when local farms are supported by their community. One such example is when people pay to get a box of fresh fruits and vegetables delivered each week. Sometimes school salad bars use local produce.

Have you ever eaten a pluot, a fruit produced by crossing a plum with an apricot? How about the purple arugula leaves that brighten up your salad plate? California farmers produce over 350 crops from asparagus to zucchini!
Agriculture—the science, art and business of soil cultivation, crop production and the raising of livestock

Ailment—illness or sickness

Canvas—a strong cloth with a coarse weave; often made of cotton

Cashmere—fibers from goats

Certified Organic—a food produced without the use of synthetic pesticides, synthetic fertilizers, bioengineering or ionizing radiation.

Chlorophyll—a substance in green plants that converts light energy into chemical energy using carbon dioxide and water

CIMIS (California Irrigation Management Information System)—a program that monitors weather

Climate—the kind of weather a place has

Combine—a machine or tractor that cuts, threshes and cleans a crop while moving across a field

Commodity—any product, such as grain or fruits used in trade

Consumer—someone who uses products

Cotton—a plant that produces long fibers that are used to make things such as fabric and rope

Cross-pollination—to transfer pollen from one variety of plant to another

Data—facts or known information

Dehydration—to dry or remove water

Fertilized—in flowers the process where pollen actually reaches the ovary.

Fertilizer—any substance added to water or soil to increase the nutrients available to plants

Fleece—the intact coat of wool shorn from a sheep

Hieroglyph—a picture, character or symbol standing for a word

Horticulture—the growing and caring for gardens and orchards including vegetables, fruits, and ornamental flowers, shrubs and trees

Linen—a fabric made of flax fibers

Manure—solid animal waste products

Mulch—soil, straw, wood chips or any loose substance placed on the ground to conserve soil moisture, prevent soil erosion or control weeds.

Mechanically—by machine or some type of equipment

Niche—a suitable or special place or position

Nut—a dry fruit with one seed whose outer wall becomes very hard

Perishable—liable to spoil or decay

Pest—a living thing such as a plant, animal or virus that is unwanted in a particular place at a particular time

Pesticide—a chemical used to control pests

Photosynthesis—process where plants use light, carbon dioxide and water to produce sugars

Pollinate—when pollen transfers from the anther to the stigma of a flower

Pollutant—a substance in water, soil, air or elsewhere that impairs its usefulness

Produce—to make; sometimes refers to fruits and vegetables

Sulfur—a mineral sometimes used to control insects and fungi

USDA—United States Department of Agriculture, a governmental agency

Wool—the fibers from sheep

Activity

Find two of the glossary terms in this newspaper. Copy the sentences each are in and then report the uses in bibliography format. Use quotation marks which are required when you copy something. You must also provide credit; hence, the bibliography.

Example:

Sentence Quote

“Celery was first used to cure stomach ailments.”

Bibliography

“Tasty Plants,” What’s Growin’ On?, p. 3.
Fun Facts!

California’s Top 10 Commodities for 2004

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Commodity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Milk and Cream</td>
<td>$5,365,992,000</td>
</tr>
<tr>
<td>2</td>
<td>Grapes</td>
<td>$2,756,535,000</td>
</tr>
<tr>
<td>3</td>
<td>Nursery Products</td>
<td>$2,649,326,000</td>
</tr>
<tr>
<td>4</td>
<td>Almonds</td>
<td>$2,200,055,000</td>
</tr>
<tr>
<td>5</td>
<td>Cattle and Calves</td>
<td>$1,633,740,000</td>
</tr>
<tr>
<td>6</td>
<td>Lettuce</td>
<td>$1,462,331,000</td>
</tr>
<tr>
<td>7</td>
<td>Strawberries</td>
<td>$1,218,860,000</td>
</tr>
<tr>
<td>8</td>
<td>Tomatoes</td>
<td>$1,090,589,000</td>
</tr>
<tr>
<td>9</td>
<td>Hay</td>
<td>$1,010,175,000</td>
</tr>
<tr>
<td>10</td>
<td>Flowers</td>
<td>$1,001,882,000</td>
</tr>
</tbody>
</table>

Source: California Agricultural Statistics Service

Each year, an average Californian consumes about 126 pounds of fresh fruit, 197 pounds of fresh vegetables, 251 eggs, 22 gallons of milk, 29.8 pounds of cheese, and 184 pounds of meat and poultry.

Lavender was used for mummification and as a perfume by the Egyptians, Phoenicians and peoples of Arabia more than 2,500 years ago. It is grown in California’s Sacramento Valley. To learn more about commercial lavender production, check out lavenderfarm.com

Nearly 1/3 of California is covered with forests. Every Californian uses the equivalent of a 100-foot tree each year.

Sources: California Farm Bureau Federation and The Forest Foundation

It takes 1¼ gallons of milk to make one pound of cheese.

Acknowledgements

The California Foundation for Agriculture in the Classroom (CFAITC), a 501(c)(3) nonprofit educational organization, provides educators with low cost and free materials, training and information to increase student understanding of California agriculture while teaching the core disciplines.

Contact CFAITC or www.cfaitc.org for:
- Resources/Lesson Plans
- Story-writing Contest
- Conference Opportunities
- Newsletters
- Web Site (www.cfaitc.org)
- Kids’ Corner (kids.cfaitc.org)

2300 River Plaza Drive
Sacramento, CA 95833
(800) 700-AITC
www.cfaitc.org

Editor: Pamela Emery
Executive Director: Judy Culbertson
Design: Erik Davison, The Fresno Bee