What role does Agriculture play in your life? Believe it or not, agriculture is in everything you do throughout the day. The cotton sheets on your bed, the scrambled eggs in your breakfast, the leather in your shoes, the paper in your notebook, your apple for lunch, the grass and trees outside, the milk with your snack, the lettuce in your salad, and the cookie for dessert…they all come from agricultural products.

California is the top agriculture producing state in the country. What does that mean? It means we grow more food, fiber, flowers, forest, and fuel than any other state. The Top-Ten commodities all fall into these five categories: the five “F”s of Agriculture. Look around you, where ever you live, not too far away, are the ranches and farms that grow these commodities. Next time you’re out and about, take a look and see if you can figure out What’s Growin’ On? around you!

This year’s What’s Growin’ On? is inspired by the wealth of commodities that grow in our state. Over 400 different commodities grow in California. Read through each page of What’s Growin’ On? and you will find out more. There’s information about each of the Top-Ten and you’ll also find activities and challenges to get you thinking a little deeper about what goes into the commodities that are growin’ around here!

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Happy Reading!

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Milk and dairy foods are rich in a wide range of nutrients that are enjoyed by children and adults. Most milk in the United States comes from cows, but goats, camels, and sheep also produce milk. Beverages from plant sources like soy or almond are not true “milk.”

What does milk come from?

Milk is number one! Milk is number one! Milk is number one! Milk is number one! Milk is number one! Milk is number one! Milk is number one!

An early example of biotechnology was the use of micro-organisms to produce cheese, yogurt, and bread. Ancient Egyptians made cheese using biotechnology. In the 12th century, Genghis Khan fed his already brawny warriors yogurt for extra strength. Research how biotechnology and the use of micro-organisms help in the process of cheese and yogurt making. Compare “then and now” procedures. Students can work in groups and present their findings to the class.

Unscramble the words to finish each sentence. Yeida __________ foods are an important part of a healthy diet. Milk is a good source of lmccuia __________ which is important for strong bones. Gtyuor __________ and eeesch __________ are examples of dairy foods. Milk has rtpnei __________ which is good for building muscle. Children ages 9 and older as well as adults should eat erhte __________ servings of dairy foods each day.

Enjoy delicious yogurt that you and your family can make at home. It’s easy! www.healthyeating.org/Healthy-Eating/Meals-Recipes/Browse-Search-Recipes/rid/58472/homemade-yogurt.aspx or make cheese using the “Say Cheese” Ag-Bite from CFAITC. Go to www.learnaboutag.org/agbites/

Check your price!

I visit dairies, look at cows, and formulate rations and supplements for them.

What is in a dairy cow’s ration? A meal for a cow would include corn silage, alfalfa hay, cottonseed, rolled corn, almond hulls, and a protein source such as canola meal.

What is your education and background? I was raised on a farm in Arkansas, got my bachelors degree in Animal Science, my masters degree in Dairy Science, and my PhD in Ruminant Nutrition. I’ve been doing my job for over 30 years.

My Plate

MyPlate is an illustrated guide of what a balanced meal looks like. It should include: Grains, Protein, Vegetables, Fruits, and Dairy.

Activity: What should you put on your plate? Draw or write foods for your own MyPlate for lunch. Make sure you create a balanced meal!

See www.choosemyplate.gov/about for more details of what each food group contains as well as portions. Share your balanced meal with your classmates!
A Season of Almonds

Almonds are a Top-Ten crop in California. All the almonds purchased in the United States come from California! And about 80% of almonds purchased in the world come from our great state!

**A Season of Almonds**

**WINTER - Dormancy**
- Trees are dormant or resting.
- All leaves have dropped.
- Trees are storing up nutrients.

**SPRING - Pollination**
- For almonds to grow, the trees need to be pollinated. About 1.6 million colonies of honey bees are required to pollinate almond orchards in California.
- In February, flowers bloom on the branches.

**SUMMER - Growth**
- Almonds continue to mature with the shell hardening and the kernel developing.
- Hulls begin to split, allowing the inner shell to begin to dry.
- When the almonds are ready to be harvested, the hull will begin to open. This is called the hull split.

**FALL - Harvest**
- The grower shakes the trees with a machine called a shaker. The almonds fall to the ground.
- After the almonds have dried for about a week, they are swept into rows by a machine called a sweeper.
- The almonds are picked up by a harvester and trucked to a processing plant to be packaged and shipped throughout the world!

**Activity**

**Have you tried this?**
Take a class survey and find out how many students have tried the following:
- Raw Almonds _________
- Almond Butter _________
- Almond Crackers _________
- Marzipan _________
- Roasted Almonds _________

**CAREER: Apiarist/Beekeeper**

Shannon Wooten (pictured with his wife, Glenda), is an Apiarist/Beekeeper and Owner of Wooten Golden Queens, Palo Cedro, CA.

What is your job? I raise and sell queen bees; which is time consuming and technical, so most beekeepers don’t do it themselves. I also deliver colonies of bees to almond orchards. A colony is a box of bees with about 40,000 bees and 1 queen.

What is something interesting about your job? I handle my bees without a suit or gloves. If you handle the bees gently, they won’t sting you. In the spring time, you can get stung 50-100 times per day!

**Did You Know?**

- Almonds are used as a protein source for natural disaster victims.
- Almond extract is not made from almonds. It usually comes from apricot or peach pits.
- Almonds are related to apricots, peaches, and cherries.
- Bees can fly 22 miles per hour and fly five miles round trip.
- Bees have five eyes.

**Bee Activity:**

Because of a problem called Colony Collapse Disorder or CCD, bees are disappearing across the country. Farmers have to ‘rent’ bees to pollinate their trees.

Almond farmers depend on bees, but there has been a shortage in the United States. Talk to your local Cooperative Extension or write a letter to your local beekeeper and find out how we can save the bee population. Research online about how to keep bee colonies healthy. Present your findings to your class.

**STEM Activity**

**Design an Orchard**

Orchards are planted in different patterns with different spacing. A common pattern is square with spacing of 22 feet x 22 feet. Plan out your own orchard with a scale drawing. Calculate how many trees you will plant per acre and then using graph paper, map out where your trees will be. Use one inch graph paper and show your calculations.

Steps:
1. Make calculations:
   - 1 acre = 43,560 square feet
   - Tree spacing = 22 ft x 22 ft = 484 square feet per tree
   - 43,560 square feet / 484 square feet = 90 trees
2. Using 1 inch graph paper, scale your drawing to 1 inch = 22 feet
3. Map out where your trees will be, can you get 90 trees on your page? If not, you will need to show less than 1 acre.
4. Add your math calculations, scale, and any labeling.
5. Decorate your orchard, name your ranch, and color.
6. Challenge: Research other orchard planting patterns and spacing. Do another scale drawing.

**Career Spotlight**

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

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

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

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

Wilson Farms’ owners say, “When the ranch needs something to get done, Luis makes it happen.”

---

**Grape Structures**

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

**STEM Activity**

**Recipe**

Try this Great Grape Smoothie!

1 cup seedless grapes  
½ cup frozen strawberries and cherries  
½ orange, peeled and sliced  
½ banana, peeled and sliced

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

---

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

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

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

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Cattle and calf operations are another Top-Ten commodity in California agriculture. Follow the trail to learn more about beef!

**STEM Activity: Build It Better**

Cattle are one of nature’s hardest animals, and are experts in finding and utilizing natural shelter against the elements. Design a place for your cattle herd. Take into consideration the following factors:

- **Cattle are herd animals.** This means they want to stay together with other cattle, not by themselves.
- **Cattle need to have food and water.** Cattle can graze on rangeland or on pasture if there is adequate grass. If there isn’t, they will need to be fed hay.
- **Cattle need healthcare.** Your herd will need to be vaccinated, de-wormed and branded. If an animal is injured or giving birth, they may need additional help. This can happen out on the rangeland or in a corral with a chute. Either way, you will need to contain your cattle in order to handle them.
- **Cattle need to be handled safely.** This is important to their well-being as well as the handler’s. Full-grown cattle can weigh up to 1,500 pounds, so you wouldn’t want to be stepped on or pushed around.

**Activity Requirements:**

Design a ranching operation for cattle on an 8 ½ x 11 paper, bird’s-eye view. Show the pen or range where your herd lives. Show where your herd will get food and water. Include a space for storing hay out of the weather. Show a corral and chute where your cattle can be contained while they receive vaccinations, de-worming, branding or treatment for injury. It must be safe for the animal and the handler. Name your ranching operation. Show details in your drawing. Label all parts of your drawing, include all italic words.

To learn more about safe structures for animals, view: www.youtube.com/user/TempleGrandin

“*If you’re ridin’ ahead of the herd, take a look back every now and then, to make sure it’s still there.*”

- Old West Proverb

**Cowboy Poetry**

Cowboy poetry is as old as cowboys themselves! The tradition began on the long cattle drives of the 1880s. A cowboy poem is a narrative type of poetry with a western theme. It must be recited as well as written.

**Activity**

Use the information you’ve learned about beef and do your own research to write a cowboy poem that you memorize or read to your class. Alternate activity: research cowboy poetry, choose a poem, determine its message, memorize it, and retell it to your class or write about a famous cowboy poet.

**Career Spotlight**

**CAREER: Cowgirl**

Amanda Barrett, Cowgirl, Rankin Ranch, Walker Basin, CA

What does your job involve? As a cowgirl, my primary responsibilities are to care for our cattle and the land on which they graze.

How did you become a cowgirl? I was born and raised on my family’s ranch in Central California. I returned to the ranch after graduating college.

What training do you need? A lot of the training that you need comes from hands-on experience. You can learn a lot from animal science and business classes, but you learn even more when you put this knowledge to use.

**CAREER: Cowboy**

Jerry Spencer, Cowboy/Rancher, Van Vleck Ranching & Resources, Inc., Rancho Murieta, CA

How did you become a cowboy? I was raised on my family’s cattle ranch in Northern California. I went to Cal Poly, San Luis Obispo and majored in Animal Science and Agricultural Business. That training along with on-the-job training is how I became a cowboy/rancher.

What does a typical day look like for you? I ride my horse quite a bit to check on cattle, doctoring them and moving them. Sometimes I use an ATV or a pickup to get from place to place. I also have to do office work, tracking finances and administrative work.

**Source:** www.calbeef.org; www.beefitswhatsfordinner.com; www.beefboard.org
Strawberries Strategies

Californians love their berries. Strawberries grow especially well in our state because of the temperate climate from the coast. Here is a story of the many strategies people use to take extra care to grow scrumptious strawberries.

Breeding
Growing strawberries starts even before they are planted. Scientists look for ways to make healthy strawberry plants by making them more resistant to pests and diseases.

Planting
Virtually all strawberry plants in California start as runners trimmed from mother plants, grown at high-elevation nurseries in Northern California. Once strong and healthy, they are shipped to farms across the state, where they are planted by hand.

Harvesting
All strawberries are picked by hand. Strawberry harvesting teams work hard to pick each berry and pack it inside a clamshell container. The containers are placed inside trays that are quickly transported to shipping facilities where they are cooled.

Selling and Shipping
Within 24 hours of being picked, the berries are loaded into refrigerated trucks and transported across the country and the world. 88% of the berries grown in the United States come from California. Berries are sold as fresh or frozen, or they are used as ingredients in other products.

True/False
1. Strawberries have lots of Vitamin C. T/F
2. Strawberries each have about 50 seeds. T/F
3. California produces about 88% of our country’s strawberries. T/F
4. Strawberries grow on trees. T/F
5. The country of Belgium has a strawberry museum. T/F

Class Connection
Go to a grocery store produce section. Check strawberry labels or ask where the strawberries were grown. Mark the location on a map. Compare locations with other students’ findings.

STEM Activity: Strawberry DNA
Using common household items, you can separate and observe strawberry DNA. This experiment can be done in class, for a science fair, or even just for fun! Go to the website: www.genome.gov/Pages/Education/Modules/StrawberryExtractioninstructions.pdf
Or visit LearnAboutAg.org for another version in Extra! Extra! Classroom Extensions.
Activity

Find and identify the Top-Ten commodities and their by-products in the map. Color!

Top-Ten and By-Products Answers: Milk, cheese, yogurt, ice cream; almonds; grapes; lettuce; strawberries; nursery; walnuts; tomatoes; hay

What else did you find? Did it come from agriculture?

Activity

What would you do without agriculture?

Cross off everything on your list that has something to do with agriculture. What is left? Think about it, during the day. If it were not for agriculture you wouldn't have most of the things you use every day.

The Sun, the Soil, the Water, the Seeds, the Plants, the Animals, all go together to produce the food YOU ME and WE need to grow!

Activity

What do we have now that we didn't back then? Fill in your findings and share with your class.

Then and Now

What was going on in 1986? California Foundation for Agriculture in the Classroom was just starting out! Read the table below to see some agricultural comparisons between then and now. What do the changes mean? Does an increase in population but a decrease in farm acreage matter? What if the drought continues? Discuss with classmates to draw some conclusions. Research and write a report about the importance of and/or changes in California agriculture.

What do you think about what you have learned today? Share your thoughts with your classmates and teacher.

Activity

It's pretty impressive! Not only does California produce over 400 agricultural products, it is the top producing agricultural state in the US! In the world, California is in the top 20, producing as much or more than most countries! Right here, in your backyard, is California Agriculture… growing dairy cows for milk, almonds, grapes, cattle and calves, strawberries, walnuts, lettuce, hay, tomatoes, and nursery plants. Look around and you'll see the important role they play in your life…
Walnuts are a Top-Ten crop. Why are they in the top ten? Geography, History, and Health…read on to learn more!!

### Geography

California geography plays a role in the success of walnuts in our state. The mild climate and fertile soils make ideal growing conditions for walnut production. Walnuts are primarily grown in the Central Valley from Redding to Bakersfield. California grows 99% of the walnuts grown in the United States...right here! And we produce 35% of the world's walnut crop. So Californians aren't the only ones eating walnuts; they are exported and enjoyed around the world.

### Activity

**Draw the major walnut-producing areas in California.**
Locate Redding and Bakersfield. Color the Central Valley.

### Timeline

- **7000 BC:** Walnuts can be traced back to Persia
- **1770 AD:** First English walnuts brought to California by Mission Padres.
- **1877 AD:** Joseph Sexton planted the first commercial walnut orchard near Goleta, CA.
- **1914 AD:** Luther Burbank developed the Paradox rootstock variety.
- **2015 AD:** Walnuts are a 1.8 billion dollar crop for California

### STEM Activity: Let’s try it!

**Materials:** 2 different colored straws per student, clear tape, 1 pair of scissors per student

**Process:**
- Pick one straw. This is your rootstock. Make a sloping diagonal cut, about 1” long.
- On the same straw, make a second cut about 1/3 of the way down from the top of the first cut. This cut should be almost parallel to the first. The straw should now look like it has a tongue!
- Repeat the process on the second straw. This represents your scion stock.
- Line the two pieces up together and tape!

### Health

The fact that walnuts are great for you is another reason for their popularity in California. Walnuts are packed with vitamins, minerals, and polyunsaturated fat (the “good” fat!) and contain fiber and protein. Walnuts are also used in foods around the world. In China, walnuts are used in mooncakes, popular during the mid-autumn festival. In Turkey, walnut baklava is a popular dessert, and in Germany, sweet strudel is made with walnuts.

### Activity

**How would you use walnuts?**

Draw a plate with your favorite meal using walnuts.

### Many ways for Walnuts!

Walnuts used for snacking or baking are sold whole (in shell or shelled) or chopped. Walnut oil is used for salad dressings and to flavor fish and steaks. Walnut flour can be used for those with gluten-free diet requirements. Walnut butter is becoming popular as a substitute for peanut butter.

### Activity

With a partner or small group, discuss the meanings of idioms. Then, as a group create your own.

- “Tough nut to crack” (meaning hard to understand or get to know)
- “Everything from soup to nuts” (meaning almost everything one can think of)
- “Go Nuts”
- “Nuts for You”
- “Drive someone nuts”

---

Luther Burbank was a pioneer in plant breeding. During his long 55 year career, he developed over 800 plant varieties including fruit, grains, flowers, and vegetables. One example of his work is the plumcot, a combination of a plum and apricot.

**CAREER:** Plant Breeder

**Luther Burbank**, (1849-1926), Plant Breeder, Santa Rosa, CA

Let’s Graft

Did you know you can spot a walnut tree by its base? Most California walnut trees are **grafted**, which means they are actually made of two types of walnut trees! Grafting is the process of putting two plants together so they become one. The point where the two come together is called a union.

Black walnuts are used for **rootstock** because they do not get root disease as easily as other varieties. They are more resistant to root disease.

So why don’t we just grow Black walnuts? Black walnuts taste very strong and are smaller. This is why farmers graft a tastier variety such as English walnut onto the Black walnut rootstock. The tree grafted to the top is called the scion stock. A process called “Whip and Tongue” is the most common form of grafting with California walnuts.

**scion stock**

union

**whip & tongue graft**

**root stock**

Mature walnut trees

---

CA Standards: ELA CCSS: SL.3-8.1, 1a, NGSS: 3-LS1.B, 4-LS1-1, 1A, 5-LS2-1, 3-5-ETS1, MS-LS1-2, MS-ETS1.A


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Lettuce: How do you grow?

The lettuce you purchased at your local market is very fresh. There is a lot of planning and preparation before a lettuce crop is planted. First, the farmer prepares the field by using a laser to level the field, then beds are prepared to plant seeds. Sprinklers or drip irrigation are used to water the emerging plants and throughout their growing season. It is important to fertilize plants so that plants are healthy. Integrated Pest Management (IPM) is used to control pests and diseases that could harm plants. Lettuce is harvested carefully and quickly when it is ready to eat. Harvested lettuce is cooled and stored just above freezing to keep it fresh. Lettuce is then transported in a refrigerated truck to market.

‘Lettuce’ Keep you Healthy!

Lettuce may help maintain
• Vision
• Healthy immune system
• Cell growth
95% of lettuce is water!

What jobs are involved in producing lettuce? Choose a job related to lettuce production using evidence from the text or doing additional research. On a separate sheet of paper, draw a picture of yourself in a lettuce career spotlight, and write a paragraph about what you do.

STEM: How long do you grow?

Using a calendar, compute the answer:
When is Harvest? When lettuce is planted in the summer, it takes 65 to 80 days to grow. If it was planted on June 5, what would be the earliest day it could be harvested?
When to Plant? If lettuce is planted in late fall, it could take as long as 130 days to grow. If you want to harvest on January 12, when should you plant?
Hay is a Top-Ten commodity in California. One example of hay is alfalfa, which has been around for more than 4,000 years. Alfalfa seeds came to California from South America around 1850. It is a perennial crop living from 5-12 years depending on variety and climate. Tractors and implements play a critical role in the production of hay.

Say Hay!

Seed Drill
A sowing device that precisely positions seeds in the soil and then covers them. Fun Fact: There are many varieties of hay grown in California, including alfalfa, timothy, bermuda grass, and oat hays.

Swather
Cuts and conditions the hay, which allows the hay to cure faster. It also puts the hay in windrows. Fun Fact: Silage is fermented high-moisture fodder fed to ruminants. It is usually made from grass crops or hay.

Hay Rake
Turns the windrow over to allow the other side to dry and can also put two windrows together. Fun Fact: Alfalfa is a drought-tolerant plant. Farmers will cut hay seven or more times per year, called “cuttings.”

Hay Baler
Compresses cut and raked hay into bales that are easy to handle, transport, and store. Fun Fact: Bales can range in size from 100 to more than 1500 lbs!

Harrowbed
Collects the bales from the field and puts them into stacks in the field. Fun Fact: The harrowbed was developed in the 1950s by Gordon Grey. It was spelled “Harobed” after his daughter’s name (spelled backwards). What was her first name? ____________

Hay Squeeze
Picks up the stacks from the field and loads them on a trailer for transport. Fun Fact: Hay can come in small, large, or round bales.

Truck and Trailers
Transport stacks of hay, usually about 30 to 40 tons per load, to storage or directly to the buyer. If one hay bale weighs 100 lbs., how many hay bales can you load on your truck? ____________

Hay Barn
A Hay Squeeze unloads the trailer and stores the hay in a Hay Barn. Now, it’s ready to be sold or fed to livestock. Fun Fact: Alfalfa provides key nutrients and roughage needed by cattle and horses for a healthy diet.

Source: www.LearnAboutAg.org/resources/fact/alfalfa.pdf ©2016 California Foundation for Agriculture in the Classroom. All Rights Reserved.
Where in the US?

Whether you are eating a taco in Sedona, gumbo in New Orleans, BBQ in Kansas City, pizza in Chicago, spaghetti in Brooklyn or a hamburger and fries in Boise, the tomatoes in your meal most likely came from California.

On the map, find and mark the state where you would be eating these meals.

96% of all processed tomato products eaten in the US come from California. California also leads the world in the production of processing tomatoes!

The tomato is the world’s most popular fruit. Why is a tomato a fruit? To a scientist, tomatoes are fruits because they have seeds in them. So cucumbers, pumpkins, and beans are also considered fruits. Vegetables are any part of the plant that is not a fruit: roots (carrots, beets), stems (asparagus, bamboo shoots), leaves (lettuce, spinach), and flowers (broccoli, cauliflower). To a grocer or a chef, a tomato would be considered a vegetable because of how it is used in cooking.

STEM ACTIVITY: Transportation Math

Processed tomatoes have to get from California to states all over the country. Pretend you are a truck driver, starting out in Sacramento, California, and have six cities throughout the country to deliver to. Using information from the table, calculate the following:

• How many miles is it round trip to deliver your load? Please fill in the table.
• How long will it take you to get to each city along the route if you are traveling at 60 mph? Round to the nearest hour, fill in the table.
• If your truck gets 5 mpg in diesel, how many gallons of diesel will you use? Round to the nearest tenths place, fill in the table.
• Using an average diesel cost of $3.25 per gallon, how much will you spend on your trip in diesel? Fill in the table.

<table>
<thead>
<tr>
<th>Destination: city to city</th>
<th>Mileage (in miles)</th>
<th>Hours Driven (nearest hour)</th>
<th>Gallons used (round to tenths)</th>
<th>$ spent on diesel (round to hundredths)</th>
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</thead>
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<td></td>
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<td>Boise-Sedona</td>
<td>878</td>
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</tbody>
</table>

Career Spotlight

Career: Truck Driver

Chris Eck, Core-Mark, West Sacramento, CA

What is the training for truck driving? Training requires classes through the Department of Transportation or a private company to get your permit. Then you have to pass a DMV test to get your Class A license.

What do you haul? I haul many products. Some examples are tomatoes, milk, candy, and lemons.

What are some facts about truck driving? My truck gets between 4-6 miles per gallon depending on the weight of the freight. I can drive 11 hours per day but need 10 hours of downtime between shifts. I can drive 60 hours per week. If you see a truck pulled off the freeway, they may be taking a required break.

What is a tip you have for us about truck drivers? Always give truck drivers time, we can’t always see you and don’t stop fast!

Did You Know? For best flavor, tomatoes should be eaten at room temperature.

CA Standards: ELA CCSS: RI.3-5.1, 7, W.3-5.2, RI.6-8.1, RI.6.7, W.6-8.2, W.6-8.9, RH.6-8.7, Math CCSS: 5.NBT.5, 6.NS.3, 7.NS.2
Sources: http://learnaboutag.org/resources/fact/tomatoes.pdf; www.transportation.gov
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Nursery Plants rank in California’s Top-Ten commodities. Nursery plants include trees, shrubs, sod, seeds and bedding plants. Read on to learn about sowing (planting) and growing plants in nurseries.

**Nursery Production**

Nurseries grow all sorts of landscaping products for your home, school, and neighborhood. Ornamental (decorative) shrubs and trees, fruit trees, vegetables, grasses and flowers all start at a nursery. Greenhouse photo shows Dietes bicolor, a perennial plant.

**Learn to identify trees!** Use the following tree identification key to figure out different types of trees. Choose a leaf, make some observation notes about the tree and its leaves, including a sketch. Using that information, go to the website listed below, and identify what you find. Good luck!

www.arborday.org/trees/whattree

**The Nursery Times**

Create a class newspaper or newsletter, “The Nursery Times.” Make it all about plants from California agriculture and your school. Review articles and information from this issue of *What’s Growin’ On?* and do interviews and research to write your newspaper. Create puzzles and include photos and cartoons.

**STEM Activity: Propagation**

Take a cutting from a house plant or shrub with at least 2 leaf nodes. Dip cut end in rooting hormone. Place in a small, well-drained pot of clean potting soil up to the second node. Leave a few inches of stem sticking out of the soil with a few leaves. Water soil and allow to drain excess water. Mist or keep moist like a wrung-out sponge. In a week or two, new growth should appear. Continue growing until plant is mature enough and danger of frost has passed. Keep a record or journal of your project. Include dates, notes, and drawings. Share your results with your class. Extension: Do some research to learn why plants are able to grow by propagation. Suggested plants are roses, philodendrons, hydrangeas, ivy, Christmas cactus, African violets, and snake plants.

**FRUITS and VEGETABLES**

Some nurseries grow and sell potted fruit and vegetable plants that can be used by families to get a head start in their gardens. Some popular plants to grow are carrots, cucumbers, and zucchini. If you are planning a garden, consider what time of year, or season, it is. Some plants are cool season, meaning they grow best through the winter, whereas some plants are warm season and grow best through the summer.

**Facts:** Carrots have many nutrients including Vitamin A, which is good for your eyes and skin. Cucumbers grow on vines and are low in calories. You can add a slice of cucumber to your water to make a great refreshing taste!

**Career Spotlight**

**Career: Nursery Director**

Luis Verdoza, 
Director of Technical Services, 
Village Nurseries Wholesale, LLC

**What do you do in your job?** My main focus is supporting our production growers in growing good quality plant material. This is done by taking soil and water tests and walking our production areas and fields looking for plant health issues.

**What was your training for your job?** There is a lot of science and math in growing plants. I did my studies at Cal Poly, Pomona and got my degree in Ornamental Horticulture.

**Anything you’d like to share?** What I like about my job is seeing our plants beautifying places like Disneyland, the San Diego Zoo, malls, neighborhoods, parks and other places. It makes me feel proud that I had some part in that.

Source: www.cdfa.ca.gov/statistics, amhistory.si.edu/ourstory/activities/sodhouse/more.html, sciencekids.co.nz, choosemyplate.gov, thefoodchannel.com, Exploring Agriscience by Ray V. Herren

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**Administrative**: Relating to the management of a company.

**Antioxidants**: Prevents harmful reactions where oxygen is combined with other substances.

**Beds**: Area of soil for planting crops.

**Biotechnology**: The use of living cells, like bacteria, to make other products (e.g., yeast to make bread).

**Bird’s-eye view**: View from a high angle, or what a bird might see.

**Brawny**: Strong, muscular, or powerful.

**Chaff**: Dry, small pieces of hay or grain.

**Chute**: Fenced passage for directing livestock.

**Clamshell**: Hinged-container that opens like a clam.

**Commodity**: Product of agriculture, includes plants and animals.

**Cultivate**: To grow crops or plants. To loosen or break up soil.

**Cure**: Age or dry out.

**Exported**: Ship to another country.

**Extract**: Used for flavoring.

**Fodder**: Food, or feed for livestock.

**Freight**: Goods that are carried by ship, train, truck, or airplane.

**Gluten-Free**: Usually referring to a diet without gluten, which is found in wheat, for example.

**Graft**: Join together.

**Grower**: A farmer.

**Hybrid**: Combination of two different types or varieties.

**Integrated Pest Management (IPM)**: Using multiple resources to manage agricultural pests, such as natural predators, varying planting times, and planting a variety of plant that is resistant to pests.

**Irrigation**: Providing water to plants.

**Marzipan**: Confection consisting primarily of sugar or honey and almond meal, sometimes augmented with almond oil or extract.

**Micro-organisms**: Extremely small living things, only visible by microscope, e.g., bacteria.

**Perennial**: Grows for two or more years, includes plants and trees.

**Pollination**: Transfer of pollen from plant to plant to allow fertilization.

**Processed**: Change from one form to another (e.g., fresh tomatoes to ketchup).

**Propagation**: To reproduce.

**Resistant**: Not affected or harmed by something.

**Rootstock**: Root portion of a tree that another tree is grafted to.

**Ruminant**: Mammals that chew their cud. (e.g., cows, sheep, goats)

**Sowing**: Scattering seeds over the earth, planting.

**Temperate**: Mild or moderate.

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**Activity**

Choose two glossary words and use both in a complete sentence. Write your sentence in the space provided.

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CA Standards: ELA CCSS: L.3.2g, L.3.4d, L.3.5b, L.3.6, L.4.2d, L.4.4c, L.4.6, L.5.2e, L.5.4c, L.5.6, L.6-8.4c, L.6-8.4d, L.6-8.6
California Foundation for Agriculture in the Classroom (CFAITC) is a 501(c)(3) non-profit organization that provides educators with free and low cost standards-based materials, training opportunities, and information to promote student understanding of California agriculture. The Foundation’s vision is an appreciation of agriculture by all. Contact CFAITC to request additional classroom resources, such as the Extra! Extra! Classroom Extensions that complement this newspaper.

Prizes include:
- E-reader
- Expense-paid trip to Sacramento for you, your parents, and your teacher to attend awards ceremony
- Engraved plaque
- Agriculture-related book

Contest Deadline: November 1, annually

Write a creative story about your favorite agricultural topic and submit it to the Imagine this… Story Writing Contest. State-winning stories will be illustrated by high school art students and published into a book. Visit www.LearnAboutAg.org/imaginesthis for more information. Common Core State Standards (W.3-8.2,3)

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