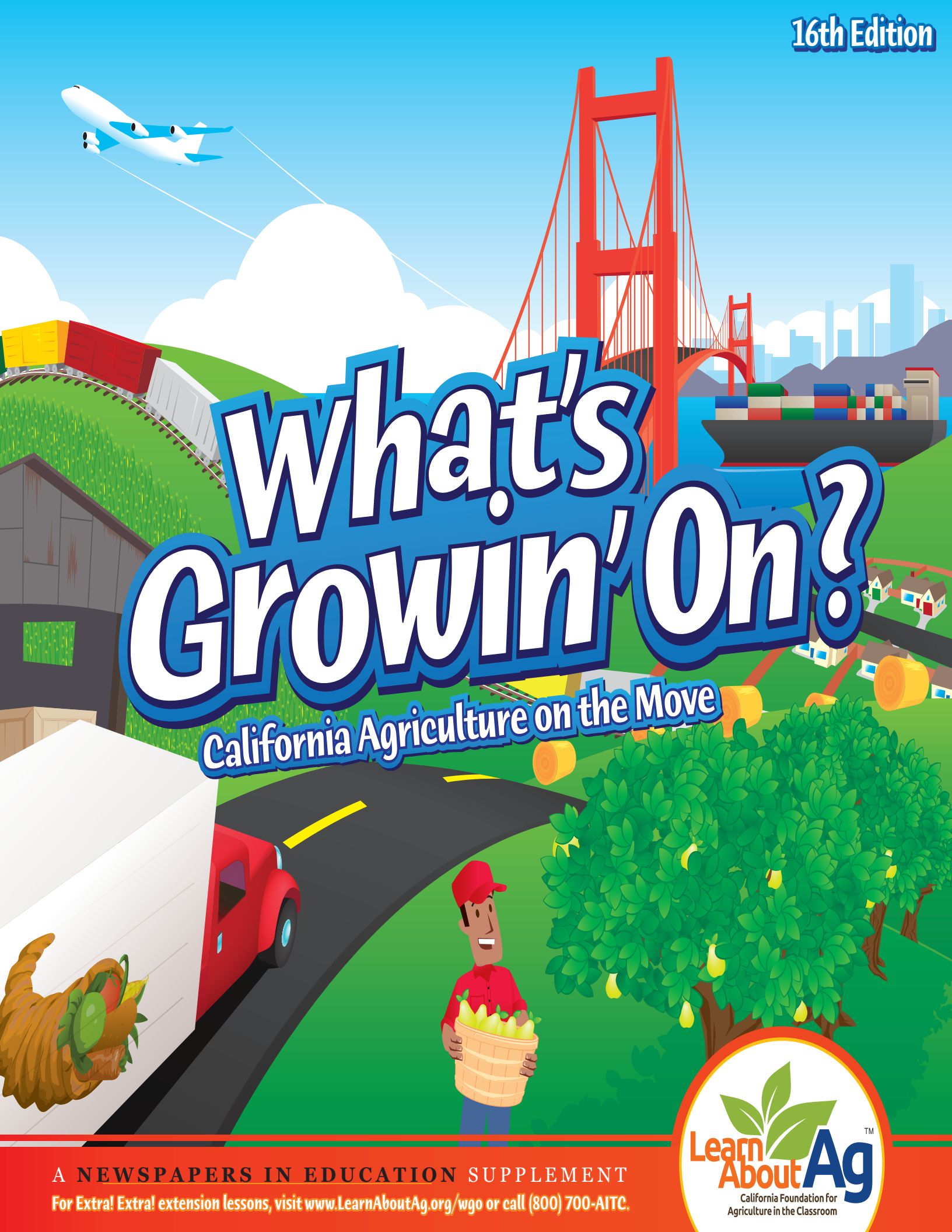


What's Growin' On?

California Agriculture on the Move



A NEWSPAPERS IN EDUCATION SUPPLEMENT

For Extra! Extra! extension lessons, visit www.LearnAboutAg.org/wgo or call (800) 700-AITC.

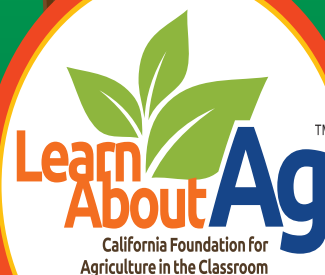


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Introduction

Welcome! Thank you for your interest in California Foundation for Agriculture in the Classroom's student activity newspaper, ***What's Growin' On? California Agriculture on the Move***. Developed by educators like you and reviewed by industry experts, ***What's Growin' On?*** offers fun and engaging ways to teach and practice core academic skills while sharing the importance of agriculture in our lives.

EXTRA! EXTRA! Classroom Extensions contains ideas and opportunities for extending the content presented in the student newspaper. Activity ideas are varied to help you meet the different learning styles of students in your classroom. Opportunities for group work, hands-on activities, and visual displays support the needs of ELL students as well as challenge GATE students.

The agriculture-themed examples and activities found in ***What's Growin' On? California Agriculture on the Move*** are designed to motivate and inspire your students by connecting classroom lessons to real-life experiences. This is accomplished by weaving agriculture into academics so students can better relate to the food they eat, water they drink, clothes they wear, homes they live in, and open spaces they enjoy. Additionally, using the newspaper as an instructional tool allows young people to discover the relevance of their classroom studies by reading news stories, acquiring knowledge, forming opinions, and broadening their understanding of the world they live in.

California Foundation for Agriculture in the Classroom is dedicated to increasing the awareness and understanding of agriculture among California's educators and students. We provide educators with resources and programs that enhance agricultural literacy. To request a free teacher resource packet or a classroom set of the current edition of ***What's Growin' On? California Agriculture on the Move***, order online at LearnAboutAg.org/wgo or contact us via e-mail (info@LearnAboutAg.org) or phone (800-700-2482).

Let's Move

Extension Ideas

Many Links in the Supply Chain

Using the supply chain diagram on page three as an example, students will choose a specific agricultural product and research the steps it takes to move that product from the farm to the consumer. Students will design a poster illustrating the links in the supply chain, and present it to their peers.

Standards: CCSS ELA: W.3-8.7, SL.3-5.4

Where in the World... Does A Candy Bar Come From?

As a class, brainstorm the raw ingredients needed to make a candy bar. Record ideas on the board. The list may include cocoa, milk, sugar, nuts, corn syrup, vanilla, paper, and aluminum foil. Challenge students to plot the origins of these products using an online mapping tool (such as Google maps). They can use a print or online encyclopedia, as needed. Discuss how trade agreements, inclement weather, pest infestations, labor shortages, or war/conflict could impact the supply chain for the candy bar company.

Standards: CA History-Social Science: K-5.CST.4; CCSS ELA: W.3-8.7

What is a Food Hub?

Food hubs are designed to enable small farms to reach larger markets like school campuses and school districts, hospitals, and corporate kitchens. Rather than an individual farm assuming responsibility for sales and deliveries, it can sell to a food hub, which aggregates, markets and delivers produce from many farms in a region. Watch a video by the University of California about how food hubs work. <https://www.youtube.com/watch?v=dyH6k7M1zkl>

Standards: CA History-Social Science: 3.5

Resources

California Foundation for Agriculture in the Classroom (learnaboutag.org)

- **Lesson:** *Food on the Move: Food Transportation Specialist* (Grades 6-8)

University of North Carolina (learnnc.edu)

- **Lesson Plan:** *Let's Get Moving* (Grades 2-3)

National Science Teachers Association (nsta.org/store)

- **Lesson Plan:** *Science and Our Food Supply: Investigating Food Safety from Farm to Table* (Grades 6-12)

National Agriculture in the Classroom (naitc.usu.edu)

- **Online Game:** *From Seed to Shelf* (Grades 6-12)

Websites

- Logistics for Kids: Students' Guide to Career Exploration in Logistics
camcode.com
- U.S. Department of Transportation
transportation.gov/womenandgirls/resources-teachers-mentors

Books

- Whitman, S. ***What's Cooking? The History of American Food***. Lerner Publications Company, 2001.

Start Your Engines

Extension Ideas

Classification of Agricultural Machines

Find and cut out agricultural machines from newspaper ads, magazines, and online sources. Have groups of students sort and classify agricultural equipment pictures into four categories:

- Preparing the soil
- Planting the crop
- Maintaining the crop
- Harvesting the crop

Ask an Agricultural Mechanic

Invite a farm equipment mechanic to your classroom to share information about farming equipment. Have this person discuss how pieces of equipment are used and how farm equipment has changed over the years. At the end of the presentation, have students ask and answer questions about information they learned, or summarize the key points.

Standards: CCSS ELA: SL.3-8.3

A Heavy Load

Challenge students to move a brick (or another heavy object) across wet, smooth, and uneven terrain. Students may push or pull the object, but they may not directly touch it. Have students create a method for measuring effort, and compare the effort required by different terrain to achieve the same results. Compare their findings to the difficulties of moving agricultural machinery or agricultural loads in different conditions.

Standards: NGSS 3-PS2-1

Resources

California Foundation for Agriculture in the Classroom (learnaboutag.org)

- **Lesson Plan:** *Simple and Complex Machines Used in Agriculture* (Grades 2-5)

American Farm Bureau Foundation for Agriculture (myamericanfarm.org)

- **Online Game:** *Equipment Engineer* (Grades 5-6)

AIMS Center for Math and Science Education (aimsedu.org)

- **Lesson Plan:** *Simply Machines* (Grades 3-5)
- **Lesson Plan:** *Machine Shop* (Grades 5-9)

Websites

- John Deere Kids
deere.com
- Farm Safety Just for Kids
farmsafetyjustforkids.org

Books

- Brady, P. ***Tractors in Action***. Capstone Press, 2012.
- Bushey, J. ***Farming the Land, Modern Farmers and Their Machines***. Carolrhoda Books, 1987.
- Cowley, J. ***The Rusty, Trusty Tractor***. Boyd Mills, 1999.
- DK Publishing. ***Total Tractor!*** DK Publishing, 2015.
- Nelson Maurer, T. ***John Deere, That's Who!*** Henry Holt and Co., 2017.

Where the Rubber Meets the Road

Extension Ideas

Flat Stanley Keeps on Truckin'

Ask a truck driver to transport Flat Stanley on a route and send the class photos of the places they stopped along the way. Poll the class at each stop along the route and graph the number of students who have visited that location. Examples and templates are available at flatstanleyproject.com. Don't know a truck driver? Ask the foodservice supplier to your school cafeteria.

Standards: CCSS Math: 3.MD.3; CCSS ELA: 3-5.W.3

Build Your Own Fleet

Divide students into small groups. Invite each group to draw an agricultural product from a hat. They will research the type of truck and trailer used to transport their chosen product. Groups must select a name for their trucking business, and use art supplies and recycled boxes to build a fleet of trucks that can carry their agricultural load. Advanced learners may be challenged to build their models to scale.

Standards: NGSS: 3-5-ETS1-1; CCSS Math: 7.G.1

Roll On!

Brainstorm the types of agricultural products transported in trucks. Select a single product, a likely point of origin, and a destination. Use a map to highlight the route taken to deliver your product. Use a ruler and the map scale to calculate how many miles traveled, and the approximate number of hours on the road.

Standards: CA History-Social Science: K-5.CST.4; CCSS Math: 4-5.MD.1

Resources

California Foundation for Agriculture in the Classroom (learnaboutag.org)

- **Lesson:** *Food on the Move: Food Transportation Specialist* (Grades 6-8)

American Farm Bureau Foundation for Agriculture (myamericanfarm.org)

- **Online Game:** *Harvest This* (Grades 3-5)

Websites

- Trucking Moves America
truckingmovesamerica.com
- Truckers Report
thetruckersreport.com/library/lesson-plans-goods-and-services-and-how-we-get-them
- California Trucking Association
truckingdrivesca.com

Books

- Friend, D. ***With Any Luck, I'll Drive a Truck***. Nancy Paulsen Books, 2016.
- Weatherby, B. ***The Trucker***. Scholastic, Inc, 2004.

On the Right Track

Extension Ideas

Primary Source Document: The Pacific Railway Act

Read *The Pacific Railway Act* as a class, and discuss ways in which the act impacted California agriculture. Students will work in pairs to create a transcript identifying one-way agriculture was impacted, citing at least two examples of specific textual evidence. Students will read and record their transcript to create a 60-second podcast that can be shared with the class, or made available online.

Standards: CCSS ELA: 6-8.RH.1; CA History-Social Science: 4.4

I've Been Workin' On the Railroad

As the railroads crossed the U.S. and became a part of everyday life, it was only natural that songs about railroads would become part of our culture, art, and music. All major musical genres have songs about the sights and sounds of the railroad. As a class, brainstorm a list of songs relating to railroads. In groups, select a song and examine the lyrics. Write an additional verse for the song using information from *What's Growin' On?* pages 8-9, and perform it for the class.

Standards: CA Music: 3-4.3.1; 5.3.3; 8.3.3, 8.3.5

The History of Citrus

Read the California Bountiful Article, *The History of Citrus*. Identify the role of railroads in the history of citrus farming, and write a one paragraph summary that includes key details. Use the dates in the article to create a visual timeline.

Standards: CCSS ELA: 3-8.RI.2

Resources

National Endowment for the Humanities (edsitement.neh.gov)

- **Lesson:** *I Hear the Locomotives: The Impact of the Transcontinental Railroad* (Grades 4-8)

National Education Association (nea.org/tools/lessons)

- **Lesson:** *The Transcontinental Railroad* (Grades K-5, 6-12)
- **Primary Document:** *The Pacific Railway Act* (Grades 6-12)

Websites

- Trains 4 Kids
trc.trains.com/trains4kids
- Operation Lifesaver (train safety)
www.oli.org

Books

- Bunting, E. *Train to Somewhere*. Clarion Books, 1996.
- Coiley, J. *Train*. Alfred A. Knopf, 1992.
- Gibbons, G. *Trains*. Holiday House, 1987.

Gateway of Trade and Transport

Extension Ideas

imPORTant Careers

California ports operate 24 hours a day, 7 days a week. They are a whirlwind of activity involving several modes of transportation and hundreds of jobs. ***What's Growin' On? California Agriculture on the Move*** features the careers of stevedores and maritime pilots, and there are many others! Use internet resources to research the different careers found at California's ports. An excellent database of careers can be found online at careeronestop.org. For each career, include a list of three key skills required for the job, starting salaries, and required education.

Standards: CCSS ELA: 3-8.RI.1,5

Whatever Floats Your Boat

Explore the concept of buoyancy by testing the limits of model boats made with tin foil. In a controlled environment, add weight to each boat (almonds or pistachios work well). Compare the boats that held the greatest load, and those that sunk under pressure. What design characteristics improve a boat's buoyancy?

Standards: NGSS: 3-PS2-1, MS-PS2-2, 3-5-ETS1-1

Port Report

Choose any of the 12 California ports to research and examine. Find multiple sources for information. Write an informative/explanatory text to convey ideas and information clearly. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. Include a bibliography.

Standards: CCSS ELA: 3-8.W.2

Resources

Port of Long Beach Academy (academy.polb.com/teachers/lesson-plans)

- **Resource:** *Port Activity Book* (Grades K-8)
- **Lesson Plan:** *Middle School Math* (Grades 6-8)

PORT: A Transportation System (port.thinkport.org/lessonplans)

- **Lesson Plan:** *Loading A Ship: Balancing Act* (Grades 5-8)

The Port of Los Angeles (portoflosangeles.org/education)

- **Lesson Plan:** *A Maritime Adventure: English and Language Arts at the Port of Los Angeles* (Grades 4-12)

Websites

- Department of Transportation
dot.ca.gov/hq/tpp/offices/ogm/seaports
- Port of Hueneme
portofhueneme.org
- Port of West Sacramento
cityofwestsacramento.org/city/depts/cmo/port_of_west_sacramento/

Books

- Batio, C. ***Super Cargo Ships***. Enthusiast Color, 2001.
- Potter, J. ***Ships***. DK Publishing, 1994.

Up, Up, and Away

Extension Ideas

Aviation Biographies

Pioneers in aviation paved the way for advancements in importing and exporting highly perishable agricultural products. Have students use the Internet or library sources to find information about people who have made achievements and contributions in aviation. Students will use this information to create a brief biography. Have each student draw an illustration of the person featured in his or her biography.

Standards: CCSS ELA: W.3-8.2

It's a Bird, It's a Plane...

California agriculture depends on a variety of different aircraft that accomplish many different jobs. In this activity, students will create a directory of aircraft used in agriculture using print or online sources. They must use text features and search tools to locate information about aircraft capabilities, wingspan, hopper capacity (for application aircraft), and cost. A labeled diagram should accompany their research.

Standards: CCSS ELA: RI.3-8.5

Build an Anemometer

Aerial applicators are dependent on weather—changes in the wind and temperature affect their work. Wind and temperature influence the way an airplane flies and where the material being applied will land. Agricultural aviation pilots must be aware of the weather conditions. If the weather conditions are not right for spraying, an ag pilot must wait until they are. An anemometer is a device that is used to measure wind speed. Challenge students to make a basic anemometer using common household supplies and measure the wind daily, recording observations.

Standards: NGSS: 3-ESS2-1, 3-5-ETS1-1

Resources

California Agricultural Aircraft Association (caaa.net)

- **Video:** *The Modern Aerial Applicator* (Grades 6-12, available at vimeo.com)

National Aeronautics and Space Administration (NASA) (nasa.gov/education/resources)

- **Online Game:** *Jumbled Jets* and *Airplane High Low* (Grades 1-5)
- **Resource:** *Aeronautics Educator Guide* (Grades 2-4)

Federal Aviation Administration (faa.gov/education)

- **Resource:** *Aviation Science Activities for Elementary Grades* (Grades 3-8)
- **Resource:** *Flying Ace Activities* (Grades 4-6)

American Farm Bureau Foundation for Agriculture (myamericanfarm.org)

- **Online Game:** *The Great Seed Search* (Grades 3-5)

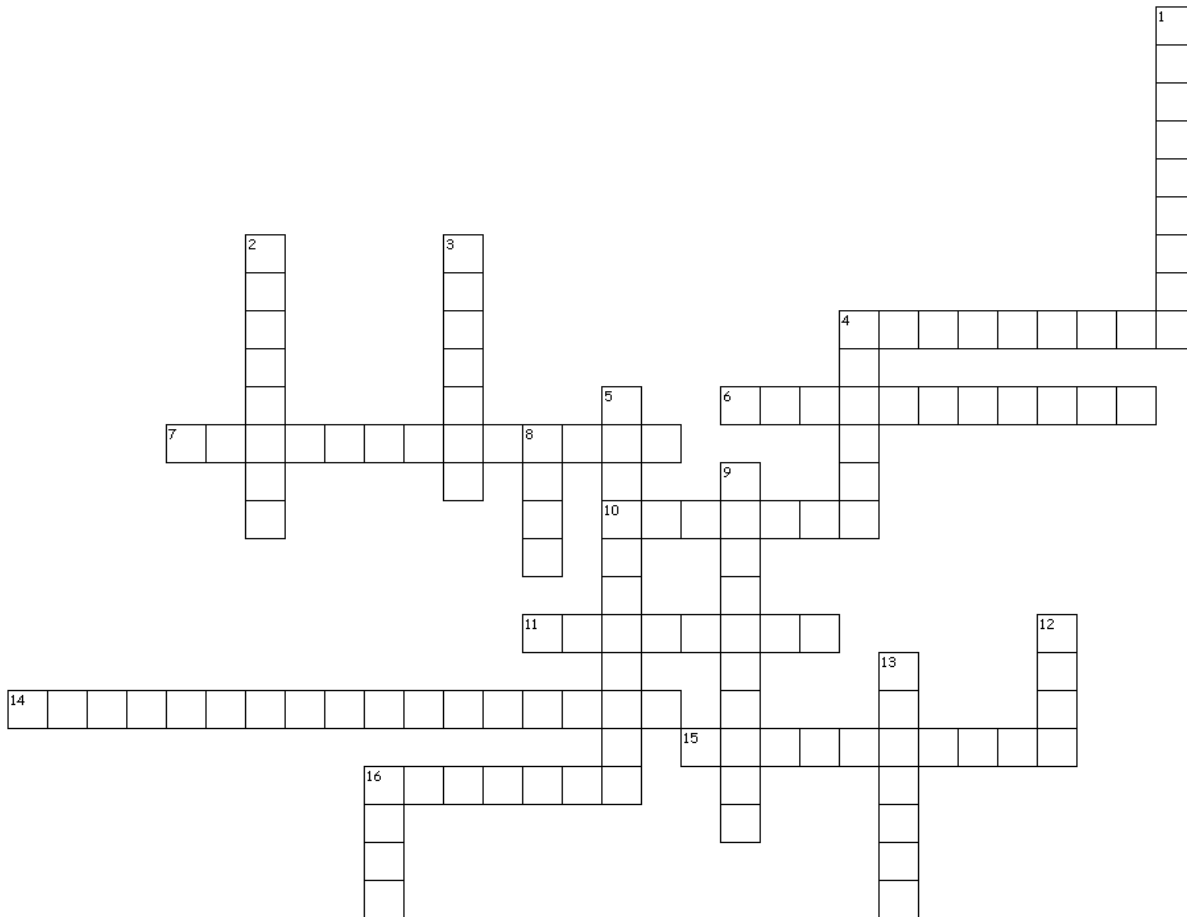
Websites

- Smithsonian National Air and Space Museum
howthingsfly.si.edu
- National Agricultural Aviation Association
www.agaviation.org

Books

- Boehm Jerome, K. ***Who Was Amelia Earhart?*** Penguin Workshop, 2002.
- DK. ***The Big Book of Airplanes.*** DK Children, 2016.
- Prior, J. ***Take Off! All About Airplanes.*** Teacher Created Materials, 2011.
- Scarry, R. ***A Day at the Airport.*** Random House Publishing, 2001.

Agricultural Transportation Crossword



Across

4. Passages through which water flows.
6. Existing or occurring within a state.
7. Not likely to spoil or decay.
10. To receive goods or materials from another country.
11. A powerful motor vehicle that has large rear wheels used for pulling farm implements and trailers and carrying heavy loads.
14. Extending or going across a continent.
15. A person who loads and unloads boats in port.
16. In or to a foreign country or countries.

Down

1. To separate from conducting bodies by means of nonconductors to prevent transfer of electricity, heat, or sound.
2. A written grant by a country's legislative or sovereign power.
3. To send goods or materials to another country.
4. Goods carried on a ship, plane, or vehicle.
5. Likely to spoil or decay.
8. A box, frame, or enclosed place used for storage.
9. A product of agriculture that can be bought and sold.
12. A center of activity.
13. Operated by pressure transmitted when a quantity of liquid is forced through a small hole or through a tube.
16. A small open motor vehicle with one or two seats and three or more wheels designed for use on rough ground. Also known as a quad or three-wheeler.

Agricultural Transportation Crossword

Answer Key

Across

- 4. Passages through which water flows. (channels)
- 6. Existing or occurring within a state. (intrastate)
- 7. Not likely to spoil or decay. (shelf-stable)
- 10. To receive goods or materials from another country. (import)
- 11. A powerful motor vehicle that has large rear wheels used for pulling farm implements and trailers and carrying heavy loads. (tractor)
- 14. Extending or going across a continent. (transcontinental)
- 15. A person who loads and unloads boats in port. (stevedore)
- 16. In or to a foreign country or countries. (abroad)

Down

- 1. To separate from conducting bodies by means of nonconductors to prevent transfer of electricity, heat, or sound. (insulate)
- 2. A written grant by a country's legislative or sovereign power. (charter)
- 3. To send goods or materials to another country. (export)
- 4. Goods carried on a ship, plane, or vehicle. (cargo)
- 5. Likely to spoil or decay. (perishable)
- 8. A box, frame, or enclosed place used for storage. (bin)
- 9. A product of agriculture that can be bought and sold. (commodity)
- 12. A center of activity. (hub)
- 13. Operated by pressure transmitted when a quantity of liquid is forced through a small hole or through a tube. (hydraulic)
- 16. A small open motor vehicle with one or two seats and three or more wheels designed for use on rough ground. Also known as a quad or three-wheeler. (ATV)

Field Trip Ideas

Historical Farms, National Parks, and Museums

- Ardenwood Historic Farm, Fremont
ebparks.org/parks/ardenwood
- California Ag Museum, Woodland
californiaagmuseum.org
- California Railroad Museum, Sacramento
californiarailroad.museum
- Golden State Model Railroad Museum, Point Richmond
gsmrm.org
- Hiller Aviation Museum, San Carlos
hiller.org
- LA Maritime Museum, Los Angeles
lamaritimemuseum.org
- March Field Air Museum, Moreno Valley
marchfield.org
- NASA Ames Visitor Center, Mountain View
nasa.gov/ames/visitorcenter
- Orange Empire Railway Museum, Perris
oerm.org
- Planes to Fame Air Museum, Chino
planesoffame.org
- San Diego Air and Space Museum, San Diego
sandiegoairandspace.org
- San Diego Model Railway Museum, San Diego
sdmrm.org

- San Francisco Maritime National Historic Park, San Francisco
www.nps.gov/safr
- Santa Barbara Maritime Museum, Santa Barbara
sbrmm.org
- South Coast Railroad Museum, Goleta
goletadepot.org

Additional Ideas

- Visit a grocery store distribution center. See first-hand how van trailers are unloaded and grocery goods are stored for distribution.
- Visit a local agricultural operation, and observe how transportation is used to move agricultural products.
- Find a California port near you, and organize a visit to see cargo ships in action.
- Visit a local or private airstrip and get to know a pilot. Learn about the skills and education required to become a pilot. See inside a plane.
- Attend a county-wide Farm Day or Ag Day organized by your local Farm Bureau. Call your nearest Farm Bureau office, or visit *LearnAboutAg.org/programs*.

Answer Key

Page 3

Scavenger Hunt Activity:

automobile plow

6,863

asparagus, cherries, strawberries, blueberries, leafy greens, grapes, or raspberries

rice

livestock

26°F

Port Hueneme

tanker truck

stevedore

550 MPH

Unscramble the Letters Activity: LOGISTICS

Page 4

Marcus' Modes of Transportation Activity:

pickup truck

ATV

agricultural aircraft

tractor

forklift

semi-truck

Page 5

Tractors through Time Activity: 1890, 1905, 1907, 1914, 1925, 1934, 2018

Page 6

Tanker Truck Activity:

Stored: 40°F

Pasteurized: 162°F

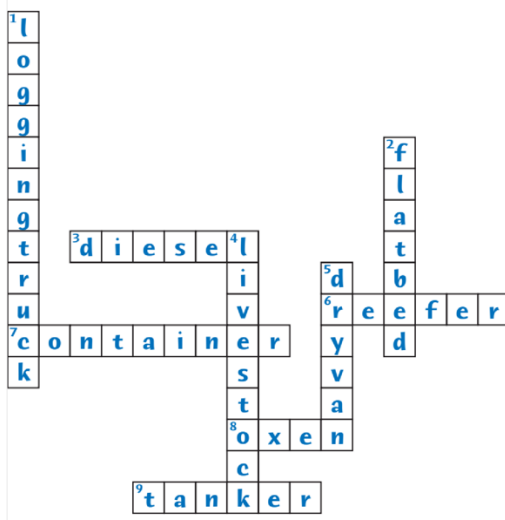
Cooled: 39°F

How much greater is the temperature of the milk during pasteurization than in the storage tank?

122°F

Page 7

Van Trailer Activity:



Logging Trailer Activity:

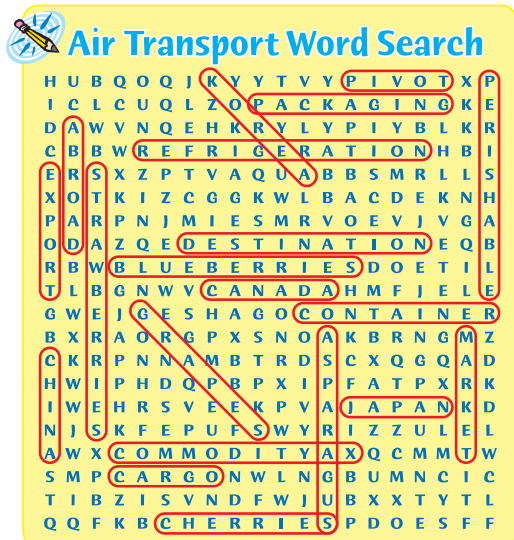
seedlings – reefer trailer
harvested trees – logging trailer
wood chips – container trailer
paper – dry van trailer
lumber – flatbed trailer

Livestock Trailer Activity: 48,750 pounds and 22,113 kilograms

Page 8

Fahrenheit to Celsius Activity:

Produce	Storage Temp. in °C
Peaches	0
Pears	-1.7
Avocados	6.7
Asparagus	2.2
Garlic	-3.3
Mandarin Oranges	3.9



Agricultural Fields Activity:

Leafy Greens: angle DFB = 130°

Blueberries: 3,600,000 feet²

Cherries: 6,974,881 feet²

Asparagus: 9,200 feet

Circular Field Activity:

Crop	Percent	Degrees
Corn	20%	72
Alfalfa	35%	126
Sugar Beets	45%	162

