7th edition

What's Growin' On?

Your Link to California Agriculture

Teacher's Supplement

California Foundation for
Agriculture in the Classroom
2300 River Plaza Drive
Sacramento, CA 95833-3293
www.cfaitc.org

Introduction

Welcome! Thank you for your interest in California Foundation for Agriculture in the Classroom's (CFAITC) student activity newspaper, *What's Growin' On? Your Link to California Agriculture.* Developed by educators, *What's Growin' On?* offers fun and engaging ways to teach problem-solving and critical thinking skills in the curricular areas of reading, writing, mathematics, science and social studies while familiarizing students with their local newspaper.

This teacher's supplement contains ideas and opportunities to extend the content presented in the student activity newspaper. Depending on the needs of your specific classroom, this supplement includes inquiry-based labs, related readings and methods for incorporating technology into each learning experience. CFAITC encourages teachers to continue teaching life-long lessons outside the pages of the student newspaper, and have provided a list of field trip and guest speaker ideas that may strengthen student learning and comprehension. Finally, recognizing that each student in your classroom has uniquely different learning styles and educational needs, we have provided GATE and ELL adaptations that can help tailor each topic to your students. We hope you are able to deepen your classrooms learning through these lesson ideas.

The agriculture-themed examples and activities found in *What's Growin' On?* are designed to motivate and inspire your students, connecting classroom lessons to real-life experiences and circumstances. This is accomplished by weaving **agriculture** into teaching so that students can better relate to food they eat, 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 new knowledge, forming opinions and broadening their understanding of the world they live in.

California Foundation for Agriculture in the Classroom (CFAITC) is dedicated to increasing the awareness and understanding of agriculture among California's educators and students. CFAITC provides educators with resources and programs that enhance agricultural literacy. To request a free teacher resource packet or copies of the current edition of *What's Growin' On?* contact CFAITC via e-mail (cfaitc@cfbf.com) or phone (800-700-AITC).

Newspapers in Education (NIE) is comprised of hundreds of newspapers throughout the United States that promote and aid in newspaper education. Whether creating or offering special curricula or programs, NIE touches the lives of students in countless ways. Local NIE programs reach out to their educational communities by providing teachers with training and resources that expand the newspaper's use as an effective tool—a real-life textbook, to which students respond enthusiastically. For more information about California Newspapers in Education (CNIE), visit *www.cal-nie.org.*

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Ewe Turn

Extension Ideas

1. Introduce students to the many everyday items we enjoy that come from sheep. Bring samples of the products listed in "Ways We Use Sheep" into the classroom. Students can identify each product and determine what part of the animal was used to produce it.

2. Challenge students to focus on sheep products in a round-robin writing activity. Students sit in groups and each individual student begins writing their own story. After one minute, students pass their story to the right, using paper to cover all but the last line of the story. The next student continues the story based on the visible line of writing. Students continue to pass the story after each minute. Students must creatively incorporate one sheep product in their writing.

3. Teach students the different names for male, female and young animals. Review with students by playing farm bingo. Students place each animal term in a square of their bingo grid. Call out descriptors, while students mark the correlating term on their bingo grid. Example: The teacher calls out "young goose" and students mark "gosling" in response.

4. Use the nutrition information at *www.superiorfarms.com/pages/nutrition.htm* to show students how to create bar graphs comparing the nutritional value of different cuts of lamb. Students can also use the information provided to create a bar graph illustrating the percentage of U.S. Recommended Daily Allowances (RDA) provided by a three ounce serving of cooked lean lamb.

Guest Speaker Ideas

- Give students a glimpse of an old-world culture by inviting a person of Basque heritage to your classroom. Ask them to share the significance of sheepherding to their culture and the history of Basque development in the West.

- Spinning wool is an art that may have originated more than 20,000 years ago. Ask a spinner to visit your classroom and demonstrate the art of spinning wool by hand. Contact your local guild for possible spinners.

Field Trip Idea

- Visit a sheep breeder to observe newborn lambs. Ask the breeder to explain lamb marking—the process of ear tagging, tail docking and castration—and why it is carried out.

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Technology Opportunity
Go online and check out the sheep "Ag Mag" developed by Illinois Agriculture in the Classroom. Students learn a variety of facts about these wooly animals while discovering career opportunities in the sheep industry.
www.agintheclassroom.org/060605/Teachers/Printable/agmags/AG_MAG_13.pdf

Inquiry Opportunity
Create a science lab that encourages students' curiosity about wool. After leaning about ways we use sheep, students develop a research project to determine which type of yarn is stronger. Encourage students to explore a wide range of variables, such as yarn brand, color, and origin. Students can also compare yarn made from different breeds of sheep (Corriedale vs. Merino) or compare sheep yarn to alpaca yarn.

Books About Sheep
Brady, de Peter. **Ovejas**. Bridgestone Books, 1999. This book, with Spanish text, shows the raising and caring of sheep. ISBN 978-1-56065-790-3

Kalman, Bobbie. **Hooray for Sheep Farming**. Crabtree Publishing Company, 1997. This story celebrates raising sheep for wool and explores the process of shearing, lambs, sheep dogs, wool processing, farm maintenance and the proper care of sheep. ISBN 978-0-86505-669-5

Paulsen, Gary. **The Haymeadow**. Yearling, 1994. John Barron is asked to spend the summer taking care of six sheep and is not quite sure how he will survive. ISBN 978-0-440-40923-6

Schuh, Mari C. **Sheep on the Farm**. Capstone Press, 2001. Through photographs, this emerging reader discusses sheep that are raised for meat, wool, and milk. ISBN 978-0-7368-0994-8

Sloat, Teri. **Farmer Brown Shears His Sheep**. Scholastic, 2001. In this whimsical picture book with simple text, learn how a sheep is sheared and how the wool is processed and made into colorful sweaters. ISBN 978-0-7894-2637-6

ELL Adaptation
Participating in cultural arts and crafts is one way for students to become "experts" in the classroom. In this adaptation, students create yarn pottery, a Hispanic art form. For this project each student will need yarn in a variety of lengths and colors, paper bowls, glue and Popsicle sticks.

Instruct students to cover the inside bottom of the paper bowl lightly with glue. Next, students will place the end of a string of yarn in the glue in the center of the bottom and wrap it in circles, around and around. They may use the Popsicle stick to tap the yarn into the glue and smooth flat. Students will keep wrapping the yarn around in circles, adding other lengths of different colors and more glue until they reach the rim of the bowl. Allow to dry. Finally, students will turn their bowl over and repeat the same actions on the outside of the bowl.

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Is Your Lunch Local?

Extension Ideas

1. Challenge students to create a menu featuring seasonal fruits and vegetables. Visit *www.cfatic.org/seasonal* to view a chart on seasonal products. Students can visit the grocery store, visit a farmers' market or use newspaper ads to determine the cost of making a seasonal meal for their entire family. Students will convert measurements and examine serving sizes to determine an accurate cost for the meal.

2. Produce your own local agriculture products by planting a school garden. Students can pick and maintain their choice of produce or flowers. California School Garden Network (*www.csgn.org*) has abundant information about how to grow a successful school garden. Use the garden as a teaching tool to teach math, science, history, English-language arts, visual arts and nutrition.

3. Familiarize students with California grown produce. Assign each student a California grown product. Students research where the product is produced, its economical impact, statistics and production trends, markets and, if an edible product, the nutritional value. Students illustrate their findings by creating bulletin board displays, oral presentations or dramatic performances.

4. Students can determine if their lunch is local by examining how far each item they ate traveled. Using grocery ads or other resources, students can verify in which state (or country) their food was likely grown. Using a world map, students take measurements to discover how many miles their food traveled. Find out whose lunch traveled the least and how many "food miles" the class has collectively. Create graphs to represent your findings.

Guest Speaker Idea

- Invite a regional certified farmers' market coordinator to visit your class to explain some of the benefits of shopping at a farmers' market. Encourage students to ask about the variety of products found at a farmer's market and find out why California agriculture lends itself to this type of selling environment. Visit *www.cafarmersmarkets.com* for more information.

Field Trip Idea

- There are more than 100 Community Supported Agriculture (CSA) programs in California. Find a CSA near your community (*www.localharvest.org/csa*) and schedule a visit to their farm to find out how they are helping Californians buy local agriculture products. If possible, subscribe your classroom to the farm's CSA, so your class can try new produce on a regular basis.

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Inquiry Opportunity
Create a research opportunity that encourages students' curiosity about California grown agriculture products. After leaning about different locally grown products, students can develop a grocery store research opportunity to answer questions they may have about the topic. Students can use interviews to determine why people buy California grown products or how important it is to consumers, and investigate costs to conclude which country (or state) produces the least expensive or most expensive products. Challenge students to interpret their findings using charts and graphs.

Books About Buying Local
Ehlert, Lois. **Market Day**. Harcourt, Inc, 2000. This story, told with folk art, shows what a family does at the farmers' market in town square. ISBN 978-0-15-202158-0

Phelan-Sissel, Peggy. **A Visit to the Farmers' Market**. Brain Child Books, 2006. This easy-to-read picture book highlights the benefits of shopping at the farmer's market.
ISBN 978-0-9771010-0-9

Rendon, Marcie R. and Cheryl Walsh Bellville. **Farmer's Market**. Lerner Publishing Group, 2001. Full of colorful photographs, this book describes the efforts of many families who work hard to produce food that is sold at farmers' markets. ISBN 978-1-57505-462-9

GATE Adaptation
Country of origin labeling has its fair share of benefits and drawbacks. The law spent countless days in the offices of legislators as they determined the desires of their constituents and decided whether to vote for or against the bill. Instruct students to research the newly-adopted law and take a decisive stance. Students will prepare and practice a one-minute debate that will persuade their fellow classmates to take the same stance. Students take turns presenting their debates and take a final vote, determining if the bill would have become a law if they were our country's elected representatives.

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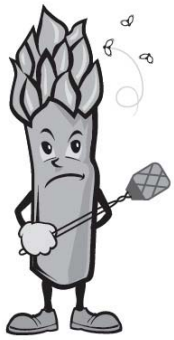
Invasion!



Extension Ideas

1. Many invasive species enter our country undetected due to being in the larvae stage of development upon entrance. Illustrate this stage of development with a fruit fly observation jar. Place a peeled banana in a mason jar until fruit flies appear. Once they appear, cover the jar with a stocking or lid pierced with holes. After three to four days, release the flies and replace the lid. At this point, there will be undetected eggs on the banana. After five to seven days, the eggs will hatch and fruit flies will appear. Encourage students to journal and draw pictures of the process.

2. Feature different invasive pests on the classroom bulletin board. Each week, highlight images, facts, country of origin, anatomy, physical features, targeted agriculture products, and other information about a different invasive species.

3. Show students different traps that are used in agriculture to analyze what pests are present in orchards, fields, barns and home. (Sample traps may be obtained from your County Agriculture Commissioner's office.) What is the function of a trap? Explain that traps are commonly used to identify pests, determine pest populations and reduce the number of particular pests.

4. Students create posters illustrating "America's Most Wanted Pest." Using the information found on page five of *What's Growin' On?,* as well as other sources, students work in groups to create a colorful poster illustrating the pest and listing unique characteristics. Characteristics may include likely places of hiding, physical characteristics, nation of origin and what crime they committed. Students can take turns presenting their posters to the entire class.

Guest Speaker Ideas

- So you have a pest, now what? Invite a Certified Pest Control Advisor (PCA) to the class to learn more about methods used for controlling unwanted pests. Ask them to share the benefits and drawbacks of different pest control strategies.

- Find out if there are any invasive species in your community. Arrange a visit from a representative of your County Agriculture Commissioner's office. These individuals actively monitor the pests in your community by setting and maintaining insect traps. Ask them to bring samples of the types of traps they use to monitor insect populations.

Field Trip Idea

- Many science-focused colleges and universities have a substantial collection of insects, often located in their entomology laboratory. Schedule a visit to the lab and meet with a real-life entomologist. Students will have the opportunity to see various insect species and might even be able to recognize some of them from *What's Growin' On?*

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Inquiry Opportunity
Create a research opportunity that encourages students' curiosity about pests and invasive species. Students create their own insect traps from random classroom materials or materials brought from home. Students can make their own decisions about what design will work best and what bait will attract the most insects. Instruct students to record observations during the morning and evening, if possible. Are all the captured insects considered pests? Have students report back and determine which trap designs worked best and why they were so successful.

Books About Pests
Cranshaw, Whitney. **Pests of the West**. Fulcrum Publishing, 1998. This handbook with photographs may aid home gardeners or family farmers in identifying and eradicating pests of the west. ISBN 978-1-55591-401-1

Dorros, Arthur. **Ant Cities**. HarperTrophy, 1988. This nonfiction book with colorful illustrations describes the activities that occur in an ant colony. ISBN 978-0-06-445079-9

Gariand, Sarah. **Eddie's Garden and How to Make Things Grow**. Frances Lincoln Children's Books, 2004. Learn how plants need soil, sun, and water to make plants in Eddie's garden grow, and learn some specifics about garden pests and flowers. ISBN 978-1-84507-015-1

Julivert, Angels. **The Fascinating World of Ants**. Barron's, 1993. Many facts about ants are presented in a way to give young readers some understanding of nature's role for these dynamic insects. ISBN 978-0-8120-6281-6

Kalman, Bobbie and Tammy Everts. **Bugs and Other Insects**. Crabtree Publishing Company, 1995. Through colorful photographs, learn the anatomy of specific insects and some unique characteristics they have. ISBN 978-0-86505-713-5

Van Allsburg, Chris. **Two Bad Ants**. Houghton Mifflin Company, 1988. A group of ants sets out to please their queen by gathering all they can of a delicious crystal. But two ants become greedy and experience far more than they anticipated. ISBN 978-0-395-48668-9

ELL Adaptation
Students can use the words found in the "Word Wall" section on page five of *What's Growin' On?* to create pictures that illustrate each of the invasive species-related vocabulary words. Create stem sentences that correspond to each vocabulary word. Place the stem sentences on the walls around the rooms, and instruct students to take turns matching the illustrations they created to the correct stem sentence.

<u>Example:</u>
Stem sentence: *Luckily, the garden was full of these insects.*
Answer: Students place their pictures of *beneficial insects* under the stem sentence.

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Food Grows Where Water Flows

Extension Ideas

1. Farmers are continually looking for cost-effective ways to reduce the amount of water used to grow the food we eat. Instruct students to research a specific irrigation technique and prepare a two-minute commercial illustrating the benefits of using this technique and addressing the shortcomings. Upon completion of the presentations, work as a class to install an effective and water-conserving irrigation system somewhere on the school grounds.

2. Use the *Imagine this…*story "Water Flowing Keeps Crops Growing" by Russell Sweet to inspire students to become authors of their own stories. Instruct students to write a fact-based fictional story about California water.

3. Students can create a rain gauge to monitor the amount of rainfall received each hour, day, month or year. To build a rain gauge, each student needs a transparent plastic or glass jar and a small, laminated, paper ruler. Tie the ruler to the mouth of the jar, so it is always easily accessible. When you measure the rainfall, do not measure from the inside, as the volume of the ruler will give an inaccurate reading. Students can compare rainfall at different locations throughout town or record daily average rainfall, creating charts and graphs to represent their findings.

4. In groups, students can create their own watershed and observe how water moves from high to low points in elevation. To begin, students crumple up a two foot piece of wax-coated butcher paper to make a three dimensional topography, complete with hills and valleys. Next, students gently flatten out the paper so the topography remains and place the paper in a plastic storage container. Lift one end of the container a few inches off the ground using a book or block. Next, fill a spray bottle with colored water, instructing students to make it "rain" on their piece of land. Where does the water flow? Why? Use the model to illustrate erosion and run-off pollutants by placing cocoa powder throughout the model and watching the water sweep it down stream.

Guest Speaker Idea

- Ask a county water agency official to visit the class and explain the water challenges within the community. Ask the official to explain water availability, impact on California agriculture and provide tips for conserving water in the home.

Field Trip Idea

- Show students where the water goes after we wash our hands, run a load of laundry or flush to toilet. Take students on a field trip to a wastewater treatment plant so they can observe the entire process of turning our wastewater into effluent water.

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Technology Opportunity
The water use calculator from H_2O Conserve gives students an estimate of the total amount of water they use, or their "water footprint." It analyzes information about the water students use in their home, as well as the water used to produce the food they eat and the products they buy. Students also learn ways to reduce their "water footprint" by conserving water.
www.h2oconserve.org

Inquiry Opportunity
Create a research opportunity that encourages students' curiosity about how water moves through soil. Students create a water permeability test using two-liter bottles with the bottoms cut off, colored water and natural earth materials such as sand, gravel, ash, silt and clay. Each group of students is given a bottle and instructions to fill a third of the bottle with their choice of layered earth material. Each group will determine the appropriate method for testing water permeability (time, color of soil, etc.). Challenge students to answer the following questions: 1) How does water filter into the ground? 2) What are some of the things that control water infiltration?

Books About Water
Carle, David. **Drowning the Dream**. Greenwood Publishing Group, 2000. This book uses first-hand voices of Californians to illustrate how imported water has transformed the Golden State's environment and quality of life. ISBN 978-0-275-96719-2

Gariand, Sarah. **Eddie's Garden and How to Make Things Grow**. Frances Lincoln Children's Books, 2004. Learn how plants need soil, sun, and water to make plants in Eddie's garden grow, and learn some specifics about garden pests and flowers. ISBN 978-1-84507-015-1

Lindeen, Carol. **Water Basics**. Capstone Press, 2008. This simple text and photographs present water and the water cycle. ISBN 978-1-4296-0005-7

McClurg, Sue. **Water and the Shaping of California**. Heyday Books, 2001. This chronicle of California's waters follows the history of the precious resource from the Spanish settlement period through the Gold Rush to the ban of hydraulic mining. ISBN 978-1-890771-33-1

Schuh, Mari C. **Drinking Water**. Capstone Press, 2006. Learn how water helps keep your body healthy. ISBN 978-0-7368-6926-3

GATE Adaptation
Students conduct an investigation about the water quality of a local creek. Take students to the creek site to collect data and analyze it. Water data may include pH, temperature, conductivity and transparency. Students can use the data to make predictions about creek health and monitor changes over time.

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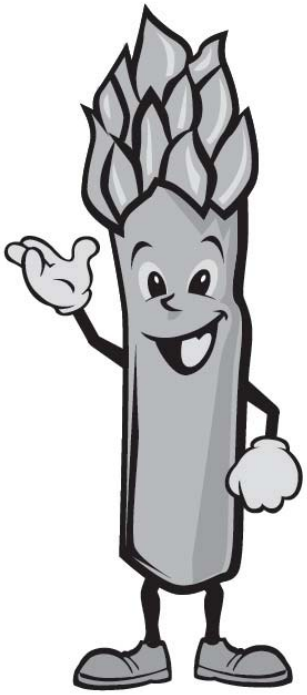
Asparagus… That's the Spear-it!



Extension Ideas

1. Ask students to research an asparagus recipe or bring in a family recipe that features asparagus. Use the student's contributions to create an asparagus cookbook. Include colorful illustrations and a creative cover.

2. Observe the asparagus life cycle firsthand by planting and maintaining your own asparagus plants at school. Plant asparagus crowns (two-year-old root clumps) in the spring, after the danger of hard frost. The crowns should be planted in nutrient rich soil with good winter drainage. For the first season, no harvest should occur. The plants may take 5-6 years to reach maturity, but your patience will be rewarded– asparagus can often be harvested for up to eighty days! Students will enjoy the fruit of their labor and watch the plant as it changes throughout the year.

3. At the market, students will find both green and white asparagus. How does this happen? Challenge students to find out why some asparagus is white and some is green. Research the nutritional value for each color of asparagus. Use the nutritional information to determine differences and averages and create graphs.

Guest Speaker Idea

- Invite a chef to visit your class and demonstrate how to cook their favorite asparagus dish. Ask the chef to emphasize the nutritional value of eating fresh vegetables and share a 'kid-friendly' recipe with the students as well.

Field Trip Idea

- California is the home of the greatest asparagus-producing region in the United States– the San Joaquin Delta. Seventy-five percent of all asparagus grown nationwide is produced in California. Visit an asparagus farm on the San Joaquin Delta and find out why it has prime growing conditions for asparagus. Plan your visit to coincide with the annual Stockton Asparagus Festival, a three-day, food and entertainment festival which celebrates asparagus. Visit *asparagusfest.com* for more information.

Technology Opportunity

Use the food label from the California Asparagus Commission to teach students to read nutrition labels. Challenge students to use math skills to convert the Percent Daily Value into an accurate representation for their children their age.
www.calasparagus.com/consumer/nutrition-info.htm

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Inquiry Opportunity
Create a research opportunity that encourages students' curiosity about asparagus growth. After leaning about the life cycle of an asparagus plant, students develop a research opportunity to answer questions they may have about the topic. Students compare the growth of a cut stem of asparagus to other cut vegetable or flower stem growth. Use tulips, celery stalks, bamboo shoots, kohlrabi, and a variety of other 'stems' to determine which stems continue to grow after being cut. Which stems grow the most? Which stems grow the fastest? Students can determine the best method for measuring growth, executing the experiment and create hypotheses about the outcome. Challenge students to interpret their findings using charts and graphs.

Books About Asparagus and Other Vegetables
Gibbons, Gail. **The Vegetables We Eat**. Holiday House, 2008. Enjoy a wealth of information about a variety of vegetables, from how they are planted to how they get to stores.
ISBN 978-0-8234-2153-4

Hughes, Meredith Sayles. **Stinky and Stringy: Stem and Bulb Vegetables**. Lerner Publications Company, 1998. This book examines the discovery and migration of onions, garlic, leeks, celery, asparagus, and rhubarb, as well as their roles in cooking, technology, and world cultures.
ISBN 978-0-8225-2833-3

Smith, Cathy. **Plants on My Plate**. National Geographic, 2001. See photographs of the plants from which vegetables on your plate come. ISBN 978-0-7922-8925-8

Weaver, William Woys. **100 Vegetables and Where They Came From**. Algonquin Books, 2000. Enjoy learning about one hundred intriguing vegetables from around the world, some of which are regulars on the dinner table. ISBN 978-1-56512-238-3

Wolfman, Judy. **Life on a Crop Farm**. Lerner Publishing Company, 2001. Learn the best way to pick asparagus, when to pick sweet corn, and about the planting, picking, and selling of the produce we eat. ISBN 978-1-57505-518-3

ELL Adaptation
Use play dough and digital photos to illustrate the life cycle of an asparagus plant. Students use the play dough to create different 'scenes' illustrating everything from planting asparagus crowns, to harvest, to the dinner table. For each scene, snap a digital photo. Next, students work in the computer lab to digitally arrange photos in chronological order and create descriptions of each photo. Emphasize the use of complete sentences and correct spelling.

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Turkey Talk

Extension Ideas

1. Benjamin Franklin, an admirer of the wild turkey, was disappointed when the bald eagle was chosen as a symbol of the United States of America. He felt that the wild turkey should have been the chosen bird. Instruct students to research both bald eagles and turkeys to decide if Americans made the right choice in choosing the bald eagle as our national bird. Students can present the merits of both birds as they convince the class of their perspective.

2. Show students why feathers are so important to turkeys and other birds. Students can dissect feathers to learn how birds have adapted, discover the benefits of hollow feathers and observe the intricate series of barbs and barbules that give feathers their form and support their function.

3. It takes about 28 days of incubation to hatch a young turkey. Students can observe, monitor and journal about the process of hatching poults, or young turkeys. Temperature and relative humidity, which measures the amount of moisture in the air, is extremely important in the process of egg incubation. Student scientists can keep a daily log of temperature, egg turning, humidity, water level and visual observations.

4. Introduce students to a variety of turkey products. Many students think turkey only appears on the table for Thanksgiving dinner. Work with students to cook samples of turkey bacon, turkey sausage, or turkey sliders. Address issues about food safety and preparation. Also share nutrition information about these different food items.

Guest Speaker Idea

- Raising livestock is an important component of youth organizations such as FFA or 4-H. Invite a local student, who has raised their own turkey into your classroom to share about their experience. What type of commitment does it take to care for an animal? What are the benefits they receive? What do turkeys eat and what type of housing do they need?

Field Trip Idea

- Take a trip to a turkey farm! By visiting a farm, students can see the process from the hatchery to the grocery store. If you do not have a farm to visit nearby, visit the school computer lab and take students on a virtual tour! *www.norbest.com/virtual_turkey_tour.aspx.*

Technology Opportunity

What's the price tag on your turkey dinner? Use the article, *Slightly Higher Thanksgiving Dinner Cost This Year,* from the American Farm Bureau Federation, to create a price index, tracking the

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cost of Thanksgiving dinner from 1986 to 2006. Calculate the price index for a given year by comparing the cost of the market basket of items in the current year to its cost in the base year (1986).
Example: (Current cost of market basket/Base year cost of market basket) x 100
www.fb.org/index.php?fuseaction=newsroom.newsfocus&year=2006&file=nr1114.html

Inquiry Opportunity
Create a research opportunity that encourages students' curiosity about turkeys and offers a first hand experience raising them. Feed trials are used to determine which feed or feed additives make a young polut grow into a mature, healthy and nutritious tom or hen. Students can perform their own feed trials to determine the best feed for a growing turkey. Students use online resources and research documents to determine the best way to test feed effectiveness. Assign each group a different bird and allow the group to select a feed or amendment of their choice. Work with the class to determine variables and the best way to run the trial. Students can determine the weight gain and feed efficiency for their trial. Challenge students to interpret their findings using charts and graphs.

Books About Turkeys and Poultry
Llewellyn, Claire. **What's for Lunch? Eggs**. Franklin Watts, 2003. This book reveals how eggs are produced, and how people all around the world eat them. ISBN 978-0-516-21547-1

Singer, Marilyn. **Eggs**. Holiday House, 2008. This picture book contains many surprising facts about eggs and the resourceful methods used to protect them.
ISBN 978-0-8234-1727-8

Wallace, Carol. **Turkeys Together**. Holiday House, 2005. In this beginning reader, two mother turkeys are afraid to leave their nests because their eggs are being stolen until a pointer puppy offers them a solution. ISBN 978-0-8234-1895-4

GATE Adaptation
Share *The First Thanksgiving Proclamation of 1676* with students to illustrate the historical significance of this primary source document. Use other resources to set the context for the proclamation. Challenge students to interpret the document by defining unknown vocabulary words, re-writing the document in their own creative words, or comparing the first Thanksgiving to a different significant moment in history.

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Turf's Up!

Extension Ideas

1. Using the measurements and specifications on page twelve of *What's Growin' On?*, students can determine the cost of greening a professional sports stadium. Have each student select a stadium. Determine the amount of turf needed to green the field and the total cost. Using the average ticket price for the venue, how many seats would they need to sell to cover the cost of greening the field for a game?

2. There are nearly 10,000 species of grasses belonging to the family Poacea. Bamboo, corn and rice are examples of cultivated grasses. With so many choices, how does a homeowner decide what turf to install? Instruct students to work in groups to determine the best type of grass for their climate, precipitation and physical environment. Research different types of grasses, their characteristics and their maintenance needs. Students can show what they know on a poster board, through role plays or by an oral report.

3. Green, weed-free lawns didn't exist in America until the late eighteenth century. Research the history of the American lawn. What brought about this transformation? Create a timeline in the classroom where students can contribute important mile-markers for the "lawn revolution." What key innovations made beautiful green turf a possibility? Encourage students to draw pictures illustrating what the area right outside their front door may have looked like as time progressed and homeowners adapted new styles.

Guest Speaker Idea

- *U.S. News & World Report* listed "landscape architect" as one of the 30 best careers in 2009. Invite a landscape architect into the classroom to share about their job and how they work with turf on a daily basis. Ask this professional to share the details of their job including educational background, responsibilities and starting pay to introduce students to one of the many careers available in the field of agriculture.

Field Trip Idea

- Although your community may not have a turf farm nearby, many communities have golf courses, which serve as excellent examples of installed and scrupulously maintained turf grass. Visit a local golf course and ask the head grounds keeper to give the class a tour, showing how different grasses are installed or maintained throughout the course. Find out what considerations were taken when selecting the variety of grass and how often they replant or replace areas of turf.

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Technology Opportunity
In 2003, NASA used satellite imagery, census data and aerial photographs to estimate the total area of turf grass in the contiguous 48 states. NASA's research determined golf courses and lawns cover three times more acreage than corn, making turf the single largest irrigated crop in the United States. Use Google Maps or download Google Earth to view aerial and satellite images of your school district, neighborhood, or town. Estimate the amount of acres in the community that are covered by turf and create a pie chart depicting what percentage of turf is found in parks and schools, residential neighborhoods, commercial areas or golf courses. *www.maps.google.com*

Inquiry Opportunity
Create a science lab that encourages students' curiosity about water. Most lawns, depending on grass variety, require approximately one inch of water per week to maintain a healthy color. Students create their own lab to verify the amount of water needed to maintain a green lawn. Encourage students to investigate how different grass varieties and watering techniques may affect their findings.

Books About Turf
Blaisdell, Molly. **The Grass Patch Project**. Picture Window Books, 2008. Jason's classmates agree that a grass patch project is the best idea for their school's Earth Day contest. ISBN 978-1-4048-2292-4

GATE Adaptation
Sod vs. Astroturf… which is better? Challenge GATE students to make a television infomercial "selling" their audience on either product. Use online resources to research the materials' impact on the environment, create cost comparisons, and each ground covering's influence on athlete safety. Each infomercial should describe the various benefits and include athlete testimonials and an action step for the viewer.

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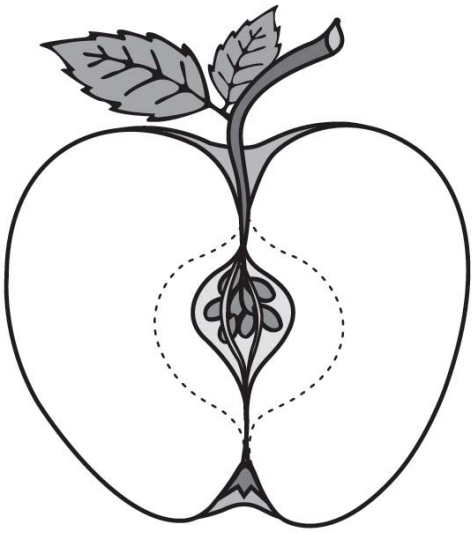
Fresh and Fruity California Apples



Extension Ideas

1. Historians believe the Seneca Indians were the first people to make dolls out of apples, but mountaineers in Appalachia made the craft popular. These handmade toys are still produced in the Appalachian Mountain region today. Students can learn about American history by creating their own apple dolls by carving faces, drying apples and making clothes of scrap material. Invite parent helpers to the classroom to assist with the project.

2. Sweet, tart, crisp and juicy… the taste of fresh California apples! Students can decide for themselves which apple variety they like best by participating in an apple taste test. Pick up several varieties of apples at the grocery store or farmers' market. Students create a rubric, evaluating sweetness, sourness, texture and appearance, and use adjectives to describe each criterion. Lastly, students research the different apples to determine when they are in-season and if they are best for making pies or applesauce.

3. What percentage of an apple's weight is water? How does an apple's water content compare to other fruits and vegetables? Lead students through a lab where they weigh apples, dry them, and determine the amount of water lost during the drying process. Divide the original weight of the apple by the weight of the water lost to determine what percentage of the apple is water. Students repeat the process with a variety of produce and create a graph to illustrate their findings.

4. Use apples to teach students about symmetry. Guide students through dissecting an apple by cutting it vertically. Discuss with students what the word "symmetry" means and how to determine if an object is symmetrical. Students can use a piece of string or a mirror to check the symmetry of the fruit. If the interior of the cut does not have symmetry, define the term "asymmetrical." Repeat the process, this time cutting the apple horizontally. Ask students to estimate what the inside of the apple will look like. Students check the apples for symmetry again, discovering the rotational symmetry of this cut.

Guest Speaker Idea

- Apple trees are often propagated through grafting. In the process of grafting, a portion of scion wood (a cutting from an existing apple tree) is surgically connected to the roots of another apple tree. Contact your local chapter of California Rare Fruit Growers to request a visit to teach the class how to graft their very own apple tree. Visit *www.crfg.org* for more information.

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Field Trip Idea

- Today there are more than 450 apple growers and almost 50 apple handlers/marketers in the state of California. Although only commercially producing apples for 19 years, California ranks as the country's fourth highest apple producing state. Take advantage of California's unique climate and visit an apple orchard in your backyard. For a California orchards listing, visit *www.allaboutapples.com/orchard/ca.htm.*

Technology Opportunity

A Web quest is an inquiry-oriented lesson in which most or all of the information that students explore and evaluate comes from the Web. Students can learn more about the history of Johnny Appleseed and discover his vision in planting apple trees across the U.S.
its.guilford.k12.nc.us/webquests/Apples/apples.htm

Inquiry Opportunity

Create a research opportunity that encourages students' curiosity about apples and the technology used to preserve fruits and vegetables in the grocery store. Students compare the browning that occurs on apples after cutting and treating them with different anti-browning solutions. The solution may include lime or lemon juice, saran wrap, plastic baggies, apple juice, vitamin C tablets, and more. Brainstorm with the class potential treatments and why they think they will or will not effectively stop apple browning. Students chose three different treatments for their apples, monitoring the browning over the period of a week. Students work in groups to determine the effectiveness of each treatment based on a set criterion. These criteria might include taste, color, softness, smell, etc.

Books About Apples

Anderson, Catherine. **Apple Orchard**. Heinemann Library, 2005. Take a field trip to an apple orchard and learn how apples are picked and how they arrive at the store.
ISBN 978-1-4034-6159-9

Burckhardt, de Ann L. **Manzanas**. Bridgestone Books, 1998. This book, with Spanish text, shows the growing and harvesting of apples. ISBN 978-1-56065-785-9

Farmer, Jacqueline. **Apples**. Charlesbridge, 2007. This educational book features the history, uses, and anatomy of apples. Also includes recipes and nutritional information.
ISBN 978-1-57091-694-6

Gibbons, Gail. **Apples**. Holiday House, 2001. Learn about apple production in this colorful, simple-to-read book. ISBN 978-0-8234-1669-1

Lindbergh, Reeve. **Johnny Appleseed**. Megan Tingley, 1993. Rhymed text and illustrations relate the life of John Chapman, whose distribution of apple seeds across the Midwest left a legacy still enjoyed today. ISBN 978-0-316-52634-0

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Moses, Will. **Johnny Appleseed: The Story of a Legend**. Penguin Group, 2004. Colorful folk art accompanies the legend about John Chapman. ISBN 978-0-14-240138-5

Shapiro, Jody Fickes. **Up, Up, Up! It's Apple Picking Time**. Scholastic, 2004. Learn about the many varieties of apples when Miles and his family pick apples in Grandma and Grandpa's California orchard. ISBN 978-0-439-68988-5

ELL Adaptation

Idioms are an important part of the English language. Write on a chart a few of the statements below. All of them contain an idiom related to food. Call on students to read the sentences and to explain the special meanings of the idioms in them. After reviewing the phrases, assign a phrase to each student. Encourage them illustrate the meaning of each idiom and combine the illustrations into a classroom book. (Idioms adapted from *www.education-world.com*)

Thomas needed money for the movie so he had to **butter up** his father.
That college only accepts students who are the **cream of the crop**.
Megan turned as **red as a beet** when I caught her cheating.
Marco acted as **cool as a cucumber** on the day of the big race.
Jake bragged that the test would be a **piece of cake**.
Maybe he was telling the truth, or maybe he was **full of beans**.
At the bake sale, my sister's brownies **sold like hotcakes**.
People were **packed in like sardines** on the subway train.
My father works hard to **bring home the bacon**.
My father stopped to **chew the fat** with our neighbor, Mr. Jones.
Oresha and I went to the game to **egg on** our team.
Her ring looked expensive, but she **got it for peanuts**.
The puppies in the cage were **going bananas**.
Stephanie is **the apple of her father's eye**.
My teacher told me I had to **beef up** my report on George Washington.
Ted Turner is the **big cheese** for the Atlanta Braves.
It was so cold, I practically **froze my buns off**.
Even though Paul worked at the job, he wasn't able to **cut the mustard**.
I opened my big mouth at the wrong time, so now I have to **eat my words**.
That's the problem **in a nutshell**.
Books by that author are not my **cup of tea**.
The vase was broken so there was **no use crying over spilled milk**.
The little Jackson boy is a **bad egg**.
I was embarrassed to give my piano teacher such a **cheesy** gift.
We should have known the **half-baked idea** would not work.
Please don't **spill the beans** about the surprise party.

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