

### **Extra! Extra! Classroom Extensions** A NEWSPAPERS IN EDUCATION SUPPLEMENT

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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? Props to Specialty Crops.* 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? Props to Specialty Crops* 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. This year, we've also added creative ideas to incorporate *What's Growin' On?* into distance learning platforms. 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 Growin' On? Props to Specialty Crops*, order online at *LearnAboutAg.org/wgo* or contact us via e-mail (*info@LearnAboutAg.org*) or phone (916-561-5625).

#### Extension Ideas

#### A-Pea-O, A-Bean-O, A-Min-O!

Meat, poultry, eggs, dairy, and fish are complete sources of protein because they contain all 9 essential amino acids. The nine essential amino acids are: histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine. Plant sources of protein contain amino acids, but typically not all nine. Create a table to organize information about each plant source of protein featured on page three. Include the amount of protein per serving, and the essential amino acids present. Are there any combinations of plant-based protein that can provide your body with all nine essential amino acids? Why are amino acids important for health?

Standards: CA Health Education: Grade 4: 1.1.N, 3.2.N, Grade 5: 1.8.N, 3.2.N, Grade 7 and 8: 1.2.N

#### Plant a Seasonal Garden

Plant a winter or summer garden. Use online resources to help you determine the best protein crops to plant and when. Keep in mind the right seasons for each crop. Use California Foundation for Agriculture in the Classroom's *California CROP Circles* as a guide (*https://learnaboutag.org/resources/gardens\_crop/*). Each regional circle illustrates proper planting and harvesting times for 18 crops commonly found in California gardens. Math problems on the back of each page strengthen math and critical thinking skills.

Standard: NGSS: MS-LS1-5

#### The Price of Protein

Which protein is the best value? On your next trip to the grocery store, record the prices per weight for a variety of animal and plant-based protein sources. At home, use online resources to determine protein per unit of different foods. For example, A large egg has 6 grams of protein. Depending on the brand and whether you buy organic, a dozen large Grade-A eggs typically costs around \$3.00, putting the cost of a gram of protein at about 4 cents. Create a bar graph with price on the y-axis and different sources on the x-axis. Summarize your findings and hypothesize factors that may influence cost.

Standards: CC Math: CCSS.MATH.CONTENT.3.MD.B.3, CCSS.MATH.CONTENT.6.RP.A.3.B

#### **Distance Learning: Recipe Find and Share**

Use online recipe databases to find a recipe that includes at least two different plantbased protein sources listed on page three of *What's Growin' On?* Determine the protein content per serving. At your next class meeting, share a screenshot of the recipe you found and explain how you determined the protein per serving. After everyone has shared, discuss different recipe combinations that could be combined to create a meal that would provide the recommended 34 grams of protein needed by 9 to 14-year-olds. Standards: CC Math: CCSS.MATH.CONTENT.6.RP.A.3.B, CCSS.MATH.CONTENT.7.RP.A.3

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

- Resource: CROP (California Regions of Optimal Planting) Circles (Grades 6-12)
- **Resource:** Agriculture Fact and Activity Sheets: Artichoke, Avocado, Dry Beans, Mushrooms (Grades 6-12)

Utah Agriculture in the Classroom (*utah.agclassroom.org*)

• Lesson Plan: A Tale of Two Burgers: Beef and Plant Based Protein (Grades 9-12)

FoodMASTER - Food, Math, and Science Teaching Enhancement Resource *(foodmaster.org)* 

• Unit: *Protein* (Grades 6-8)

Websites

- Seasonal Produce Guide snaped.fns.usda.gov/seasonal-produce-guide
- MyPlate
  choosemyplate.gov

- Dickmann, N. *Protein (Healthy Eating with MyPlate).* Heinemann-Raintree, 2012.
- Lee, S. The Powerful Protein Group. Capstone Press, 2012.

### Leaf it to Herbs

#### Extension Ideas

#### Make a Tin Foil Tea Infuser

A tea infuser is a tool that allows you to steep loose tea leaves in a cup of hot water. The infuser holds the tea leaves together and keeps them from floating freely through your beverage. Follow these directions to make your own tea infuser to steep the perfect cup of tea.

- 1. Fold it in half twice (it will be a square <sup>1</sup>/<sub>4</sub> the original size).
- Gently place your tea leaves in the center of the foil.
- 3. Bring the corners of the foil together, twisting them to create a pouch.
- 4. Use a toothpick to carefully poke a few holes in the bottom and sides of the foil. Small holes will keep tea leaves in the pouch and out of your cup.
- 5. Place the foil inside your mug and, with adult supervision, add boiling water.
- 6. When your tea is cool enough to drink, taste it. If you like a stronger taste, brew it longer.

#### **Distance Learning: Herb Infographics**

Infographics are an increasingly popular way of sharing information in newspapers, magazines, and online news sites. These visual representations of knowledge and information are designed to make complex ideas and large amounts of data easy to understand. During your next virtual class meeting, find and share a variety of examples from online sources, textbooks, magazines, and news sources. After, create your own infographic poster that will help others learn more about a useful herb. At your next class meeting, share your poster with the entire class.

Standards: CC ELA: CCSS.ELA-LITERACY.CCRA.R.7, CCSS.ELA-LITERACY.CCRA.W.2, CCSS.ELA-LITERACY.CCRA.W.7, CCSS.ELA-LITERACY.CCRA.W.8

#### **Shrinking Herbs**

Drying fresh herbs is one way to minimize food waste and ensure you have flavorful herbs on hand throughout the year. Herbs can lose 50 to 75 percent of their mass during the drying process. Students can practice writing and solving problem sets about drying herbs. For example:

- 1. Basil loses 75% mass by drying. How much fresh basil do you need if you want to make 1.5 kg of dried basil? A: 6 kg
- 2. Parsley loses 60% mass by drying. After drying you have 10 ounces of parsley. How much fresh parsley did you start with? A: 16.7 oz
- 3. You have 2 pounds of fresh thyme. After drying, you have 13 ounces of dried thyme. What percent of your original mass was lost in the drying process? A: 40.6%

Standards: CC Math: CCSS.MATH.CONTENT.6.RP.A.3, CCSS.MATH.CONTENT.7.RP.A.3

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

- Unit: Edible Plant Parts (Grades 2-3)
- Lesson Plan: Tasty Testing (Grades 5-8)
- **Resource:** *Herbs Fact Sheet* (Grades 6-12)

Kids Gardening (kidsgardening.org)

- Lesson Plan: Grow Your Own Herbal Tea (Grades K-5)
- **Resource:** *Exploring Herbs* (Grades K-8)

Vermont Harvest of the Month (vermontharvestofthemonth.org)

• Lesson Plan: Harvest Lessons: Herbs (Grades K-4)

#### Websites

• UC Master Gardener Program mg.ucanr.edu

- Biggs, M. et. al. Vegetables, Herbs & Fruit. Laurel Glen, 2002.
- DK Publishing. *The Story of Food: An Illustrated History of Everything We Eat.* DK, 2018.
- Pallotta, J. The Yummy Alphabet Book. Charlesbridge, 1994.
- Pallotta, J. *The Spice Alphabet Book*. Charlesbridge, 1994.

### Edible Flowers: Eating Your Way Through the Garden

#### **Extension Ideas**

#### **Edible Flowers 2.0**

If eating the petals of real flowers doesn't sound appealing to you, try this decidedly delicious version. Use real food to create a model of a flower, including all the flower parts listed on page five of *What's Growin' On?* Use your creativity to represent each plant part: raisins for anthers, banana chips for petals, pretzel sticks for the style—whatever snacks you have at home. Nut and seed butters are useful as "glue." Once your model is complete, celebrate by eating your creation. Standards: NGGS: 3-5-LS1-1; CC ELA: RST.6-8.4

#### **Distance Learning: Fibonacci Flowers**

Prior to the class meeting, have each student pick a fresh flower and carefully count the number of petals. During the class meeting, have each student report back, recording the number of petals in a shared space. Certain numbers should occur with frequency. Explain to students that these numbers belong to the Fibonacci sequence. These numbers include: 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, etc. Depending on the age of students, have students either: 1) identify the rule (the next number is obtained from the sum of the two preceding); or 2) given the rule, determine the next few numbers in the sequence. Watch an educational video about the Fibonacci sequence (Try "Doodling in Math" by Vihart on YouTube) to support the lesson.

Standards: CC Math: CCSS.MATH.CONTENT.3.NBT.A.2, CCSS.MATH.CONTENT.8.F.A.1,

#### **Tasty or Toxic? Identifying Edible Flowers**

Not all flowers are edible. Some are poisonous, including common garden flowers like rhododendron and foxglove. Create an educational poster that informs an audience about three common, yet toxic flowers. Include photos, common and scientific names, information about harmful effects. and precautionary advice.

Standards: CC ELA: CCSS.ELA-LITERACY.W.3-6.7, CCSS.ELA-LITERACY.W.3-6.8, CCSS.ELA-LITERACY.SL.3-8.4

#### **Petals in Prose**

Flowers are a perennial theme of poetry. Indeed, the word for a book of poems, 'anthology', even comes from the Greek word 'flower'. Many classic poems have been written about flowers. Have students choose, read, and analyze a classic poem written about flowers (or assign one to the class). After students have identified the poem's form and sound, they can also describe images, clarify words and phrases, and evaluate the poem's theme.

Standards: CC ELA: CCSS.ELA-LITERACY.RL.3.4, CCSS.ELA-LITERACY.RL.4-5.2, CCSS.ELA-LITERACY.RL.5-7.5, CCSS.ELA-LITERACY.RL.6-7.4

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

- Unit: Too Much? Too Little? (Grades 5-8)
- Lesson Plan: Fabulous Flowers (Grades K-2)
- **Resource:** *Cut Flowers Fact Sheet* (Grades 6-12)

Utah Agriculture in the Classroom (*learnaboutag.org*)

- Lesson Plan: Flower Power (Grades 3-5)
- Lesson Plan: *Flower Power* (Grades 6-8)
- **Resource:** Origami Parts of a Flower (Grades 5-12)
- **Resource:** Parts of a Flower Poster (Grades 5-12)

#### Websites

- Exploratorium's Secret Life of Flowers exploratorium.edu/gardening/bloom/secret\_life\_of\_flowers
- California Cut Flower Commission ccfc.org
- Conservatory of Flowers
  conservatoryofflowers.org

- Azarian, M. A Gardener's Alphabet. Houghton Mifflin Company, 2005.
- Bodach, V. Flowers. Capstone Press, 2007.
- Bunting, E. *Flower Garden.* Voyager Books, 2000.
- Daynes, K. How Do Flowers Grow? Usborne, 2015.
- Ehlert, L. *Planting a Rainbow.* Voyager Books, 1992.
- Godwin, S. *A Seed in Need.* Picture Window Books, 2001.
- Guillain, C. Spot the Difference: Flowers. Heinemann Library, 2008.
- Heller, R. *The Reason for a Flower.* Putnam Publishing Group, 1999.
- James, F. From Field to Florist. National Geographic, 2001.
- Royston, A. Life Cycle of a Sunflower. Heinemann Library, 1999.
- Saunders-Smith, G. Flowers (Growing Flowers). Capstone Press, 1998.
- Spilsbury, L. and R. Why Do Plants Have Flowers? Heinemann Library, 2006.
- Whitehouse, P. *Flowers.* Heinemann Library, 2002.

# Cabbage, Cauliflower, and the #CruciferousCrew

#### **Extension Ideas**

#### **Colorful Competition**

Plant pigments called anthocyanins give purple cauliflower and cabbage their bold purple hues. Anthocyanin can be used as a pH indicator—it reacts by changing colour in acidic and alkaline environments. Do purple cabbage and purple cauliflower react similarly when exposed to substances? To find out, prepare two saucepans: each containing a cup of the roughly chopped vegetable and one cup water. Bring to a boil and simmer for approximately 15 minutes. Strain the liquids into separate bowls using a sieve. Once cool, use a pipette to add the vegetable liquid to a variety of substances, such as lemon juice, water, milk, baking soda, bicarbonate soda, vinegar, and bleach. Record and discuss your observations. Can you determine which vegetable has higher levels of anthocyanin?

Standard: NGSS: MS-PS1-2

#### How The #CruciferousCrew Traveled the World

We are fortunate that every member of the #cruciferouscrew is grown seasonally right here in California. However, the geographic region from which these crops originated can differ greatly from their present-day distribution. Using reputable online search tools, research the origin of at least four cruciferous vegetables. Create a digital or physical map that illustrates how and when these crops arrived in the U.S. Standards: CA History-Social Science: 3.1, HSS Analysis Skills (6-8) Chronological and Spatial Thinking 3; CC ELA: CCSS.ELA-LITERACY.RH.6-8.3, CCSS.ELA-LITERACY.RH.6-8.7

#### **Cruciferous Comparisons**

Bar graphs are used to compare facts—the bars provide a visual display for comparing quantities in different categories or groups. Bar graphs help us to see relationships quickly. Challenge students to create a bar graph comparing the nutrient value of different cruciferous vegetables. Students should use online research tools to find data and determine the appropriate measurable units. During your next class meeting, have students share the graph they made and present a one sentence summary of their findings.

Standard: CC Math: CCSS.MATH.CONTENT.3.MD.B.3

#### Distance Learning: How Does Cauliflower Grow? Video

Have you heard of EdPuzzle, the free assessment-centered tool that allows teachers and students to create interactive online videos by embedding questions throughout? Use EdPuzzle to build-in science related questions on the video, "CAULIFLOWER – How Does it Grow?" by True Food TV. At your next class meeting, discuss the video and the science that goes into producing a marketable crop of cauliflower. Standards: NGSS: 3-LS1-1, 5-LS2-1

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

- Unit: Fruits and Vegetables for Health (Grades 4-6)
- Unit: Edible Plant Parts (Grades 2-3)
- Activity: We Garden: Eat Your Plants (Grades 1-3)
- **Resource:** Fact and Activity Sheet Set (Grades 3-12)
- **Resource:** California Department of Education Fruit and Vegetable Photo Cards (Grades 3-12)

FoodMASTER - Food, Math, and Science Teaching Enhancement Resource *(foodmaster.org)* 

• Units: Vegetables (Grades 3-5) and Vegetables (Grades 6-8)

Websites

- Harvest of the Month
  harvestofthemonth.cdph.ca.gov
- Fruits & Veggies for Better Health (Have a Plant) https://fruitsandveggies.org/
- USDA Nutrition
  nutrition.gov

- Blackaby, S. and C. Delage. *Plant Plumbing: A Book About Roots and Stems.* Picture Window, 2005.
- Butterworth, C. How Did That Get in My Lunchbox? Candlewick Press, 2013.
- Eclare, M. *A Harvest of Color: Growing a Vegetable Garden.* Ragged Bears, 2002.
- Gibbons, G. The Vegetables We Eat. Holiday House, 2008.
- Karas, G.B. On the Farm, at the Market. Henry Holt and Co, 2016.
- Lebovitz, A. *Where Does Broccoli Come From? A Book of Vegetables.* Experience Delicious, 2018
- Lin, G. The Ugly Vegetables. Charlesbridge, 2009.
- Stevens, J. Tops & Bottoms. Harcourt Brace, 1995.

### **Turning Heads with Leafy Greens**

#### **Extension Ideas**

#### **A Field in Perspective**

Perspective is what gives a three-dimensional feeling to a work of art. It is a system of representing the way that objects appear to get smaller and closer together the farther away they are from the viewer. To draw a field of leafy greens in perspective, use a ruler to draw a straight horizontal line in the upper half of your paper. This is called the horizon line. Draw a dot somewhere on the horizon line. This is called the vanishing point. To make the rows of leafy greens, draw double sets of diagonal lines from the vanishing point to the sides and bottom of your paper. Fill in with heads of leafy greens that get smaller as they reach the vanishing point. Standards: CA Visual Arts: 8.VA:Cr1.2, 4.VA:Cr2.1, 5.VA:Cr2.1, 7.VA:Cr2.1

Leafy Green Smoothie

The essence of a green smoothie is fruit and leafy greens. The health benefits of adding leafy greens to your smoothie is that it adds extra phytonutrients and fiber. Baby spinach is an excellent choice--its mild flavor doesn't diminish the fruit flavors. All you need to make a green smoothie is a blender, fruit, and leafy greens. You can't go wrong with the following tips: First, blend 1 cup of spinach (or another leafy green) with 1 cup of liquid (juice or water). Next, blend in frozen fruit like mango, banana, or pineapple. Finally, enjoy! For an extra challenge, measure and record your ingredients. Use rate language ("For every one cup leafy greens, we added two cups frozen fruit. There is ½ cup of greens for each cup of fruit.") to describe the ratio relationship. Standard: CC Math: CCSS.MATH.CONTENT.6.RP.A.2

#### **Distance Learning: Marketing Packaged Salad Kits**

In the past 30 years, packaged salads have grown from non-existent to the number one-ranked vegetable in produce department sales. Divide students into produce company teams to design and market a new packaged salad. Once the team settles on the ingredients, direct them to Canva (or a similar, web-based tool) to design a marketing poster to promote the new salad. The marketing poster should show a vibrant image of each ingredient, feature the health benefits of consuming the product, and highlight the convenience of packaged salads.

Standards: CC ELA: CCSS.ELA-LITERACY.W.5-8.1, CCSS.ELA-LITERACY.W.5-8.7

#### **Sense-ational Leafy Greens**

Humans have five basic senses: touch, sight, hearing, smell, and taste. Use all five senses to observe and compare different leafy green vegetables. Record your observations in a science journal. Include a scientific sketch of each specimen. Discuss similarities and differences between the different vegetables. Standard: NGSS: MS-LS-1.8

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

- Unit: Fruits and Vegetables for Health (Grades 4-6)
- Unit: Edible Plant Parts (Grades 2-3)
- Activity: We Garden: Eat Your Plants (Grades 1-3)
- **Resource:** Agriculture Fact and Activity Sheets: Lettuce, Spinach (Grades 6-12)
- **Resource:** California Department of Education Fruit and Vegetable Photo Cards (Grades 3-12)

Massachusetts Agriculture in the Classroom (aginclassroom.org)

• Lesson Plan: Leaf Taste Competition (Grade 1)

SuperKids Nutrition (superkidsnutrition.com)

• Lesson Plans: Leafy Greens Lessons (Grades 3-5)

Growing Minds Farm to School (growing-minds.org)

• Lesson Plan: Lettuce Exploration (Grades 3-5)

Websites

- California Leafy Green Handler Marketing Board safeleafygreens.com
- Harvest of the Month harvestofthemonth.cdph.ca.gov

- Cherry, L. How Groundhog's Garden Grew. Blue Sky Press, 2003.
- Dickmann, N. Vegetables (Healthy Eating with MyPlate). Heinemann-Raintree, 2012.
- Schuh, M. Lettuce Grows on the Ground. Capstone Press, 2011
- Wylie, C. Pete Moss and the Super Strong Spinach. Rodale Kids, 2018.
- Steinbeck, J. *East of Eden.* Penguin Classics, 1952. (HS Level)

### The Ins and Outs of Specialty Crop Gardens

#### **Extension Ideas**

#### **Garden Diorama**

Use an old, empty shoebox to create a three-dimensional garden scene featuring specialty crops. Gather a variety of seed catalogs. You can request catalogs online from most seed companies, or ask your neighborhood garden-guru. With scissors in hand, let your creativity run wild. Cut out images of vigorous plants, beautiful flowers, ripe fruits and vegetables. Plan the layout and details of your diorama. Paint the inside walls of your box or cover them with colored paper. Add details to the walls of your diorama—a picket fence, pollinators, sunny sky, etc. Use cardstock and glue to make footings for your seed catalog images. Place and glue them within the box. Add a few friendly insects or a bag of soil and voilà—your own garden in a box! Standard: CA Visual Arts: 3.VA:Cr1.1, 5.VA:Cr1.1, 3-5.VA:Cr2.2, 3.VA:Cr2.3

#### **Distance Learning: Garden Bug Hunt**

There are over one million known species of insects in our world, making up nearly 75 percent of the animal kingdom. Insects play an unseen but important role in our ecosystem. Head out to your garden or a local greenspace for a bug hunt. Students may want to bring a camera or phone to catch a few pictures, or a journal to make a few notes. Gardens often contain other inhabitants from the animal kingdom that are not classified as true insects, such as spiders, earthworms, and pill bugs. Try to find at least one flying insect, one insect on a leaf, and one insect in the soil. Share your findings using an online discussion tool, like FlipGrid or YO Teach! Be sure to discuss how each of the insects found effect the garden habitat.

#### **Harvest Helper**

Using materials found around the house, design a tool that will make harvesting a fruit, vegetable, or nut easier. First, choose a fruit, vegetable, or nut you can easily access in a garden setting. Next identify your available materials and resources (constraints). Next, compare different designs and based on how well they will work and if you have the available materials and resources. Finally, test your design. Can your invention harvest the produce? Does it damage the produce in any way? Is it easy to use? Discuss different ways to improve your harvesting tool. Standards: NGSS: 3-5-ETS1-1, 3-3-ETS1-2, 3-5-ETS1-3

#### **Ratios in the Garden**

A seed's germination rate indicates the percentage of seeds that will sprout under proper conditions over the given germination period. Even in a fresh packet of seeds not all seeds will germinate. Seeds may be damaged by environmental conditions or possess genetic defects that hamper growth. To test the germination rate of a packet of seeds, carefully count out 20-50 seeds from the packet. Moisten a folded paper towel, place the seeds inside, and place towel and seeds in a sealable bag. Set the seeds in a warm location. Check seeds every few days, most will sprout within two weeks (check the information on the seed packet on expected germination time). Write a fraction that compares the number of seeds that germinated to the number of seeds that were planted. Change each fraction to a fraction that has a denominator of 100, then show each fraction as a percentage. Compare your results to the germination rate indicated on the packet.

Standards: CC Math: CCSS.MATH.CONTENT.7.RP.A.1, CCSS.MATH.CONTENT.7.RP.A.3

#### Resources

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

- Unit: Fruits and Vegetables for Health (Grades 4-6)
- Unit: Edible Plant Parts (Grades 3-8)
- Activity: Prolific Pollinators (Grades 3-8)
- **Resource:** WE Garden Lesson Packet (Grades 1-6)
- **Resource:** CROP (California Regions of Optimal Planting) Circles (Grades 1-6)
- **Resource:** Gardens for Learning (Grades K-12)

Nutrients for Life Foundation (nutrientsforlife.org)

• Lesson: How Does Your Garden Grow? (Grades 3-5)

Utah Agriculture in the Classroom (utah.agclassroom.org)

- Lesson: Shape, Form, and Function in the Garden (Grades 3-5)
- **Lesson:** Exploring Texture in the Garden (Grades 3-5)
- Lesson: Color in the Garden (Grades 3-5)

National Gardening Association (garden.org)

• **Resource:** GrowLab: A Complete Guide to Gardening in the Classroom (Grades K-8)

Websites

- University of Illinois Extension's My First Garden
  web.extension.illinois.edu/firstgarden
- Missouri Botanical Garden's Biology of Plants mbgnet.net/bioplants
- Exploratorium's Science of Gardening exploratorium.edu/gardening
- The Classroom Victory Garden Project classroomvictorygarden.org

- Brennan, M. *I Saw it in the Garden.* Mitten Press, 2006.
- Brisson, P. The Summer My Father Was Ten. Boyds Mills Press, 1999.
- Cole, H. Jack's Garden. Green Willow Books, 1997.
- Cherry, L. How Groundhog's Garden Grew. Blue Sky Press, 2003.
- DiSalvo-Ryan, D. *City Green.* HarperCollins, 1994.
- Fleischman, P. Weslandia. Candlewick Press, 2002.
- Gaines, J. *We Are the Gardeners.* Thomas Nelson, 2019.
- Henderson, K. And the Good Brown Earth. Candlewick Press, 2003.
- Kogan Ray, D. Lily's Garden. Roaring Brook Press, 2002.
- Levenson, G. Pumpkin Circle: The Story of a Garden. Tricycle Press, 2002.
- Nagro, A. *Nuestra Huerta Generosa: Our Generous Garden.* Dancing Rhinoceros Press, 2009.
- Quattlebaum, M. Jo MacDonald Had a Garden. Dawn Publications, 2002.
- Talmage, E. *Unearthing Garden Mysteries: Experiments for Kids.* Fulcrum Publishing, 2000.

### Citrus—Squeeze the Day

#### **Extension Ideas**

#### **Distance Learning: The History of Citrus**

Citrus crops triggered a different kind of gold rush in 1849, that is still going strong today. Read the California Bountiful

(http://www.californiabountiful.com/features/article.aspx?arID=695) article, *The History of Citrus in California* from the March/April 2010 issue. After reading the article, write a one paragraph summary that includes key details. Use the dates included in the article to create a visual timeline. Consider using an online timeline creation tool, such as myHistro, to create a digital story based on the article. Share your digital timeline during your next class meeting.

Standards: CCSS ELA: 3-8.RI.2; CA History-Social Science: HSS Analysis Skill K-5

#### **Citrus Circuit**

Batteries are everywhere—in toys, cars, flashlights, and cell phones. But how do they work? Why do they stop working? Building a lemon battery will help answer these questions. First, use wire cutters to strip approximately 2-3 inches of plastic insulation an 18-gauge (or smaller) copper wire. Cut the uninsulated section of wire from the roll. Next, straighten a steel paper clip. Use the wire cutters to cut the paper clip the same length as the copper wire. Roll the lemon gently on a hard surface to break the cell walls and loosen the juice inside. Finally, insert the copper wire and the paper clip into the lemon, approximately 1-inch deep. The two wires need to be very close to each other, but not touching. Gently touch your tongue to both wires at the same time. What do you notice? If you felt a tingle or metal taste, your lemon battery was generating an electric current. Try to identify the different parts of a battery in your lemon: electrodes, electrolyte, electrons. Repeat with a different citrus fruit and compare your results. Standards: NGSS: 4-PS3-2

#### The Big Chill

In California, many citrus varieties are grown during the cold winter months. Although many varieties are tolerant of the cold, temperatures below 32°F can freeze the fruit and damage the tree. Growers use frost-protection measures to protect their orchard, such as wind machines or irrigation systems, or a combination of both. After researching existing methods for frost protection, design your own method. Explain the constraints of your design, how you would test it, and the scientific principles employed. Standard: NGSS: 3-5-ETS1-1, 3-5-ETS1-2

#### Bang for Your Buck

The skin to flesh ratio varies significantly between different varieties of citrus. Since citrus fruits are typically purchased by weight, choosing a variety with less skin (peel) and more flesh will give you more value for your dollar. After peeling several different varieties of citrus fruits, weigh the skin and the flesh separately. Determine the percent total weight for the skin. Compare with the class, and create a table with your findings. Standard: CC Math: CCSS.MATH.CONTENT.4.MD.A.2, CCSS.MATH.CONTENT.6.RP.A.3, CCSS.MATH.CONTENT.7.RP.A.2 **Resources** 

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

- Resource: Citrus Fruits and Asian Citrus Psyllid Fact Sheet (Grades 6-12)
- **Resource:** Orange You Glad We Have Farmland (Grades 3-5)
- Lesson: A "Sour" Subject (Grades 5-6)
- Lesson: Asian Citrus Psyllid (Grades 3-5)

FoodMASTER - Food, Math, and Science Teaching Enhancement Resource *(foodmaster.org)* 

• Unit: Fruits (Grades 3-5)

Tesco Supermarkets (*eathappyproject.com*, *youtube.com*)

• Video Series: Juicy Clementines (Grades 3-12)

Websites

- USDA's Hungry Pests
  hungrypests.com
- The Citrus Pest & Disease Prevention Program californiacitrusthreat.org
- The Wonderful Company halosfun.com

- Bullard, L. Orange Food Fun. Capstone Press, 2006.
- Keller, KT. From Oranges to Orange Juice. Capstone Press, 2004.
- Trumbauer, L. The Story of Orange Juice. Yellow Umbrella Books, 2006.

## Let's Make Your Food SUPER Tasty!

#### Extension Ideas

#### **Rooted in Taste**

Gather examples of root vegetables, such as carrots, beets, radishes, rutabagas, kohlrabi, and turnips from a farmers' market. Make sure these examples still have their green tops attached and smaller secondary roots. Have students note the similarities and differences in appearance, taste, texture, and fragrance. Cut each vegetable longitudinally and instruct students to identify and record the vegetable's anatomical parts.

Standard: NGSS: 4-LS1-1

#### Preserve It!

Most consumers agree that the most flavorful fruits and vegetables are picked during their peak of ripeness. However, many fresh fruits and vegetables can be picked in season and preserved for later enjoyment. Fresh, frozen, canned, dried, or 100 percent juice—you can enjoy the taste of seasonal fruits and vegetables year-round. Choose a fruit or vegetable and research ways it can be preserved. Create a poster-sized flow chart that illustrates the step-by-step process of preservation. Present your poster and findings to your class.

Standards: CC ELA: W.3-8.7

#### **Distance Learning: The Science of Taste**

Fruits and vegetables are becoming more flavorful and sustainable through plant breeding. Plant breeding is the art and science of changing the traits of plants in order to product desired characteristics—including flavor. Examples of super flavorful fruits include "cotton candy" and "gum drop" grape varieties. Create a super tasty fruit or vegetable of your choice. Which plants would you cross to attain the desired taste? How would you market it to consumers? What would the packaging look like? Create an audio ad for your tasty fruit or vegetable, less than 30 seconds in length. Share it during your next class meeting.

Standards: CC ELA: CCSS.ELA-LITERACY.SL.6-8.4, CCSS.ELA-LITERACY.SL.6-8.5

#### The Many Tastes of Olives

There are seemingly countless ways to produce and cure (process) olives, which creates an amazing array of flavor profiles. Conduct an olive taste test to sample a few of the many flavors. Include California grown green ripe olives and black ripe olives, as well as olives from around the world. Try Kalamatas (Greece), Castelvetrano (Italy), Niçoise (French), Manzanilla (Spain), or Beldi (Morocco). Make scientific observations about color, texture, smell, size, and taste.

Standard: NGSS: MS-LS-1.8

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

- Program: Taste and Teach (Grades K-12)
- Lesson: Walnuts, Naturally Nutritious (Grades 6-8)
- Lesson: Supreme Seeds (Grades K-2)
- Lesson: Tasty Testing (Grades 5-8)

National Center for Agricultural Literacy (agliteracy.org)

- Lesson: Chocolate Taste Testing (Grades 3-12)
- **Kit:** *Bitter/Sweet Cucumber Taste Test* (Grades 3-12)

Utah Agriculture in the Classroom (*utah.agclassroom.org*)

• **Lesson:** Apple Genetics: A Tasty Phenomena (Grades 6-8)

Websites

- International Food Information Council Foundation's Science of Taste foodinsight.org/the-science-of-taste
- Harvest of the Month
  harvestofthemonth.cdph.ca.gov

- Darbyshire, T. *Who Grew My Soup?* Publications International, 2009.
- Hardesty, C. *Grow Your Own Pizza: Gardening Plans and Recipes for Kids.* Fulcrum Publishing, 2000.
- Gunderson, M. *Cowboy Cooking.* Blue Earth Books, 2000.
- Gunderson, M. Southern Plantation Cooking. Blue Earth Books, 2000.
- MacDonald, F. *Discovering World Cultures: Food.* Crabtree Publishing Company, 2001.
- Pallotta, J. The Spice Alphabet Book. Charlesbridge, 1994.
- Pallotta, J. The Yummy Alphabet Book. Charlesbridge, 1994.

### Tops, Middles, and Bottoms

#### **Extension Ideas**

#### **Plant Part Relay Race**

Print and cut out pictures of approximately 30 different fruits and vegetables. Randomly divide the pictures into two groups. Glue the pictures onto index cards of two different colors. Label three lunch-sized paper bags "tops," "middles," and "bottoms." Participants form two equal lines at one end of an open area. Evenly divide the pictures cards by color. Place the picture cards face down in front of the first person in each line. Arrange the labeled paper bags in a line, 20-50 feet away from the teams. The goal is for each team to correctly categorize each fruit and vegetable as a top, middle, or bottom plant part. After the race, review the contents of each bag. The winning team will have the greatest number of correctly sorted cards. Standard: NGSS: 4-LS1-1

#### Life from the Top, Middle, or Bottoms

Write a creative narrative from the point of view of a California grown fruit, nut, or vegetable. The story should outline the life of a chosen crop from the farm to the table. After selecting a fruit, nut, or vegetable, imagine what you would see, feel, hear, taste, and smell from the produce's perspective. Use California Foundation for Agriculture in the Classroom's Agricultural Fact and Activity Sheets (*learnaboutag.org/resources/fact*) to provide the necessary background information. Share your story with a peer or your entire class.

Standards: CCSS.ELA-LITERACY.W.3-8.3

#### **Edible Plant Game**

Review what students know about edible plant parts by playing an interactive "I Have, Who Has…" style game. Download and print the game cards (pages 39-54) at *learnaboutag.org/resources/lesson/edibleplant*. Pass a card out to each student. Instruct students to form a large circle and hold their edible plant card in front of them. Begin the game by having one student read his or her question from the card aloud. The student who has the correct answer will hold his or her card up for the class to see and say, *I am a* \_\_\_\_\_\_. Then that student will read the question from their card aloud to the class. Continue the game until all 28 cards have been shared. After playing the game once, redistribute cards and play again. Challenge students to beat the clock, as they recite and retain facts about California fruits and vegetables. Standards: NGSS: 4-LS1-1; CA Health Education: Grade 7 and 8: 1.6.N

#### **Distance Learning: Going in Circles with Plant Parts**

Choose two different plant parts (leaf vs. stem, flower vs. root) and compare them using a Venn diagram. Consider a variety of characteristics such as appearance, cell structure, and culinary use. Use Canva's (*canva.com*) easy-to-use online Venn diagram maker to share your findings at your next class meeting. Standard: NGSS: 4-LS1-1

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

- Resource: Ag-Bites: Tops or Bottoms (Grades K-3)
- Unit: Too Much? Too Little? (Grades 6-8)
- Unit: Edible Plant Parts (Grades 2-3)

Virginia Agriculture in the Classroom (agclassroom.org/va)

• **Resource:** Jr. Sprout Healthy Eating (Grades 3-4)

Utah Agriculture in the Classroom (utah.agclassroom.org)

• Lesson: Shape, Form, and Function in the Garden (Grades 3-5)

Websites

- The Great Plant Escape web.extension.illinois.edu/gpe
- Western Grower's Producepedia producepedia.com
- Kids Growing Strong kidsgrowingstrong.org/parts-of-a-plant
- The Salad Garden learningliftoff.com

- Gibbons, G. From Seed to Plant. Holiday House, 1991.
- Heller, R. The Reason for a Flower. Puffin Books, 1999.
- Messner, K. Up in the Garden and Down in the Dirt. Chronicle Books, 2017.
- Pallota, J. The Vegetable Alphabet Book. Charlesbridge, 1992.
- Richards, J. A Fruit is a Suitcase for Seeds. First Avenue, 2006.
- Schuh, M. *Carrots Grow Underground.* Capstone Press, 2011.
- Schuh, M. Tomatoes Grow on a Vine. Capstone Press, 2011.
- Schuh, M. *Lettuce Grows on the Ground.* Capstone Press, 2011.

## It's the Pits: All About the Drupe Group

#### Extension Ideas

#### **Pick Your Pit**

The latest trends in food are bringing consumers and farmers together. Make a video or comic journal about a unique shopping experience at a local farmer's market, fruit stand, or u-pick farm. Prior to your trip to the market or farm, develop a list of questions to ask the farmer. Questions may include where the fruit was grown, who works on the farm, types of care throughout the growing season, harvest methods, uses, and more. The narrative (video or comic) should highlight the day's sequence of events while incorporating interesting facts about stone fruit.

Standards: CC ELA: CCSS.ELA-LITERACY.W.3-8.3, CCSS.ELA-LITERACY.W.3-5.8

#### **Dried Drupes**

Drupes, particularly fleshy fruits, are ideal for home preservation. Drying is one of the simplest and least expensive forms of food preservation, requiring only warm temperatures combined with good air circulation. Methods for drying drupes include solar drying, conventional ovens, or an electric dehydrator. Weigh the fruit before and after drying to determine percent moisture loss and observe physical changes that occurred during the drying process.

Standard: NGSS: 5-PS1-3

#### **Distance Learning: Distributing Drupes...Continued**

The value of California drupes exported to other countries has a significant economic impact on our entire state. Use the information found on page 13 of What's Growin' On? to create a bar graph comparing the values of exported drupe crops. Use unit fractions to convert dollar amounts to a standard unit. Create your bar graph using an online tool, such as Canva's free bar chart maker (canva.com) and share your creation at your next class meeting.

Standards: CC Math: CCSS.MATH.CONTENT.5.MD.A.1, CCSS.MATH.CONTENT.5.MD.B.2

#### Sink or Swim

Grab some drupes and test their buoyancy—the force that causes objects to float. Place a large jar filled with water (to the brim) in a larger pan. Make sure there is no water in the pan. First, predict whether the drupe will sink or float. Weigh the drupe and record its weight in grams. Next, carefully lower your drupe into the jar. Does it float or sink? Record the results. If it sinks, pour the water from the pan into a measuring cup. Measure the water in milliliters—this is the volume, the amount of space that food took up. If it floats, gently push it down with the tip of a pencil until water spills into the pan. Measure the water in milliliters. To calculate density, divide the drupe's weight in grams by its volume in milliliters. Repeat the experiment with different drupes. Which drupes float? Which drupes sink? What is the relationship to density? Standards: NGSS: MS-PS1-1, CC Math: CCSS.MATH.CONTENT.5.MD.C.5, CCSS.MATH.CONTENT.6.NS.B.2

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

- Resources: Almond, Walnut, Cherry, Cling Peach, Pistachio, Olive, and Prune Fact Sheets (Grades 6-12)
- **Thematic Unit:** California Almonds: An Almond Story (Grades 3-5)
- **Thematic Unit:** Edible Plant Parts (Grades 2-3)
- Lesson Plans: A Walnut Orchard Through the Seasons (Grades 2-3), The Importance of Grafting (Grades 4-5), Naturally Nutritious (Grades 6-8), A Seedy Fruit Challenge (Grades 2-4)

Almond Board of California (almonds.com)

- Activity Book: An Almond Story (Grades 3-5)
- Video: An Almond Story (Grades 3-8)

Websites

- American Pistachio Growers americanpistachios.org
- Produce for Better Health Foundation fruitsandveggies.org
- Almond Board of California almonds.com
- Walnut Marketing Board walnuts.org
- California Cling Peaches californiaclingpeaches.com
- UC Davis Fruit and Nut Research Information Center fruitandnuteducation.ucdavis.edu/fruitnutproduction

- Bryant, B. and B. Fentress. Almonds: Recipes, History, Culture. BF • Publications, 2014.
- Ehlert, L. Pie in the Sky. Harcourt, Inc, 2004.
- Hauck, P.E. A Timeless Journey Told by Mr. Walnut. Dab Publishing Company, 2000.
- Hauck, P.E. *Plum Full of Prunes.* Dab Publishing, 1999.
- Munoz, F. Almonds: Shake, Sweep, and Eat. Independent Publishing, 2019.
- Schaefer, L. Pick, Pull, Snap! Where Once a Flower Bloomed. Greenwillow Books, 2003.

### Our State, Our Specialty Plate

#### **Extension Ideas**

#### **Distance Learning: Food Groups**

Teach students about the five food groups that are part of a healthy diet by screen sharing the food group page from *www.choosemyplate.gov/food-groups* at your next class meeting. Explore each of the food groups as a class (fruits, vegetables, grains, protein, and dairy). As you click on each food group, have students select at least three foods that they enjoy from each group. As a follow up activity, students can write letters about their favorite foods to a parent, grandparent, or other relative offering ideas for a healthy meal and explaining why it's important to eat foods from each food group. Standards: CA History-Social Science: Grade 3: 3.1, 3.5; CC ELA: CCSS.ELA-LITERACY.W.3-8.4

#### **My Local Plate**

We are lucky to live in California, where an abundance of locally grown produce, livestock, and seafood, and countless other foods and beverages are available. How can we eat healthfully while also eating locally? Find your county on a map of California (*learnaboutag.org/resources/grab*). First, identify the top commodities produced in your county. Next, determine which food group each commodity belongs to—where does it fit on MyPlate? Finally, identify why your county is best suited to produce certain commodities. How does history, immigration, location, soil, climate, and water resources affect the local agriculture industry?

Standards: CA History-Social Science: Grade 3: 3.1, 3.5

#### **Plan Your Plate**

Let's think about foods, food groups, and putting together basic meals. Create a poster of a daily meal plan that follows the MyPlate guidelines and includes a variety of healthy foods. Use your own drawings or pictures of food cut from magazines to illustrate your poster. Drawing a sample meal is encouraged! Share your plate on social media using the hashtag #MyPlateMyState.

Standards: CA Health Education: Grade 4: 6.1.N, Grade 7 and 8: 5.1.N

#### **Grocery Store Bingo**

Visit your local grocery store (or farmers' market) for a game of MyPlate bingo. Before you go, create your own bingo grid of five-by-five squares. In each column of five squares, write the name of foods from one of the MyPlate food groups. For example, if the first column is fruit, you would include apples, peaches, grapes, raisins, and bananas. Continue until each box has a food item listed inside. Head to the grocery store, where you'll keep track of food sightings by crossing off the squares within the grid. Fresh, frozen, and canned varieties all count. Remember, we need foods from all five food groups for a healthy diet. If finding five in a row isn't challenging enough, attempt a diagonal bingo, picture frame bingo, or blackout.

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

- **Lesson Plan:** Fruits and Vegetable for Health (Grades 4-6)
- **Resource:** Ag Bite: Drive Through Nutrition (Grades 3-6)

Oregon Agriculture in the Classroom Foundation

**Lesson Plan:** Give Me Five! (Grades 3-5)

North Carolina Agriculture in the Classroom

**Unit:** The Farmer Grows a Rainbow (Grades 3-5)

Utah Agriculture in the Classroom

- **Resource:** *Fill MyPlate Game* (Grades 3-8)
- Lesson: Understanding MyPlate (Grades 3-5)
- Lesson: What's on MyPlate? (Grades 3-5)
- **Lesson:** Grocery Store Problem Solving (Grades 3-5)

Websites

- Dairy Council's MyPlate Match Game • healthyeating.org
- My American Farm's Grocery Grab and Finders Keepers myamericanfarm.org
- MyPlate choosemyplate.gov

- Aboff, M. The Fantastic Fruit Group. Capstone Press, 2012.
- Aboff, M. The Great Grains Group. Capstone Press, 2012.
- Butterworth, C. How Did That Get in My Lunchbox? The Story of Food. Candlewick Press, 2011.
- Dickmann, N. Dairy (Healthy Eating with MyPlate). Heinemann-Raintree, 2012.
- Dickmann, N. Fruits (Healthy Eating with MyPlate). Heinemann-Raintree, 2012.
- Dickmann, N. Grains (Healthy Eating with MyPlate). Heinemann, 2012.
- Dickmann, N. Protein (Healthy Eating with MyPlate). Heinemann-Raintree, 2012.
- Dickmann, N. Vegetables (Healthy Eating with MyPlate). Heinemann-Raintree, 2012.
- Lee, S. Healthy Snacks, Healthy You! Capstone Press, 2012.
- Leedy, L. Jack and the Hungry Giant Eat Right with MyPlate. Holiday House 2015.
- Olson, G.M. MyPlate and You. Capstone Press, 2012.
- Rissman, R. Healthy Eating with MyPlate: Using MyPlate. Heinemann, 2012.