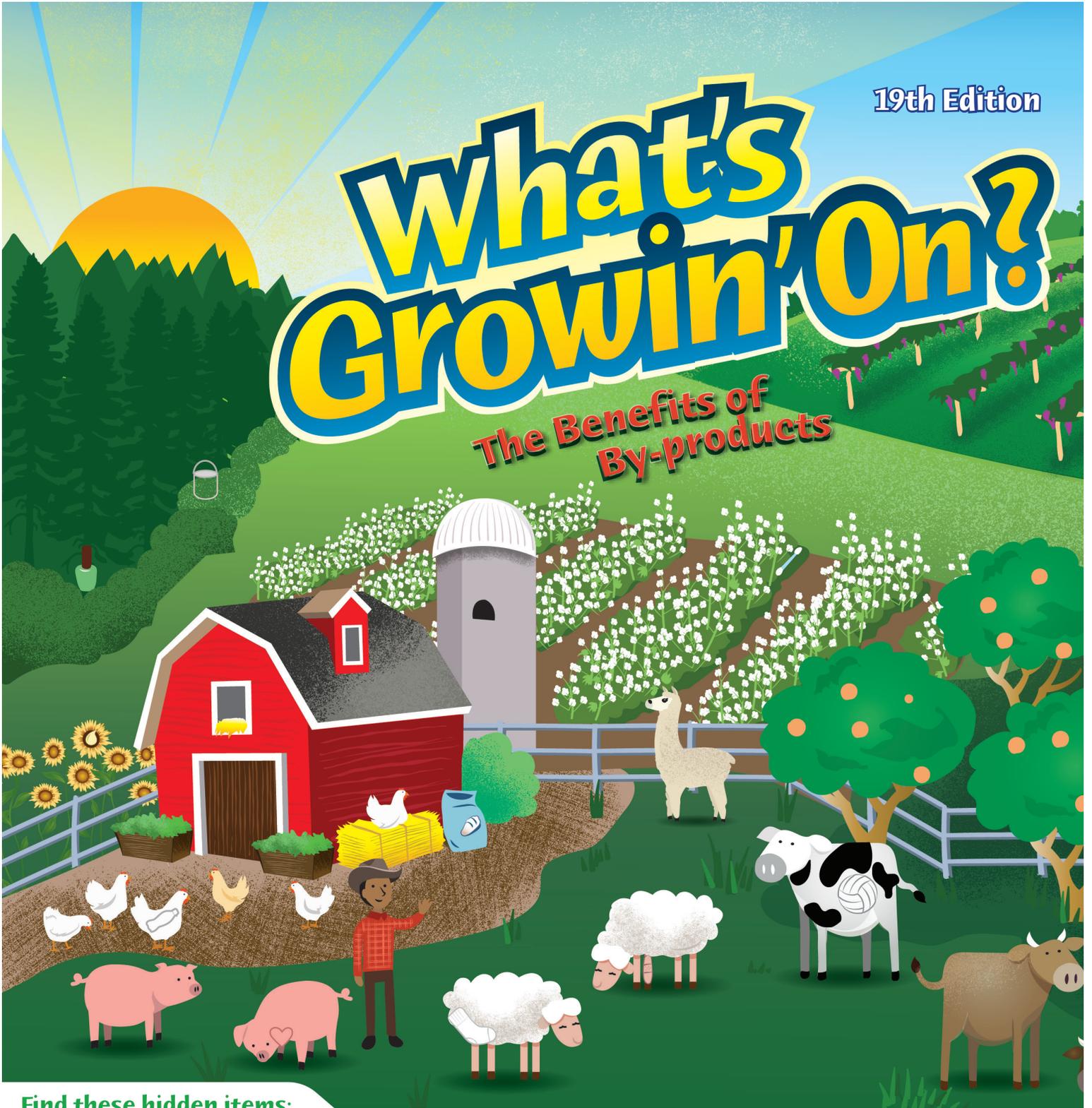


19th Edition

# What's Growin' On?

## The Benefits of By-products



Find these hidden items:

-  football
-  sock
-  heart valve
-  pencil
-  bandage
-  nail polish
-  volleyball
-  cotton swab
-  paint
-  vitamins
-  oil
-  oyster shell
-  biodegradable bottle

### Extra! Extra! Classroom Extensions

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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? The Benefits of By-products***. 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 agriculturally-themed examples and activities found in ***What's Growin' On? The Benefits of By-products*** 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. 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 classroom set of the current edition of ***What Growin' On? The Benefits of By-products***, order online at [LearnAboutAg.org/wgo](http://LearnAboutAg.org/wgo) or contact us via e-mail ([info@LearnAboutAg.org](mailto:info@LearnAboutAg.org)) or phone (916-561-5625).

# California's All Star Heavy Hitters

## ***Extension Ideas***

### **Hey Batter, Batter!**

Did you know minor league baseball teams are also referred to as a farm team? Research a California minor league baseball team, also known as a farm team, and recreate the jersey or mascot to reflect one of our “heavy hitter” commodities. Have each student present the new jersey or mascot to the class.

Standards: CC ELA:CCSS.ELA-LITERACY.CCW.3-4.7, CCSS.ELA-LITERACY.CCRI.3.5

### **Sharing is Caring**

Read this quick excerpt about how the Pellini Family barter with Ms. Wong, then answer the questions below.

The Pellini Family Packing Shed packs fresh apples into boxes that will be shipped to different grocery stores. Sometimes they receive apples that are overripe, damaged, or not sellable. These unwanted apples will have to be disposed of at the cost of the business, since they can't go to a grocery store to be sold. Instead of throwing the apples away, the Pellini Family calls Ms. Wong, the production manager at La Pomme to see if they could use these apples. Ms. Wong sends over a truck to the packing facility and takes all the unwanted apples, at no cost to the Pellini Family. These apples will get a new life and be made into vinegar, which La Pomme will be able to sell.

Questions:

1. Look up and define the word barter. How does this expert use bartering?
2. What are other uses of “unwanted” or damaged apples? Brainstorm some ideas and share with a partner. Have you ever used damaged apples?
3. Create a flowchart showing the life of a damaged apple.
4. Extra Activity - Make your own short story about bartering using a commodity found in this magazine.

Standards: CC ELA:CCSS.ELA-LITERACY.CC.RI.3.1-3, CCSS.ELA-LITERACY.RI.4.1-3.

### **Polyphenol on your Plate**

Polyphenols are a micronutrient that we can get from certain plant-based foods. They are packed with antioxidants and loaded with potential health benefits. Research and compile a list of 5 different foods that are high in polyphenol. Next, go to [www.myplate.gov](http://www.myplate.gov) and complete the “Create Your Own MyPlate Menu” activity while using as many polyphenol-rich foods in your meal as possible.

Standards: CC ELA: CCSS.ELA-LITERACY.W.3.7; CCSS.ELA-LITERACYW.4.7

## Resources

California Foundation for Agriculture in the Classroom ([learnaboutag.org](http://learnaboutag.org))

- **Lesson Plan:** *People and Plants Need Nutrients* (Grades K-2)
- **Resource:** Agriculture Fact and Activity Sheets: *Apples, Avocado, Fresh Carrots, Processing Tomatoes* (Grades K-12)

New York Botanical Garden ([www.nybg.org](http://www.nybg.org))

- **Lesson Plan:** *Lifecycle of an Onion Bulb*
  - Direct Link:  
[https://www.nybg.org/content/uploads/2017/03/Lifecycle\\_of\\_an\\_Onion\\_Bulb\\_Layout\\_1.pdf](https://www.nybg.org/content/uploads/2017/03/Lifecycle_of_an_Onion_Bulb_Layout_1.pdf)

## Websites

- California Apples  
[calapple.org](http://calapple.org)
- California Avocados  
[californiaavocado.com/](http://californiaavocado.com/)
- Grimmway Farms  
[grimmway.com](http://grimmway.com)
- Have a Plant  
[fruitsandveggies.org](http://fruitsandveggies.org)
- National Onion Association  
[onions-usa.org](http://onions-usa.org)
- USDA MyPlate  
[myplate.gov](http://myplate.gov)

## Books

- Marlowe, Brooke. ***No Ordinary Apple***. Wisdom Publications, 2013.
- Snyder, Inez. ***Tomatoes to Ketchup***. Childrens Pr, 2003.
- Vanhecke, Susan. ***An Apple Pie for Dinner***. Two Lions, 2009.

# The Scoop on Drupes

## Extension Ideas

### Got Almond Milk?

You can make your own almond milk at home or in the classroom by following the steps below.

1. Soak 1 cup of almonds overnight in cold water.
1. Drain the almonds and place them into a blender and add in 3 cups of fresh water. Blend the almond and water mixture until it reaches a homogeneous texture.
2. Pour the mixture through a cheesecloth over a large bowl.
3. Add the mixture back into the blender adding in a pinch of salt and add your desired flavor into the mix. Vanilla is a great option.
4. Re-blend the mixture and enjoy!

Using the provided measurements in the steps above, estimate how much almond milk you will end up with. Measure the mixture at the end to see if you were correct.

Standards: CC Math: CCSS.MATH.CONTENT.MD.C.4, CCSS.MATH.CONTENT.MD.C.5

### Let's Go Nuts for Nuts!

Using the chart below, have students research and record the number of calories, fat, protein, and sugar for 1 cup of each of the following nuts.

Nut Type	Calories	Fat	Protein	Sugar
Almond				
Cashew				
Macadamia Nut				
Coconut				

Need another challenge? Using the same layout, research and record the number of calories, fat, protein, and sugar in 1 cup of milk from the nuts listed above.

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

### To Drupe, or Not to Drupe

Have students write a short poem about a drupe using information from the newspaper page, or by doing their own research. Let their imagination soar! Once they have completed their poem, have them read it to a partner or present it to the class.

Standards: CC ELA: CCSS.ELA-LITERACY.CCRI.3-5.2-4,7, CCSS.ELA-LITERACY.CCW.3-5.2,7, CCSS.ELA-LITERACY.CCSL.3-5.4

## Resources

California Foundation for Agriculture in the Classroom ([learnaboutag.org](http://learnaboutag.org))

- **Resource:** Agriculture Fact and Activity Sheets: Almond, Table Olives, Walnuts (Grades K-12)
- **Activity:** *Fun with Almond Math* (Grades 3-5)
- **Lesson Plan:** *Growing Almonds: Fact or Opinion* (Grades 3-5)
- 

National Agriculture in the Classroom ([agclassroom.org](http://agclassroom.org))

- **Lesson Plan:** *Cracking Open the Story of Nuts* (Grades 3-5)
- **Lesson Plan:** *Peaches: What's All the Fuzz About?* (Grades 3-5)

## Websites

- California Almonds
- [almonds.com](http://almonds.com)
- California Cling Peaches  
[californiaclingpeaches.com](http://californiaclingpeaches.com)
- California Ripe Olives  
[calolive.org](http://calolive.org)

## Books

Munoz, F. ***Almonds: Shake, Sweep, and Eat.*** Independent Publishing, 2019.

Thomas, P. ***Thomas Jefferson Grows a Nation.*** Calkins Creek, 2015.

# May the Forest Be with You

## ***Extension Ideas***

### **Show Me the Money**

The California forestry industry provides over 177,000 jobs and profits nearly 39 billion dollars annually. If California agriculture makes roughly 54 billion dollars a year, what percentage of that total comes from the forest industry?

Standard: CC Math: CCSS.MATH.CONTENT.6.RP.A.3.C, CCSS.MATH.CONTENT.6.RP.A.3.D.

### **A Lumberjack of All Trades**

The California forestry industry offers a wide variety of jobs. Have students research and help create a large class list of all the different types of jobs offered in this industry. Have students select a job they think is interesting and have them create a short job description explaining what this job entails. Have students share their job description with the class or do a gallery walk and hang up all the student's job descriptions around the classroom for their peers to read.

Standards: CC ELA: CCSS.ELA-LITERACY.CCW.3-5.2,7, CCSS.ELA-LITERACY.CCSL.3-5.4,6

### **The California Forest Practice Act**

Have students research and create a presentation using a digital platform about the historical significance of how the California Forest Practice Act contributes to today's forestry industry. Have students peer review each other's work and allow for edits to be made before presenting and submitting their final project.

Standard: CC ELA: CCSS.ELA-LITERACY.CCW.3-5.2-3,5,7, CCSS.ELA-LITERACY.CCRI.3-5.2

## Resources

California Foundation for Agriculture in the Classroom ([learnaboutag.org](http://learnaboutag.org))

- **Resource:** *Ag-Bites: Making Recycled Paper* (Grades K-3)
- **Resource:** *Forest Resources Fact Sheet* (Grades K-12)
- **Video:** *How Drones are Helping to Plant Trees – A Cleaner Future*

DIY Network ([diynetwork.com](http://diynetwork.com))

- **Activity:** *Kid-Friendly Wooden Stamps*

I Can Teach My Child ([icanteachmychild.com](http://icanteachmychild.com))

- **Activity:** *Simple Tree Bark Boats*
- **Activity:** *Outdoor Tree Bark Rubbings*

Websites

- Arbor Day Foundation  
[arborday.org](http://arborday.org)
- California Department of Parks and Recreation  
[kids.parks.ca.gov](http://kids.parks.ca.gov)
- California State Parks PORTS Program  
[ports-ca.us](http://ports-ca.us)
- Forest Foundation  
[calforestfoundation.org](http://calforestfoundation.org)
- Smokey the Bear  
[smokeybear.com](http://smokeybear.com)
- United States Forest Service  
[fs.usda.gov](http://fs.usda.gov)

Books

Burns, D. ***Trees, Leaves, & Bark***. Cooper Square Publishing, 1995.

Ingoglia, G. ***The Tree Book for Kids and Their Grown-Ups***. Brooklyn Botanic Garden, 2013.

# Cereal-ously Great By-Products Come from Cereal Crops

## **Extension Ideas**

### **Grow Your Own Wheat**

Grow your own wheat in the classroom using the scientific method to test a hypothesis (for younger students, have one hypothesis the class is testing, for older students, have each student create their own). Use the resource link below titled *Growing Wheat in the Classroom* for the full instructions and material list. Have students collect data on the growth of wheat. Have them present their findings to the class either using a presentation board or by creating a digital media presentation.

Standards: CC ELA: CCSS.ELA-LITERACY.CCRST.6-8.3, CCSS.ELA-LITERACY.CCSL.3-5.3-6, CCSS.ELA-LITERACY.CCSL.6-8.4-6, CCSS.ELA-LITERACY.CCW.3-5.5,7, CCSS.ELA-LITERACY.CCW.6-8.4,5,7

### **A Rice Kernel in Time**

Research the history of rice production in California and create a timeline marking down key dates in history. Ask students to add to a timeline by drawing pictures to go with key dates in history. Have each student share a favorite timeline event with the class or with a partner.

Standards: CC ELA: CCSS.ELA-LITERACY.CCW.3-5.2,4,7, CCSS.ELA-LITERACY.CCW.6-8.2,4,7,8, CCSS.ELA-LITERACY.CCRI.3-5.2, CCSS.ELA-LITERACY.CCSL. 3-5.2,4,5,6, CCSS.ELA-LITERACY.CCSL. 6-8. 4-6

### **The Great Debate: Rice vs. Wheat Harvest**

Did you know wheat and rice used to be harvested by hand? Thanks to modern technology, rice and wheat are now able to be harvested by a combine. Divide your classroom in half: one side will research the methods used in wheat harvest while the other side will research the methods used in rice harvest. Here are some research questions to get them started:

- What type of implements or machinery are needed for rice/wheat harvest?
- What time of year is rice/wheat harvested?
- How much does one bushel of rice/wheat cost?
- What type of wildlife habitat does rice/wheat provide?

Once their research is complete, conduct a debate style class discussion comparing the differences and similarities between rice and wheat harvesting in California.

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.6-8.1-6.

## Resources

National Agriculture in the Classroom ([agclassroom.org](http://agclassroom.org))

- **Lesson Plan:** *Serious Cereal Science* (Grades 6-8)
- **Companion Resource:** *Serious Cereal Science Kit*
- **Activity:** *Bread in a Bag*
- **Lesson Plan:** *Food Science: Bread Dough Challenge* (Grades 9-12)
- **Lesson Plan:** *Wheat Germ DNA* (Grades 3-5)
- **Lesson Plan:** *FoodMASTER: Grains* (Grades 3-5)

California Wheat Commission ([californiawheat.org](http://californiawheat.org))

- **Lesson Plan:** *Growing Wheat in the Classroom*

Spicy Southern Kitchen ([spicysouthernkitchen.com](http://spicysouthernkitchen.com))

- **Activity:** *Old-Fashioned Rice Pudding*

Websites

- California Rice  
[calrice.org](http://calrice.org)
- California Wheat Commission  
[californiawheat.org](http://californiawheat.org)
- National Association of Wheat Growers  
[wheatworld.org](http://wheatworld.org)
- Think Rice  
[usarice.com](http://usarice.com)

Books

Heos, B. *From Wheat to Bread (Who Made My Lunch?)*. Amicus Ink, 2018.

Sligar, M. *Daddy's Got Dirt: A California Rice Story*. Rice Farming TV, 2020.

# A-Maize-Ing Non-California Commodities

## ***Extension Ideas***

### **Soybean Oil vs. Soybean Meal**

Research soybean oil and soybean meal. Create a Venn diagram and compare the differences and similarities between the two by-products. Have students share their Venn diagram with a partner.

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.3-5.4-6, CCSS.ELA-LITERACY.CCW.3-5.2, CCSS.ELA-LITERACY.CCRI.3-5.9

### **DIY Corn Plastic**

Use the link below to make your own corn plastic with your class. After completing this activity, here are some questions to have your students research and have a class discussion about:

1. Why is plastic made from corn different from other types of plastic?
2. Do you think using corn plastic could help decrease the amount of plastic waste produced? Why or why not?
3. How can you help reduce plastic waste in your school, home, and community?

DIY Corn Plastic Link: <https://www.childrensmuseum.org/blog/museum-home-diy-corn-plastic>

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.3-5.1-4,6, CCSS.ELA-LITERACY.CCSL.6-8.1-6, CCSS.ELA-LITERACY.RST.6-8.3

### **Peanut Plant Lifecycle**

Research and draw the lifecycle of a peanut plant. Label each phase of the lifecycle, draw a picture for each phase, and add a brief description of the phase.

Standards: CC ELA: CCSS.ELA-LITERACY.CCW.3-5.2,7, CCSS.ELA-LITERACY.CCW.6-8.2,4,7,8

## Resources

California Foundation for Agriculture in the Classroom ([learnaboutag.org](http://learnaboutag.org))

- **Resource:** *Corn Fact Sheet* (Grades K-12)

National Agriculture in the Classroom ([agclassroom.org](http://agclassroom.org))

- **Lesson Plan:** *Nuts About Peanuts!* (Grades 3-5)
- **Lesson Plan:** *Corn an A-maizing Plant: Food, Fuel, and Plastic* (Grades 3-5)
- **Lesson Plan:** *From Soybeans to Car Parts* (Grades 3-5)
- **Lesson Plan:** *Fueling Up for a Career in Biofuel* (Grades 6-8)
- **Lesson Plan:** *Topsy-Turvy Soybeans* (Grades 3-5)
- **Lesson Plan:** *Cracking Open the Story of Nuts* (Grades 3-5)

## Websites

- American Soybean Association  
[soygrowers.com](http://soygrowers.com)
- Georgia Peanut Commission  
[gapeanuts.com](http://gapeanuts.com)
- Missouri Corn  
[mocom.org](http://mocom.org)
- Nebraska Corn Board  
[nebraskacorn.gov](http://nebraskacorn.gov)

## Books

Bailey, R. ***Peanut Butter (How It's Made?)***. Pogo Books, 2017.

Erickson, L. ***Sweet Corn and Sushi: The Story of Iowa and Yamanashi***. McMillen Publishing, 2004.

Landau, E. ***A True Book: Corn***. Childrens Pr. 1999.

Lo, G. ***Auntie Yang's Great Soybean Picnic***. Lee & Low Books, 2017.

Marzollo, J. ***The Little Plant Doctor: A Story about George Washington Carver***. Holiday House, 2011.

Nelson, R. ***From Kernel to Corn***. LernerClassroom, 2012.

# Everything but the Oink, Moo, and the Cock-a-doodle-doo

## **Extension Ideas**

### **The Tail of Livestock Domestication**

The livestock animals used today have a long history of domestication. In fact, many of these livestock animals originated in other countries and looked nothing like the animals we have today. Focusing on these main livestock species: beef, pork, sheep, and poultry; research the history and domestication. Create a digital media presentation with your research and share it with the class. Make sure to cite your sources.

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.3-5.2-6, CCSS.ELA-LITERACY.CCW.3-5.2,5,7, CCSS.ELA-LITERACY.CCRI.3-5.2, CCSS.ELA-LITERACY.CCSL.6-8.1-6, CCSS.ELA-LITERACY.CCW.6-8.2-4,7,8, CCSS.ELA-LITERACY.CCRI.6-8.1-3.

### **Where Did I Come From?**

All livestock species have a place where they originated. Using a world map, have students research the origin of different livestock species and identify their place of origin on the map.

Additional questions to ask students could include:

1. Does the place of origin for each species still use/have that livestock animal?
2. Are the places of origin for most species close to each other or are they far away?
3. How do you think animals get domesticated by humans?

Standards: CC ELA: CCSS.ELA-LITERACY.RH.6-8.7, CCSS.ELA-LITERACY.CCSL.3-5.1-6, CCSS.ELA-LITERACY.CCSL.6-8.1-6

### **Cattle Collage**

Cattle provide an array of everyday by-products. Create a collage using magazine clippings (or real items) that are by-products of cattle. To extend this activity for older students, have them research what part of the cow makes the by-products they chose. You could also do this activity for sheep, pig, and chicken by-products.

Standards: CC ELA: CCSS.ELA-LITERACY.CCW.3-5.7, CCSS.ELA-LITERACY.CCW.6-8.7,8.

## Resources

California Foundation for Agriculture in the Classroom ([learnaboutag.org](http://learnaboutag.org))

- **Lesson Plan:** *Ag-Bite: Got Guts?* (Grades 3-5)
- **Lesson Plan:** *Ag-Bite: Cowboy Brands* (Grades 3-4)
- **Lesson Plan:** *Roll of the Genes* (Grades 3-5)
- **Resource:** *Farm to You: Beef* (Grades 5-6)
- **Resource:** *Farm to You: Pork Production* (Grades 5-12)

National Agriculture in the Classroom ([agclassroom.org](http://agclassroom.org))

- **Lesson Plan:** *At Home on the Range* (Grades 3-5 & 6-8)
- **Lesson Plan:** *Beef Basics* (Grades 3-5)
- **Lesson Plan:** *Eggs: From Hen to Home* (Grades 3-5)
- **Lesson Plan:** *Eggs in the World of Food Choices* (Grades 3-5)
- **Lesson Plan:** *From Wool to Wheel* (Grades 3-5)
- **Lesson Plan:** *FARMLAND: Animal Welfare* (Grades 9-12)
- **Lesson Plan:** *Making a Brand for Ourselves the “Cowboy” Way* (Grades 3-5)
- **Lesson Plan:** *Pigs on the Farm* (Grades 3-5)
- **Lesson Plan:** *The Remarkable Ruminant* (Grades 6-8)
- **Lesson Plan:** *Truth or Hogwash?* (Grades 3-5)
- **Lesson Plan:** *Think in Pictures: Like Dr. Grandin* (Grades 3-5 & 6-8)

## Websites

- American Goat Federation  
[americangoatfederation.org](http://americangoatfederation.org)
- American Sheep Industry Association  
[sheepusa.org](http://sheepusa.org)
- California Cattlemen’s Association  
[calcattlemen.org](http://calcattlemen.org)
- California Department of Food and Agriculture  
[cdfa.ca.gov](http://cdfa.ca.gov)
- California Poultry Federation  
[cpif.org](http://cpif.org)
- California Pork Producers Association  
[calpork.com](http://calpork.com)

## Books

Brooks, F. **Food**. Usborne Publishing Ltd, 2014.

Icenoggle, J. **‘Til the Cows Come Home**. Boyds Mill, 2004.

Meredith, S. **Chickens on the Farm**. Rourke Educational Media, 2010.

# Udderly Efficient Cattle By-Products

## **Extension Ideas**

### **From Milk to Yogurt**

Create a flow chart to map out the process of how yogurt is made starting with the cow and ending with the final product: yogurt. Add a visual for each step in the process. Share your flowchart with a neighbor. Did you both have similar steps?

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.3-5.1,4-6, CCSS.ELA-LITERACY.CCW.3-5.2,7, CCSS.ELA-LITERACY.CCRI.3-5.2, CCSS.ELA-LITERACY.CCSL.6-8.1-6, CCSS.ELA-LITERACY.CCW.6-8.1,4,7,8

### **Can You Taste the Difference?**

Conduct a taste test with your class comparing different cow and goat dairy products. You can do the taste test blind (without telling the students which species the by-product is from) or with labels. Have the students create a hypothesis about which species they think each by-product came from. When tasting, have students use all senses (if possible) and have them record their findings. At the end, do a class poll to see how many students preferred goat by-products instead of cow by-products.

Standards: CC ELA: CCSS.ELA-LITERACY.RST.6-8.3, CCSS.ELA-LITERACY.CCW.6-8.2,4,5,8, CCSS.ELA-LITERACY.CCW.3-5.2,5

### **Cow vs Goat Milk**

Goat milk is known for having many nutritional benefits similar to cows' milk. Using the chart below, have students research and record the differences between 1 cup of cow milk and 1 cup of goat milk to discover the nutritional differences and similarities. Ask them to write a paragraph explaining the differences and similarities of the two types of milk and site their resources used for their research.

	<b>1 Cup of Cow Milk</b>	<b>1 Cup of Goat Milk</b>
<b>Calories</b>		
<b>Protein</b>		
<b>Fat</b>		
<b>Carbs</b>		
<b>Lactose</b>		
<b>Calcium</b>		

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.6-8.2, CCSS.ELA-LITERACY.CCSL.3-5.3,4, CCSS.ELA-LITERACY.CCW.6-8.4,7,8, CCSS.ELA-LITERACY.CCW.3-5.7.

## Resources

California Foundation for Agriculture in the Classroom ([learnaboutag.org](http://learnaboutag.org))

- **Lesson Plan:** *A Day Without Dairy* (Grades 3-5)
- **Resource:** *Dairy Fact Sheet* (Grades K-12)
- **Lesson Plan:** *The Ultimate Efficient Recycler* (Grades 3-5)
- **Lesson Plan:** *Sun, to Moo, to You* (Grades 3-5)
- **Resource:** *Farm to You: Beef* (Grades 5-6)
- **Resource:** *Farm to You: Pork Production* (Grades 5-12)

National Agriculture in the Classroom ([agclassroom.org](http://agclassroom.org))

- **Lesson Plan:** *Blue's the Clue: Souring Milk for Science* (Grades 6-8)
- **Resource:** *Biotech Cheese Kit*

Clearway Community Solar ([clearwaycommunitysolar.com](http://clearwaycommunitysolar.com))

- **Activity:** *Creating Biogas from Your Pantry*
  - Direct Link: <https://www.clearwaycommunitysolar.com/blog/science-center-home-experiments-for-kids/creating-biogas-from-your-pantry/>

Michigan State University ([msu.edu](http://msu.edu))

- **Activity:** *Anybody Can Teach Science: Milk Tasting*
  - Direct Link: [https://www.canr.msu.edu/news/anybody\\_can\\_teach\\_science\\_milk\\_tasting](https://www.canr.msu.edu/news/anybody_can_teach_science_milk_tasting)

The Inspired Treehouse ([theinspiredtreehouse.com](http://theinspiredtreehouse.com))

- **Activity:** *Fine Motor Skills Activity: Milking a Cow*

## Websites

- Dairy Council of California  
[usdairy.com](http://usdairy.com)
- Dairy Cares  
[dairycares.com](http://dairycares.com)
- The California Dairy Press Room & Resources  
[californiadairypressroom.com](http://californiadairypressroom.com)
- Penn State Extension  
[extension.psu.edu](http://extension.psu.edu)

## Books

Butler, V. ***Chuck's Ice Cream Wish (Tales of the Dairy Godmother)***. Feeding Minds Press, 2020.

Goodman, S. ***All in Just One Cookie***. Greenwillow Books, 2006.

Yunk, D. ***Milk Comes from a Cow?*** Kansas Farm Bureau, 2007.

# Warm and Fuzzy By-Products

## ***Extension Ideas***

### **Be A Fiber Artist**

Using various types of fiber, create an original artwork piece. In a few short sentences, have students reflect on their art piece and identify the type(s) of fiber they used, what their inspiration was, and what they like most about their art piece. Display the artwork in the classroom for a gallery walk.

Standards: CA Visual Arts: 8.VA:Cr.2.1

### **Let's Take A Closer Look...**

Collect different types of fiber samples such as cotton, wool, mohair, silk. Observe these different types of fibers under a microscope with your class. Have students draw in their journal what they see under the microscope – encourage detailed drawings! Analyze and interpret observation data and have students compare and contrast the differences between the various fiber samples.

Standards: NGSS: LS3-1, CC ELA: CCSS.ELA-LITERACY.CCW.3-5.2,7; CCSS.ELA-LITERACY.CCW.6-8.2,7,8

### **A Bit of Cotton History**

Divide students into groups of two or three. Each group will select a cotton related topic they must research, write an informative text about, and create a visual display. Have students cite their sources. Potential research topics include:

- Cotton and the Civil War
- Eli Whitney and the Cotton Gin
- Samuel Slater and Cotton Milling
- The History of Cotton Songs
- The Many Uses of Cotton
- Cotton Bales
- Cotton Production in California
- The Cotton Plant
- Cotton Fabrics
- Cotton's Journey from Field to Home

Once completed, have each group share their visual display with the class to teach about their piece of cotton history.

Standards: CC ELA: CCSS.ELA-LITERACY.CCW.3-8.2,5,7, CCSS.ELA-LITERACY.CCSL.3-8.4,5

## Resources

California Foundation for Agriculture in the Classroom ([learnaboutag.org](http://learnaboutag.org))

- **Resource:** *Cotton Fact Sheet* (Grades K-12)

National Agriculture in the Classroom ([agclassroom.org](http://agclassroom.org))

- **Activity:** *Hands-On with Wool*
- **Lesson Plan:** *A Common Thread: The Significance of Wool in Medieval England* (Grades 6-8)
- **Lesson Plan:** *Bartering Through the Seasons* (Grades 3-5)
- **Lesson Plan:** *Clothes on the Grow* (Grades 6-8)
- **Lesson Plan:** *King Cotton* (Grades 3-5, 6-8, & 9-12)
- **Lesson Plan:** *My Farm Web* (Grades K-2 & 3-5)

Growing Hands-on Kids ([growinghandsonkids.com](http://growinghandsonkids.com))

- **Activity:** *25 Cotton Ball Hands-On Activities for Kids*

Science Buddies ([sciencebuddies.org](http://sciencebuddies.org))

- **Activity:** *Make a Cotton Ball Launcher*

Tennessee 4-H ([4h.tennessee.edu](http://4h.tennessee.edu))

- **Activity:** *STEM Activities in the Clothing and Textile Project Area*
  - Direct Link:  
<https://4h.tennessee.edu/wp-content/uploads/sites/47/2020/04/W881.pdf>

## Websites

- Alpaca Owners Association Inc  
[alpacainfo.com](http://alpacainfo.com)
- American Sheep Industry Association  
[sheepusa.org](http://sheepusa.org)
- California Wool Growers Association  
[californiawoolgrowers.org](http://californiawoolgrowers.org)
- Cotton Today  
[cottontoday.cottoninc.com](http://cottontoday.cottoninc.com)

## Books

Butterworth, C. *Where Did My Clothes Come From?* Candlewick, 2017.

Keeler, P., McCall, F. *Unraveling Fibers.* Atheneum, 1995.

Lyon, G. *Weaving the Rainbow.* Atheneum/Richard Jackson Books, 2004.

Myers, M. *National Geographic Readers: Llamas (L1).* National Geographic Kids, 2020.

Williams, S. *Working Cotton.* HMH Books for Young Readers, 1997.

# So-'Fish'-ticated Agriculture

## ***Extension Ideas***

### **A Scale Drawing**

Find a quality picture of an aquatic animal and have the class create a scale drawing. Have each student identify the type of animal they drew and to research two new by-products the species could make.

Standards: CC ELA: CCSS.ELA-LITERACY.CCW.3-5.2,7, CCSS.ELA-LITERACY.CCW.6-8.2.7,8

### **Careers in Aquaculture**

With the aquaculture industry slowly growing, there comes a need for more employees. Research different jobs related to the aquaponics industry and select one that interests you. Create a digital presentation on the job and present it to the class. Is this a job you would like to do one day?

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.3-5.4-6, CCSS.ELA-LITERACY.CCW.3-5.2,7, CCSS.ELA-LITERACY.CCSL.6-8.2,4-6, CCSS.ELA-LITERACY.CCW.6-8.2,4,7,8.

### **Caviar: A Natural Delicacy**

Caviar has a rich history dating back to 1240 AD when it was first noted as being part of Russian traditions. Today, caviar still holds its status of being a rich delicacy and for a good reason. Have students research the nutritional benefits of caviar and create a nutrition label of their own design.

Standards: CC ELA: CCSS.ELA-LITERACY.CCW.3-5.2,7, CC ELA: CCSS.ELA-LITERACY.CCW.6-8.2,4,7,8

## Resources

National Agriculture in the Classroom ([agclassroom.org](http://agclassroom.org))

- **Lesson Plan:** *Exploring Aquaponics* (Grades 3-5)
- **Lesson Plan:** *Overfishing and Aquaculture* (Grades 3-5 & 6-8)
- **Kit:** *Classroom Aquaponics Kit*
- **Companion Resource:** *Into the Outdoors: Farm Science*

## Websites

- California Aquaculture Association  
[caaquaculture.org](http://caaquaculture.org)
- U.C. Davis Aquaculture Cooperative Extension  
[aquaculture.ucdavis.edu](http://aquaculture.ucdavis.edu)
- 4H Virtual Farm Tour  
<https://www.sites.ext.vt.edu/virtualfarm/main.html>
- Sea Grant California  
[caseagrant.ucsd.edu](http://caseagrant.ucsd.edu)
- National Aquaculture Association  
[thenaa.net](http://thenaa.net)

## Books

Bang, M. ***Ocean Sunlight: How Tiny Plants Feed the Seas***. The Blue Sky Press, 2012.

Somervill, B. ***Producing Fish (The Technology of Farming)***. Heinemann, 2012.

Teckentrup, B. ***Fish Everywhere***. Big Picture Press, 2019.

# Heart-full Thanks to Agriculture!

## ***Extension Ideas***

### **Collagen Source Search**

Collagen can be sourced from both plant and animal cells. Review the common sources of collagen and create a T-chart for the commonalities or differences in cell content. Share your results with a neighbor and add more ideas to your T-chart that you didn't have already.

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.6-8.1,4, CCSS.ELA-LITERACY.CCW.6-8.2,4,5,7,8, CCSS.ELA-LITERACY.CC SL.3-5.1,4,6, CC ELA: CCSS.ELA-LITERACY.CCW.3-5.5,7

### **But Wait, There's More!**

There are many by-products used for human health that aren't listed on the newspaper page. Using the main commodities listed on the newspaper page, create a collage using magazine clippings (or hand-draw) of other health related by-products. Identify what species the by-products are from and what it might be used for in the medical field. Share your collage with the class.

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.6-8.1,2,4-6, CCSS.ELA-LITERACY.CCW.6-8.2,4,7,8, CCSS.ELA-LITERACY.CCSL.3-5.4,5,6, CCSS.ELA-LITERACY.CCW.3-5.2,7

### **Head, Shoulders, Knees, and By-Products!**

Have students get with a partner or a small group. See if they can identify different by-products their classmates have. Note – this could include food that was eaten, vitamins, bandages, what is in their pocket, anything can count! If they don't know where a certain item came from, encourage them to research it.

Standards: CC ELA: CCSS.ELA-LITERACY.CCSL.3-5.1,3,6, CCSS.ELA-LITERACY.CCSL.6-8.1,6

## **Resources**

California Foundation for Agriculture in the Classroom ([learnaboutag.org](http://learnaboutag.org))

- **Resource:** *Ag-Bite: Link 'Ems* (Grades 6-8)

National Agriculture in the Classroom ([agclassroom.org](http://agclassroom.org))

- **Lesson Plan:** *Fortified for Health* (Grades 3-5)
- **Lesson Plan:** *FoodMASTER: Fruit* (Grades 3-5)
- **Lesson Plan:** *Right This Very Minute* (Grades 3-5)
- **Lesson Plan:** *Source Search* (Grades 3-5 & 6-8)

Science Buddies ([sciencebuddies.org](http://sciencebuddies.org))

- **Activity:** *Diabetes Science Projects*

We Are Teachers ([weareteachers.com](http://weareteachers.com))

- **Lesson Plan:** *16 Hands-On Heart and Circulatory System Activities for Kids*

Websites

- KidsHealth  
[kidshealth.org](http://kidshealth.org)
- Centers for Disease Control and Prevention  
[cdc.gov/healthyschools/bam/teachers.htm](http://cdc.gov/healthyschools/bam/teachers.htm)
- Learn to be Healthy  
[learntobehealthy.org](http://learntobehealthy.org)

Books

Aston, D. ***An Orange in January***. Dial Books, 2007.

Gosselin, K. ***Taking Diabetes to School***. JayJo Books, 2004.

Rockwell, L. ***Good Enough to Eat: A Kid's Guide to Food and Nutrition***. HarperCollins, 2009.

# Farm to Classroom

## ***Extension Ideas***

### **I-Spy In Your Classroom**

It's time for real life I-Spy! Before class, identify different items in your classroom that will serve as the answers to your I-Spy game. With the class, have students seated and start by reminding everyone that by-products are everywhere, even in the classroom. Give different hints to the class about the item you are thinking about. Encourage students to read through the magazine to help get ideas of what the item could be if they seem stuck. Students can either point at the object, grab the object, or raise their hand when they think they know the answer.

Standards: SL.3-5.1,3,6.; SL.6-8.1,2.

### **My Favorite By-Product Show & Tell**

Ask each student to bring one of their favorite things from their house (toy, book, gadget, etc). Whatever item they choose to bring, they must be able to identify what by-products are used to make it. An extension idea is to have students write up a small reflection of the item they chose and talk about how it is made or what it is made from.

Standards: SL.3-5.3,4,6.; W.3-5.2.; SL.6-8.4,5,6.; W.6-8.2,4,8.

### **What By-Products Mean to Me**

After reading through the newspaper, have students write a short paper summarizing what they learned about by-products. Have them answer these questions in their summary:

- What by-product surprised you most with where it comes from? Why?
- What is a by-product you use every day? Where does it come from?

Standards: W.3-5.1,2.; W.6-8.2,4,8.

## Resources

California Foundation for Agriculture in the Classroom ([learnaboutag.org](http://learnaboutag.org))

- **Resource:** *Ag-Bite: Garden in a Glove* (Grades 3-8)
- **Resource:** *Ag-Bite: Desktop Gardens* (Grades 2-5)
- **Resource:** *Grab Bag: Pick-A-Peck*
- **Resource:** *Grab Bag: Farmers 2050*
- **Resource:** *Grab Bag: Farming is Everywhere Coloring Book* (Grades K-2)

National Agriculture in the Classroom ([agclassroom.org](http://agclassroom.org))

- **Lesson Plan:** *AgVenture: Sourcing Ag Careers* (Grades 6-8)

## Websites

- National Farm to School Network  
[farmtoschool.org](http://farmtoschool.org)
- CDFA Office of Farm to Fork  
[cafarmtofork.cdfa.ca.gov/CaFarmtoSchoolProgram.htm](http://cafarmtofork.cdfa.ca.gov/CaFarmtoSchoolProgram.htm)
- Field to Family  
[fieldtofamily.org/farm-to-classroom-resource-portal-for-educators/](http://fieldtofamily.org/farm-to-classroom-resource-portal-for-educators/)

## Books

Detlefsen, L. ***Right This Very Minute: A Table-to-Farm Book About Food and Farming.*** Feeding Minds Press, 2019.

Maurer, T. ***John Deere, That's Who!*** Henry Holt and Co, 2017.

Nolan, J. ***PB&J Hooray!: Your Sandwich's Amazing Journey from Farm to Table.*** Albert Whitman & Company, 2014.