



California Almonds

An Almond Story

Grades 3-5



California Foundation for
Agriculture in the Classroom

2300 River Plaza Drive
Sacramento, CA 95833
(916) 561-5625 • (800) 700-2482
www.LearnAboutAg.org

California Foundation for Agriculture in the Classroom

Vision: An appreciation of agriculture by all.

Mission: To increase awareness and understanding of agriculture among California's educators and students.



California Foundation for
Agriculture in the Classroom

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1st Edition

February 2016

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Acknowledgments

Writers/Editors

Rebecca Bailey
Mary Pat Jones
Jenny Nicolau
DeAnn Tenhunfeld

Original Development Team

Laceyanne Sullivan Chojnacki
Jennifer Dickey

Executive Director

Judy Culbertson

Layout and Design

Nina Danner
Lyn Hyatt
Jennifer Ray

Special Thanks



The California Foundation for Agriculture in the Classroom is dedicated to fostering a greater public knowledge of the agriculture industry. The Foundation works with K-12 teachers, community leaders, media representatives, and government executives to enhance education using agricultural examples in order to help young people acquire the knowledge needed to make informed choices.

The original concept for *California Almonds: An Almond Story* was developed by participants in the Almond Board of California's Almond Leadership Program. The lesson plans were further developed by California Foundation for Agriculture in the Classroom with support from the Almond Board of California. The unit incorporates the Almond Board of California's *An Almond Story* student activity book throughout the lessons.

The 3-5 grade unit, *California Almonds: An Almond Story* was created to foster an appreciation for agriculture, while teaching students about almonds. Students will learn about all aspects of almonds including the life cycle of the almond tree, almond harvest, different uses for almonds, history of almonds, and nutritional information. *California Almonds: An Almond Story* has been aligned to Education Standards for California Public Schools including Common Core and Next Generation Science Standards.

The Foundation would like to thank the people who helped create, write, revise, and pilot test *California Almonds: An Almond Story*. Their comments and recommendations contributed significantly to the development of this unit. Their participation does not necessarily imply endorsement of all statements in the document.

Curriculum Update and Review Committee

Judy Culbertson
CA Foundation for Agriculture in the Classroom

DeAnn Tenhunfeld
CA Foundation for Agriculture in the Classroom



Introduction

This five-lesson unit for grades 3-5 teaches about agriculture by focusing on all aspects of the almond industry. Students will learn about the people involved in growing almonds, development of almond trees and nuts, almond processing, different uses of almonds, almond history and nutritional information. Almonds are an important commodity in California agriculture. Approximately 6,800 growers located throughout the Central Valley of California produce close to two billion pounds of almonds each year. California produces more than 80% of the world's almonds and virtually 100% of the domestic supply.

This unit reinforces the current educational standards for California: Common Core and Next Generation Science Standards. It builds on students' creativity and innovation, critical thinking and problem solving, collaboration, and communication skills. The standards are located on the sidebar of each lesson, specify grade level, subject matter, and standard number. A standard matrix is located on pages 46–54.

Agriculture is an important industry in the United States, especially in California. As more rural areas become urbanized and more challenges exist to maintain and improve the quality of the planet and feed the people of the world, it is extremely important to educate students about their environment, agriculture, and the modern technologies that continue to make Earth a viable and productive planet. *California Almonds: An Almond Story* is one of many educational units developed and distributed by the California Foundation for Agriculture in the Classroom.

Unit Overview

Brief Description

This five-lesson unit incorporates using English Language Arts, Math, and Science skills while teaching about almonds, a top commodity in California agriculture. Students will use *An Almond Story* activity book, video, and other handouts to supplement the lessons. Students will write opinion/informative essays, poetry, design and conduct a science experiment, write a personal narrative based on a family history, and create a classroom recipe book. There are also numerous extension lesson ideas for additional student or classroom projects. Teaching the unit completely and in order is recommended.

California Standards

A concerted effort to improve student achievement in all subject areas has impacted education throughout California. The California Foundation for Agriculture in the Classroom provides educators with numerous resource materials and lessons that can be used to teach and reinforce the standards for California Public Schools: Common Core State Standards, the Next Generation Science Standards, and current Content Standards. The lessons encourage students to think for themselves, ask questions, and learn problem-solving skills while learning the specific content needed to better understand the world in which they live.

This unit includes lessons that can be used to teach and reinforce many of the educational standards covered in grades three through five. The purpose of the unit is to strengthen Common Core skills while introducing students to Agriculture. Detailed information on the alignment of each lesson with California standards is provided on pages 46–54.

Evaluation

This unit incorporates numerous activities and questions that can be used as evaluation tools, many of which can be included in student portfolios. With an emphasis on student inquiry, few lessons have “right” or “wrong” answers, but rather engage students in thinking critically about their learning experience and applying what they learn to real-life experiences. Embedded assessments includes oral and written responses to open-ended questions, group presentations and other knowledge-application projects.



Unit Overview

Visual Display Ideas

- ▶ Invite an almond farmer to your classroom and have them explain what they do and show tools and other hands-on examples related to their work.
- ▶ Have students create a travel brochure based on the almond industry and California.
- ▶ Create a classroom poetry book that includes student poems and art work.
- ▶ Create a classroom cook book that includes student and family recipes. Include illustrations.



Fact or Opinion

Purpose

Students will learn about the process of getting almonds from farm to table as well as jobs in the almond industry.

Time

Teacher preparation:
10 minutes

Student activities:
2 - 50 minute lessons plus
additional time for writing

Materials

- ▶ KWL Chart Paper
- ▶ *An Almond Story* video available at www.youtube.com/watch?v=4jUaJ7ebhXo
- ▶ The Almond Board of California's slide show at www.almonds.com/consumers/about-almonds/almond-lifecycle
- ▶ Other almond harvest website: www.coeshakers.com/videos.
- ▶ *An Almond Story* activity book page 12: a Busy Little Almond or go to www.LearnAboutAg.org/lessons, click on *California Almonds: An Almond Story*, and then download *An Almond Story* activity book. (an answer key for activity book pages is at the bottom of each page)

Background Information

Producing almonds is a year-long process. Almond growers pay special attention to the almond trees to make sure they are thriving all year long. Almond trees begin their cycle in a dormant state, which usually lasts from November to February. Once spring arrives, the almond trees burst into bloom and the bees come to pollinate. From March to June, the almond kernel is developing and hardening. In July, once the kernel has grown to its full potential, it goes into the hullsplit phase where the outside hull (the soft, pliable protective layer) splits open. In late summer, the almond trees are harvested and the almonds are transported to the processing plant, where the almonds later get shipped around the world.

Procedure

1. Introduce the Almond unit of lessons. Explain that students will learn about all aspects of California Almonds through this unit as well as practice skills in Language Arts, Science, Math, History, and Nutrition.
2. Introduce the purpose of lesson one: Students will learn about the process of growing almonds and the steps it takes starting with tree pollination to transportation of the finished product. In addition, students will learn and practice fact and opinion. Students will use what they've learned about almonds to write an informative or opinion essay.
3. Discuss what students already know about almonds and what they want to know. Write answers on the KWL chart (add to chart as you go through future lessons).
4. Watch the *Almond Story* video. Add information to the KWL chart.
5. Show the Almond Life Cycle slides on the Almond Board of California's website: www.almonds.com/consumers/about-almonds/almond-lifecycle
 - a. November through February, almond trees go through a period of dormancy that allows them to store nutrients.
 - b. Between February and early March almond trees begin to bloom. Different varieties bloom at different times.
 - c. Most almond trees need pollination so bees are brought to the orchard to carry pollen and pollinate the almond blossoms, which is the first start to crop development.



Fact or Opinion

- ▶ Factual Frank and Opinion Opie Worksheets (page 10)

California Standards

Grade 3

Common Core English Language Arts

- ▶ RI 3.1, 3.2, 3.3, 3.7
- ▶ RF 3.4b
- ▶ W.3.1, 1a, 1b, 1c, 1d, 3.2, 2a, 2b, 2c, 2d
- ▶ SL 3.1, 3.3

Next Generation Science Standards

- ▶ 3-LS1.1
- ▶ 3-LS1.B

Grade 4

Common Core English Language Arts

- ▶ RI.4.1, 4.3, 4.7
- ▶ W.4.1, 1a, 1b, 1c, 1d, 4.2
- ▶ SL.4.1

Next Generation Science Standards

- ▶ 4-LS1-1
- ▶ 4-LS1.A

- d. From March to June, almonds grow and mature, with the outer shell (hull) hardening and the kernel developing.
 - e. During July and August, the hulls begin to split which allows the almond shell to begin to dry. Right before harvest the hull opens completely.
 - f. From August to October, harvest begins. Harvest equipment called shakers come into the orchard and clamp the trunk of the trees. They shake the tree vigorously (for 3-4 seconds) and the almonds fall to the ground. The almonds stay on the ground for a little over a week and then are swept into rows by another piece of equipment called a sweeper. For an online video example of a shaker see www.coeshakers.com/videos (Teacher note: If you wish to show this to your class, we recommend viewing the video site first)
 - g. Next, almonds are picked up by a harvester, transferred into a trailer and hauled to a huller/sheller facility where they go onto a conveyer belt and the hull and shell are separated from the almond kernels. The almonds are also separated out according to size.
 - h. After hulling and separating, almonds are stored until they are shipped or processed further.
6. As a class, have students read and complete page 12, a Busy Little Almond, in their activity books, or go to www.LearnAboutAg.org/lessons, click on *California Almonds: An Almond Story*, and then download *An Almond Story* activity book. Discuss new information. Add to KWL chart.
 7. Discuss or review the meaning of fact and opinion. A fact is a statement that is true and can be proven. An opinion is a statement based on a belief or how someone feels and can't be proven. Have students practice by using the Factual Frank and Opinion Opie worksheet (page 10). Have students complete the page and discuss.
 8. Clarify what students have learned about almonds so far. Add to "learned" column of KWL chart. Keep for future lessons.
 9. Have students write an opinion or informative essay on almonds. Students may focus on harvest or another area from their almond activity book. Student papers should have an introduction, include reasons or facts, include linking words and domain specific vocabulary, as well as have a conclusion. Have students present their paper.



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Fact or Opinion

Grade 5

Common Core English Language Arts

- ▶ RI.5.3
- ▶ W.5.1, 1a, 1b, 1c, 1d, 5.2, 2a, 2b, 2c, 2d, 2e
- ▶ SL.5.1

Extensions

- ▶ Have students read and complete pages 11 and 20, People in the Almond Industry and Nuts about Recycling in their *Almond Story* activity book. After students finish, ask them to re-read the pages, this time looking for fact and opinion. Students should find and underline fact or opinion statements on the activity book pages and discuss with a partner.
- ▶ Have students create a Fact or Opinion class quiz.
- ▶ Have student groups make posters about almond harvest. Students should illustrate their posters. Have students present their posters. Display posters in your classroom.
- ▶ Record student or group presentations and watch as a class. Have students give feedback on the presentations.

Factual Frank and Opinion Opie

Name _____

Factual Frank only speaks in fact and Opinion Opie only speaks in opinion. Draw a line to each of the statements that are fact to Frank and the statements that are opinion to Opie.

Factual Frank



Almond trees bloom in the spring.

Almond blossoms smell good.

Almond trees are fun to climb.

Almond trees require bees to pollinate.

Growing almonds is hard work.

Almonds are tasty.

The machines used for harvest are so cool.

Blanching is the process of removing the skin of the almond.

California Almonds are shipped to more than 90 countries.

Two machines used for harvest are called shakers and sweepers.

Opinion Opie



Science and Poetry with Almonds

Purpose

Students will learn about the almond tree life cycle including tree dormancy, pollination, bloom and kernel development of an almond.

Time

Teacher preparation:
10 minutes

Student activities:
2 - 50 minute lessons plus additional time for science activity and poetry writing

Materials

Part 1:

- ▶ *An Almond Story* video available at www.youtube.com/watch?v=4jUaJ7ebhXo
- ▶ KWL Chart (from previous lesson)
- ▶ Chart paper or whiteboard
- ▶ *An Almond Story* activity book, pages 4, 5, and 6: Mother Nature, the Almond Life Cycle, and Dormancy and Bloom or go to www.LearnAboutAg.org/lessons, click on *California Almonds: An Almond Story*, and then download *An Almond Story* activity book (an answer key for activity book pages is at the bottom of each page).

Background Information

Almond trees begin their cycle in a dormant state, which usually lasts from November to February. Once spring arrives, the almond trees burst into bloom and the bees come to pollinate. From March to June, the almond kernel is developing and hardening. In July, once the kernel has grown to its full potential, it goes into the hullsplit phase where the outside hull (the soft, pliable protective layer) splits open. In late summer, the almond trees are harvested and transported to the processing plant to be shipped around the world.

Procedure

Part 1

1. Watch the *Almond Story* video if you haven't already from the previous lesson. Add any new information to the KWL chart.
2. Discuss the purpose of the lesson today: to learn about how almonds develop including what trees need, dormancy of the trees during the winter, pollination by bees, and bloom in the spring. Students will use what they learn to conduct a science experiment. For part two, students will learn about kernel development and write two types of poetry: an acrostic and a cinquain related to almonds as well as create a class poetry book.
3. Have a class discussion about what plants need to grow. Add student ideas to the board. The list should include: sunlight, water, air, nutrients, and soil. Trees are considered plants and need the same thing. Have students complete page 4, Mother Nature, in their activity book.
4. Put a year-long timeline on chart paper or on the board; label seasons and months. Have students turn to page 5, the Almond Life Cycle, and follow along as you determine at what point the life cycle stages go on the timeline. Example would be almond trees are dormant in the winter- between November and February. Trees bloom in the spring, pollination occurs before bloom. Almond kernels are developing in March to June. During summer, hullsplit occurs. In late summer, harvest begins and transportation to the processing plant begins. Have students complete page 5, the Almond Life Cycle, in their activity books.



Science and Poetry with Almonds

- ▶ Ag-Bite 1: Desktop Gardens from California Foundation for Agriculture in the Classroom, go to www.LearnAboutAg.org/agbites.
- ▶ Seed experiment supplies: soil, container-jar lid or plastic soup cup lid, water, ruler, thermometer, journals (students create using copy paper folded, stapled and decorated)

Part 2:

- ▶ *The Almendro Poem*
- ▶ Almonds for demonstration
- ▶ *An Almond Story* activity book, page 9: Kernel Development
- ▶ Cinquain worksheet (page 16)
- ▶ Thesaurus

California Standards

Grade 3

Common Core English Language Arts

- ▶ RF.3.4b
- ▶ W.3.7
- ▶ SL.3.1
- ▶ L.3.2g

Next Generation Science Standards

- ▶ 3-LS1-1

5. Have students read and complete page 6 in their activity books on Dormancy and Bloom (or assign as homework). Almond trees are dormant in the winter. They lose all of their leaves and store up nutrients during this time. In the spring, leaves and buds start to form and bees carry pollen between trees. Review as a class. Add new information to the KWL chart.
6. Have students work in groups to conduct an experiment on what plants need to grow. Have students make observations daily for several weeks and record their observations and drawings in a journal. Include date, temperature, growth measurements, and any other observations including drawings. Use CFAITC Ag-Bites 1: Desktop Gardens as a guide for growing in your classroom. Go to www.LearnAboutAg.org/agbites. Have students complete the project with a group oral presentation sharing their findings.

Possible experiments include:

- ▶ Group 1: Plant seeds in different soil types and compare growth.
- ▶ Group 2: Plant seeds in different locations with different amounts of sunlight and compare growth.
- ▶ Group 3: Plant seeds in different locations with different temperatures (inside, outside, in a refrigerator) and compare growth.
- ▶ Group 4: Plant seeds and use different amounts of water and compare growth.

Part 2

1. Open the lesson by reading the poem, *The Almendro Poem*. Review the poem and what students have learned about almonds so far.
2. Discuss the purpose of today's lesson: to learn about the kernel or seed development of an almond and write poetry.
3. Hold an almond up and ask, "What can I do with this almond?" Model a response, "I can bake the almond." What else can I do with an almond? (examples: eat, chop, slice, touch, etc.) Record student answers on the board, leaving room to add a list of synonyms. Next to the list of words, write "synonyms." Clarify student understanding of synonyms. Ask for and share examples: eat: chew, swallow, munch...chop: cut, slice, mince. Have students



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Science and Poetry with Almonds

Grade 4

Common Core English Language Arts

- ▶ RF.4.4b
- ▶ W.4.7
- ▶ SL.4.1

Next Generation Science Standards

- ▶ 4-LS1-1
- ▶ 4-LS1.A

Grade 5

Common Core English Language Arts

- ▶ RF.5.4b
- ▶ W.5.7
- ▶ SL.5.1

Next Generation Science Standards

- ▶ 5-LS1-1
- ▶ 5-LS1.C

use a thesaurus if needed. Explain to students that their list of words can help them when they're writing a poem. Using descriptive words when writing helps the reader get a picture in their mind of what the writer is describing. Add other words related to almonds and develop a list of synonyms for students to use.

4. Have students read page 9 in their activity books on Kernel Development. Read the activity together. Review the concept of an acrostic (or introduce and model if no prior exposure).
5. For more practice, do one class example. Write the word BEE vertically. Add- Buzzing, Everywhere, Every day to each of the letters. Have students complete the activity on page 9.
6. Next, have students create their own acrostic poem. Explain that they can use any word but it must be related to almonds. Have students share with their partner. Ask for a few students to share whole class.
7. Hand out the cinquain worksheet. Review the concept of a cinquain. Have students work with a partner or group to brainstorm a cinquain about almonds, bees, or a machine used in almond production.
8. Have students create their own cinquain about almonds.
9. Share with a partner, share with the class.
10. Have students create several poems each of acrostic poems and cinquain poems. Have them choose their best work to illustrate and put into a class poetry book on almonds. Display for students to read. Have a class story time and have students share their poems with other classes.

Extensions

- ▶ Have students complete page 8, Pollination, in their *Almond Story* activity book.
- ▶ Try out The Poetry of Agriculture lesson from Idaho Ag in the Classroom. www.idahoaitc.org
- ▶ Have students research about bees and give an oral report. They should include a visual such as a poster or model.

Science and Poetry with Almonds

- ▶ Have students create Life Cycle posters. It can be on almonds, bees, or another type of tree or insect. Students should present their posters.
 - a. First, have students create a rough draft poster on regular size paper. Have them fold their paper into fourths. Label each section with the seasons in the following order-clockwise from upper left corner: (winter, spring, summer, fall)
 - b. On a separate piece of paper or their rough draft poster if there is space, have students write one to three sentences of what is happening to the almond during each season.
 - c. After teacher approval of their writing, they may draw a scene to go with the sentences, on their rough draft poster.
 - d. Add more labeling to the poster: dormancy (winter), bloom (spring), hullsplit (summer), almonds (fall), harvest (summer/fall). Also include pollination and show detail of a tree (roots, trunk, branches, leaves) and of an almond (hull, shell, kernel) in a section of the poster.
 - e. Have students evaluate and proofread their own work, then with a partner, and then show you.
 - f. After teacher approval, students may create a full size Almond Season poster based on their rough draft poster. Drawings, labels, and sentences must be included. Students should include the title of the poster as well.

The Almendro Poem

There once was a farmer named Almendro. He lived not in the big city, but on a ranch where much of the world's crops grew. The beautiful place, found in California, was known as the Great Central Valley ...

The best crops grow there, some in orchards, some in rows,
wherever an abundance of water flows.

Stretching 500 miles, the farmland you see,
is very important to California's economy.

With winter over, there is much to be done,
as the valley orchards welcome the sun.

Almendro will soon pursue many bees
to pollinate his thousands of almond trees.

Soft pink and white petals will later appear,
as the work of the bees are needed each year.

Eventually the petals will fall to the ground,
allowing the almond kernels to grow big and round,

With their fuzzy green shells known as a hull,
life for Almendro is never dull.

As the almonds continue to grow and grow,
the branches become heavy, and start hanging low.

Then the hulls open wide,
leaving the kernels to dry inside.

Harvest is soon to begin!

With the orchards clean and clear,
Almendro's tree harvest is near.

Using the tree shaker, the nuts will fall,
quickly covering the orchard floor.

The sweeper sweeps nuts and picks up from each row,
when the hulls are removed, the almonds are ready to go!

Next time you're in the grocery store,
Look for almonds in your milk, cereal, candy and more.

Now you know how almonds grow,
where they come from and all the places they go.

Cinquain

Name _____

Line 1: Noun

Line 2: Two adjectives

Line 3: Three verbs

Line 4: Short statement about the noun

Line 5: Noun or synonym



Orchard
Grassy, Flowery
Grow, Ponder, Climb
Lots of work
Grove

Now it is your turn.

Write your own cinquain poem using a noun that relates to almonds:

_____, _____

_____, _____, _____



Fun with Almond Math

Purpose

Students will multiply, divide, combine and reduce fractions using real world applications working with almond grower word problems and recipes.

Time

Teacher preparation:
10 minutes

Student activities:
50 minute lesson plus homework

Materials

- ▶ *An Almond Story* video available at www.youtube.com/watch?v=4jUaJ7ebhXo (optional)
- ▶ *An Almond Story* activity book, pages 7, 10, 16 and 17: Responsible Production, Hullsplit to Harvest, and Almond Forms and Food or go to www.LearnAboutAg.org/lessons, click on *California Almonds: An Almond Story*, and then download *An Almond Story* activity book (an answer key for activity book pages is at the bottom of each page).
- ▶ KWL Chart
- ▶ Almond samples: whole, sliced, diced, flour, almond butter, milk, oil
- ▶ Fractions in the Kitchen worksheet (pages 19 and 20)

Background Information

Different customers prefer their almonds different ways. California Almonds are shipped to more than 90 countries, so it's no surprise that people use almonds in a variety of ways. It is very common to go to the grocery store and see almonds in many different forms and many different products.

Sometimes almonds are left alone, which are called whole, natural almonds. Other times, the skin is removed, which makes the almond appear white. We call this method of removing the skin blanching. Almonds that are sliced are often used for soups, salads and pastries. Chopped almonds are often added to cookies, brownies or cereals. Using the right form of almond for the right application is very important, but it's just as important we use the right amount.

Procedure

1. Introduce the lesson. Explain that today students will learn about the production of almonds and use math to solve and create real world math problems. View the *Almond Story* video if you haven't already.
2. Have students open their *Almond Story* activity book to page 7, Responsible Production or go to www.LearnAboutAg.org/lessons, click on *California Almonds: An Almond Story*, and then download *An Almond Story* activity book Discuss vocabulary: acre, bee box, queen bee. Read and work through the problems as a class.
3. Turn to page 10, Hullsplit to Harvest. Read as a class and have students work on problems independently. Review as a class.
4. Continue in the activity book using pages 16-17, Almond Forms and Food. Discuss vocabulary: whole, natural, blanched, sliced, slivered, chopped, application. Show and discuss examples of different almond types and when they would be used.
5. Add any new information about almonds to the KWL chart.
6. For homework, hand out the Fractions in the Kitchen (pages 19-20) worksheet. Brainstorm ways people use fractions. Have students add ideas to their worksheet and complete on their own.



Fun with Almond Math

California Standards

Grade 3

Common Core English Language Arts

- ▶ W.3.4
- ▶ W.3.10

Common Core Math

- ▶ 3.OA.3
- ▶ 3.OA.4
- ▶ 3.OA.7

Grade 4

Common Core English Language Arts

- ▶ W.4.4
- ▶ W.4.10

Common Core Math

- ▶ 4.OA.2
- ▶ 4.OA.3
- ▶ 4.NF.3c
- ▶ 4.NF.3d

Grade 5

Common Core English Language Arts

- ▶ W.5.4
- ▶ W.5.10

Common Core Math

- ▶ 5.NBT.5
- ▶ 5.NF.1

Extensions

- ▶ Have students create almond word problems to go with pages 2 and 23, Color the Orchard and Color the Shaker. After they have created their word problems, have them check with a partner, then check with you. After teacher approval, they should write their problems on the pages. Students may color the pages.

Example problems:

- If a farmer gets 2,670 pounds of shelled almonds per acre, how many pounds does he get with 25 acres? (66,750 lbs.)
 - If a farmer has 198 trees per acre, how many total trees are there on 25 acres? (4,950 trees)
 - Using the information from the first two problems, how many pounds of shelled almonds will the farmer get per tree? (13.48 lbs. per tree)
- ▶ Create an almond classroom quiz using student word problems. Have students take the quiz.

Fractions in the Kitchen

Name _____

We have already learned what fractions are and why they are important. But still, people often forget that fractions are something that we use absolutely every day. Name some ways in which you use fractions in your daily life.

Did someone mention cooking? That's right! One of the most common ways fractions are used on a daily basis is when we are preparing food. Below are recipes from across the globe that contain almonds. Take a look at each recipe and see where fractions can be combined or reduced to make the recipes easier to follow.

Chinese Almond Cookies

Ingredients:

$\frac{4}{2}$ cup flour + $\frac{6}{8}$ cup flour = _____ cups of flour

$\frac{1}{3}$ cup sugar + $\frac{4}{6}$ cup sugar = _____ cup sugar

$\frac{1}{4}$ teaspoon baking soda + $\frac{1}{4}$ teaspoon baking soda = _____ teaspoon baking soda

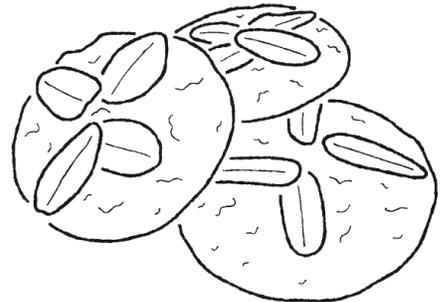
$\frac{2}{4}$ teaspoon salt = _____ teaspoon salt

$\frac{1}{2}$ cup butter + $\frac{2}{4}$ cup butter = _____ cup butter

$\frac{1}{1}$ egg = _____ egg

$\frac{1}{3}$ teaspoon almond extract + $\frac{2}{3}$ teaspoon almond extract = _____ teaspoon almond extract

$\frac{96}{2}$ almonds = _____ almonds





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Almond History and Cultural Significance

Purpose

Students will learn the history of the almond tree and about global markets.

Time

Teacher preparation:
10 minutes

Student activities:
50 minutes plus time for family history interviews and writing

Materials

- ▶ *An Almond Story* video available at www.youtube.com/watch?v=4jUaJ7ebhXo (optional)
- ▶ Peach (or photo), Almond
- ▶ *An Almond Story* activity book, pages 3, 18 and 19: Almond History and Global Markets or go to www.LearnAboutAg.org/lessons, click on *California Almonds: An Almond Story*, and then download *An Almond Story* activity book (answer key for activity book pages is at the bottom of each page).
- ▶ California Grows... map download at www.learnaboutag.org/resources/learn/map.pdf
- ▶ World Map
- ▶ Almonds Across the World handout and knowledge check (pages 23-25)

Background Information

The ancestry of the almond is unknown, but almonds are thought to have originated in the Mediterranean area of Europe. Explorers ate almonds while traveling the Silk Road between the Mediterranean area, central Asia and eastern Asia. Before long, almond trees were being enjoyed by many different cultures, from China to India and beyond.

The almond tree was brought to California from Spain in the mid-1700s by the Franciscan Padres. The moist, cool weather of the coastal missions, however, did not provide very good growing conditions. By the turn of the 20th century, almonds were firmly established in the Sacramento and San Joaquin areas of California's Central Valley. Surprisingly, the almond is not a member of the nut family, but rather is actually a family member of stone fruits such as nectarines, peaches, plums and cherries. For this reason, some people refer to an almond as a fruit.

Procedure

1. Introduce the purpose of the lesson: to learn about the history of the almond tree and where almonds are produced around the world. Students will also learn how different cultures use almonds and write a personal narrative using a family member interview.
2. Show the *Almond Story* video if you haven't from a previous lesson.
3. Hold up a peach or photo of a peach. Ask students what they think they will be learning about today. Most students should reply, "Peaches!" But you will correct them by saying, "Wrong! We are learning more about almonds today! I'm holding up a peach because peaches and almonds are related. They both are considered stone fruits. Other stone fruits include nectarines, plums and cherries. In fact, if you crack open the pit of the peach, you will find a bitter almond. It looks like an almond, and if you crush it, it smells like an almond. It is used to make almond extract, but if you eat it, you could get sick. Stick with almonds from an almond tree."
4. Tell students that today's focus is almond history and almonds around the world. Have students open their *Almond Story* activity books to page 3, Almond History. Almonds were introduced into California by the Franciscan Padres in the 1700s but they didn't thrive until the 1800s when trees were planted inland. Today, almonds are the number two crop in California and California produces more than 80% of the world's almonds! Have students

Almond History and Cultural Significance

California Standards

Grade 3

Common Core English Language Arts

- ▶ RI.3.7
- ▶ W.3.3

Grade 4

Common Core English Language Arts

- ▶ RI.4.7
- ▶ W.4.3

Grade 5

Common Core English Language Arts

- ▶ RI.5.7
- ▶ W.5.3

complete the activity.

5. Show the California Grows... map. Have students find the Central Valley and note what areas almonds are grown.
6. Have a world map available and point out countries as students continue reading in the activity book, pages 18-19, Global Markets. Find and discuss different countries and how they use almonds. In the Mediterranean, almond trees have grown for centuries. Ancient Greek medical books discuss the use of almonds. In Italy, ancient Romans showered newlyweds with almonds for good luck. Padres from Spain brought almonds to California! Have students complete pages and add new information about almonds to the KWL chart.
7. Read and complete the Almonds Across the World handout: History of the Almond Tree, Almonds around the World, and the Almonds Across the World Knowledge Check (pages 23-25). Discuss any new information about history and different cultures that use almonds.
8. Talk about any traditions student's families may have. Ask if any students have ancestors from any of the countries referenced in the reading. Discuss favorite snacks that are a family tradition. Ask if anyone has favorite family recipes or snacks that include almonds.
9. To complete the lesson, have students interview a grandparent or family member. Find out their family history and any special stories. First, students should write their questions and get them approved by the teacher. Then students should choose a family member to interview and write out their answers. Next step is to write a personal narrative about their family member. Draw a picture of the family member to include with their writing. Share the story with the class. Completed projects should include the interview questions, answers, drawing and final writing.

Extensions

- ▶ Research different culture's recipes using almonds. Make the recipe and bring in to share. Make a class cookbook with different recipes.
- ▶ Research other stone fruits. Make a poster display or a report comparing them.
- ▶ Make an almond timeline. Include where the fruit was first used and how it is used today.

Almonds Across the World

The History of the Almond Tree

The almond is actually a type of tree native to the Middle East and South Asia. There are many different types of almond trees. Many of the ancient tree varieties produced seeds that were bitter and harmful to eat. Ancient people discovered, however, that some of these trees produced sweet seeds. Soon those seeds, also called almonds, became a staple food. By 4000 B.C., almonds were eaten in nearly every civilization, and humans began to cultivate, or farm, them.

One of the earliest mentions of almonds is in ancient Hebrew text which dates back to 2000 B.C., over 4,000 years ago! In 1352 B.C., King Tut, one of the most famous pharaohs in Ancient Egypt, took handfuls of almonds with him into his tomb to nourish him during his journey to the afterlife. Almonds spread with conquerors and explorers throughout the ages from their place of origin along the Mediterranean to North Africa and Southern Europe. In 1700 A.D., they made it all the way to California with the Franciscan Padres. The type of almond that came with the Padres from Spain, however, did not grow well in the California climate. It wasn't until nearly 100 years later that almonds were successfully cultivated in California. Today, farmers in California produce more than 80% of the world's almond supply.

Almonds Around the World

Almond farming in California doesn't just provide delicious food for America, it also delivers the best in quality and flavor throughout the world. In fact, cultures from all reaches of the globe have treasured almonds for thousands of years as a source of good luck, good health, and good fortune - and many still do today. It just goes to show how no matter where they appear, almonds are always a perfect fit.



Japan

The Japanese swoon for delicate oval balls of almonds coated in chocolate, and pretzel sticks dipped in milk, dark, or white chocolate and coated with diced almonds.



China

Almonds are most popular during autumn and winter - especially during the Chinese New Year - as a roasted, salted snack. There are also unique flavors such as abalone!



India

Here, almonds are considered "brain food" for kids and play a key role in traditional sweets known as mithai. Almonds are also a common gift during the festival of Diwali.

Almonds Across the World *(continued)*

The Mediterranean

Ancient Greek medical texts are among the oldest to discuss the use of almonds, and today they've remained an integral part of the health-focused Mediterranean lifestyle.



Italy

Italians started the tradition of giving Jordan almonds as wedding favors, and now they use them to mark other milestones too: red for graduations, green for engagements, blue for a baby boy and pink for a baby girl.



Spain

Franciscan Padres from Spain originally brought the almond tree to California in the 1700s, and Spanish cooks still use almonds in several traditional treats and recipes.



France

Almonds are used in French patisserie treats such as marzipan and almond-cream-filled puff pastries called Galette des Rois (the cake of the Kings) enjoyed on the Feast of the Epiphany.



Germany

Almonds are used for Germany's mouth-watering marzipan confections and are starting to become more popular in snack foods eaten at open-air fests and Christmas markets.



Sweden

The Swedes have been known to hide an almond in rice pudding as a symbol of good fortune. Whoever finds it is said to get married in the coming year.



California, USA

80% of the world's almonds are produced in California, and from raw almonds and almond butter to almond flour, almond milk and almond oil, Americans love all things almonds.

Almonds Across the World – Knowledge Check

Name _____

Instructions: Please choose from the following countries to fill in the blanks of the sentences below. Each country will be used one time.

Germany



Spain



France



Sweden



China



Italy



India



1. Franciscan Padres from _____ first brought almonds to California in the 1700s.
2. In _____ almonds are considered a prized “brain food” for children.
3. People in _____ consume the most almonds during their New Year’s celebration.
4. Jordan almonds are commonly given out in _____ to celebrate weddings, births, graduations, engagements, and anniversaries.
5. Confections made with marzipan are quite popular in the country of _____.
6. In _____, the Galette des Rois, or Cake of Kings, is an almond cream-filled pastry eaten during the Feast of the Epiphany.
7. The people of _____ have been known to hide almonds in rice pudding as a symbol of good fortune.



Nutritious Almonds

Purpose

Students will learn about a balanced diet and the nutritional benefits of eating almonds. Students will learn nutrition vocabulary and create a meal and recipe book incorporating almonds.

Time

Teacher preparation:
5 minutes

Student activities:
50 minutes plus additional time for researching recipes and creating a recipe book

Materials

- ▶ *An Almond Story* video available at www.youtube.com/watch?v=4jUaJ7ebhXo (optional)
- ▶ California Almonds – Delicious and Nutritious Handout (page 29)
- ▶ *An Almond Story* activity book, pages 14-15, 21-22: My Plate, a Tasty Little Nut, and Recipes or go to www.LearnAboutAg.org/lessons, click on *California Almonds: An Almond Story*, and then download *An Almond Story* activity book (an answer key for activity book pages is at the bottom of each page).
- ▶ KWL chart

Background Information

Throughout history, almonds have been enjoyed not only for their delicate flavor, versatility and great crunch, but also their legendary nutritional properties. For example: Almonds are a nutritionally dense and filling snack: A 1-ounce, 160-calorie serving of almonds, or about a handful, is an excellent source of Zinc (0.9mg), Potassium (200mg), Vitamin E (7.3mg), and Monounsaturated Fats (9g). Almonds also are a good source of Fiber (3.5g), Protein (6g), Iron (1mg), Riboflavin (0.3mg), Niacin (1mg), and Calcium (75mg). All of these things may help provide that “full” feeling everyone wants after a meal or snack. On the back of most food packages, you will find a nutrition label. This label not only shows the ingredients for that food, but also explains the amount of product typically eaten in one sitting (sometimes referred to as a serving size).

Procedure

1. Introduce the purpose of the lesson: students will learn about almonds and their nutritional value as well as plan a meal or menu using almonds and create a classroom recipe book.
2. Show the *Almond Story* video if you haven't already from a previous lesson.
3. Ask, “Who knows what nutrition means?” Discuss the definition of nutrition and nutrients. (Nutrition is the process of eating the right kind of food so you can grow properly and be healthy. Nutrients provide nourishment from food and are essential for health and growth)
4. Almonds are full of nutrients that are good for your body. Have students look at the California Almonds – Delicious and Nutritious handout (page 29) or project it on the board. Read together and discuss vocabulary: Calories, Zinc, Potassium, Vitamin E, Monounsaturated Fats, Fiber, Protein, Iron, Riboflavin, Niacin, and Calcium.
5. As a class, read and complete pages 14-15, My Plate and A Tasty Little Nut. Emphasize that almonds are in the protein food group which is important in building strong muscles.
6. Have students share what they eat regularly that are good sources of the nutritional components discussed.



California Foundation for
Agriculture in the Classroom

Nutritious Almonds

California Standards

Grade 3

Common Core English Language Arts

- ▶ W.3.6
- ▶ W.3.7

Grade 4

Common Core English Language Arts

- ▶ W.4.6
- ▶ W.4.7

Grade 5

Common Core English Language Arts

- ▶ W.5.6
- ▶ W.5.7

7. Add to the KWL chart. Review what they've learned.
8. Read the recipes on pages 21-22 and have students plan meals, or a menu, for the day, incorporating the recipes. Have students share their meal and menu ideas.
9. Create a classroom recipe book. Have students bring recipes from home or research different recipes they would like to include. Check out www.almonds.com/consumers/recipe-center or www.choosemyplate.gov/recipes for ideas. Students should type their recipes and compile recipes into a classroom recipe book.
10. Using the KWL Chart, review what students have learned throughout the *California Almonds: An Almond Story* unit. Consider adding in the extension ideas from each lesson to continue learning about California Almonds.

Extensions

- ▶ Have students complete page 13, Eating Right, from *An Almond Story* activity book.
- ▶ Plan an Almond Recipe Cook-off contest where students bring in their recipes and compete for Best Recipe.
- ▶ Have an almond tasting. Try almond butter, roasted and salted, natural, blanched, etc.
- ▶ Comparison test: bake a familiar treat like cookies, using different flours, including almond. See if students can tell the difference.

California Almonds

Delicious and Nutritious

They say good things come in small packages. In the case of the California almond, this is especially true. As shown below, only 1 ounce, or about 23 almonds, packs in a whole lot of nutrients to keep you healthy and feeling your best.

160 Calories: Units of energy that you need to keep your body going strong.

Calcium (75mg): Helps build and maintain strong bones and teeth.

Niacin (1mg): B vitamin that supports energy production.

Riboflavin (0.3mg): B vitamin that helps convert food into fuel; important for red blood cell production.

Zinc (0.9mg): Helps your immune system which is your body's defense against illness.

Iron (1mg): Carries oxygen to all body cells; plays a role in energy production.

Potassium (200mg): Helps regulate blood pressure; important for heart health and muscle contraction.

Vitamin E (7.3mg): Antioxidant that helps protect cells from damage and helps promote healthy skin and hair.

Monounsaturated Fats* (9g): Good fats that help decrease LDL (bad) cholesterol and increase HDL (good) cholesterol.

Fiber (3.5g): Helps promote fullness and digestive health; helps maintain healthy blood sugar levels.

Protein (6g): Building block of the body; helps build muscle, bone, skin, and nails; helps keep you satisfied.



*Scientific evidence suggests, but does not prove, that eating 1.5 oz. of most nuts, such as almonds, as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease.

Answers to Commonly Asked Questions

How did almonds come to be in California?

The ancestry of the almond is unknown, but almonds are thought to have originated in the Mediterranean area of Europe. Explorers ate almonds while traveling the Silk Road between the Mediterranean area, central Asia and eastern Asia. Before long, almond trees were being enjoyed by many different cultures, from China to India and beyond.

The almond tree was brought to California from Spain in the mid-1700s by the Franciscan Padres. The moist, cool weather of the coastal missions, however, did not provide very good growing conditions. By the turn of the 20th century, almonds were firmly established in the Sacramento and San Joaquin areas of California's Central Valley.

Who grows almonds?

The almond industry is driven by family farmers. More than 91% of almond farms are family farms – many operated by third and fourth generation farmers who plan to pass down their land and way of life to their children and grandchildren. Having lived – and often grown up – on the land, they understand the importance of managing their orchards and natural resources responsibly for current and future generations.

Source: United States Department of Agriculture, 2012 Census of Agriculture: Subject Series, Typology, Table 6.

What irrigation do almond growers use?

83% of almond growers practice demand-based irrigation, tracking items like soil moisture, tree water status or weather conditions to determine when to irrigate their orchards rather than watering on a predetermined schedule. 70% of almond orchards use micro irrigation systems (think mini-sprinklers for the trees), decreasing water runoff, putting water directly in the root zone and allowing for precise timing and rate of irrigation. 62% of growers use soil maps while designing their irrigation systems to best match the soil characteristics of their orchards for optimal water infiltration and distribution.

Source: California Almond Sustainability Program

Do almonds use more water than other crops?

The fact is most fruit and nut trees in California use about the same amounts of water.¹ But what's extraordinary is what almond growers

Answers to Commonly Asked Questions

here in California are doing to increase water efficiency. They were early adopters of water-saving micro-irrigation and other technologies that have helped reduce the amount of water it takes to grow a pound of almonds by 33% since 1994.²

Sources:

¹California Polytechnic State University, San Luis Obispo. Irrigation Training and Research Center. ITRC Report No. 03-001: California Crop and Soil Evapotranspiration. ETc Tables 1-13. January 2003.

²University of California, 2010. Food and Agriculture Organization of the United Nations, 2012 Almond Board of California, 1990-94, 2000-14.

What other products come from almond trees?

Almond trees, and the water used to grow them, actually produce three products, two of which are foods. Shells are used as an alternate energy source in co-generation plants and as livestock bedding. The hull is the dry and fuzzy fruit that protects the almond when it's growing. Hulls are sold as livestock feed, which reduces the amount of water used to grow other feed crops. The kernel is the nutrient-rich almond we eat.

Source: Almond Board of California

What is dormancy?

Each year, after harvest is over and before spring comes, the almond trees settle in for the long winter. We call this stage dormancy. Dormancy is a time for the almond trees to store nutrients and energy for spring. When you drive by a dormant almond orchard, it may look dead, but the trees are actually still alive. The trees are bare and don't have any leaves on them. All you can see are the branches and the trunks of the trees. At the return of spring, the almond trees wake up and the first sign of growth on an almond tree is called a bud.

What is pollination?

Pollination is the act of carrying pollen between plants. Without bloom or pollination, we simply would not have almonds. Soft pink-and-white petals appear each spring to attract the bees that pollinate thousands of trees. What's so special about almond pollination is that generally, every other row of almonds is planted with a different variety of almond. Growers must plant the rows with different varieties for cross-pollination. Cross-pollination occurs when the bees move the pollen from one variety to another. Bees help to pollinate more than 90 crops each year. These crops include apples, cherries, melons, pumpkins and sunflowers. What you may not know is that bats, hummingbirds, wasps,

Answers to Commonly Asked Questions

butterflies, moths, flies and beetles can pollinate plants, too; however, bees do the best job at pollinating almond trees.

What is kernel development?

After the bees pollinate the trees, the petals will fall to the ground, and the almonds grow big and round. During this time, there are three main layers growing, maturing and hardening. The center of the almond, which is the part we eat, is called the kernel. Around the kernel is a protective covering called the shell. The hull is the fuzzy green coating, which protects the shell and the kernel.

How are almonds harvested?

From mid-August through October, mechanical tree “shakers” harvest the almonds by vigorously shaking them to the ground. The almonds then dry naturally for about a week in the orchard before they are swept into rows and picked up by machine.

What happens to almonds after harvest?

After harvest, almonds go to a huller/sheller where the kernels pass through a roller to remove the hull, shell and any remaining debris. Next stop: the handler for sizing, where the kernels drop into separate bins according to size. After sizing, almonds are kept in controlled storage conditions to maintain quality until they’re either shipped or further processed into any variety of different forms for diverse culinary uses. More than 80% of the world’s almonds are produced in California, ranging from products like whole natural almonds and almond butter to almond flour, almond milk and almond oil; Americans love all things almonds. And while the U.S. may be the largest market for almonds with about 30-40% of the crop sold for domestic use, the rest of our almonds are shipped internationally.

What happens to the hull and the shell once they are removed?

Rather than throwing them away, the almond growers recycle the almond hulls and almond shells by selling them to dairymen. The almond hulls (the soft green outer covering of the almond) are used as feed for cows. Since the almond shells are hard, cows don’t eat the shells, but they do enjoy sleeping on them.

Answers to Commonly Asked Questions

Are almonds good for you?

Almonds are a tasty snack that do a lot of good things for your body. The protein in almonds helps to build and repair our bodies, the fiber aids the digestion of foods, and the calcium helps in building and maintaining strong bones and teeth. Although many foods may be good for you, it's important to remember not to eat too much of one thing. Even if you don't like one type of food, there's plenty of other foods that have similar nutrients. A serving of almonds (about 23) is a great snack to enjoy anytime, anywhere.

Almonds are a nutritionally dense and filling snack: A 1-ounce, 160-calorie serving of almonds, or about a handful, is an excellent source of vitamin E and magnesium, and a good source of fiber and phosphorous. Almonds also have unsaturated fat (13g), saturated fat (1g), protein (6g), potassium (200mg), calcium (75mg), iron (1mg) and fiber (3.5g). All of these things may help provide that "full" feeling everyone wants after a meal or snack. On the back of most food packages, you will find a nutrition label. This label not only shows the ingredients for that food, but also explains the amount of product typically eaten in one sitting (sometimes referred to as a serving size).

What is MyPlate?

MyPlate is a diagram created by the United States Department of Agriculture. It helps us learn which foods are the most nutritious and how much we should eat every day to stay healthy. MyPlate is broken up into food groups: fruits, vegetables, grains, proteins and dairy. Almonds are listed on MyPlate under the protein food group along with meat, poultry, eggs, seafood, beans, peas and other nuts.

How are almonds grown?

Producing almonds is a year-long process. Almond growers pay special attention to the almond trees to make sure they are thriving all year long. Almond trees begin their cycle in a dormant state, which usually lasts from November to February. Once spring arrives, the almond trees burst into bloom and the bees come to pollinate. From March to June, the almond kernel is developing and hardening. In July, once the kernel has grown to its full potential, it goes into the hullsplit phase. In late summer, the almond trees are harvested and transported to the processing plant to be shipped around the world.

Agricultural Organizations

General

American Farm Bureau Foundation for Agriculture

600 Maryland Avenue SW, Suite 1000W

Washington, DC 20024

Phone: (202) 406-3700

Toll free: (800) 443-8456

E-mail: curtism@fb.org

Website: www.agfoundation.org

Website: www.myamericanfarm.org

California Farm Bureau Federation

2300 River Plaza Drive

Sacramento, CA 95833

Phone: (916) 561-5500

Email: cfbf@cfbf.com

Website: www.cfbf.com

California Foundation for Agriculture in the Classroom

2300 River Plaza Drive

Sacramento, CA 95833

Toll free: (800) 700-2482

Fax: (916) 561-5697

Email: info@LearnAboutAg.org

Website: www.LearnAboutAg.org

National Agriculture in the Classroom

Website: www.agclassroom.org

National 4-H Cooperative Curriculum System, Inc.

405 Coffey Hall, 1420 Eckles Avenue

St. Paul, MN 55108-6068

Phone: (612) 624-4900

Toll free: (800) 876-8636

E-mail: shopext@umn.edu

Website: www.4-h.org

Website: www.4-hmall.org



Agricultural Organizations

**University of California
Agriculture & Natural Resources Communication
Services Publications**
1301 South 46th Street, Building 478
Richmond, CA 94804
Toll-free: (800) 994-8849
E-mail: anrcatalog@ucdavis.edu
Website: www.anrcatalog.ucdavis.edu

USDA, National Agricultural Library
10301 Baltimore Avenue
Beltsville, MD 20705-2351
Phone: (301) 504-5755
Fax: (301) 504-6011
E-mail: agref@nal.usda.gov
Website: www.nal.usda.gov

Teacher Resources and References

Agriculture - General

America's Heartland

This national public television series profiles American farmers throughout the U.S. and educates viewers about the product, process, and people behind the food, fuel, and fiber they rely upon. There are 172 half-hour episodes available, and more than 50 segments on CA agriculture. Lesson plans, study guides, and other educational resources that accompany this series are available free of charge at www.americasheartland.org/education.

Grades K-adult

KVIE - America's Heartland
2030 W. El Camino Avenue
Sacramento, CA 95833
E-mail: tbastine@kvie.org
Website: www.americasheartland.org

Food and Farm Facts Educator's Guide

Grade-specific booklets provide step-by-step lesson plans that teach students about the nation's food system, with an emphasis on history, change, and economics. Includes reproducible activity sheets and is aligned to national learning standards for math, science, social science, language arts, and health. This resource complements American Farm Bureau Foundation for Agriculture's Food and Farm Facts booklet.

Grades 4-6, 7-12

American Farm Bureau Foundation for Agriculture
600 Maryland Avenue SW, Suite 1000W
Washington, DC 20024
Phone: (202) 406-3700
Fax: (202) 314-5121
Toll-free: (800) 443-8456
E-mail: foundation@fb.org
Website: www.agfoundation.org
Website: www.myamericanfarm.org

Teacher Resources and References

Imagine this... Story Writing Contest

This contest creates a positive learning experience that promotes reading, writing, and the arts, and furthers the understanding of agriculture in our lives. The *Imagine this...* Story Writing Contest is an annual statewide writing program for students. Regional and state level prizes are awarded to winning students and their teachers. State-winning authors will have their stories published in an illustrated book that will be distributed to school libraries and classrooms across the state. Entries must be postmarked by November 1, annually.

www.learnaboutag.org/imaginethis

Grades 3-8

California Foundation for Agriculture in the Classroom

Attn: Imagine this... Story Writing Contest

2300 River Plaza Drive

Sacramento, CA 95833-3293

Phone: (916) 561-5625

Fax: (916) 561-5697

Toll-free: (800) 700-AITC

E-mail: imaginethis@learnaboutag.org

Website: *www.LearnAboutAg.org*

Almonds

Almond Board of California Materials

All About Almonds Fact Sheet

This fact sheet is downloadable and offers detailed nutritional information.

www.almonds.com/sites/default/files/content/attachments/allaboutalmonds.pdf

Free: Available online

An Almond Story

This activity book provides students with information about how almonds grow and the many processes they undergo before arriving in the grocery store. Available at the following link *www.learnaboutag.org/resources/lesson/almonds_activity.pdf* or to request hard copies of the activity book, please contact Rebecca Bailey at rbailey@almondboard.com

Grades 3-5

Free: Available online

Teacher Resources and References

An Almond Story Video

Just right for third graders, Almond Board of California's "An Almond Story" Video, a companion piece for the popular activity book, tells the California Almond story from the perspective of a bee left behind in the orchard after the pollination season is over. Auntie Bee's story is spellbinding as she expounds on the almond's history, its unique food properties and many uses, as well as its incredible nutritional value. "An Almond Story" is a captivating classroom learning experience that's as much fun as it is educational. The video and the activity book are meant to be used together by grade school teachers. View on the Almond Board of California's YouTube Channel at:

www.youtube.com/watch?v=4jUaJ7ebhXo

Grades 3-5

Free: Available online

Almond Board of California

1150 9th Street, Suite 1500

Modesto, CA 95354

Phone: (209) 549-8262

E-mail: staff@almondboard.com

Website: www.almonds.com

YouTube Channel: www.youtube.com/user/AlmondBoardofCA

Almond Fact and Activity Sheet

This California-specific fact sheet includes information on almond production, history, nutrition, and economic value. The activity sheet provides lesson ideas and interesting facts about almonds.

www.LearnAboutAg.org/resources/fact/almonds.pdf

Grades 4-12

Free: Available online

California Foundation for Agriculture in the Classroom

2300 River Plaza Drive

Sacramento, CA 95833-3293

Phone: (916) 561-5625

Toll free: (800) 700-AITC

Fax: (916) 561-5697

E-mail: info@LearnAboutAg.org

Website: www.LearnAboutAg.org

Teacher Resources and References

Bees

Buzzing a Hive

This guide explores the complex social behavior, communication, and hive environment of the honey bee through activities that mix art, literature, role-play, and drama.

www.lhsgems.org/GEM120.html

Grades K-3

\$20 plus shipping and tax

University of California, Berkeley

GEMS

Lawrence Hall of Science, #5200

Berkeley, CA 94720-5200

Phone: (510) 642-7771

Fax: (510) 643-0309

E-mail: gems@berkeley.edu

Website: *www.lhsgems.org*

California State Beekeepers Association

5307 Jeppson Court

Salida, CA 95368

Phone: (209) 545-5359

Website: *www.californiastatebeekeepers.com*

Honey Bee Activity Book

Students can have fun coloring while they learn about bees and honey in this 24-page booklet. Also includes activities.

www.dadant.com/catalog/m000501-coloring-book-new-style

Grades K-6

\$0.35

Teacher Resources and References

Honey Bee Life Cycle Chart

Poster-sized chart illustrates the life cycle of queen, worker, and drone honey bees. <http://www.dadant.com/catalog/m00002-honey-bee-life-cycle-chart>

Grades 3-12

\$14.65 plus s/h, tax

Dadant & Sons
2765 South Golden State Boulevard
Post Office Box 2819
Fresno, CA 93745
Phone: (559) 495-0230
Fax: (559) 495-0232
Toll-free: (877) 432-3268
E-mail: dadantca@dadant.com
Website: www.dadant.com

The Honey Files: A Bee's Life

This 20-minute VHS or DVD video and 96-page teacher's guide will have you and your students buzzing! These fun, new, educational materials provide information, classroom activities, and worksheets about bees, honey, and pollination.

www.honey.com/tools-tips-and-resources/the-honey-files-teachers-guide

Grades 4-6

\$15, includes s/h

Discounts available for educators

National Honey Board
11409 Business Park Circle, Suite 210
Firestone, CO 80504
Phone: (303) 776-2337
Fax: (303) 776-1177
Toll-free: (800) 553-7162
Website: www.honey.com

Planet Bee Foundation

Information on bees and educational programs for schools.

3035 25th Avenue
San Francisco, CA 94132
Phone: (415) 235-8959
E-mail: info@planetbee.org
Website: www.planetbee.org

Teacher Resources and References

Education – General

Lesson Plan of the Day

View the daily lesson plans and search “agriculture” to try one that has an agricultural twist.

Grades K-12

Free: Available online only

Education World

Website: www.educationworld.com

MyPlate: Food Guide Plate for Kids

Information on the five food groups, nutrition guidelines, recipes, and much more! www.choosemyplate.gov/MyPlate

Grades 1-12

Free

Science

The Growing Classroom: Garden-Based Science Activity Guide

The Growing Classroom is an award-winning resource book containing loads of hands-on, garden-based science and nutrition activities. The book also includes step-by-step instructions for creating and maintaining a garden-based learning program. Topics include teamwork in the garden, environmental awareness, soil, plants, ecology, cycles, weather, nutrition, and food choices. The appendix includes gardening how-to's for adults.

www.lifelab.org/store/curriculum/#tgc

Grades K-12

\$39.95

Life Lab Science Program

1156 High Street

Santa Cruz, CA 95064

Phone: (831) 459-2001

Fax: (831) 459-3483

E-mail: admin@lifelab.org

Website: www.lifelab.org



Teacher Resources and References

Whiz Kid Activities

These activity sheets introduce students to agricultural research topics. The quizzes and activities can be used for student clubs or other programs. Includes a Webquest that challenges students to investigate current trends in agricultural research. www.ars.usda.gov/is/kids/teachers/WhizKidActivities.html

Grades 3-8

Free: Available online only

Agricultural Research Service, USDA
5601 Sunnyside Avenue, 1-2232B
Beltsville, MD 20705-5130
Phone: (301) 504-1633
Fax: (301) 504-1641
E-mail: dianne.odland@ars.usda.gov
Website: www.ars.usda.gov

Related Websites

Agriculture Research Service

www.ars.usda.gov

Almond Board of California

www.almonds.com

Agrium

www.growingthenextgeneration.com

American Farm Bureau

www.myamericanfarm.org

California Department of Food and Agriculture, Kids' Page

www.cdfa.ca.gov/kids

California Farm Bureau Federation

www.cfbf.com

California Foundation for Agriculture in the Classroom

www.LearnAboutAg.org

Dadant & Sons

www.dadant.com

Old Farmer's Almanac

www.almanac.com

Old Farmer's Almanac for Kids

www.almanac4kids.com

National Agriculture in the Classroom Website

www.agclassroom.org

National Honey Board

www.honey.com

USDA: MyPlate

www.choosemyplate.gov

University of California Student Farm/Children's Garden

asi.ucdavis.edu/programs/sf

Related Literature

Cheng, Andrea. **When the Bees Fly Home**. Tilbury House Publishers, 2002. Jonathan learns how his family earns a living from beekeeping. ISBN 978-0-88448-238-3

Hughes, Meredith Sayles. **Hard to Crack, Nut Trees**. Lerner Publications Company, 2001. Presents information on the history, growing requirements, uses, and food value of various nuts grown around the world. Includes recipes.

Micucci, Charles. **The Life and Times of the Honeybee**. Houghton Mifflin, 1997. Depicts the life cycle and habits of the honey bee, describing the organization of the hive and the making of honey. ISBN 978-0-395-86139-4

Mortensen, Lori. **In the Trees, Honey Bees**. Dawn Publications, 2009. Simple rhyming words and realistic illustrations describe the life cycle of the honey bee. The book also includes two pages of background information about honey bees. ISBN 978-1-58469-115-0

Peterson, Cris. **Harvest Year**. Boyds Mills Press, 1996. Full-color photos and clear, concise text take readers month-by-month through a sampling of the wide diversity and volume of crops grown throughout the United States. ISBN 978-1-56397-571-4

Slade, Suzanne. **What if There Were No Bees?** Picture Window Books, 2011. A book about the grassland ecosystem showing what would happen to the ecosystem if bees disappeared. ISBN 978-1-4048-6019-3

Spilsbury, Louise and Richard Spilsbury. **Plant Parts**. Heinemann Library, 2003. From bean sprouts to redwood trees, this book looks at how different plants are made of the same parts. ISBN 978-1-4034-0504-3

Spilsbury, Louise and Richard Spilsbury. **Plant Products**. Heinemann Library, 2003. Describes the many ways people use plants in their daily lives. ISBN 978-1-4034-0505-0

Whitehouse, Patricia. **Brown Foods**. Heinemann Library, 2003. Find out where the brown foods, such as almonds and olives, come from. ISBN 978-1-4034-3840-9

Matrix of Standards

3rd Grade

California Standards	Description	Fact or Opinion	Science and Poetry with Almonds	Fun with Almond Math	Almond History and Cultural Significance	Nutritious Almonds
Common Core English Language Arts						
Reading Informational Text 3.1	Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.	x				
Reading Informational Text 3.2	Determine the main idea of a text; recount the key details and explain how they support the main idea.	x				
Reading Informational Text 3.3	Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.	x				
Reading Informational Text 3.7	Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).	x			x	
Reading Foundational Skills 3.4b	Read on-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings	x	x			
Writing 3.1, 1a, 1b, 1c, 1d	<p>Write opinion pieces on topics or texts, supporting a point of view with reasons.</p> <ul style="list-style-type: none"> ▶ Introduce the topic or text they are writing about, state an opinion, and create an organizational structure that lists reasons. ▶ Provide reasons that support the opinion. ▶ Use linking words and phrases (e.g., because, therefore, since, for example) to connect opinion and reasons. ▶ Provide a concluding statement or section. 	x				

Matrix of Standards

3rd Grade

California Standards	Description	Fact or Opinion	Science and Poetry with Almonds	Fun with Almond Math	Almond History and Cultural Significance	Nutritious Almonds
Common Core English Language Arts <i>(continued)</i>						
Writing 3.2, 2a, 2b, 2c, 2d	Write informative/explanatory texts to examine a topic and convey ideas and information clearly. <ul style="list-style-type: none"> ▶ Introduce a topic and group related information together; include illustrations when useful to aiding comprehension. ▶ Develop the topic with facts, definitions, and details. ▶ Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information. ▶ Provide a concluding statement or section. 	x				
Writing 3.3	Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.				x	
Writing 3.4	With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.			x		
Writing 3.6	With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others.					x
Writing 3.7	Conduct short research projects that build knowledge about a topic.		x			x
Writing 3.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.			x		
Speaking & Listening 3.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.	x	x			
Speaking & Listening 3.3	Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.	x				

Matrix of Standards

3rd Grade

California Standards	Description	Fact or Opinion	Science and Poetry with Almonds	Fun with Almond Math	Almond History and Cultural Significance	Nutritious Almonds
Common Core English Language Arts <i>(continued)</i>						
Language 3.2g	Consult reference materials, including beginning dictionaries, as needed to check and correct spellings.		x			
Common Core Mathematics						
3.OA.3 Operations and Algebraic Thinking	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.			x		
3.OA.4 Operations and Algebraic Thinking	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example: <i>determine the unknown number that makes the equation true in each of the equations:</i> $8 \times ? = 48$, $5 = \square \div 3$, $6 \times 6 = ?$			x		
3.OA.7 Operations and Algebraic Thinking	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.			x		
Next Generation Science Standards						
3-LS1-1 Molecules to Organisms	Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.	x	x			
3-LS1.B Molecules to Organisms	Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.	x				

Matrix of Standards 4th Grade

California Standards	Description	Fact or Opinion	Science and Poetry with Almonds	Fun with Almond Math	Almond History and Cultural Significance	Nutritious Almonds
Common Core English Language Arts						
Reading Informational Text 4.1	Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.	x				
Reading Informational Text 4.3	Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.	x				
Reading Informational Text 4.7	Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.	x			x	
Reading Foundational Skills 4.4b	Read on-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings.		x			
Writing 4.1, 1a, 1b, 1c, 1d	<p>Write opinion pieces on topics or texts, supporting a point of view with reasons and information.</p> <ul style="list-style-type: none"> ▶ Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer’s purpose. ▶ Provide reasons that are supported by facts and details. ▶ Link opinion and reasons using words and phrases (e.g., for instance, in order to, in addition). ▶ Provide a concluding statement or section related to the opinion presented. 	x				
Writing 4.2	Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	x				
Writing 4.3	Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.				x	

Matrix of Standards 4th Grade

California Standards	Description	Fact or Opinion	Science and Poetry with Almonds	Fun with Almond Math	Almond History and Cultural Significance	Nutritious Almonds
Common Core English Language Arts <i>(continued)</i>						
Writing 4.4	Produce clear and coherent writing (including multiple-paragraph texts) in which the development and organization are appropriate to task, purpose, and audience.			x		
Writing 4.6	With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.					x
Writing 4.7	Conduct short research projects that build knowledge through investigation of different aspects of a topic.		x			x
Writing 4.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.			x		
Speaking & Listening 4.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.	x	x			
Common Core Mathematics						
4.OA.2 Operations and Algebraic Thinking	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.			x		
4.OA.3 Operations and Algebraic Thinking	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.			x		

Matrix of Standards 4th Grade

California Standards	Description	Fact or Opinion	Science and Poetry with Almonds	Fun with Almond Math	Almond History and Cultural Significance	Nutritious Almonds
Common Core Mathematics <i>(continued)</i>						
4.NF.3c Number and Operations - Fractions	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.			x		
4.NF.3d Number and Operations - Fractions	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.			x		
Next Generation Science Standards						
4-LS1-1 Molecules to Organisms	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	x	x			
4-LS1.A Molecules to Organisms	Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.	x	x			

Matrix of Standards 5th Grade

California Standards	Description	Fact or Opinion	Science and Poetry with Almonds	Fun with Almond Math	Almond History and Cultural Significance	Nutritious Almonds
Common Core English Language Arts						
Reading Informational Text 5.3	Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.	x				
Reading Informational Text 5.7	Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.				x	
Reading Foundational Skills 5.4b	Read on-level prose and poetry orally with accuracy, appropriate rate, and expression on successive readings.		x			
Writing 5.1, 1a, 1b, 1c, 1d	<p>Write opinion pieces on topics or texts, supporting a point of view with reasons and information.</p> <ul style="list-style-type: none"> ▶ Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer’s purpose. ▶ Provide logically ordered reasons that are supported by facts and details. ▶ Link opinion and reasons using words, phrases, and clauses (e.g., consequently, specifically). ▶ Provide a concluding statement or section related to the opinion presented. 	x				

Matrix of Standards 5th Grade

California Standards	Description	Fact or Opinion	Science and Poetry with Almonds	Fun with Almond Math	Almond History and Cultural Significance	Nutritious Almonds
Common Core English Language Arts <i>(continued)</i>						
Writing 5.2, 2a, 2b, 2c, 2d, 2e	<p>Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</p> <ul style="list-style-type: none"> ▶ Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. ▶ Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. ▶ Link ideas within and across categories of information using words, phrases, and clauses (e.g., in contrast, especially). ▶ Use precise language and domain-specific vocabulary to inform about or explain the topic. ▶ Provide a concluding statement or section related to the information or explanation presented. 	x				
Writing 5.3	Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.				x	
Writing 5.4	Produce clear and coherent writing (including multiple- paragraph texts) in which the development and organization are appropriate to task, purpose, and audience.			x		
Writing 5.6	With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.					x
Writing 5.7	Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.		x			x
Writing 5.10	Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.			x		

Matrix of Standards 5th Grade

California Standards	Description	Fact or Opinion	Science and Poetry with Almonds	Fun with Almond Math	Almond History and Cultural Significance	Nutritious Almonds
Common Core English Language Arts <i>(continued)</i>						
Speaking & Listening 5.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher- led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.	x	x			
Common Core Mathematics						
5.NBT.5 Number and Operations in Base Ten	Fluently multiply multi-digit whole numbers using the standard algorithm.			x		
5.NF.1 Number and Operations - Fractions	Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example: $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. <i>(In general, $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$.)</i>			x		
Next Generation Science Standards						
5-LS1-1 Molecules to Organisms	Support an argument that plants get the materials they need for growth chiefly from air and water.		x			
5-LS1.C Molecules to Organisms	Plants acquire their material for growth chiefly from air and water.		x			

Glossary

Acrostic: The first letter in each line forms a word, name, motto, or message when read in sequence. All the lines describe that word or words.

Ancestry: Family or ancestral place of origin.

B –Vitamins: Help your body make energy and release it as you need it throughout the day.

Calorie: Unit of energy.

Central Valley: A large, flat valley that dominates the central portion of the State of California.

Cinquain: A simple five line poem which follows a specific pattern.

Culinary: Of or for cooking.

Cultivate: To prepare and use the land for food or material production.

Diverse: Varied or different from each other.

Economy: The way a country manages its money and resources to produce, buy, and sell goods and services.

Fiber: Helps you feel full and cleans out your digestive system.

Hull: Protective covering around the shell and kernel.

Ingredients: A substance that forms part of a mixture, like in a recipe.

Initiate: To begin or start.

Iron: Helps transport oxygen from your lungs to the rest of your body.

Nonpareil: A common variety of almond tree.

Orchard: Piece of land planted with trees.

Originated: Began or started.

Glossary

Plant: A living organism consisting of a stem, roots, and leaves. A tree is considered a plant, typically having a single stem or trunk.

Pollinate: To carry pollen from the stamen to the pistil of a flower.

Protein: A basic component of food that is essential for building, maintaining, and replacing tissue in our bodies such as our muscles, organs, and immune system.

Potassium: Keeps your muscles and nervous system working properly by making sure they have the right amount of water.

Seedling: The part of the flowering plant from which a new plant can grow.

Synonym: Word meaning the same as another.

Vitamin E: Protects cells and tissue from damage.