California Foundation for Agriculture in the Classroom

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.

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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.

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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.

Almond trees bloom in the spring.

Factual Frank

Almond blossoms smell good.

Almond trees are fun to climb.

Almond trees require bees to pollinate.

Opinion Opie

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.

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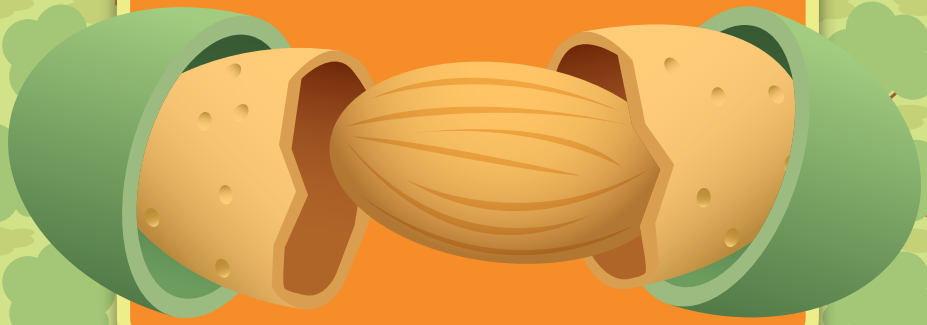
An ALMOND STORY



Name **Grade** **Teacher**

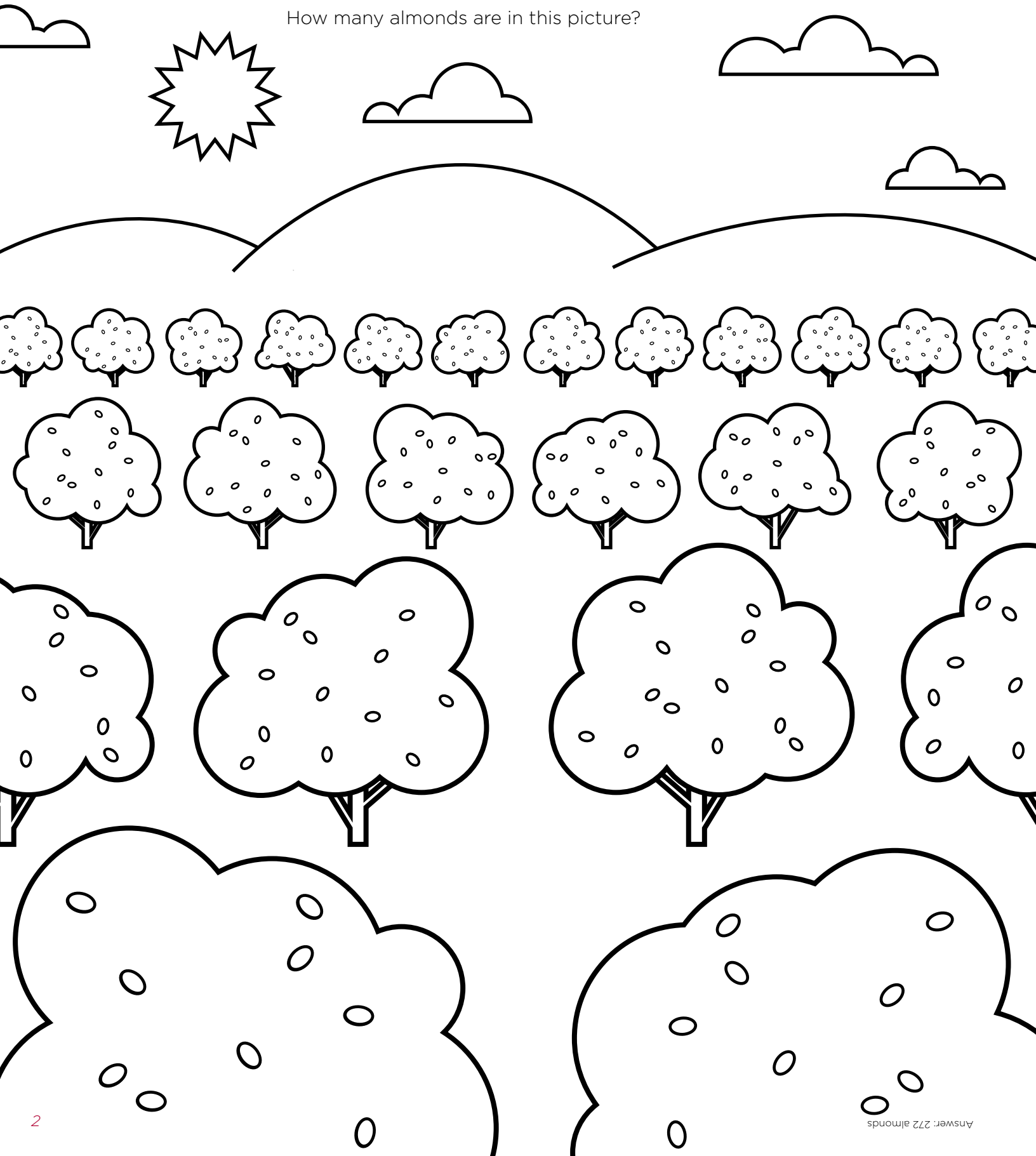
For more information on the Almond Board of California or almonds, visit AlmondBoard.com.

Almond Board of California, 1150 9th Street, Suite 1500, Modesto, CA 95354 • (209) 549-8262

california almonds
Almond Board of California

Color the Orchard

How many almonds are in this picture?



Answer: 272 almonds

Almond History

and the **ALMOND FAMILY**

VOCABULARY

ancestry: family or ancestral descent

originated: begun or started

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.

ACTIVITY

Follow the maze to see how almonds traveled from the Mediterranean area of Europe to India and beyond.

Mother Nature

WHY ALMOND TREES CAN'T LIVE WITHOUT HER

Growers work very hard to make sure their almond trees have all the **essential** tools to produce a plentiful supply of almonds. Read on to learn how sunlight, water, air, nutrients and soil help almond trees thrive.

- *Sunlight:* The warmth from the sun gives plants energy. The light from the sun aids in the **photosynthesis** process.
- *Water:* Trees need lots of water to keep growing; they also use water when converting nutrients into energy. Water is also used in the photosynthesis process.
- *Air:* Plants breathe like we do, but they breathe through their leaves and roots.
- *Nutrients:* Many nutrients are already naturally occurring in the soil. However, growers must add fertilizers and compost to assist the tree in helping to produce a good crop.
- *Soil:* Healthy, loosely packed, nutrient-rich soil is important for plant health.

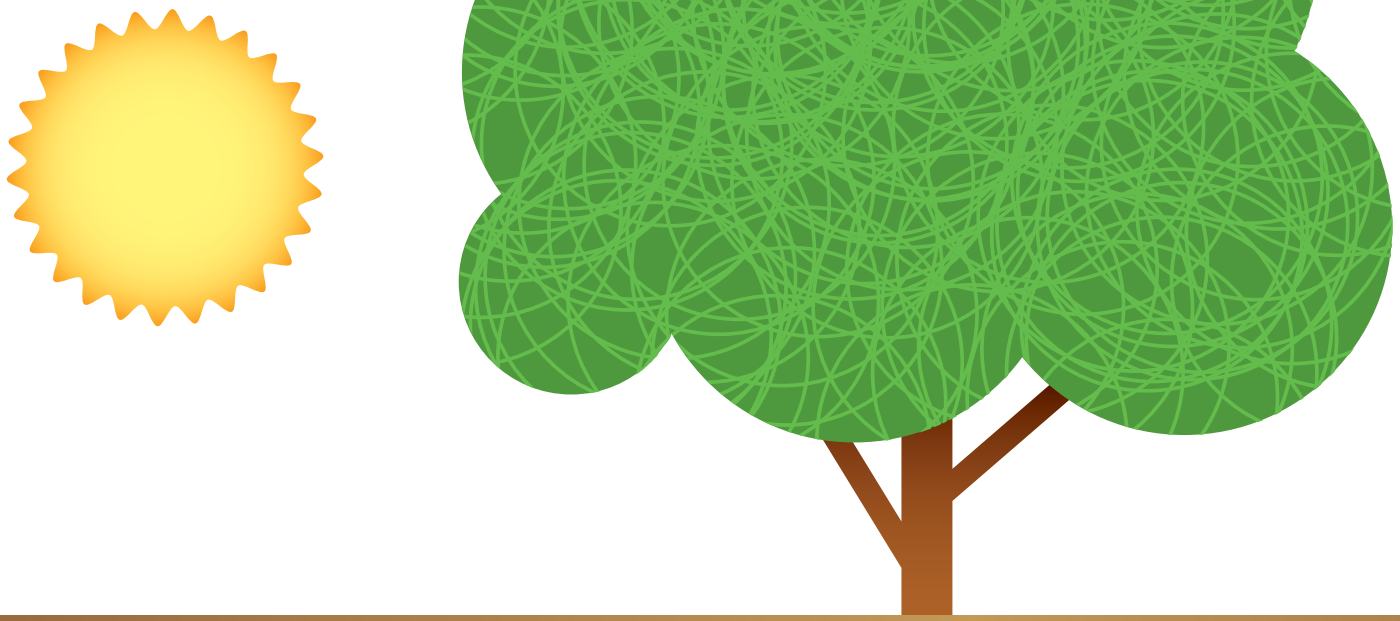
VOCABULARY

essential: absolutely necessary

photosynthesis: the process in which plants turn sunlight and carbon dioxide into food and oxygen

ACTIVITY

Next to the sun, water, nutrients and soil, write one thing each item does to help almond trees grow.



the Almond Life Cycle

VOCABULARY

dormant: Once the almonds are harvested and the cold weather sets in, the trees go to sleep for the winter. During that time, the trees are storing up their energy for the spring.

bloom: Soft pink-and-white flowers cover the almond trees during spring for the bees to come and pollinate.

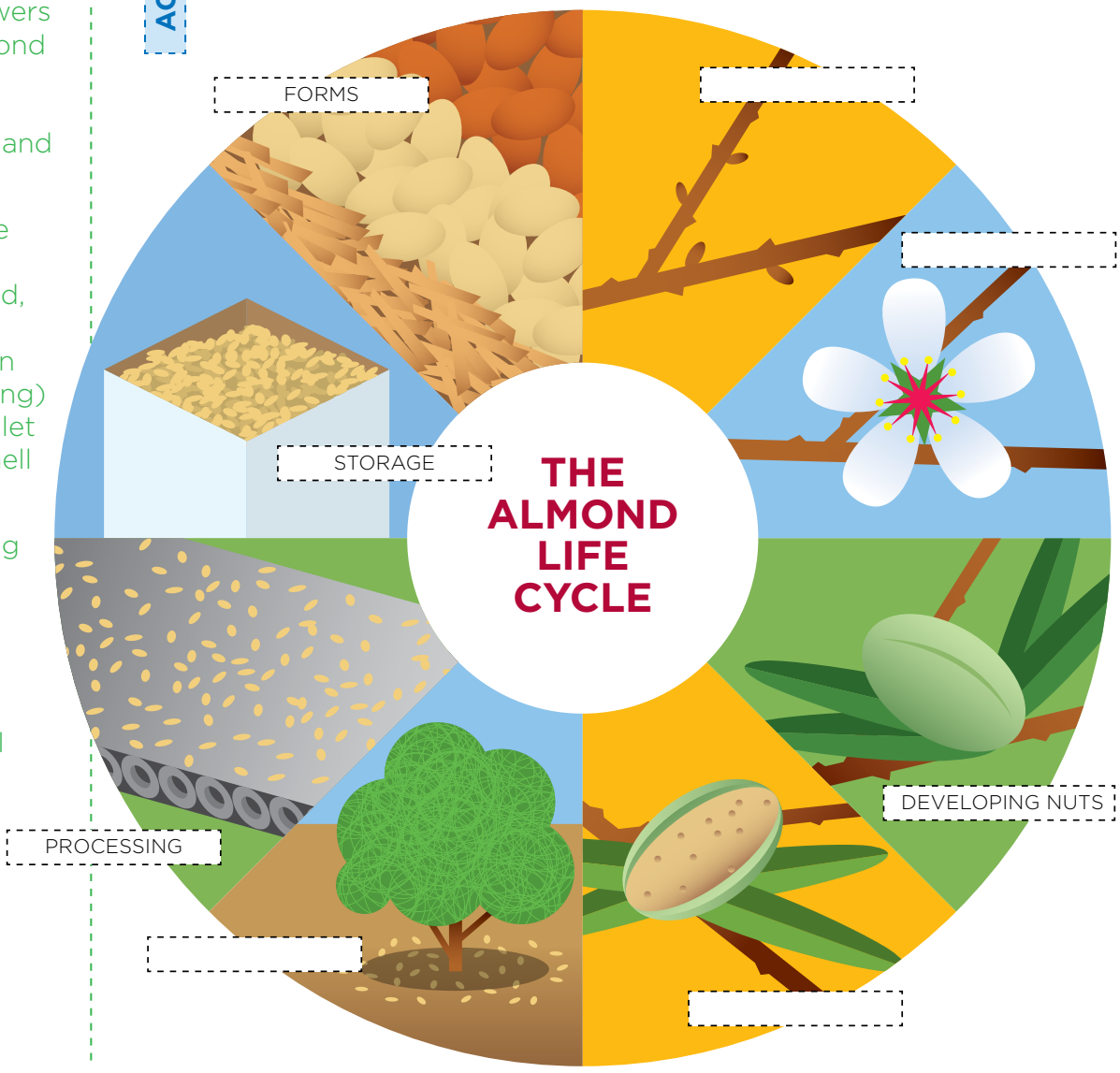
hullsplit: Once the trees have been pollinated, the almond hull (soft green outside covering) splits open to let the almond shell naturally dry.

harvest: During late summer and early fall, the almonds are removed from the trees by mechanical shakers.

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.

ACTIVITY

Use the vocabulary as a tool to fill in the missing words in the almond life cycle.



STAGE ONE:

Dormancy and Bloom

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 (because there aren't any leaves during this time), 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.

Just as soon as the grass begins to turn green and the birds begin to sing, the almond trees wake up to celebrate the return of spring. The first sign of growth on an almond tree is called a **bud**. A bud is a small flower that looks like it's wrapped up very tightly by green leaves with a pink tip. When the bud is ready to open, a small pink-and-white flower will appear. Once the flower has completely opened, bees will come and pollinate the flowers on the trees.

VOCABULARY

dormancy: stage when the trees are saving their energy for the spring

bud: the first sign of growth on a tree, before it opens and becomes a flower

ACTIVITY

In the space provided, draw a picture of an almond tree in the dormancy stage. Next, draw a picture of the first sign of growth (bud).

Responsible Production

Each day, almond growers make very important decisions as to how to grow their trees. They have to decide when to water, when to apply fertilizers, and when to bring the bees to their orchard to pollinate the trees. There is a lot of research and math associated with these decisions.

VOCABULARY

acre: a common measurement for an area of land

bee box: a box that acts as a house, or base camp, for the bees to rest and eat

queen bee: fertile, egg-laying female bee

ACTIVITY

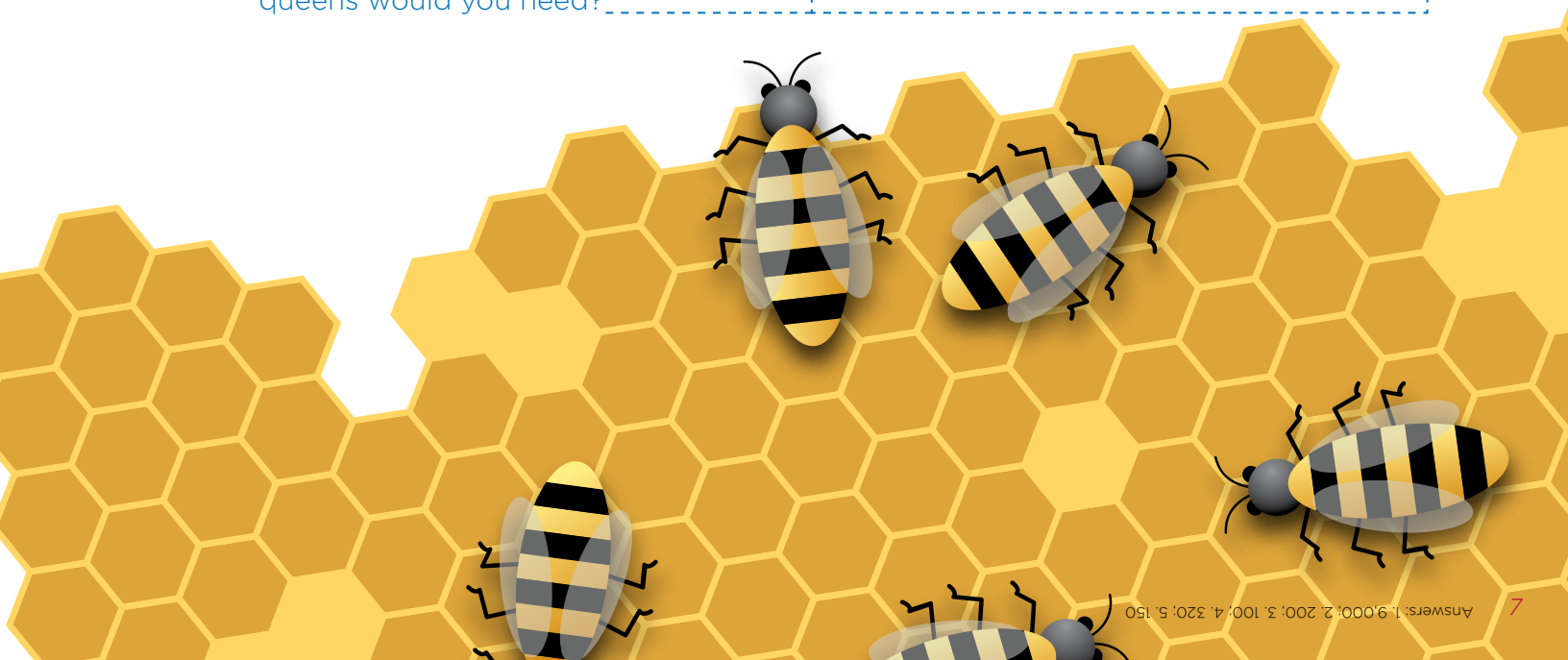
Try your hand at being an almond grower by completing the word problems below. Remember to show your work and label each answer.

Summary: Jane and Tom own 100 acres of almond trees in Modesto, California. They have planted 90 almond trees per **acre**. Each year, they put two **bee boxes** on each acre to pollinate the trees. There is one **queen bee** per box. Each bee box has eight frames within the box.

Questions:

1. How many trees are on your 100 acres?
2. How many bee boxes do you need to order for your 100 acres?
3. How many bee boxes would you order to only pollinate half of your farm?
4. How many bee frames would there be for 20 acres of almonds?
5. For 75 acres, how many queens would you need?

Answers:



STAGE TWO:

Pollination

VOCABULARY

pollination: the act of carrying pollen between plants

pollen: the fertilizing element of plants; often appears as yellow powder

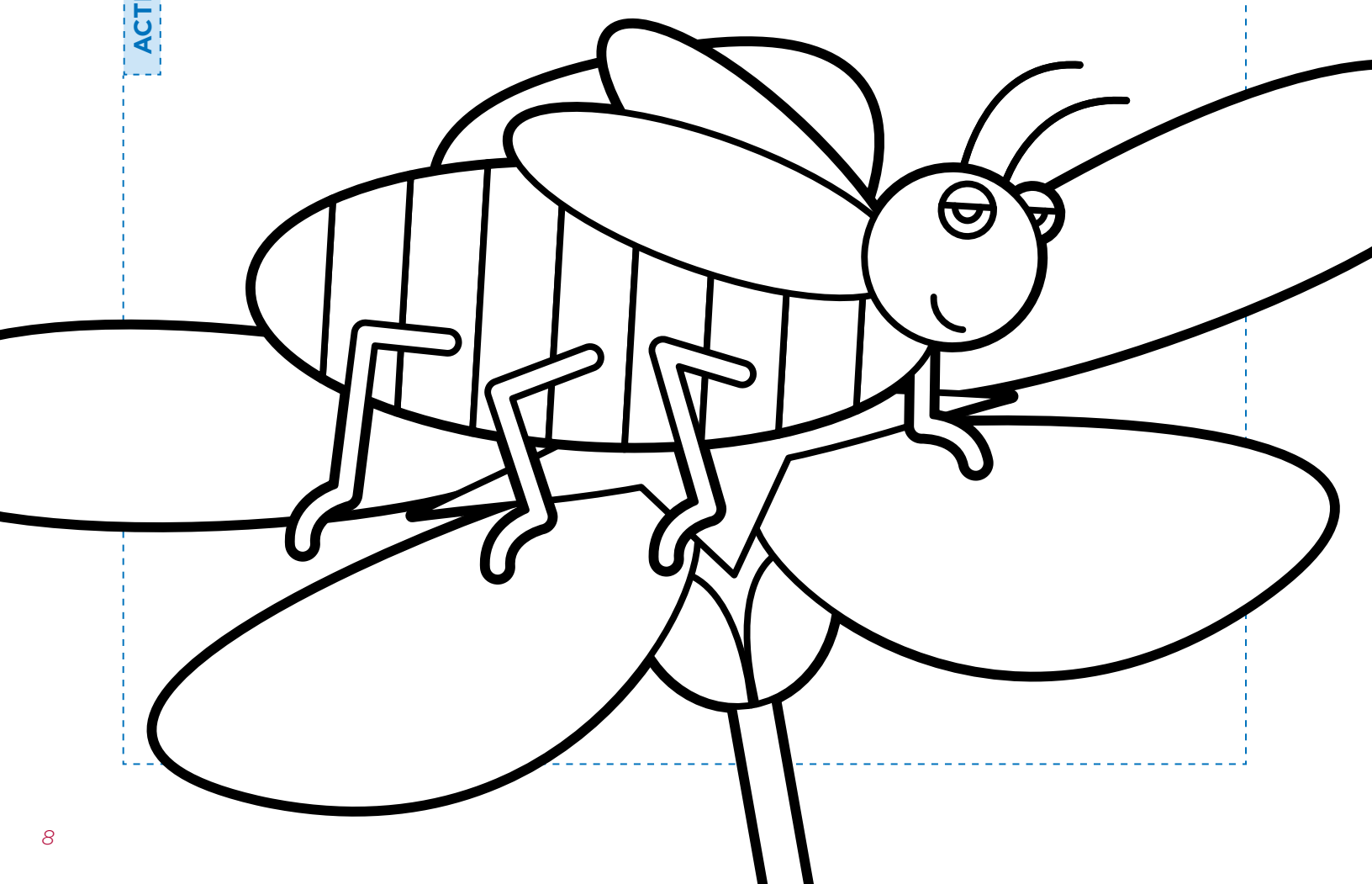
cross-pollination: the transfer of pollen from the flower of one plant to the flower of another plant

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

ACTIVITY

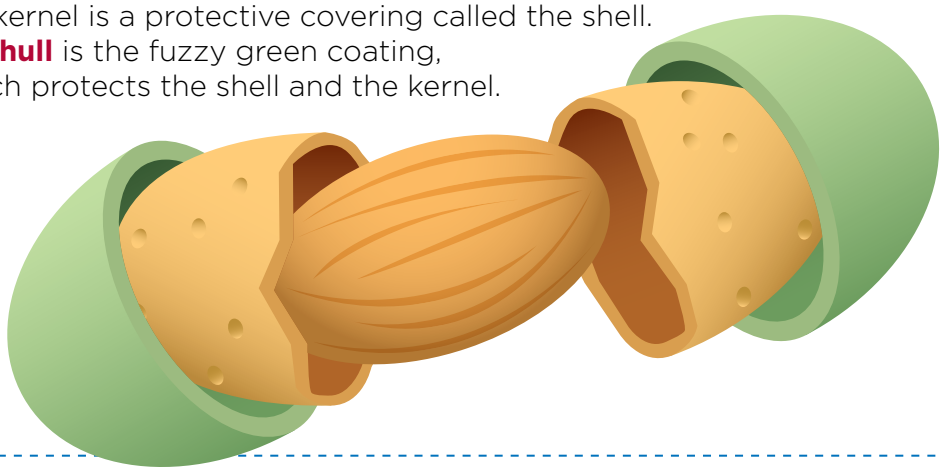
Color in the picture of the bee pollinating the flower.



STAGE THREE:

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.



VOCABULARY

kernel: another term for almond

hull: the soft-green, leathery protective covering around the kernel and shell

ACTIVITY

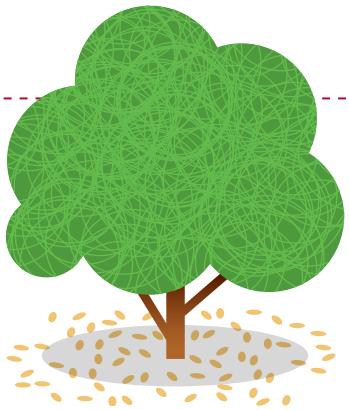
An acrostic poem uses the first letter in a topic word to begin each line. All lines of the poem should relate to, or describe the word. Refer to the two examples below to make your own acrostic poem related to almonds, or the kernel development stage.

Shines brightly
Up in the sky
Nice and warm on my skin

Shells
Open, then
Fall from the
Tree

STAGE FOUR:

Hullsplit and Harvest



VOCABULARY

harvest: time when almonds are removed from the trees, usually during late summer or early fall

shaker: a piece of equipment that has two mechanical arms that shake the trunk of the tree, which makes the almonds fall to the ground

sweeper: a piece of equipment that has broom-like brushes in front of the tires to sweep the almonds into neat rows

Before **harvest** officially begins, the almond grower must prepare the orchard floor. Almonds are usually harvested from August to September, but the actual harvest time will depend on the variety being harvested. Since different rows are planted with different varieties, each variety will be harvested individually (which helps keep the varieties separated at the processing plant).

When the almonds are ready to be harvested, the hull will begin to open. We call this hullsplit. During hullsplit, the almond shell is exposed to the sun, which naturally dries the almond.

The grower will shake the almond trees with a machine called a **shaker**. The shaker has two mechanical arms that grab the trunk of the tree and shake the almonds loose. The almonds fall to the ground, where they usually stay for 7 to 10 days to dry.

After the almonds have dried on the orchard floor, they are swept into rows with a machine called a **sweeper**. A pickup machine and a truck pick up the almonds and transport them to the processing plant. Once the almonds are processed, they are shipped around the world.

ACTIVITY

A local almond grower is ready to harvest his crop, but has some questions. Can you help him answer them? Remember to label each answer. (Provide answers in both seconds and minutes.)

1. If it takes 10 to 15 seconds to shake each tree and you have 20 trees in a row, how long will it take you to shake one row?_____
2. If it takes 10 to 15 seconds to shake each tree, how many trees can you shake in 10 minutes?_____
   What about in 1 hour?_____
3. It is a really warm, sunny week, so you are sure your almonds will dry in 8 days. If you shake the almond trees on August 20th when will they be done drying?_____
4. If the average acre of almonds gives 2,400 pounds, how many pounds of almonds would you get on 50 acres?_____
   What about on 350 acres?_____
5. If each truck can carry 44,000 pounds to the processing plant, how many trips will it take you to transport 132,000 pounds?_____

Answers: 1. 200 to 300 seconds (3.33 to 5 minutes); 2. 40 to 60 trees, 240 to 360 trees; 3. August 28th; 4. 120,000, 840,000; 5. 3

People in the Almond Industry

VOCABULARY

allied: united by a common characteristic

unique: having no like or equal

A lot of people work together to make the almond industry so successful. It's essential to have knowledgeable growers to grow healthy almond trees. Almond growers have to know a lot about science; they have to understand and work with weather and soil conditions, as well as plant health and plant nutrition.

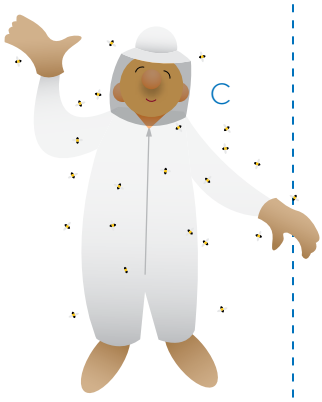
Almond processors, or the people who handle the almonds after they leave the orchard, are very skilled with equipment and computers. Many times, these men and women know how to drive large equipment (tractors and forklifts), and understand the mechanics of the equipment.

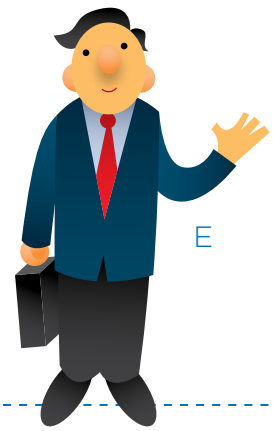
Allied industry members can be anyone who sells or markets almonds, a special company that designs a **unique** piece of equipment for the orchard, or someone who sells fertilizer for almonds. The common thread for everyone in the almond industry is that these people work well with one another, and they enjoy what they're doing.

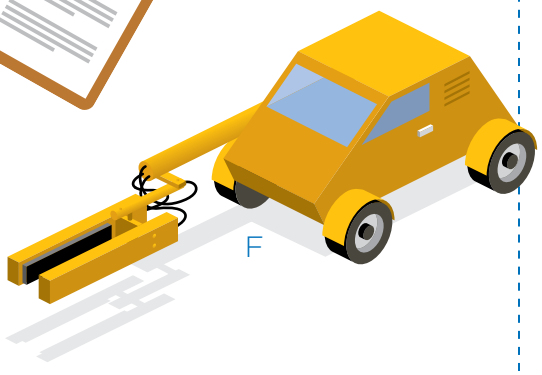
ACTIVITY

It takes a lot of people to get almonds from where they start in the orchard to where they are enjoyed by people like you! Below is a list of jobs in the almond industry. Draw a line to match each job to the image that represents it the best.

1. Almond grower
2. Chef
3. Almond salesman
4. Beekeeper
5. Almond processor
6. Food safety inspector







Answers: 1, F; 2, B; 3, E; 4, C; 5, A; 6, D

a Busy Little Almond

FOLLOWING AN ALMOND FROM THE TREE TO THE FINISHED PRODUCT

VOCABULARY

orchard stage: those activities that take place in the orchard to help the tree grow and produce almonds

harvesting stage: activities that remove the almonds from the tree and prepare them to be sent to the processor

processing stage: the actual processing of the almonds, once they leave the orchard

transportation stage: moving the almonds from one location to another

by-product production stage: the use of hulls and shells for other purposes

It really is amazing to think of all the steps one almond goes through before making its way to your kitchen. That's why it's so important for an almond grower to work closely with the people who process the almonds and those who market the almonds to be sold around the world.

ACTIVITY

Refer to the key and color each step the correct color:

- Orchard Stage
- Harvesting Stage
- Processing Stage
- Transportation Stage
- By-Product Production Stage

1 Bees pollinate the almond trees

2 Almond kernels grow on trees in the orchard

3 A shaker shakes the trees and the kernels fall to the ground

4 Almond kernels lie on the ground and dry 7 to 10 days

5 Kernels are swept into rows by a sweeper

6 Almonds are transported to a processing facility by a large truck

7 The hull of the almond is removed

8 The shell of the almond is removed

9 Some almonds are shipped to countries as whole-natural almonds

10 The shell is used by the dairy industry for bedding for the cows

11 Almonds are shipped around the world to be consumed or further processed

12 Other almonds are sliced, diced, slivered or ground into almond meal

A Almonds are shipped in-shell to countries like India

B The hull is used by the dairy industry for cattle feed

Answers: 1 and 2, Green; 3, 4 and 5, Orange; 6, Red; 7 and 8, Blue; A, Red; B, Yellow; 9, Red; 10, Yellow; 11, Red; 12: Blue

Eating Right

Some people believe that good things come in small packages, and almonds are no exception.

Almonds are a tasty snack that does 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. You can mix almonds into your cereal in the morning before you go to school, or eat a handful of almonds after you exercise. For a special treat, you can mix almonds into cookies or brownies.

VOCABULARY

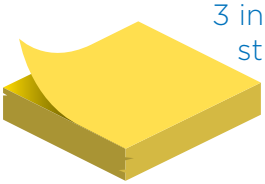
repair: to restore to a good or sound condition after decay or damage; to mend

digestion: the process by which food is broken down and nutrients are absorbed in the body

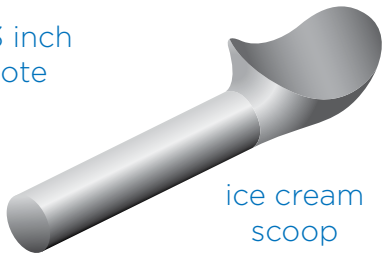
ACTIVITY

Not sure how many almonds are in an ounce? Use everyday items to compare! Below are lots of things you may see on a regular basis. Circle the ones that are about the same size as a serving of almonds.

basketball



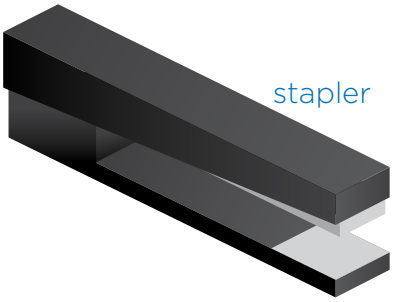
3 inch x 3 inch sticky note



ice cream scoop

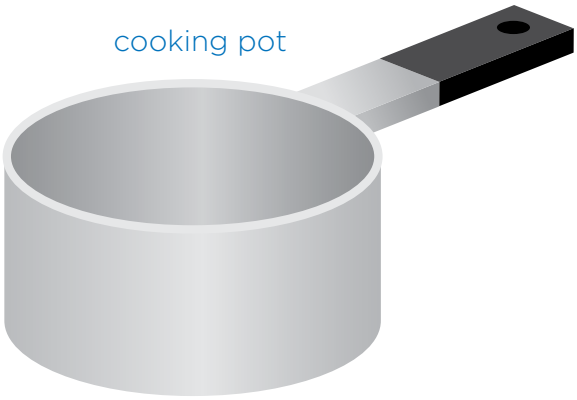
1/4 cup measuring cup

baby food jar



stapler

cooking pot



Scientific evidence suggests, but does not prove, that eating 1.5 ounces per day of most nuts, such as almonds, as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease. Good news about good fat: U.S. Dietary Guidelines recommend that the majority of your fat intake be unsaturated. One serving of almonds (28g) has 13g of unsaturated fat and only 1g of saturated fat.

Answers: ice cream scoop, sticky note, 1/4 cup measuring cup, baby food jar

My Plate

VOCABULARY

diagram: a plan, sketch, drawing, or outline that demonstrates or explains something

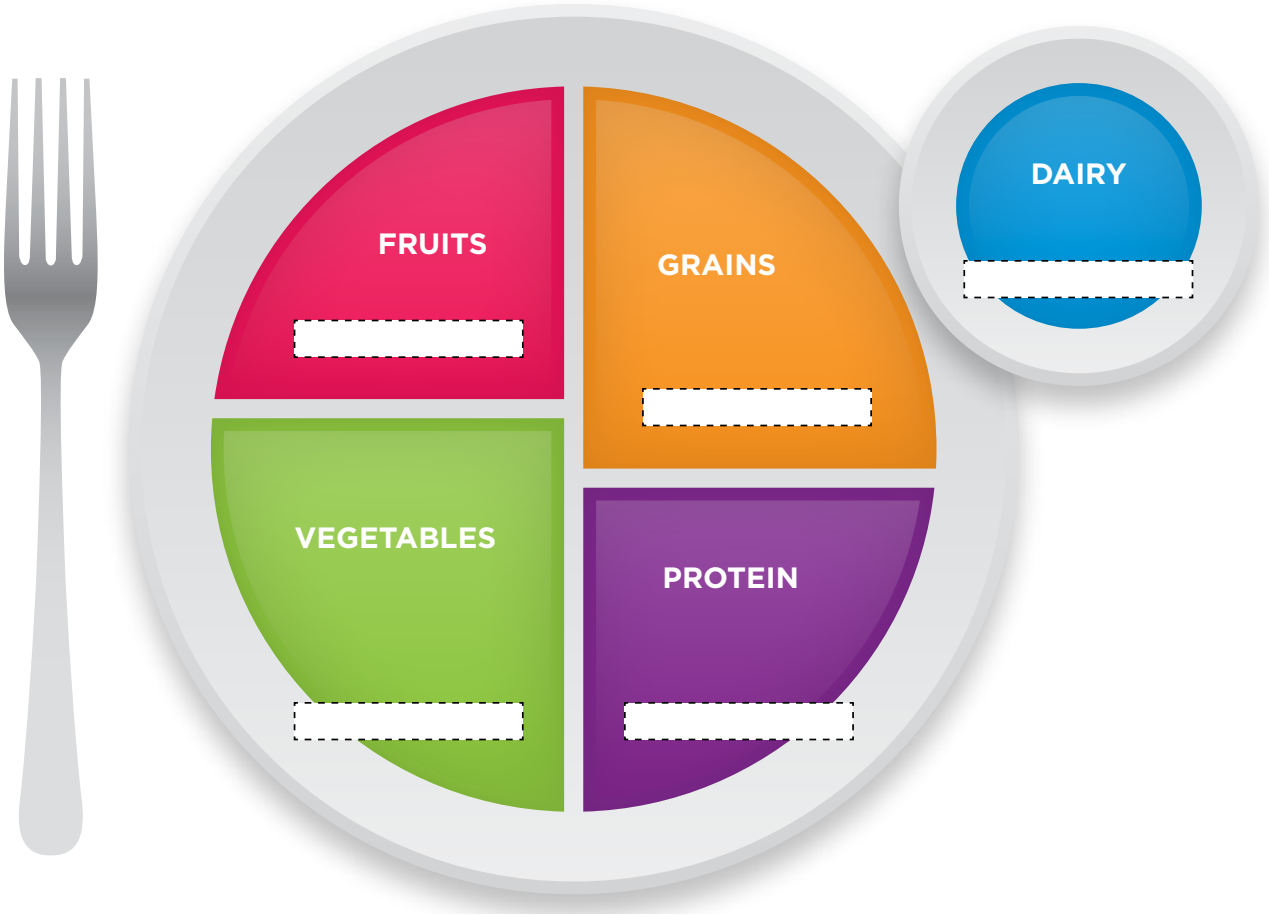
nutritious: providing nourishment; healthful

protein: part of what makes up our cells, tissues and organs; helps build strong muscles

My Plate 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. My Plate is broken up into food groups: fruits, vegetables, grains, proteins and dairy. Almonds are listed on My Plate under the protein food group along with meat, poultry, eggs, seafood, beans, peas and other nuts. Kids ages 4 to 13 should eat 4 to 5 ounces of **protein** every day. You should also have 1 cup to 1 ½ cups of fruit, 1 ½ to 2 ½ cups of vegetables, 2 ½ to 3 ounces of grains, and 2 ½ to 3 cups of dairy every day.

ACTIVITY

What will you have for dinner tonight? Under each section of the My Plate, write one food item that you might eat.



Scientific evidence suggests, but does not prove, that eating 1.5 ounces per day of most nuts, such as almonds, as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease. Good news about good fat: U.S. Dietary Guidelines recommend that the majority of your fat intake be unsaturated. One serving of almonds (28g) has 13g of unsaturated fat and only 1g of saturated fat.

a Tasty Little Nut

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 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**).

ACTIVITY

Fill in the sentences with information from above about the benefits you will receive when eating almonds. List three other reasons almonds are so great.

Almonds are _____ dense.

Almonds are an excellent source of Vitamin _____ and _____.

Almonds have
_____ grams (g) of protein,
_____ milligrams (mg) of potassium,
_____ milligrams (mg) of calcium, and
_____ milligrams (mg) of iron.

Three reasons California Almonds are so great:

1. _____
2. _____
3. _____

VOCABULARY

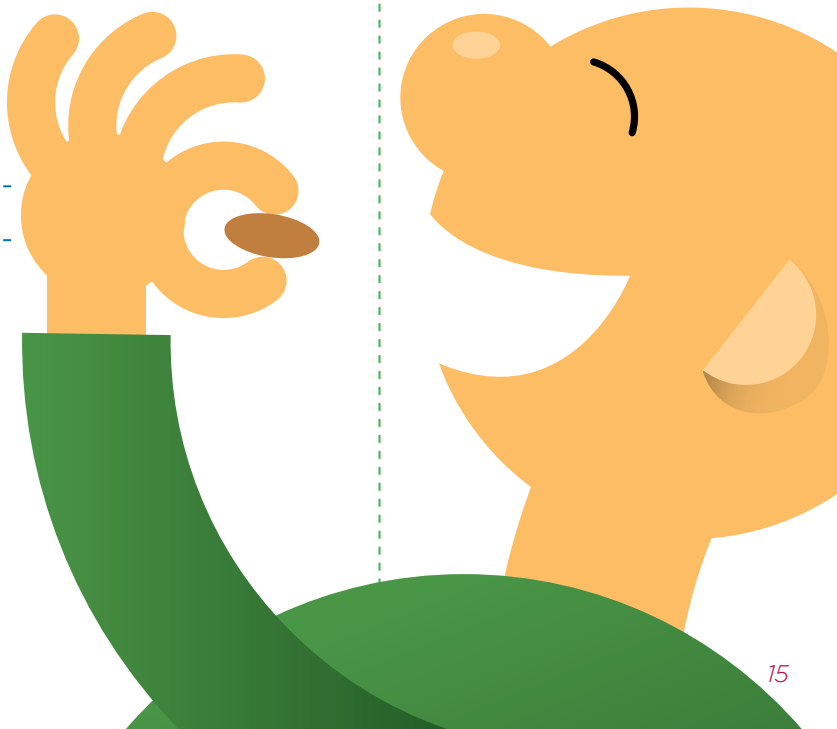
versatility: having or capable of many uses

legendary: celebrated or described in legend

nutrition label: tells you how many nutrients are in that amount of food

ingredient: a substance that forms part of a mixture

serving size: the amount of product typically eaten in one sitting



Almond Forms *and* Food

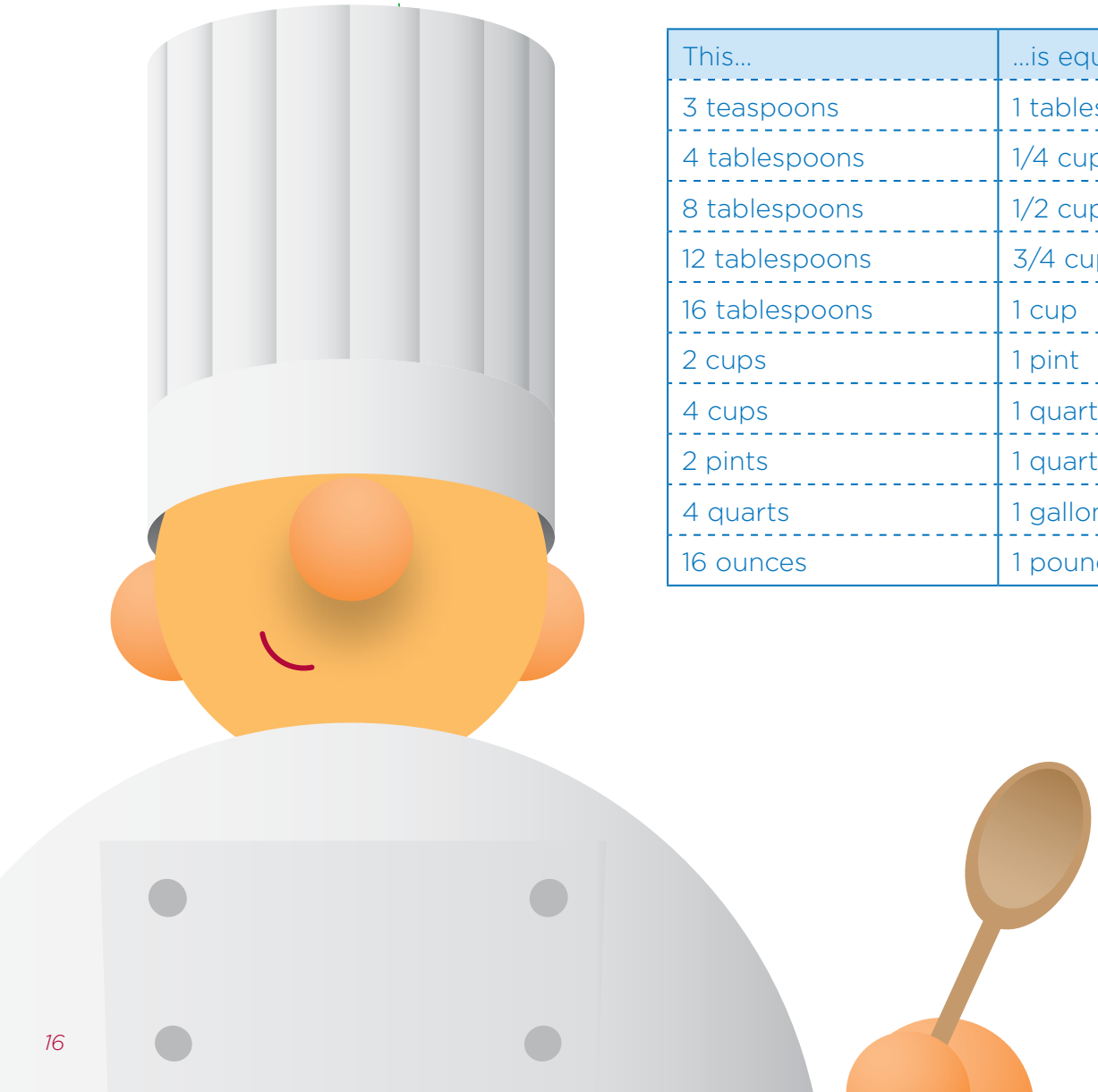
VOCABULARY

blanching: process by which the almond skin is removed and the almonds look white

application: purpose or type of product

conversions: changing between different units of measurement

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.



CONVERSIONS FOR COMMON BAKING MEASUREMENTS

This...	...is equal to this!
3 teaspoons	1 tablespoon
4 tablespoons	1/4 cup
8 tablespoons	1/2 cup
12 tablespoons	3/4 cup
16 tablespoons	1 cup
2 cups	1 pint
4 cups	1 quart
2 pints	1 quart
4 quarts	1 gallon
16 ounces	1 pound

ACTIVITY

You are the chef tonight! You are planning on having 36 people over for a party and want to serve them Almond Butter Cookies. Unfortunately, the recipe only makes 36 cookies, and each of your guests wants two cookies. You are not going to have enough! Refer to the recipe below to calculate the new amount of ingredients you will need to make two cookies, for all of your guests.

Ingredients for 36 Cookies	Ingredients for 72 Cookies
3/4 cup all purpose flour	
1/2 cup whole wheat pastry flour, or regular whole wheat flour	
3/4 teaspoon salt	
1 teaspoon baking soda	
1/4 cup unsalted butter, softened	
3/4 cup smooth, unsalted almond butter	
1/3 cup packed light brown sugar	
1/3 cup granulated sugar	
1/2 teaspoon vanilla extract	
1 egg	
36 raw whole almonds (a heaping 1/4 cup)	

Answers: 1 1/2 cups, 1 cup, 1 1/2 teaspoons, 2 teaspoons, 1/2 cup, 1 1/2 cups, 2/3 cup, 2/3 cup, 1 teaspoon, 2 eggs, 72 almonds (a heaping 1/2 cup)

ACTIVITY

There's an almond snack for every occasion! Match the following almond forms to the finished product for which they are used.

Almond Form	**Finished Product**
1. Whole, Natural Almonds	A. Cereals
2. Sliced Almonds	B. Crust for meat
3. Slivered Almonds	C. Add to your cereal
4. Diced Almonds	D. Handful (snack after school), trail mix
5. Meal or Flour	E. Salad dressing
6. Almond Butter	F. Topping for salad
7. Almond Milk	G. Almond butter and jelly sandwich
8. Almond Oil	H. Almond cookies

Answers: 1, D; 2, F; 3, A; 4, B; 5, H; 6, G; 7, C; 8, E

Global Markets

Approximately 6,000 growers located throughout the Central Valley of California produce more than a billion pounds of almonds each year. One hundred **handlers** ship these almonds to more than 90 countries. California produces more than 80% of the world's almonds and virtually 100% of the **domestic supply**.

VOCABULARY

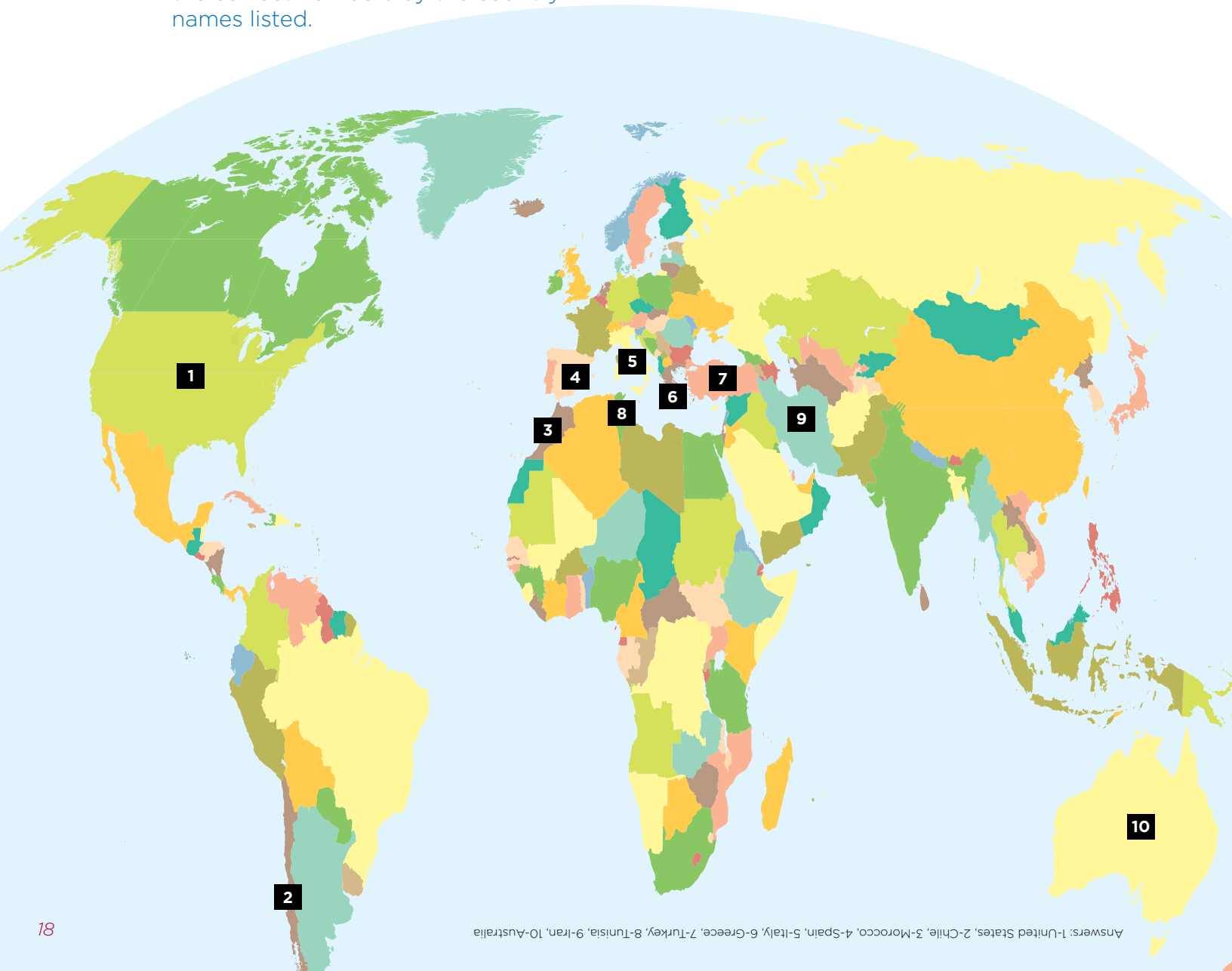
handler: a person who processes almonds

domestic supply: almonds shipped within North America (Canada, U.S.A., Mexico)

ACTIVITY

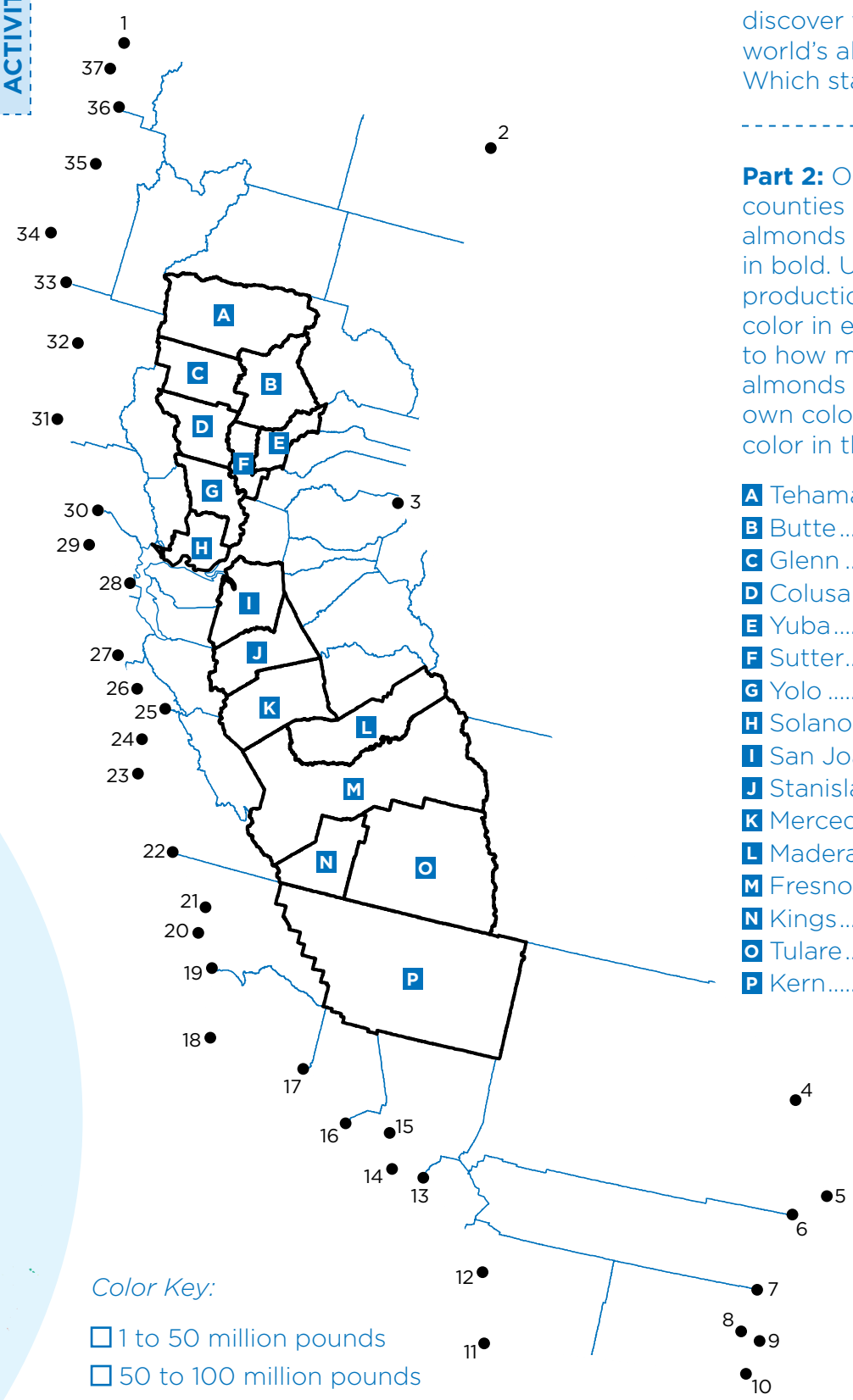
Although California produces most of the world's almonds, this wonderful nut is also grown in many other countries around the globe. The top almond-producing countries are numbered below. Using the map, write the correct numbers by the country names listed.

_____ Australia
_____ Chile
_____ Spain
_____ Italy
_____ United States
_____ Iran
_____ Greece
_____ Morocco
_____ Turkey
_____ Tunisia



Answers: 1-United States, 2-Chile, 3-Morocco, 4-Spain, 5-Italy, 6-Greece, 7-Turkey, 8-Tunisia, 9-Iran, 10-Australia

ACTIVITY



Part 1: Connect the dots to discover where most of the world's almonds are grown. Which state is it?

Part 2: On the map, you'll see counties in California where almonds are grown outlined in bold. Using the list of production quantities provided, color in each county according to how many million pounds of almonds it produces. Pick your own colors and don't forget to color in the key!

- **A** Tehama 1–50
- **B** Butte 1–50
- **C** Glenn 50–100
- **D** Colusa 50–100
- **E** Yuba 1–50
- **F** Sutter 1–50
- **G** Yolo 1–50
- **H** Solano 1–50
- **I** San Joaquin 50–100
- **J** Stanislaus ..... >100
- **K** Merced ..... >100
- **L** Madera ..... >100
- **M** Fresno ..... >100
- **N** Kings 1–50
- **O** Tulare 1–50
- **P** Kern ..... >100

Color Key:

- ☐ 1 to 50 million pounds
- ☐ 50 to 100 million pounds
- ☐ More than 100 million pounds

Nuts about Recycling

VOCABULARY

recycle: to treat or process to make suitable for reuse

reduce: to bring down to a smaller amount

reuse: to use again, especially after salvaging or processing

We now know that there are multiple stages to growing almonds, so it's no surprise there are also multiple ways almond growers reduce, reuse and recycle.

The almond kernel is processed for humans to eat, but what happens to the almond shells and the almond hulls? 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.

Almond growers also work hard to **reduce** the amount of water they use to grow the trees. Small sprinklers, called microsprinklers, are one way growers can give the almond trees the perfect amount of water.

After each almond harvest, the trees are pruned and the almond growers **reuse** the clippings from the trees. The leaves and branches are ground into little pieces (called chips) and applied to the orchard floor as mulch. These chips are recycled, once again bringing nutrients back to the soil.

ACTIVITY

What is your family currently doing to reduce, reuse and recycle at home? In this picture, circle items that you can better reduce, reuse and recycle. Next to each item you circle, write which you will do (reduce, reuse or recycle), and then how you will do that. Example: You may circle an aluminum can. Next to it, write "Recycle by putting it in the recycling bin marked for aluminum."

Cinnamon Glazed Almonds

Created by: Almond Board of California

Silver Dollar Pancakes

Created by: Elana Amsterdam, author of *The Gluten-Free Almond Flour Cookbook*

Roasted Almond Sweet Potatoes

Created by: Almond Board of California

Cinnamon Glazed Almonds

Created by: Almond Board of California
Servings: 12

Ingredients
1/3 cup butter
2 egg whites, at room temperature
Pinch of salt
1 cup sugar
3 cups whole natural California Almonds
4 teaspoons cinnamon

Preparation
Preheat oven to 325 degrees. Place butter on 15 1/2 x 10 1/2-inch jelly roll pan; place in oven to melt butter (about 7 minutes). Meanwhile, beat egg whites with salt until frothy; gradually add sugar, beating into stiff peaks. Gently fold in almonds and cinnamon. Pour almond mixture onto jelly roll pan; toss with butter. Bake about 40 minutes, tossing every 10 minutes, until almonds are crisp. Serve warm or at room temperature. Store cooled almonds in airtight container up to 2 weeks.

Silver Dollar Pancakes

Created by: Elana Amsterdam, author of *The Gluten-Free Almond Flour Cookbook*
Servings: 6 servings (3 pancakes per serving)

Ingredients
3 large eggs
1 tablespoon water
1 tablespoon vanilla extract
2 tablespoons agave nectar
1 1/2 cups almond flour
1/4 teaspoon salt
1/4 teaspoon baking soda
grapeseed oil, for cooking

Preparation
In a large bowl, whisk together eggs, water, vanilla and agave. Add almond flour, salt and baking soda and mix until thoroughly combined. Heat grapeseed oil on skillet over medium-low to medium heat. Scoop 1 heaping tablespoon of batter at a time onto the skillet. Pancakes will form little bubbles; when bubbles open, flip pancakes over and cook other side. Remove from heat to a plate. Repeat process with remaining batter, adding more oil to skillet as needed.

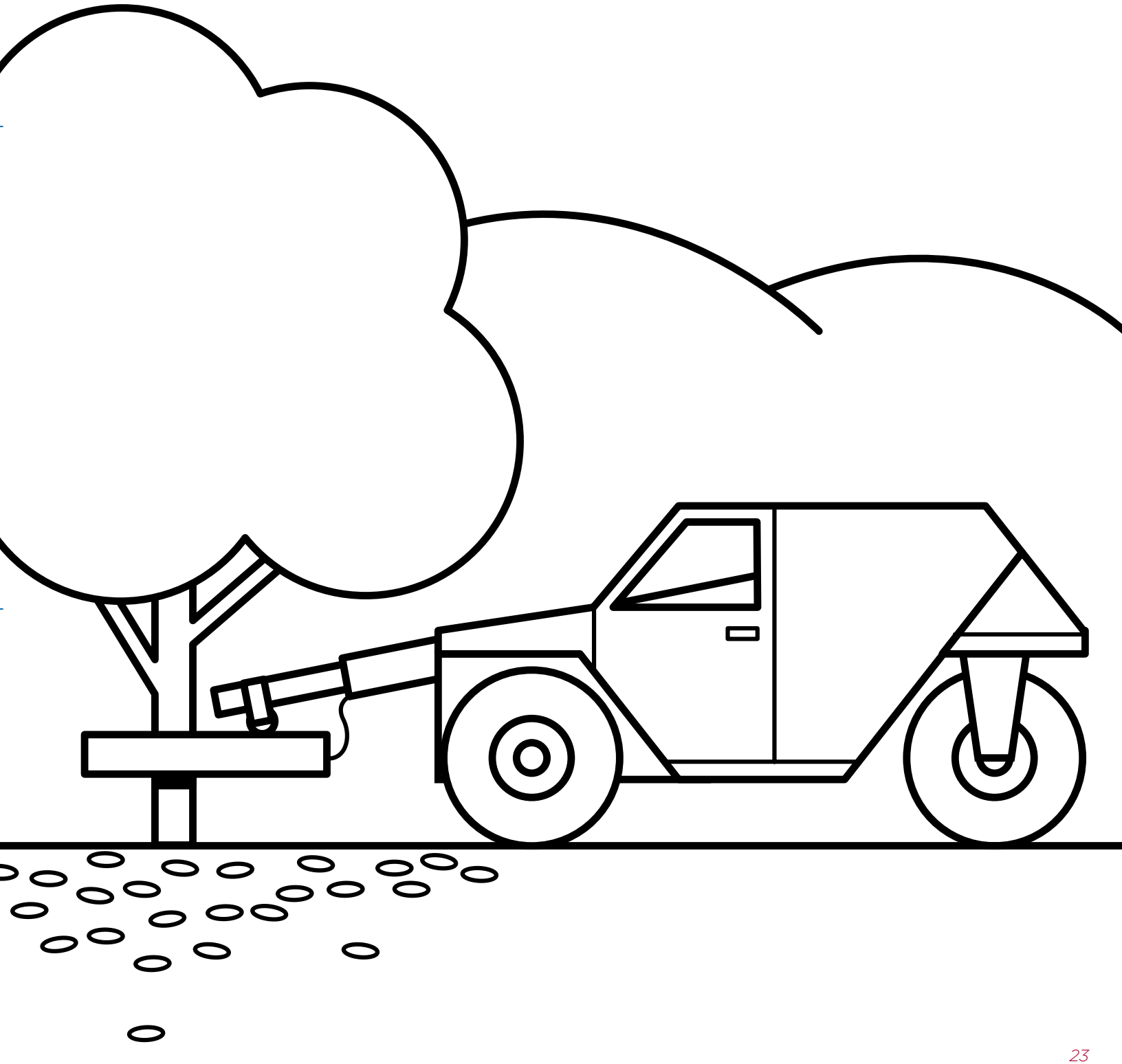
Roasted Almond Sweet Potatoes

Created by: Almond Board of California
Servings: 6 to 8

Ingredients
4 medium sweet potatoes, peeled and cut into 1-inch-thick cubes
3 tablespoons olive oil
4 large garlic cloves, minced
1/3 cup fresh thyme leaves, plus 6 thyme springs for garnish
1/2 teaspoon kosher salt (optional)
1/2 cup slivered California Almonds

Preparation
Preheat oven to 450 degrees. In a large mixing bowl, combine all ingredients (except for slivered almonds) and toss. Arrange potato slices into a single layer on a heavyweight rimmed baking sheet or in a 9 x 13-inch baking sheet. Place on the top rack of the oven and roast until tender and slightly browned, about 40 minutes. On another baking sheet, spread out the slivered almonds. Place in the oven and toast until slightly browned, about 8–10 minutes. Remove the almond baking sheet and the sweet potatoes. Mix together in a serving bowl and garnish with thyme springs. Serve warm or at room temperature.

Color the Shaker



Almond Board of California

Consumers all over the world enjoy California Almonds as a natural, wholesome and quality food product, making almonds California's leading agricultural export in terms of value. The Almond Board of California promotes almonds through its research-based approach to all aspects of marketing, farming and production on behalf of the more than 6,000 California Almond growers and processors, many of whom are part of multi-generational family operations.

Established in 1950 and based in Modesto, California, the Almond Board of California is a nonprofit organization that administers a grower-enacted Federal Marketing Order under the supervision of the United States Department of Agriculture.

For more information on the Almond Board of California or almonds, visit AlmondBoard.com.

Almond Board of California, 1150 9th Street, Suite 1500, Modesto, CA 95354 • (209) 549-8262