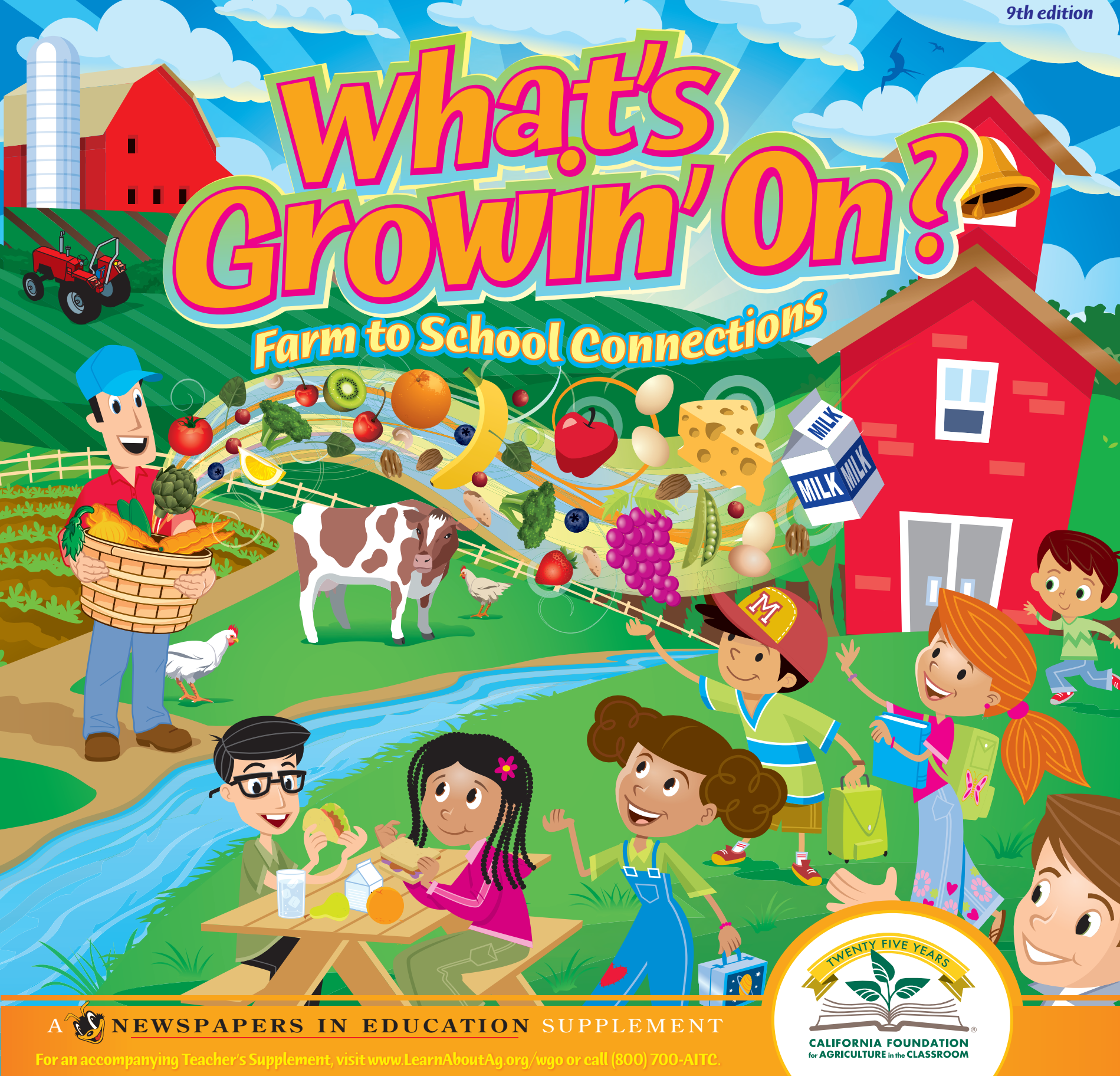
9th edition

What's Growin' On?

Farm to School Connections



A NEWSPAPERS IN EDUCATION SUPPLEMENT

For an accompanying Teacher's Supplement, visit www.LearnAboutAg.org/wgo or call (800) 700-AITC.

TWENTY FIVE YEARS

CALIFORNIA FOUNDATION for AGRICULTURE in the CLASSROOM

Thank a Farmer!

Have you ever stopped to think about where your lunch comes from? Not the cafeteria or your refrigerator at home, but where it really comes from? Your apples and grapes? Your chicken and string cheese? Have you ever wondered where the clothes that you are wearing came from before they were bought at the store? What is your t-shirt made of? Your sweater? Your favorite pair of jeans? What about the paper you write on, the books you read, and the room you're sitting in? All of these things have one thing in common—they were produced with care by a farmer!

Farming sure has changed over the past century! Today's farmer feeds more than eight times as many people as they did 50 years ago. One farmer can feed 155 people around the world! Farmers can be men or women, young or old, representing a wide variety of ethnic groups. Farmers use progressive technology to make sure agriculture products are getting to you fast, fresh, and safe. Today's farmer may even use social media tools to communicate with consumers and market their products. Farmers take on many different roles on the farm, often filling in as accountant, doctor, conservationist, researcher and so much more.

Inside this newspaper, you'll find tons of ways that we depend on farmers and you'll learn about how agriculture is an essential part of our lives. Farmers feed our nation and the world, but they are all local to somewhere. Get to know your local farmers, get to know your food, and don't forget to say "thank you!"

Table of Contents

A message for teachers

For the past nine years, California Foundation for Agriculture in the Classroom has produced ***What's Growin' On?*** to help students discover the ways agriculture impacts their lives every day. This year's edition, ***Farm to School Connections***, is inspired by the farmers and ranchers who provide the daily essentials necessary to make our society and our world function. Farm to School is a national program that connects K-12 schools to local farms with the objectives of serving healthy meals in school cafeterias, improving student nutrition, providing agriculture, health and nutrition education opportunities, and supporting local farmers. The interesting articles, activities, newspaper activities and web resources featured in ***What's Growin' On?*** will help your classroom connect to farms of California. As a teacher, you have the opportunity to introduce your students to the fascinating world around them—including agriculture!

All of our resources are developed by educators and reviewed by leading agriculture industry experts to provide accurate and factual information about each topic. The activities on the following pages meet California Board of Education Content Standards for grades three through eight, while encouraging students to know their farmer, know their food and connect with the world of agriculture!

Have You Heard it Through the Grapevine?

Cultivating an awareness of California table grapes

6000 B.C.

Vitis vinifera grapes (common grape vine) are first cultivated near northern Iran between the Black and Caspian seas.

3000 B.C.

Cultivation reaches Egypt and Phonecia (modern day Lebanon, Syria and Israel).

500 B.C.

Viticulture reaches Spain, Portugal and France, and then spreads across Europe to the British Isles.

1839

Kentucky-native William Wolfskill plants the first table grape vineyard in California.

1849

Colonel Agoston Haraszthy personally brings 100,000 table grape cuttings to California and planted them to provide fruit to the miners of the California gold rush.

1860

English settler William Thompson plants a Mediterranean grape called the "Oval Kishmish" near Yuba City, north of Sacramento. This popular green variety is now known as the Thompson Seedless.

1970

Annual per capita consumption of grapes in the United States reaches 2.5 pounds.

Today

Annual per capita consumption has reached 8.4 pounds. The major table grape growing regions are the San Joaquin and Coachella Valleys. California produces 98% of the nation's commercially grown table grapes.

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

Activity

Test your brain power with a "bunch" of brain busters! All the answers can be found by reading this page.

True or false? Growers harvest grapes when they are fully ripe.

_____

Name one of two California valleys which produce the most table grapes.

_____

_____

Who planted the first table grapes in California? _____

_____

California produces _____ percent of the nation's commercially grown table grapes.

True or false? After harvesting, grapes become significantly sweeter. _____

Answers: 1) True 2) Coachella or San Joaquin Valleys 3) William Wolfskill 4) 98 5) False. Grapes do not sweeten after harvest.

Standards: ELA- **Grade 3:** Reading 1.0, 2.0; **Grade 4:** Reading 1.0, 2.1, 2.2; **Grade 5:** Reading 1.0, 2.0; **Grade 6:** Reading 1.0, 2.0; **Grade 7:** Reading 1.0, 2.0; **Grade 8:** Reading 1.0, 2.0

Growing grapes is a year-round job. In the winter, vines are pruned by hand.

Bud break and a burst of foliage comes next. Shoots emerge, sometimes growing an inch each day!

In early spring, each vine is "girdled" with a cut that channels nutrients from the root to the fruit.

Flowers bloom and make way for tiny green grapes that will eventually ripen into clusters.

Grapes are harvested fully ripe. After they're picked they do not become sweeter.

Once picked, grapes are easily damaged by rough handling, warm temperatures and excess moisture.

A Grape Source of Nutrients

Grapes of all colors make a healthy snack. One serving of grapes (3/4 cup) is just 90 calories, has no fat or cholesterol, and virtually no sodium. Grapes are a source of **potassium**, as well as some calcium and vitamin C.

Activity

Use the information on the nutrition label to determine how many cups of grapes you would need to eat to meet your recommended daily values of vitamin C, potassium and fiber.

Standards: Mathematics- **Grade 3:** Number Sense (NS) 2.4, 3.2; Mathematical Reasoning (MR) 1.2; **Grade 4:** NS 1.5, 3.2; MR 1.2; **Grade 5:** NS 2.3, 2.4, 2.5; MR 1.2, 3.1; **Grade 6:** NS 1.2, 2.1; MR 1.3, 2.7; **Grade 7:** NS 1.2; Measurement and Geometry (MG) 1.3; MR 1.3, 2.8. Health Education- **Grade 4:** 3.2.N; Grade 5: 1.2.N; 3.2.N

Table Grape Nutrition Facts

Serving Size 3/4 cup (126g/4.5 oz.)

Amount Per Serving	
Calories 90	Calories from Fat 0
	% Daily Value*
Total Fat 0g	**0%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0g	**0%**
Sodium 15mg	**1%**
Potassium 240mg	**7%**
Total Carbohydrates 23g	**8%**
Dietary Fiber 1g	**4%**
Sugars 20g	
Protein 0g	
Vitamin A 0% *	Vitamin C 2%
Calcium 2% *	Iron 0%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories	2000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400 mg
Total Carbohydrate		300g	375g
Fiber		25g	30g

Did You Know?

Grapes are actually considered berries with an average of 100 berries per bunch.

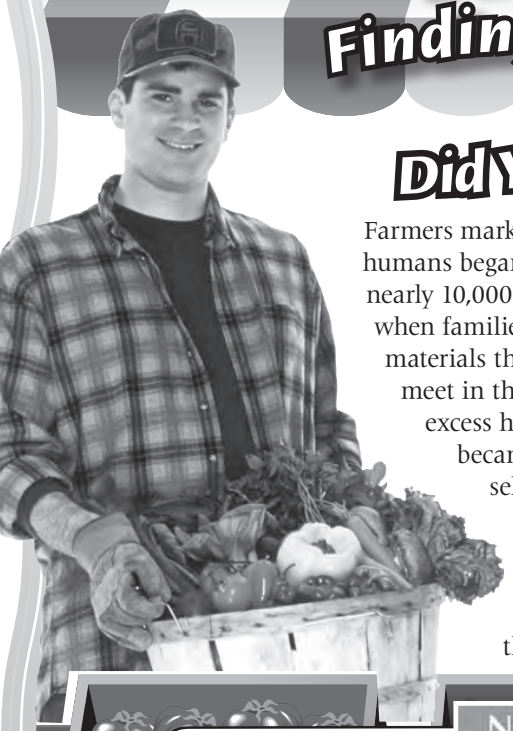
Newspaper Activity

Use your local newspaper to find supermarket ads for grapes. Compare the prices of grapes at five different stores. Determine the mean, median and mode for the given prices.

Standards: Mathematics- **Grade 3:** NS 3.3; **Grade 4:** NS 1.2, 2.1, 3.4; Statistics, Data Analysis and Probability (SDP) 1.2; **Grade 5:** SDP 1.1; **Grade 6:** SDP 1.1

Sources: California Table Grape Commission *www.freshcaliforniagrapes.com*, California Foundation for Agriculture in the Classroom *www.LearnAboutAg.org*, United States Department of Agriculture *www.MyPyramid.gov*

The Farmers Market
Finding Fresh, Unique and Local Products



Did You Know?

Farmers markets have existed since humans began farming the land, nearly 10,000 years ago. Historically, when families produced more food or materials than they needed, they would meet in the town square to sell their excess harvest. Farmers markets became a traditional way of selling local agricultural products. Today, a weekly market day is still part of normal life in villages and town squares throughout the world.

Benefits

For producers: Producers can directly **market** and sell their products, which can **supplement** farm income.

For consumers: Consumers are exposed to locally produced food and the opportunity to interact with the farmers who grew it.

For communities: Farmers markets bring money into the local economy and provide easier access to fresh, nutritious food which may otherwise be limited.

Regulations

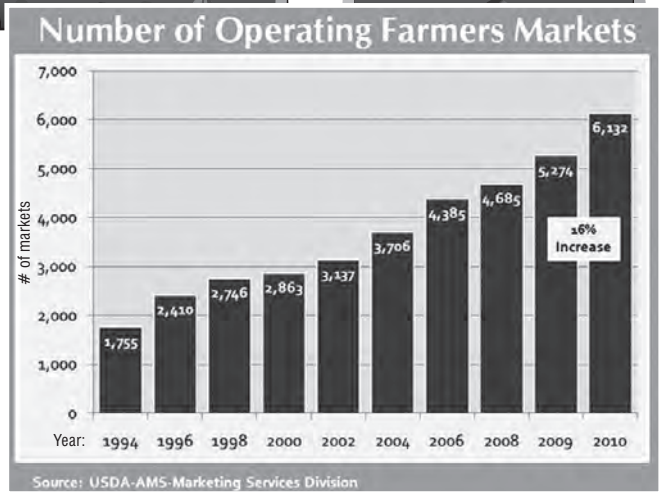
California farmers markets follow a set of rules and regulations to ensure public health and safety. Some examples include:

- Dried fruits and nuts sold unpackaged must be displayed in a covered container.
- All produce and their containers must be stored at least six inches off the ground.
- No live animals allowed within 20 feet of any area where food is stored.
- All produce must meet the California Department of Food and Agriculture (CDFA) quality standards.

For additional regulations, visit *www.LearnAboutAg.org/markets*.

Activity

Calculate the percentage increase for each year of U.S. farmers markets between 1994 and 2010. Predict how many U.S. farmers markets will operate in 2011.



Standards: Math- **Grade 5:** Algebra and Functions (AF) 1.1; Statistics, Data Analysis and Probability (SDP) 1.3; Mathematical Reasoning (MR) 1.0, 2.3, 3.3; **Grade 6:** Number Sense (NS) 1.2m 1.4, 2.3; AF 2.3; SDP 3.2; MR 1.0, 2.4, 3.3; **Grade 7:** NS 1.3, 1.6; MR 1.0, 2.5, 3.3

Are you a Market Master?

Answer the questions below to find out!

1. Rules and regulations at farmers markets ensure public health and ◯◯ _ _ _ _.
2. What is not allowed within 20 feet of any area where food is stored?
   _ _ _ ◯ _ _ _ _ ◯◯ _.
3. _ ◯◯ _ _ _ _ _ ◯ have the opportunity to interact with producers at farmers markets.
4. Use the circled letters above to unscramble and complete the following statement: Farmers markets offer a variety of _ _ _ _ _ _ _ _ products.

Standards: ELA- **Grade 3**: Reading 2.1, 2.3, 2.6; **Grade 4:** Reading 2.2; **Grade 5:** Reading 2.1; **Grade 6:** Reading 2.1

FACT:

California has more than 650 certified farmers markets.

Tech Check

Find a certified farmers market near you by visiting *cafarmersmarkets.com*. How many markets are in your city, county or region?

City:

County:

Region:

Sources: USDA Agricultural Marketing Service *www.ams.usda.gov*, Federation of Certified Farmers' Markets *www.cafarmersmarkets.com*

Know Your Farmer

Introducing the people behind the food

Dave, Mary Ann, Alayna & Matthew Renner
Renner Dairy, Ferndale, CA
Milk produced by 400 Holstein and Brown Swiss cows
Name one healthy dairy product you eat or drink: _____

California farmers are as diverse as the food and fiber they produce! Across the state, men and women have dedicated their lives to growing and raising safe, nutritious and beautiful agricultural bounty.

Photo: California Farm Bureau Federation

Kenny Watkins
Watkins Ranch, Linden, CA
Cattle
Name one product that comes from cattle: _____

Gordon Mizuno
Mizuno Resources, LLC, Tracy, CA
Asparagus
Name two adjectives that describe asparagus: _____
_____

Wilja Happé
Farmers' West Flowers & Bouquets, Inc.
Carpinteria, CA
Cut Flowers and Greens
Name a place where you can buy plants and other nursery products:
_____

Photo: California Farm Bureau Federation

Luawanna Hallstrom
Harry Singh & Sons, Oceanside, CA
Tomatoes
Name one product that contains tomatoes:
_____

To meet more California farmers, please visit www.knowacaliforniafarmer.com.

Newspaper Activity

In your local newspaper, identify a current event that affects farmers. Write a paragraph response summarizing the event and discussing whether it negatively or positively impacts farmers. Examples may include land use, water availability, fuel prices, weather and more.

Standards: ELA- **Grade 3:** Reading 2.1, 2.4; Writing 1.1; Written and Oral English Language Conventions (WOLC) 1.0; **Grade 4:** Reading 2.2; Writing 1.3, 1.8; WOLC 1.0; **Grade 5:** Reading 2.3; WOLC 1.0; **Grade 6**: Reading 2.1, 2.4; WOLC 1.0

Tech Check

Farmers Wear Many Hats

Farmers today wear many "hats"—meaning they take on many responsibilities and must be highly-skilled to be successful. Farmers and ranchers may also be the farm **accountant**, **chemist**, manager, salesperson and multiple other roles! Visit *kids.cfaitc.org/wgo/jobs* to share your ideas about the types of "hats" farmers wear.

Farmer Fun Facts

Match the correct answer to each question.

1. There are more than _____ farms and ranches in California.
2. Families own more than ____% of all California farmland. The rest is owned by non-family corporations.
3. The average size of a California farm is _____ acres.
4. California farmers grow more than ____ different crops and livestock commodities.
5. The average age of the American farmer is _____ years old.

Answers:	97	349	400	57	75,000

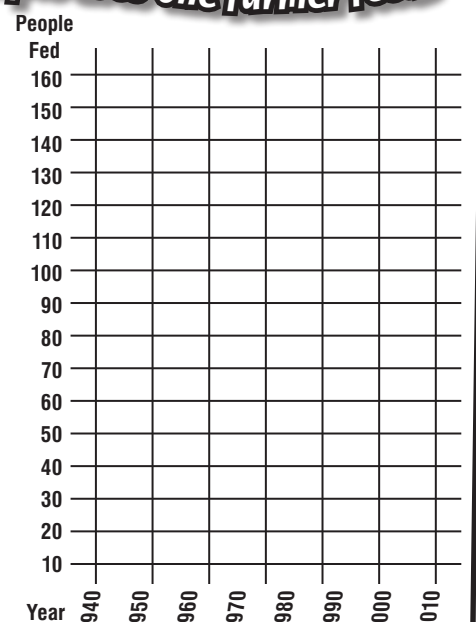
Correct answers: 1. 75,000; 2. 97; 3. 349; 4. 400; 5. 57

How many people does one farmer feed?

America's farmers are the world's most productive. Today, each U.S. farmer produces food and fiber to feed 155 people each year in the U.S. and abroad. Use the chart below to create a graph illustrating changes over the past 70 years.

Year	Number of People Fed
1940	19
1950	27
1960	46
1970	73
1980	115
1990	129
2000	139
2010	155

Source: American Farm Bureau Federation



Standards: Mathematics- **Grade 4:** Statistics, Data Analysis, and Probability (SDP) 1.3; Mathematical Reasoning (MR) 2.3; **Grade 5:** SDAP 1.2; MR 2.3; **Grade 6:** SDAP 2.1, 2.2

Sources: USDA "Know Your Farmer, Know Your Food" *www.usda.gov/knowyourfarmer*, California Country Magazine *www.californiacountry.org*, California Department of Food and Agriculture *www.cdfa.ca.gov*, National Agricultural Statistics Service *www.nass.usda.gov*

All About Organics!

Learning what USDA Organic means

"If your family chooses organic food, chances are good it comes from right here in California, which is the leading farming state in the nation and number one in organic production. Whether it is organic or conventionally grown, don't forget to eat healthy and support California farmers and ranchers."

– Secretary Karen Ross, California Department of Food & Agriculture

Activity

Objectively compare the look, taste, touch and smell of organic and conventionally grown fruits and vegetables. Record your observations in a chart or Venn diagram.

Standards: ELA- Grade 3: Written and Oral English Language Conventions (WOLC) 1.2, 1.8; Grade 7: WOLC 1.3. Mathematics- Grade 3: Mathematical Resoning (MR) 1.1; Grade 4: MR 1.1; Grade 5: MR 1.1; Grade 6: MR 1.1; Grade 7: MR 1.1

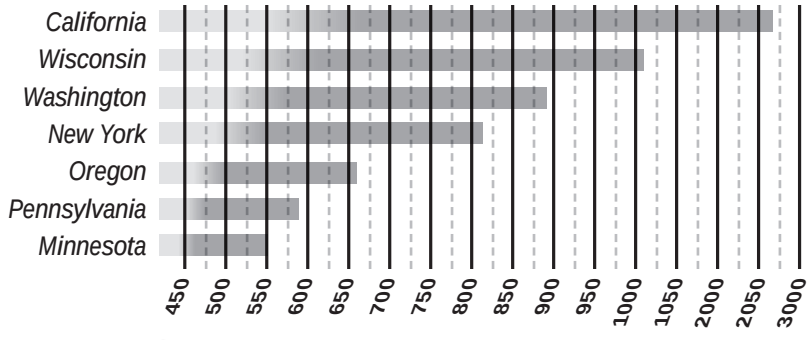
Understanding Organic Labeling

Consumers have many choices when purchasing raw, fresh and processed products. USDA labeling indicates items that contain variations of organic agricultural ingredients.

What it says...	*What it means...*	*What to look for...*
100% Organic USDA ORGANIC	Contains only organic ingredients.	USDA Organic Seal
Organic USDA ORGANIC	Contains 95% or more organic ingredients. Some agriculture products are not commercially available in organic form, so this label allows for exceptions.	USDA Organic Seal
Made with Organic Materials	Contains 70% or more organic ingredients and may list up to three of the organic ingredients on product packaging.	No USDA Organic Seal; cannot use the term "organic" anywhere on the primary display panel.
Less than 70% Organic Materials	Organic ingredients may be present, but not in a large enough quantity for special labeling.	No USDA Organic Seal: cannot use the term "organic" anywhere on the primary display panel.
Natural	For meat and poultry, it means no artificial ingredients or added color and is only minimally processed. For most other products, the claim may be truthful, but it is not regulated.	The term "natural" may be used on the primary display panel.

California Leads the Nation

Nearly 20% of the nation's certified organic farms are in California! Other top states include Washington, Wisconsin, Pennsylvania, Minnesota, Oregon and New York. Use the data illustrated in the graph below to estimate the total number of organic farms in each state and complete the chart.



State	Number of Organic Farms
California	
Wisconsin	
Washington	
New York	
Oregon	
Pennsylvania	
Minnesota	

Standards: Mathematics- Grade 4: Statistics, Data Analysis, and Probability (SDP) 1.1, 1.3; MR 2.3; Grade 5: SDP 1.4; MR 2.3; Grade 6: MR 2.4; Grade 7: MR 2.5

Did You Know?

Many colleges are offering degrees and specialized training in organic or sustainable agriculture. Santa Rosa Junior College offers a degree in Sustainable Agriculture, while Cal Poly, San Luis Obispo gives students the opportunity to work on an 11-acre organic farm while earning a minor in sustainable agriculture. For a complete list, visit *www.nal.usda.gov/afsic/pubs/edtr.*

Sources: USDA Agricultural Marketing Service, *www.ams.usda.gov*; USDA Food Safety and Inspection Service, *www.fsis.usda.gov*

Garbage to Garden Treasure

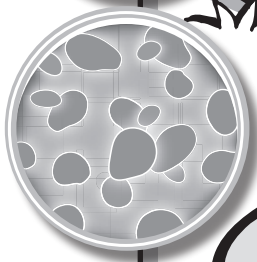
Taking a Closer Look at Compost

Composting is the purposeful decaying of **organic matter**, such as yard and food waste. The decomposition of these materials is performed by living organisms. Compost provides many benefits—when added to soil, it increases nutrient levels, holds water and improves plant growth.

Beneficial Decomposers

Microorganisms: Microscopic organisms that can't be seen with the naked eye. They do the bulk of the early work in the compost pile.

Bacteria: Single-celled organisms that use **nitrogen** and **carbon** (among other nutrients) to grow and reproduce. Bacteria is so abundant, there could be billions in a single handful of soil.



Fungi: Single or multicellular organisms that break down the **cellulose** and **lignin** in a compost pile. Fungi tend to be more present during the final stages of decomposition.

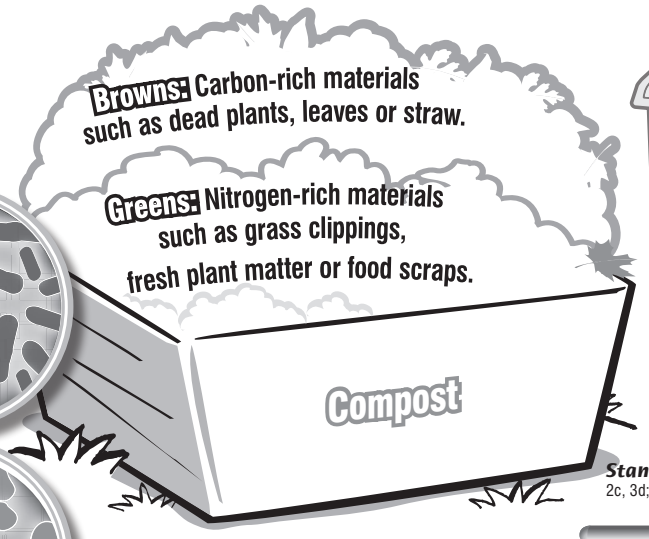
Macroorganisms: Visible decomposers that prefer lower temperatures. They feed on the piles' earlier inhabitants—bacteria.

Springtails: White, blue or black organisms that feast on fungi, mold and decomposing plant material. Approximately 1/16 - 1/4 inch long, springtails can jump using their spring-like tail.

Ants: Insects that make compost richer in phosphorus and potassium by moving minerals from one place to another. Ants feed on fungi, seeds, sweets, scraps, other insects, and sometimes other ants.

What Goes in the Compost Pile?

A healthy compost recipe includes layers of greens and browns. After layering, add water until it is moist, but not saturated. Make sure that the bacteria in your compost gets sufficient air by turning the pile often and well. The more often the pile is rotated, the quicker it will decompose. For best results, create a compost pile in a dry, covered area.



Activity **Identify which items from the list on the right would be added to the compost pile. Sort them by greens, browns or garbage (not suitable for composting). Draw an arrow to the correct layer for each item.**

- Coffee filter
- Plastic bag
- Straw
- Meat
- Oil
- Sawdust
- Dried leaves
- Tea bags
- Fresh grass clippings
- Diseased plant material
- Vegetable peels
- Paper plate
- Shoe laces
- Cheese
- Ashes

Standards: Science- **Grade 3**: 3c; **Grade 4:** 2b, 2c, 3d; **Grade 6**: 5a, 5b, 5c, 5e; **Grade 8**: 6a, 6b

The class uses a 48-inch shovel to turn the compost pile. Determine the length of the shovel in:

Worms _____
Gloves _____
Ants _____
Springtails _____

Hint: Research the approximate length of these items and organisms first.

Standards: Math- **Grade 3:** Algebra and Functions (AF) 1.1, 1.2, 1.4, 2.1; Measurement and Geometry (MG) 1.1, 1.4; Mathematical Reasoning (MR) 1.0; **Grade 4:** AF 1.1; MR 1.0; **Grade 5:** Number Sense (NS) 1.1, 2.1, 2.4, 2.5; AF 1.2; MR 1.0; **Grade 6:** NS 1.3; AF 1.1, 2.1; MR 1.0; **Grade 7:** NS 1.3; MG 1.1; MR 1.0

Have You Heard of Vermicomposting?

Garbage in – food scraps and yard waste make excellent worm food.

Earthworms have five hearts.

Earthworms can eat their weight in food scraps each day.

Earthworms breathe through their skin and have no eyes.

The most common types of earthworms used for vermicomposting are red wigglers.

Castings out – castings are the product of worm digestion and contain concentrated nutrients such as nitrogen, phosphorous, and potassium. Incorporate worm castings into the garden soil for improved plant health!

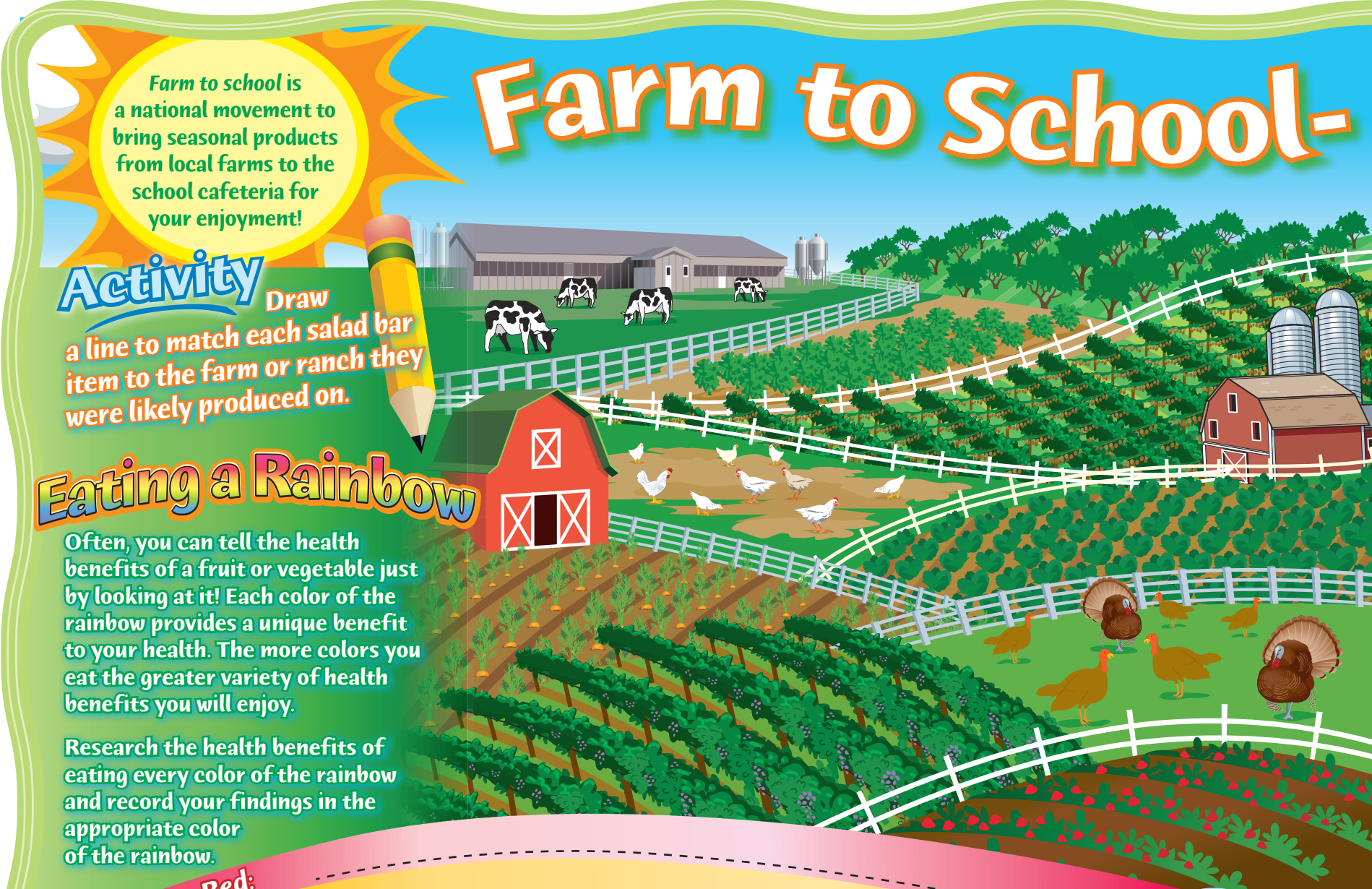
Vermicomposting is a composting technique that primarily uses earthworms as decomposers.

Standards: Science- **Grade 3**: 3c; **Grade 4**: 2c; **Grade 6**: 5c; **Grade 8**: 6a, 6b

Sources: New Mexico State University *www.nmsu.edu*, Life Lab *www.lifelab.org*

Farm to School-

Farm to school is a national movement to bring seasonal products from local farms to the school cafeteria for your enjoyment!



Activity

Draw a line to match each salad bar item to the farm or ranch they were likely produced on.

Eating a Rainbow

Often, you can tell the health benefits of a fruit or vegetable just by looking at it! Each color of the rainbow provides a unique benefit to your health. The more colors you eat the greater variety of health benefits you will enjoy.

Research the health benefits of eating every color of the rainbow and record your findings in the appropriate color of the rainbow.

Red: _____

Orange/Yellow: _____

Green: _____

Blue/Purple: _____

White:

_____

_____

_____

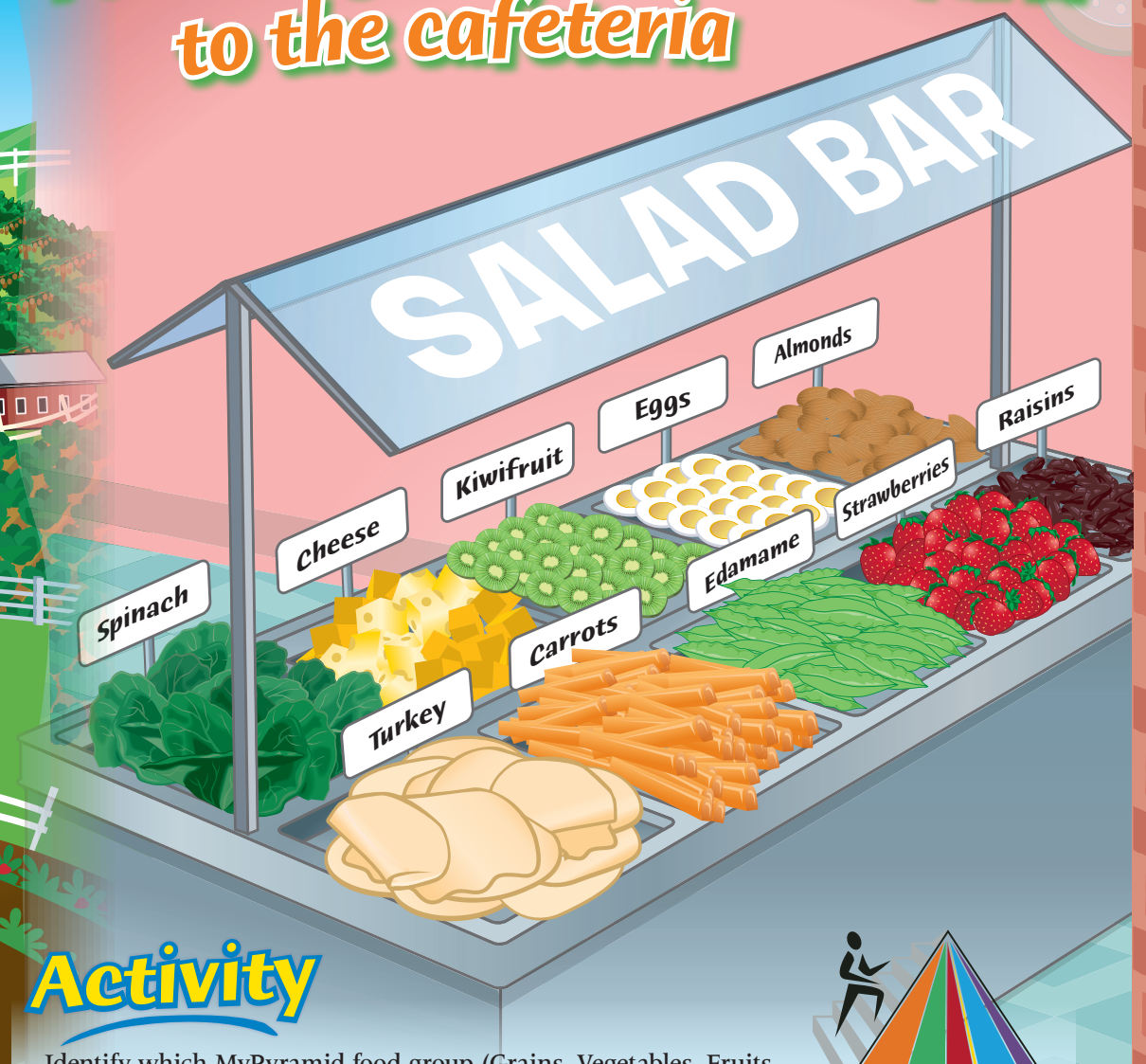
Create a plan to eat at least one fruit or vegetable from each color group this week:

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

Did You Know? More than 30 million children eat school food five days a week, 180 days a year. What do you think would happen if these students had more access to nutritious and fresh agricultural products?

Standards: Health Education- **Grade 4:** 1.1.N, 1.3.N; 6.1.N; 7.1.N; **Grade 5:** 1.8.N, 1.9.N; 5.1.N; 6.1.N; **Grade 7 and 8:** 1.1.N, 1.2.N; 5.1.N; 6.1.N; 7.1.N

Following food from the farm to the cafeteria



Activity

Identify which MyPyramid food group (Grains, Vegetables, Fruits, Milk, Meat & Beans) each salad bar item belongs to. Write the food group, along with the recommended daily serving, under each item.

MyPyramid.gov
STEPS TO A HEALTHIER YOU

Food group:	Food group:	Food group:	Food group:	Food group:
Recommended daily serving:	Recommended daily serving:	Recommended daily serving:	Recommended daily serving:	Recommended daily serving:

Standards: Health Education- **Grade 4:** 1.2.N; **Grade 5**: 1.1.N. Science- **Grade 3:** 1b; **Grade 4:** 2a

Newspaper Activity
I Have the Power!

In the cafeteria, and at home, you have the power to make positive choices about what you eat and drink. As a class, discuss what makes a food healthy. Scan the ads from a local newspaper and select healthy foods from each food group. Cut out and glue your food choices, at least one from each group, to a paper plate to create a nutritious meal. Challenge: Make separate plates for breakfast, lunch, dinner and a snack that represent your recommended servings from each group.

Standards: Health Education- **Grade 4:** 1.2.N; 5.1.N; 7.1.N, 7.2.N, 7.3.N; **Grade 5:** 1.1.N, 1.6.N; 5.1.N; 7.1.N; **Grade 7 and 8:** 7.1.N. Visual Arts- **Grade 5:** 2.5; **Grade 6:** 2.5; **Grade 8:** 2.5

Imagine this...

One way to bring fresh fruits and vegetables to school is by growing them in a school garden! In "Amy's School Garden," a young girl grows a bountiful garden so that her school has healthy and nutritious food to eat, fresh from the garden. This award-winning story by seventh-grader Ciara Chiesa, can be viewed at *www.LearnAboutAg.org/imaginethis/garden*.

Physical Activity

Physical activity is another key component to a healthy body. Physical activity must be moderate or *vigorous* to provide health benefits. In the space provided, draw a picture of yourself being *inactive*. Next to that drawing, create a picture of a physical activity you could choose to do instead. As a class, share the benefits of choosing to be physically active.

Inactivity	Physical Activity

Standards: Health Education- **Grade 4:** 1.3.N, 1.7.N, 1.8.N; 5.2.N; **Grade 5**: 1.11.N; 5.2.N; **Grade 7 and 8:** 1.14.N, 1.15.N;5.2.N, 5.4.N; 6.1.N

Sources: National Farm to School Network, www.farmtoschool.org; www.mypyramid.gov; Network for a Healthy California, www.harvestofthemonth.com

Do You Relish Condiments?

Discovering America's Favorites: Mustard, Ketchup and Relish

Mustard grows on plants that can reach ten feet tall. Bearing bright yellow flowers, mustard plants produce tiny seeds in a pod, much like beans or peas. These seeds are harvested and crushed to create the popular condiment. Once crushed, a cold liquid such as vinegar, water or wine (or a combination of these) is added, along with salt and spices. Some mustards are simmered, then cooled. Other mustards are stored and aged over time.

Did You Know?

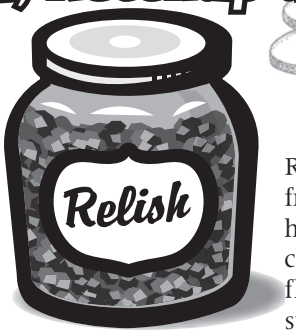
Historically, mustard was known for its medicinal purposes before its modern **culinary** use. Ancient civilizations used it for muscle pain, toothaches, indigestion and to increase blood circulation. More recent folklore suggests sprinkling mustard powder in socks to prevent frostbite.

In the 1600s Dutch and British sea merchants brought back a salty pickled fish sauce called 'ketsiap' from China. The original ketchup was more similar to soy or oyster sauce. The British were the first to begin calling the condiment "catsup." Colonial Americans borrowed and tinkered with British catsup recipes, creating mushroom and walnut-based versions. In the mid-nineteenth century, **entrepreneurs** created a product that appealed to Americans' taste for sweet foods and sold catsup made with tomatoes, vinegar, sugar, cinnamon, cayenne and salt. The Heinz Company was the first to commercially produce ketchup in the 1870s.

Activity

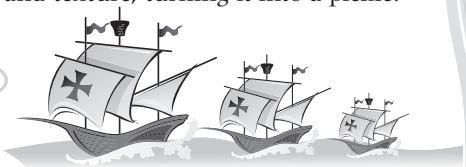
Sarah Josepha Hale was a cookbook writer who developed recipes for walnut and tomato ketchup. Research this historical figure and write a summary about her contributions to American society.

Standards: ELA- **Grade 3**: Writing 1.3; **Grade 4:** Writing 1.2; **Grade 5:** Writing 1.2, 1.6; **Grade 6:** Writing 1.2; **Grade 7:** Writing 2.3; **Grade 8:** Writing 2.3



Relish refers to individual fruits or vegetables that have been sliced, diced and chopped into small bits and flavored with vinegar, salt, sugar and spices. One of the most common types of relish is pickle relish. Pickles are actually fermented cucumbers. When you ferment a cucumber, you allow special bacteria to grow in the jar. These "good" bacteria do not cause spoilage in cucumbers. Rather, by producing acid and eating the cucumber's sugars, these bacteria change the vegetables flavor and texture, turning it into a pickle!

Did You Know?



Pickles played an important role in Colombus' discovery of America in 1492. Around the time of Colombus, many ship crews suffered from scurvy, a disease caused by lack of vitamin C. Colombus' ship stocker, a man named Amerigo Vespucci, stored ample quantities of vitamin C-rich pickles on the Niña, Pinta and Santa Maria, helping to prevent scurvy outbreaks on the historic voyage across the Atlantic. Our nation's name is derived from the pickle merchant Vespucci, who later became an explorer.

In one year, visitors to New York's Yankee Stadium consumed more than 1,600 gallons plus 2,000,000 packets of mustard.

Although Henry Heinz had developed 60 products by 1896, he used the slogan "57 Varieties" because he thought 57 was a lucky number. Today the company has more than 5,700 products around the world.

A rundown, also called a pickle, is a situation in baseball that occurs when the base runner is stranded between two bases and is in jeopardy of getting tagged out.

Nearly every American household (97%) has a bottle of ketchup in the fridge.

Tech Check

Visit *www.exploratorium.edu/cooking/pickles* to enter a virtual kitchen and try your hand at making pickles from scratch, starting with a fresh cucumber. Click on "Experience the Thrill of Pickle Making."

Newspaper Activity

Select a **condiment** company and follow them for four weeks on the stock market. Record the stock prices, at regular intervals, on a chart. Use the information about the stock price to create a line graph. Draw a trend line. If this trend continues, what will the stock price be in another week?

Standards: Mathematics- **Grade 4:** Statistics, Data Analysis, and Probability (SDP) 1.0; Mathematical Reasoning (MR) 3.0; **Grade 5:** SDP 1.0; MR 3.0; **Grade 6:** SDP 1.0; MR 3.0

Sources: Exploratorium *www.exploratorium.edu,* H.J. Heinz Company *www.heinz.com*

What's Bugging You?

Identifying garden visitors and learning about integrated pest management

Integrated pest management (IPM) is a method for controlling pests at home, at school or on the farm. IPM uses a variety of strategies which may include introducing beneficial insects, altering the growing environment, observing insect life cycles and applying pesticides when needed.

Why do we control pests?

Some garden visitors are beneficial or harmless, while others may be troublesome or harmful. These troublesome pests need to be controlled in order to keep our environment healthy and our food abundant and safe.

How do we control pests?

There are many ways to control pests. Here are a few examples of IPM strategies:

- Plant a resistant plant variety that is not attacked by the pest.
- Put down a layer of chipped-bark mulch to control weeds.
- "Pest-proof" your environment by keeping it clean, sealed and well-maintained.
- Introduce beneficial bugs that will help control harmful bugs.
- Apply environmentally-safe **pesticides** when other methods are unsuccessful. Try materials such as soaps and oils.

Bug Walk

As a class, walk around the school and collect a variety of insect species. Upon returning to the classroom, identify the species and determine if they are beneficial or harmful insects. For tips on collecting and identifying bugs, visit *extension.entm.purdue.edu/4hyouth*.

Source: Purdue University, *www.ag.purdue.edu*; University of California Cooperative Extension, *ucanr.org;* U.S. Environmental Protection Agency, *www.epa.gov*

Beneficial vs. Harmful

Determining which bugs help and which bugs hurt.

Beneficial	Harmful
You find ladybugs crawling on your tomato plants, feasting on aphids.	You have weeds growing in your newly planted vegetable garden.
Bees are buzzing around your garden pollinating the blossoms of trees and shrubs.	The lettuce plants in your school garden are being eaten by slugs.
Some lettuce growers plant flowering plants such as sweet alyssum between rows to provide pollen and nectar for syrphid flies, which feed on and eliminate harmful aphids.	Aphids are sucking the liquid from the leaves and buds of your beautiful rose bushes.

Source: University of California Integrated Pest Management *www.ipm.ucdavis.edu*

Activity

Write your own examples in the chart provided. Include one beneficial and one harmful pest. Use additional resources to conduct further research. ***Standards:*** ELA- **Grade 3:** Writing 2.2; **Grade 4:** Writing 2.1

Sensational Synonyms

A synonym is a word that can be interchanged with another word without changing the meaning of the text. Use the vocabulary box to identify synonyms for "harmful." Also identify synonyms for "beneficial."

Detrimental	**Negative**	**Positive**
Destructive	**Advantageous**	**Damaging**
Useful	**Effective**	

Harmful	Beneficial
1.	1.
2.	2.
3.	3.
4.	4.

Did You Know?

People who study the life cycle, *classification* and habits of insects are called *entomologists*.

Standards: Science- **Grade 3:** 3a; **Grade 4:** 2b; **Grade 6:** 5c, 5d

Standards: ELA- **Grade 3:** Reading 1.4, 1.7, 1.8; **Grade 4:** Reading 1.2, 1.3, 1.5; **Grade 5:** Reading 1.2, 1.3

Seasonal Cycles

Buying and Eating Seasonally

What does "in season" mean?

Eating with the seasons means you are buying and consuming fruits, nuts and vegetables soon after they are harvested. To find out if you are eating food that is in season, visit *www.LearnAboutAg.org/seasonal*.

Seasonal Super Sleuth

It doesn't take a magnifying glass to determine if a product is in season. Here is a simple checklist that will lead you to finding seasonal produce in the grocery store.

- ✓ "CA Grown" label: Because of diverse **microclimates** and an excellent water transportation system, California farmers produce more than 400 different crops and livestock commodities. If it's grown in California and available, it's likely in season.

- ✓ Price: In peak season, products will flood the market, driving down prices. Sales often lead super sleuths to in-season produce.
- ✓ Availability and abundance: If a product can be found in most grocery stores and is available in multiple varieties by several different growers, it usually is in season.
- ✓ Your farmers market: Farmers markets generally sell local produce, so you can ensure the products there are in season for your location.

Activity

Monitor the price of a seasonal fruit or vegetable over time. Create a comparison chart to determine if the price reflects the seasonality of the produce. Monitor the price using newspaper ads and online resources or take a visit to the store.

Preserve it!

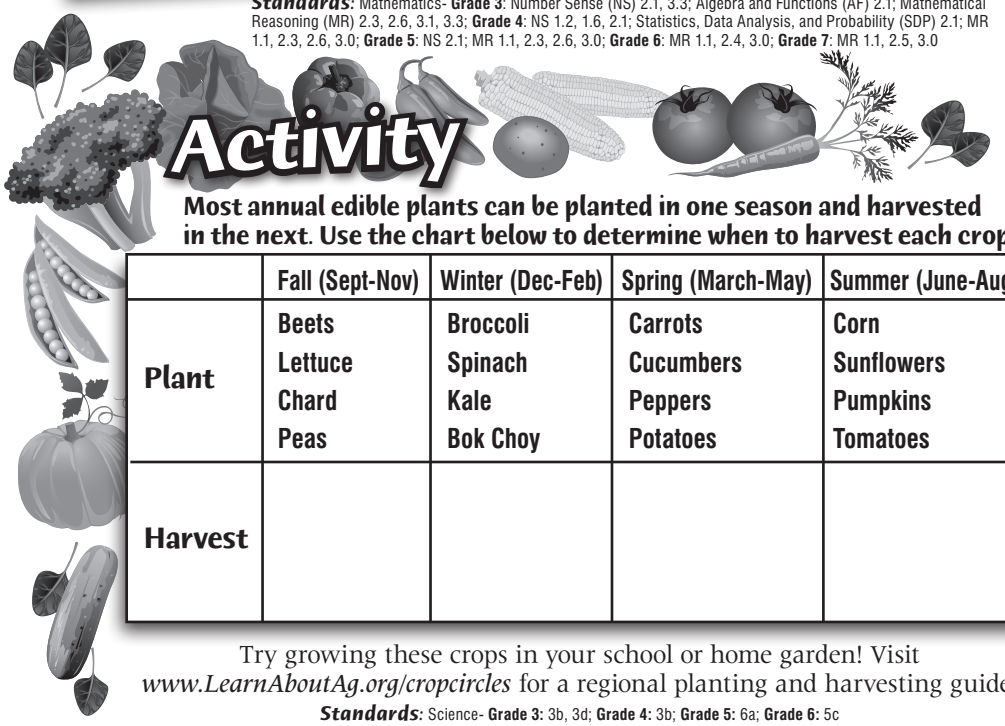
Many fresh fruits and vegetables can be picked in season and **preserved** for later enjoyment. Fresh, frozen, canned, dried or 100% juice—you can enjoy the taste of seasonal fruits and vegetables year-round.

Activity

Choose a fruit or vegetable and research ways it can be preserved. Create a poster-sized flow chart that illustrates the process of preservation. Present your poster and findings to your class.

Standards: ELA- **Grade 3:** Listening and Speaking (LS) 1.5, 1.7, 1.8, 2.0; **Grade 4:** LS 1.4, 2.0; Written and Oral English Language Conventions (WOLC) 1.1; **Grade 5:** LS 1.0, 1.4; **Grade 6:** Reading 2.1; Writing 1.4; LS 1.7, 2.0; **Grade 7:** Reading 2.2; LS 1.0, 2.0, 2.3; **Grade 8:** LS 1.0, 1.9, 2.3

Standards: Mathematics- **Grade 3**: Number Sense (NS) 2.1, 3.3; Algebra and Functions (AF) 2.1; Mathematical Reasoning (MR) 2.3, 2.6, 3.1, 3.3; **Grade 4**: NS 1.2, 1.6, 2.1; Statistics, Data Analysis, and Probability (SDP) 2.1; MR 1.1, 2.3, 2.6, 3.0; **Grade 5**: NS 2.1; MR 1.1, 2.3, 2.6, 3.0; **Grade 6**: MR 1.1, 2.4, 3.0; **Grade 7**: MR 1.1, 2.5, 3.0



Activity

Most annual edible plants can be planted in one season and harvested in the next. Use the chart below to determine when to harvest each crop.

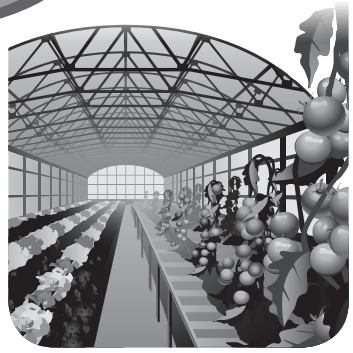
	Fall (Sept-Nov)	Winter (Dec-Feb)	Spring (March-May)	Summer (June-Aug)
Plant	Beets Lettuce Chard Peas	Broccoli Spinach Kale Bok Choy	Carrots Cucumbers Peppers Potatoes	Corn Sunflowers Pumpkins Tomatoes
Harvest				

Try growing these crops in your school or home garden! Visit *www.LearnAboutAg.org/cropcircles* for a regional planting and harvesting guide.

Standards: Science- **Grade 3:** 3b, 3d; **Grade 4:** 3b; **Grade 5:** 6a; **Grade 6:** 5c

Did You Know?

Greenhouse climates are controlled by fans and heaters to create an environment that can extend the typical growing season. These products are still considered in season!



Sources: Life Lab *www.lifelab.org*, California Department of Food and Agriculture *www.cdfa.ca.gov*

Pick it, Prep it, Cook it

Cooking with fresh produce year-round

Spring

Roasted Asparagus (Serves 3-4)

1 bunch asparagus
2 tbsp. olive oil
1 tbsp. minced garlic
¼ cup parmesan cheese

Preheat oven to 400˚F. Clean asparagus and remove tough ends. Lay asparagus on a lightly greased baking sheet. Sprinkle with olive oil, **minced** garlic and parmesan cheese. Roast at 400˚F for 5-10 minutes.

Winter

Breakfast Frittata (Serves 6)

6 eggs
1/2 cup milk
1 cup shredded Cheddar cheese
1 cup chopped chard leaves (remove **veins** and stems)
1/4 teaspoon salt
1/8 teaspoon pepper
1 tablespoon chopped fresh oregano
1 tablespoon chopped fresh basil

Heat oven to 350 degrees F. Beat eggs, milk, salt and pepper in medium bowl until blended. Add cheese, chard, oregano and basil; mix well. Spoon evenly into 12 muffin cups with liners, about 1/4 cup each. Bake in 350 degrees F oven until just set, 20 to 22 minutes. Cool on rack 5 minutes. Remove from cups; serve warm.

Summer

Mint and Honey Fruit Salad

(Serves 4)

2 peaches
2 plums
2 cups strawberries
½ cup mint
½ cup honey

Clean and cube peaches, plums and strawberries. Place fruit in bowl. **Steep** mint in 1 cup hot water. Remove mint leaves from water and discard. Add honey to hot water. Mix well and let cool. Toss fruit with honey dressing.

Fall

Stir Fry (Serves 5-8)

1 head of celery
3 carrots
1 bunch of broccoli
2 tbsp. olive oil
½ cup water
2 tbsp. soy sauce
1 tbsp. minced garlic

Chop vegetables. Heat the oil in a large frying pan. When oil is hot, add vegetables, water, soy sauce and garlic. Cook for approximately five minutes. Vegetables should soften slightly when done.

Activity

Create a list of adjectives that describe the appearance, smell, taste and texture of the recipe you prepared.

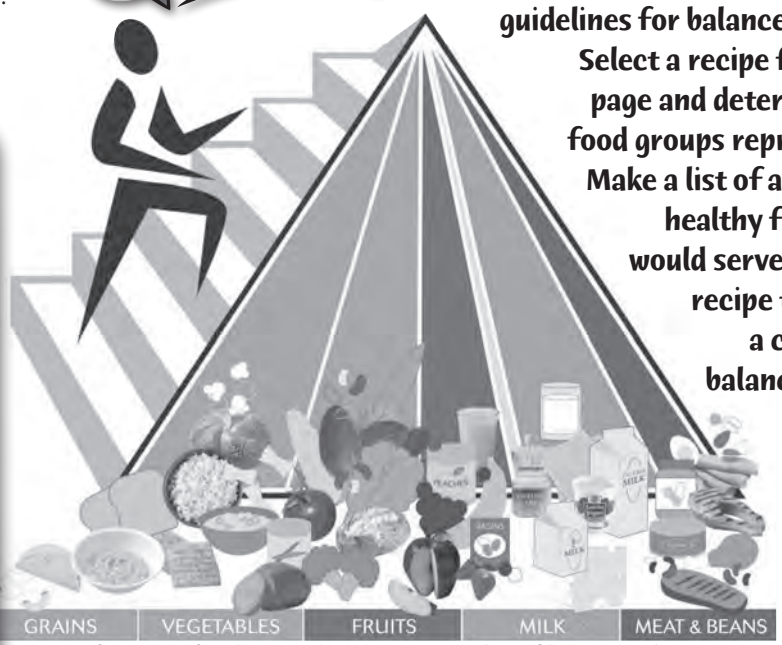
Standards ELA- **Grade 3:** Written and Oral English Language Conventions (WOLC) 1.2, 1.8; **Grade 7**: WOLC 1.3

Did You Know?

According to the *World Health Organization*, more than 200 diseases are spread through food. Do your part by cleaning hands and surfaces often, cooking to proper temperatures, refrigerating promptly, and separating meat (and their juices) from other foods.

Activity

What makes a well-balanced meal? MyPyramid offers nutritional guidelines for balanced eating. Select a recipe from this page and determine the food groups represented. Make a list of additional healthy foods you would serve with the recipe to create a complete, balanced meal.



Sources: United States Department of Agriculture *www.mypyramid.gov,* UC Davis *www.ucdavis.edu,* World Health Organization *www.who.int,* Junior Chef Central *jrchefcentral.com*

Standards: Health Education- **Grade 4:** 1.2.N; **Grade 5**: 1.1.N, 5.1.N

Activity To Make More... or Less?

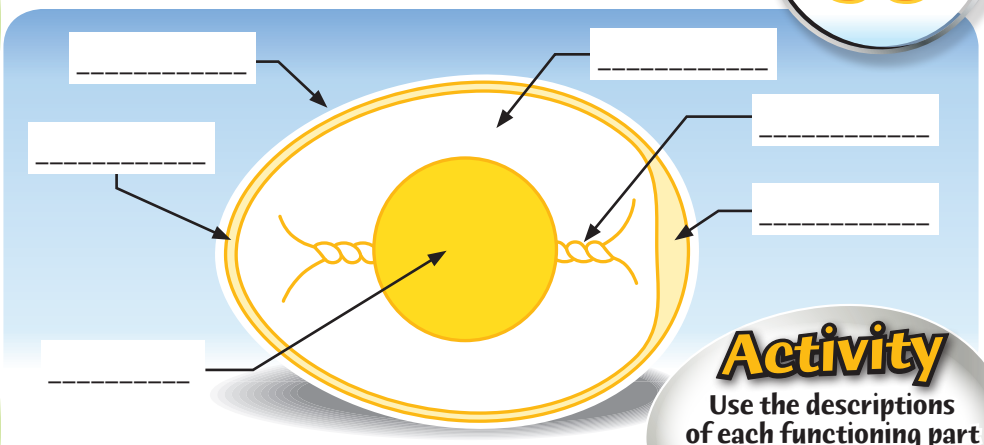
You're having friends over to share a healthy meal. Select a recipe from this page and double it to accommodate for the extra guests. How much of each ingredient will you need?

Oh no! You just found out many of your friends can't make it. Copy using the original recipe and divide it in half to serve a smaller group.

Standards: Math- **Grade 3:** Number Sense (NS) 2.1, 2.8, 3.2; **Grade 4:** NS 2.1; **Grade 5:** NS 2.2, 2.3, 2.4,2.5; **Grade 6:** NS 2.1, 2.2, 2.3

Poultry Power

Investigating chicken eggs



Activity

Use the descriptions of each functioning part to label the egg.

Standards: Science- **Grade 3**: 3a; **Grade 6**: 5c; **Grade 8**: 3b

Anatomy of an Egg

Like all living things, eggs consist of functioning parts that protect the egg and provide nutritional benefits for us!

Shell: Made mostly of calcium carbonate ($CaCO_3$) and covered with more than 17,000 **pores**, the shell provides protection.

Shell membrane: Two strong transparent **membranes** protect the egg. Made partly of keratin, a protein that's also in human hair.

Yolk: The yellow portion of the egg is a major source of iron, vitamin A, vitamin D, phosphorous, calcium, thiamine and riboflavin.

Albumen: Commonly known as the "egg white," the albumen contains approximately 40 different proteins.

Air cell: A pocket of air caused by the **contraction** of the contents while the egg cools after being laid.

Chalazae: This cord-like strand anchors the egg yolk in the center of the white.

Activity

The Incredible Nutritional Egg

Research the health benefits of the nutrients listed below. Record your findings.

Iron: _____

Vitamin A: _____

Vitamin D: _____

Phosphorus: _____

Calcium: _____

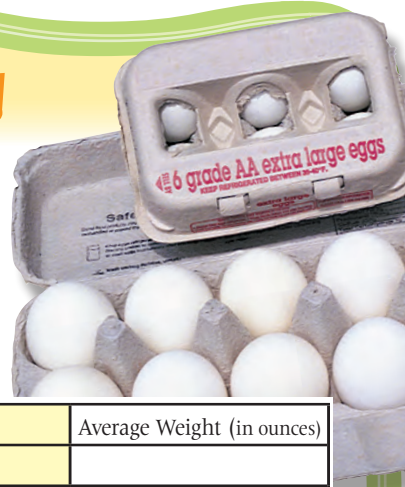
Thiamine: _____

Riboflavin: _____

Protein: _____

Standards: Health Education- **Grade 4:** 1.1.N, 1.4.N, 1.5.N; 7.3.N; **Grade 5:** 1.5.N; **Grade 7 and 8**: 1.2.N, 1.4.N, 1.7.N; 7.2.N

Eggs... sized-up!



Egg size, typically noted on the carton, tells consumers the minimum required weight for a dozen eggs. Use the information given to determine the average weight of each egg. Represent your answer in decimal form, round to the nearest 10th.

Size	Weight Per Dozen	Average Weight (in ounces)
Jumbo	30 ounces	
Extra Large	27 ounces	
Large	24 ounces	
Medium	21 ounces	
Small	18 ounces	
Peewee	15 ounces	

Standards: Mathematics- **Grade 3:** Number Sense (NS) 2.5; Measurement and Geometry (MG) 1.1; Mathematical Reasoning (MR) 2.3; **Grade 4:** NS 1.2, 3.2, Algebra and Functions (AF) 1.4; **Grade 5:** NS 2.3; AF 1.1; Statistics, Data Analysis, and Probability (SDP) 1.1; MR 2.6; **Grade 6:** NS 2.0; AF 1.0; **Grade 7:** MG 1.0

Did You Know?

California produced approximately 5.3 billion eggs in 2009, ranking it 5th in the nation for egg production.

Egg Folklore

Myths from China, Egypt, Finland and India credit eggs with the creation of Earth.

Ancient Persians were the first people known to exchange eggs dyed in festive colors to celebrate summer equinox.

In France, red eggs were offered to ensure a good harvest.

Mexico has a tradition of cracking confetti-filled eggs on people's head to celebrate birthdays.

The Navajos of North America believed that a sacred figure, the Great Coyote Who Formed in the Water, hatched from an egg.

Activity

Locate the countries referenced in "Egg Folklore" on a class map.

Standards: History-Social Science- **Grade 3:** 3.2.1. ELA- **Grade 3**: Reading 3.2l **Grade 4:** Reading 3.1

Did You Know?

The risk of getting a foodborne illness from eggs is very low. However, you can protect yourself from Salmonella, a bacteria that may be found in eggs, by cooking eggs and egg dishes to 160° or until firm.

Sources: National Agricultural Statistics Service *www.nass.usda.gov*, Exploratorium *www.exploratorium.com*, USDA Agricultural Marketing Service *www.ams.usda.gov*, American Egg Board *www.aeb.org*

What's Growin' On? Glossary

Defining terms that are a farmer's fundamentals

Accountant: Someone who maintains and balances business accounts.

Carbon: An elemental building block of molecules that make up all organisms on Earth. Carbon is stored in plant tissues through photosynthesis and is emitted back into the atmosphere through respiration.

Cellulose: A substance which makes up the essential parts of tissues and fibers in plants, wood, linen and paper.

Chemist: A scientist who specializes in chemistry.

Classification: The act of distributing things into classes or categories of the same type.

Climate: The general atmospheric conditions for a location; including rainfall, temperature, humidity, etc.

Condiment: A relish, sauce or seasoning added to food to enhance a flavor or to complement the dish.

Contraction: The act of decreasing in size, volume, quantity or scope.

Conventional: A type of agriculture system that generally relies upon technological innovations, uniform crops and labor efficiencies to achieve a high yield.

Culinary: Related to, or connected with, cooking or kitchens.

Decomposition: The process by which tissues of dead organisms break down into simpler forms of matter.

Entrepreneur: Someone who organizes a business venture and assumes the risk for it.

Foliage: A cluster of leaves.

Greenhouse: A building made of glass or plastic; for growing plants under controlled conditions.

Inactive: Lacking activity or motion.

Lignin: A naturally occurring glue-like compound that is found in trees and certain plants. Lignin binds wood fibers together.

Market: To engage in the commercial promotion, sale, or distribution of a product.

Membrane: A thin skin-like layer or film.

Microclimate: A local atmospheric zone where the climate differs from the surrounding area.

Mince: A cooking technique in which food ingredients are finely chopped.

Nitrogen: A nutrient essential to living things like plant growth and building proteins. Often added to agricultural and garden soils.

Organic matter: The residues of dead plants and animals in various stages of decomposition.

Pesticides: A method used to eliminate pests, especially insects.

Phosphorus: A chemical element found in soil in various mineral forms, but only small amounts are readily available to plants at any one time. It stimulates early growth and root development.

Pore: A tiny hole, or mass of holes, that allow passage of a liquid or gas.

Potassium: A nutrient essential to all living things. Potassium aids water uptake and pest resistance in plants; muscles and blood circulation in animals.

Preserve: To treat food in a way that prevents it from spoiling.

Repel: To put off or force away.

Steep: To let sit in a liquid to extract a flavor.

Supplement: Something that completes or makes an addition.

Vein: A vascular bundle that conducts nutrients and supports tissues in a leaf or other plant organ.

Vigorous: A forceful and energetic action or activity.

Activity

Choose five words from the glossary and write the words on the numbered lines. Find each word in the dictionary and write the guide words for that page in the area provided.

Glossary Words	Guide Words	
1._____	_____	_____
2._____	_____	_____
3._____	_____	_____
4. _____	_____	_____
5. _____	_____	_____

Resources:

American Egg Board
www.aeb.org

California Certified Farmers' Markets
www.cafarmersmarkets.com

California Department of Food and Agriculture
www.cdfa.ca.gov

California Farm to School
www.cafarmtoschool.org

California Table Grape Commission
www.freshcaliforniagrapes.com

Exploratorium
www.exploratorium.edu

Know Your Famer, Know Your Food
www.usda.gov/knowyourfarmer

Life Lab Science Program
www.lifelab.org

MyPyramid
www.mypyramid.gov

National Agricultural Statistics Service
www.nass.usda.gov

National Farm to School Network
www.farmtoschool.org

Network for a Healthy California
www.harvestofthemonth.com

New Mexico State University
cahe.nmsu.edu

To request a free ***What's Growin' On?*** Teacher's Supplement that will enhance the use of this newspaper, visit *www.LearnAboutAg.org/wgo* or call (800) 700-2482.

Standards: ELA- **Grade 3**: Reading 2.7; Writing 1.3; **Grade 4**: Reading 2.2

Fantastic Facts!

Approximately 92,000 named species of insects exist in the United States and Canada.

Last year, the average American ate 246 eggs.

California produces 98% of the fresh grapes grown in the United States.

If left alone, a grapevine will spread 50 feet or more.

Acknowledgements

California Foundation for Agriculture in the Classroom (CFAITC) is a 501(c)(3) not-for-profit organization dedicated to increasing the awareness of and appreciation for the safe, fresh and abundant agricultural products we are fortunate to enjoy in California. The Foundation provides free and low cost standards-based resources, training opportunities and K-12 classroom materials that enhance regular classroom instruction.

Contact CFAITC or visit *www.LearnAboutAg.org* for:

- Resources and lesson plans
- *What's Growin' On?* Teacher's Supplement
- Story-writing contest
- Upcoming conferences
- Newsletters
- Kids' Corner *(kids.cfaitc.org)*

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