

Roots and Fruits



A Fresh from the Farm
Elementary School Curriculum



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Roots and Fruits

Foreword

Chapter 1



Foreword

Our food has a story. Yet so often in today's fast-food, convenience culture, children and families lose sight of where their food comes from. Childhood obesity rates are rising, and the majority of children do not consume enough fruits and vegetables each day. But change is possible. Food education curricula and farm-to-school programs like *Fresh from the Farm* help students make connections between healthy bodies and a healthy environment. Studies show that a nutrient-rich diet contributes to a child's health, capacity to learn and overall well being.

Dedicated teachers, parents, and community members have the opportunity to affect change by educating children about healthy eating and where our food comes from. Knowledge of our food system helps children to be responsible consumers, enables the development of a healthier citizenry and builds stronger communities. The *Roots and Fruits* curriculum empowers teachers and schools to help children learn to savor and appreciate fresh foods, guiding them to develop healthy eating habits that will last a lifetime.

Curriculum overview

More than ever, children need to connect caring for their bodies with caring for the natural environment that sustains us all. This quiet but powerful concept is at the core of *Fresh from the Farm*, whose mission is to encourage a culture of healthy eating and environmental awareness among children.

In a study published by Occidental College, it was found that *Roots and Fruits*, which combines classroom curriculum, school gardens, organic farm tours, school lunch reform, and whole school wellness strategies, had a positive impact on children's diet and consumption of fruits and vegetables. Noted by teachers as being an "excellent program," *Roots and Fruits* lessons have been a successful addition to classroom curriculum throughout the Chicago metropolitan area since 2004.

Methodology

experiential Learning

The *Roots and Fruits* curriculum addresses themes of the environment, local farms and our food system, nutrition and health, and experiencing food with our senses. The learning styles of all students are met within the lessons by incorporating the use of visual tools, hands-on activities, and sensory tastings.





In each lesson students will...

- Identify the unique qualities of different varieties of one fruit or vegetable
- Investigate the seasonality and cultivation of a specific food
- Explore the nutrients and health benefits provided by the fruit or vegetable
- Taste the fruit or vegetable as a class

tastings

In each lesson students are encouraged to eat a colorful array of fruits and vegetables in order to provide them with a variety of essential nutrients. As in any other classroom activity, respect is key to successful lesson. Teachers are encouraged to create an atmosphere of respect—for all people in the classroom and for the food we eat. This can be done by encouraging students to try new fine foods.

Food Safety

Teachers should consider any food allergies among their students before serving the featured fruit or vegetable. Before and after each lesson, students should wash their hands. Fruits and vegetables should always be washed before serving.

Materials

Teaching tools enhance the *Roots and Fruits* lessons by engaging all learners in each lesson. By providing visual aids and interactive materials, students can make deeper connections with the material presented. The following are teaching tools that can be incorporated in *Roots and Fruits* lessons.

- **U.S. Map:** The U.S. map allows students to visualize where the different foods come from each week. This can be a perfect opportunity to address geography learning standards by incorporating map language, discussing regions of the US, and other relevant geography concepts.
- **Nutrient Chart:** The Nutrient Chart re-emphasizes the nutrients found in each color group of foods.
- **human Body diagram:** The Human Body Diagram creates visual connections between specific foods and the part of the body the foods benefit. Students begin to develop a better understanding of the location of specific body parts and the ways that nutrient-rich foods help the body.
- **Seasonality Calendar:** With this calendar, students begin to see the patterns of fresh fruit and vegetable seasonality and availability.





- **Food Manipulatives:** The brightly colored fruit and vegetable cards are fun for students to place on the various maps and charts.
- **Student workbooks:** *Roots and Fruits* workbooks guide students through the lessons and allow them to keep track of the new information they learn in each lesson. The lessons follow the same format each week, which provides consistency for students and teachers.
- **Cookbook:** Students receive a recipe at the end of each lesson and are encouraged to take the cookbook home to share the concepts of healthy local foods with their families.
- **pictures:** Pictures enhance the story of each fruit and vegetable by providing a visual context of where the food was grown, who grew it or where it was sold.

Seasonality

Teachers and program facilitators are encouraged to purchase foods for tastings from local vendors as often as possible. The sequence of lessons presented in this manual are subject to change due to the availability of each food item in each season. Communicating with local farmers and food vendors frequently can guide the specific class schedule so that each fruit and vegetable tasted is available and in its prime season. After all, fruits and vegetables are the tastiest when they are in season!

Curriculum Connections

Each *Roots and Fruits* lesson addresses core academic content areas; the geography of where food originated, the science of nutritional benefits and specific body systems, as well as reading and writing concepts. *Roots and Fruits* lessons meet several state learning standards in health, science, language arts, environmental education, and social science.

The *Roots and Fruits* curriculum provides a basic framework for teachers and educators, and can be easily modified to fit the needs of each classroom or school community. As a way to deepen the connections between students and lesson content, teachers are encouraged to consider and discuss the cultural relevance of each lesson. *Roots and Fruits* also encourages classrooms and schools to connect with community resources to enhance students' learning experiences.

Turn to the "Resources" section for more information on connecting with community resources.





Local Harvest Calendar



Fruits	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Apples												
Apricots												
Blackberries												
Blueberries												
Cantaloupe												
Cherries												
Gooseberries												
Grapes, table												
Grapes, wine												
Nectarines												
Peaches												
Pears												
Plums												
Raspberries, black												
Raspberries, red												
Strawberries												
Watermelon												
Vegetables												
Asparagus												
Beans, lima												
Beans, snap												
Beets												
Broccoli												
Brussels Sprouts												
Cabbage												
Carrots												
Cauliflower												
Cucumbers												
Eggplant												
Garlic												
Greens												
Horseradish												
Kohlrabi												
Leeks												
Lettuce												
Okra Onions,												
dry Onions,												
green Peas,												
green Peas,												
southern												
Peppers, bell												
Peppers, hot												
Popcorn												
Potatoes												
Pumpkins												
Radishes												
Rhubarb												
Spinach												
Squash, summer												
Squash, winter												
Sweet Corn												
Sweet Potatoes												
Tomatoes												
Turnips												

Roots and Fruits
Community ResouRCes
Chapter 2



Community Resources

Here are ways to seek out community resources to supplement the curriculum:

a. Local organic Farms

Tours of local organic farms provide a unique way for students to bridge concepts taught in the classroom with hands-on learning experiences outdoors. Local grocers and farmers markets are resources to inquire about local farms. There are many ways to connect the Roots & Fruits curriculum concepts with inquiry-based learning on the farm. While on a farm tour, teachers and students can:

- Explore the living organisms within the soil.
- Walk through the fields while identifying fruits and vegetables.
- Harvest, wash, and eat fresh produce.

B. Farmers markets

Farmers markets offer a venue from which local fresh fruits and vegetables can be procured for classroom lessons. In addition, farmers markets are a perfect environment to create relationships with local farmers and to learn more about their farms. Visiting a farmers market can also be an exciting way to learn more about the local food system and seasonal produce. While at the farmers market, teachers and students can:

- Interview a farmer about their organic farming practices.
- Create a scavenger hunt to find various items in the market.
- Integrate math and the local economy into team projects.

C. Farmers

Farmers themselves can be valuable resources for gathering additional lesson content. Most often, they can also provide personal stories about the cultivation of their crops and serve as a guest speaker in classrooms to answer students' questions about life as a farmer. The Roots & Fruits curriculum includes a teacher resource page for incorporating a successful farmer visit.

D. Local Chefs/ Restaurants

Many restaurants are adopting a local organic food philosophy. These restaurant owners and chefs can bring a different perspective about their role in the food system. Chefs may also choose to discuss their educational path to becoming a chef, as well as prepare healthy foods for students to taste. The Roots & Fruits curriculum includes suggestions for implementing an engaging chef visit.





e. Local Food experts

Local food experts have an area of expertise that they can share with students. Learning about additional skills, passions and professions within the food system can inspire students to develop healthy eating behaviors and cultivate their curiosities about food. Examples of local food experts include:

- Food critics
- Food writers
- Food service employees

Roots & Fruits participating Farms

the Green earth institute

10S404 Knoch Knolls Road
 Naperville, IL 60565
 630.664.5681
info@greenearthinstitute.org
www.greenearthinstitute.org

Genesis Growers

8373 East 3000 Rd.
 St. Anne, IL 60964
 815.953.1512
info@genesis-growers.com
www.genesis-growers.com

ellis Farms

233 East Britain Ave.
 Benton Harbor, MI 49022
 269.944.1515
brunefarms@aol.com

nichols Farm & orchard

2602 Hawthorn Road
 Marengo, IL 60152
 815.568.6782
nicholsfarm@aol.com
www.nicholsfarm.com

seedling enterprises

6717 11th Ave.
 South Haven, MI 49090
 269.227.3958
pete@seedlingfruit.com
www.seedlingfruit.com



Growing power

2215 W. North Ave.
 Chicago, IL 60647
 773.486.6005
Chicago@growingpower.org

prairie Crossing Learning Farm

32400 N. Harris Road
 Grayslake, IL 60030
 847.548.5400
infocenter@prairiecrossing.com

angelic organics

Learning Center

1547 Rockton Rd
 Caledonia, IL 61011
 815.389.8455

angelic organics

Learning Center

6400 S. Kimbark Ave.
 Chicago, IL 60637
 773.288.5462





Chicago area Farmers markets

Green City market

Wednesdays and Saturdays, 7 a.m. – 1 p.m.

Summer:

South end of Lincoln Park between Clark and Stockton Dr.

Winter:

Peggy Notebaert Nature Museum, 2430 N. Cannon Dr.

773.880.1266

www.chicagogreencitymarket.org

admin@chicagogreencitymarket.org

Chicago's only year-round farmers' market, which features local sustainable farmers, producers and chefs. The market, located in Lincoln Park, has a wide variety of fresh produce, baked goods, flowers, and other market items as well as educational programming each week.

Daley plaza Farmers market

Thursdays, 7 am-3 pm

Daley Plaza

50 W. Washington

Chicago, IL 60602

312.744.3315

austin Farmers market

Saturdays, 7 am-2 pm

Emmet Math, Science &

Technology Academy Parking Lot

Madison St. & Central Ave.

Chicago, IL 60644

312. 744.3315

Logan square Farmers market

Sundays, 10 am – 3 pm

Logan Square

3107 W. Logan Blvd.

Chicago, IL 60647

773.489.3222

pilsen Community market

Sundays, 9 am – 2 pm

Chicago Community Bank

Parking Lot

1800 S. Halstead

Chicago, IL 60608

773.495.0029

61st street Farmers market

Saturdays, 9 am – 2 pm

61st between Dorchester and

Blackstone Avenues

6100 S. Blackstone

Chicago, IL 60637

773. 241.6044

*Find a farmers market in
your neighborhood at
www.localharvest.org, or
www.explorechicago.org.*





Chicago area organization Resources

the Good Food project

The Good Food Project is a non-profit organization whose mission is to “introduce children to the exquisite flavors of the earth’s bounty and to help them develop a lifelong love of good food.”

<http://thegoodfoodproject.org>
goodfoodchicago@gmail.com
 773.648.0068

purple asparagus

Purple Asparagus is a non-profit organization dedicated to “bringing families back to the table” through a variety of programs such as Healthy Snacks in Schools, Family Dinners and additional programs to promote healthy family meal practices.

www.purpleasparagus.com
info@purpleasparagus.com
 773.991.1920

Common threads

Common Threads educates children on the importance of nutrition and well-being, while fostering an appreciation cultural diversity through cooking and shared meals.

www.commonthreads.org
 312.752.2690

openlands

Openlands offers a wide range of educational and consultation services for those involved with school and community gardening.

www.openlands.org
 312.863.6270

edible Garden at Lincoln park Zoo

The Edible Garden at the Lincoln Park Zoo offers a hands-on gardening and harvesting experience for students, and is an example of the plethora of fresh foods an urban garden can produce.

www.theorganicgardener.net
 847.636.2720

Chicago Botanic Garden

The Chicago Botanic Garden provides school and community garden consultation, gardens open to school trips, as well as hands-on educational opportunities.

www.chicago-botanic.org
 847.835.5440

the peggy notebaert nature museum

The Nature Museum offers a wide variety of hands-on exhibits that educate guests on the Illinois natural environment. Environmental and gardening education resources can be found in the museum’s library and resource room.

www.naturemuseum.org
 773.755.5100





healthy schools Campaign

Healthy Schools Campaign advocates for policies and practices that allow students, teachers and staff to learn and work in a healthy school environment.

www.healthyschoolscampaign.org
312.419.1810

slow Food Chicago

Slow Food Chicago is an educational nonprofit that seeks to create dramatic and lasting change in our local food system to ensure equity, sustainability, and pleasure in the food we eat.

www.slowfoodchicago.org

Building a healthier Chicago

Building a Healthier Chicago is a collaborative of local and national stakeholders working to strengthen efforts to promote the health of Chicago residents.

www.healthierchicago.org

Chicago partnership for health promotion

Chicago Partnership for Health Promotion provides nutrition education in a variety of venues across the city in order to improve nutrition and reduce disparities associated with nutritional diseases.

www.uic-cphp.org
312.996.8700

Consortium to Lower obesity in Chicago Children (CLOCC)

CLOCC is a consortium of organizations and individuals that are working to prevent childhood obesity and promote healthy lifestyles.

www.clocc.net
312-573-7760

national Resources

the Center for ecoliteracy

The David Brower Center
2150 Allston Way, Suite 270
Berkeley, CA 94704
info@ecoliteracy.org
510.845.4595

the national Farm to school network

www.farmtoschool.org
Center for Food & Justice, UEPI
Occidental College
1600 Campus Road, MS-M1
Los Angeles, CA 90041
323.341.5095

Regional Great Lakes Farm to school network

University of Wisconsin –
Madison
1535 Observatory Drive
Madison, WI 53706
608.513.3980

Community Food security Coalition

3830 SE Division St.
Portland, OR 97202
www.foodsecurity.org
503.954.2970



Roots and Fruits
LESSON — BLUEBERRIES
Chapter 3





time allotted

45 Minutes

target audience

Grades 3-5

Materials Included

- Human body map
- Nutrient chart
- Blueberry cards

additional Materials Needed

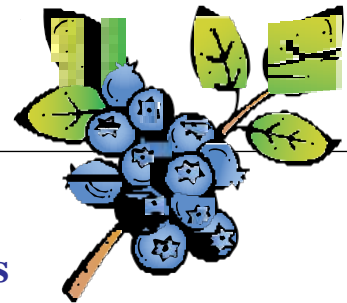
- U.S. Map
- Enlarged photo of a blueberry bush
- Fresh, local blueberries for tasting (about 2 pints per class of 30 students)
- Name, location, and pictures (if available) of local farm that cultivates blueberries
- Extra blueberries for hands-on samples
- Napkins and plates
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

Set Up

- Wash blueberries prior to lesson.
- Set out reusable plates.
- Set up human body map, nutrient chart, and U.S. map.

Learning Objectives

- Students will be able to state that blueberries originated in North America.
- Students will be able to describe the climate and conditions in which blueberries are cultivated.
- Students will be able to describe the blueberry growing season.
- Students will be able to state that the peak harvest month for blueberries is July.
- Students will be able to explain that blueberries grow on a bush and are the fruit of the plant.
- Students will be able to list two nutrients found in blueberries.
- Students will be able to identify the parts of the body the nutrients benefit.
- Students will be able to select adjectives to describe the flavor and texture of blueberries.
- Students will be able to use a map to identify where blueberries grow locally.



Introduction to Blueberries (5 minutes)

Begin the lesson by displaying and identifying today's food as a class.



Workbook #1

Fruit or Vegetable? (5 minutes)

Have students explore the inside of one of their blueberries by opening it up with their fingers. Teachers may choose to demonstrate this in front of the class instead. Invite students to share their observations. Point out that the blueberries have seeds. Explain to students that because the blueberries have seeds, they are the fruit of the plant, according to the scientific definition of a fruit.

ask: *Who can think of some other foods that contain seeds?*



Workbook #2

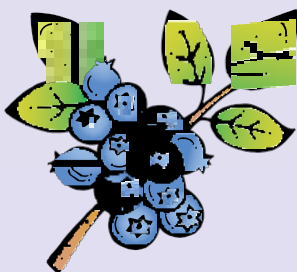


Fruit vs. Vegetable

The botanical definition of a fruit is the part of the plant that contains seeds. According to scientists, a pepper is therefore a fruit. The word vegetable is a culinary term used to describe plant foods with less sugar. Vegetables include plant parts such as leaves (lettuce), stems (asparagus), roots (carrots), flowers (broccoli), bulbs (garlic), seeds (peas and beans), and some botanical fruits (peppers, cucumbers and tomatoes).

Blueberry Facts

- Blueberries grow on bushes that can be as short as six inches (low bush variety) or as tall as four feet (high bush variety).
- Blueberries need to be watered if there is not enough rain.
- Blueberries are a perennial, which means that they do not need to be replanted each year. Perennials are plants that have a life cycle of over two years.



Eating a Rainbow (5 minutes)

Explain to students that each week they will taste fruits and vegetables from different color groups and that they will learn about the health benefits each color group of food provides for the body. It is very important to eat a “rainbow” of colors every day. Explain that different colored foods provide different nutrients, all of which are important to keep the body healthy. Nutrients help the body grow, provide energy, keep the brain working at its best, and keep the body strong and healthy. Ask: What color is today’s food?



Workbook #3

Draw (5 minutes)

Give students a few minutes to draw a picture of a blueberry in their workbooks. Encourage students to observe the size, color, and texture of the blueberry.

Where Do Blueberries Come From? (5–10 minutes)

Ask the class to make predictions about where blueberries came from originally. Blueberries originated in North America, in the area extending from southern New England to Michigan. Blueberries are one of North America’s indigenous fruit crops, growing wild across the northern and eastern part of the continent. Discuss the term indigenous.

Use the U.S. map to show the region where blueberries originated. Ask for personal connections to this region.

Explain to students that today some blueberries grow in the Midwest. Share with them the name, location, and pictures (if available) of the farm that grew today’s blueberries. Invite a student to place a blueberry manipulative on the U.S. map, indicating where today’s blueberries were grown.

Growing Blueberries (5–10 minutes)

Cultivation:

Ask students if they have heard of the word *cultivation*. Cultivation is the work and attention needed to promote or improve the growth of a plant. Cultivation describes the tasks necessary to care for a growing plant.

Have students use the information they already know, and the observations they have already made, to make predictions about how blueberries grow.



ask: Do blueberries grow on a bush, vine, or on the ground?

Allow time for thinking. Determine together that blueberries grow on a bush.



Workbook #4

ask: What part of the plant is a blueberry?

Determine together that blueberries are the fruit of the plant because they have seeds.



Workbook #5

Climate:

ask: Do blueberries grow best in warm or cool climates?

Have students make predictions based on what they already know. What do they know about the weather in the region in which blueberries grow?

- Blueberry bushes (not the berries) are tolerant of cold weather, but not colder than -20 degrees F.
- Temperature is not as important for blueberries as the amount of sunlight the plants receive. When the days get shorter in the fall and winter months, blueberries do not receive the amount of daylight needed for optimal growth.

Seasonality:

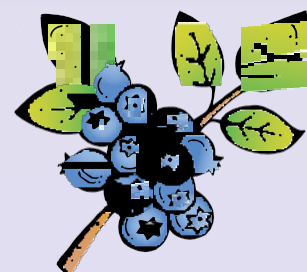
ask: When do blueberries grow? When are blueberries harvested?

Explain the terms growing season and harvest month.

- The *growing season* is the period of each year that blueberries can grow. The growing season for blueberries is May through October.
- The *harvest month* is the month that the fruit or vegetable is typically picked. The harvest month depends on the region in which it is grown, and the particular variety of fruit or vegetable. Blueberries are harvested when the fruit has matured and is ripe or ready to be eaten. The harvest month for most blueberries is July.



Workbook #6-7





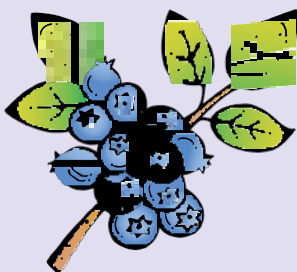
Nutrient Definitions:

antioxidants

- An antioxidant is a molecule capable of slowing or preventing the oxidation of other molecules. Oxidation reactions can produce free radicals, which start chain reactions that damage cells.
- Antioxidants may reduce premature aging, cancer, cataracts, and an array of degenerative diseases.

Fiber

- Fiber becomes glucose when absorbed by the body, which gives us energy.
- It enhances the feeling of fullness by delaying gastric emptying.
- It removes cholesterol by binding with bile in the intestine and causing it to be excreted.



Nutrients & health (5–10 minutes)

Say: *Today's food has many nutrients that benefit the body. We will focus on two nutrients today.*

antioxidants

Have students repeat the word antioxidant out loud.

ask: *Does anyone know why antioxidants are good for you?*

Explain that antioxidants, especially those in blueberries and other blue foods, are good for combating the things in the body that have a negative effect on the body's health. Antioxidants are like superheroes in the body, fighting the bad things called free radicals and helping the body heal from damage. Free radicals are harmful substances that can float around the body and attack cells, possibly leading to cancer. Antioxidants attack free radicals and keep the cells healthy. Antioxidants in blue foods are also good for brain function and help with memory.

- Nutrient Chart—Invite a student to place a blueberry manipulative on the nutrient chart.
- Human Body Map—Invite a student to place a blueberry manipulative on the human body map.

Fiber

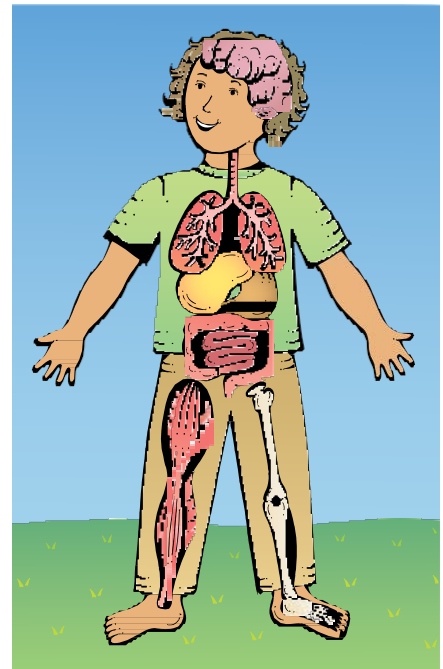
Blueberries are a source of fiber.

ask: *Does anyone know why fiber is good for the body?*

Fiber helps the body know it is full during a meal and helps the digestive system. Fiber is the nutrient that the body needs to help move food through the digestive system. Fiber also helps to lower cholesterol, which reduces the risk of heart disease.



Workbook #8-9



additional Nutrient Information

Blueberries are also a good source of vitamin C. One cup of blueberries contains 24% of daily vitamin C needs. Vitamin C helps keep colds away and helps to maintain healthy teeth and gums.

Blueberries are low in calories and sodium and contain no cholesterol. Blueberries also contain pectin, known for its ability to lower blood cholesterol, which is good for the heart.



tasting (5-10 minutes)

As a class, create three tasting rules that promote respect and responsibility among the class. Go over the adjectives in the back of the workbook. Discuss with students why it is fun and important to try new foods.

Have students wash their hands. Then hand out the blueberries and encourage students to be mindful of the food they are tasting.

1. First, instruct students to look at the features of the blueberry and observe the texture of the blueberry.
2. Next, have students smell the blueberry.
3. Then, have students take a small bite of a blueberry and listen for what the blueberry sounds like when taking a bite.
4. Lastly, have students eat an entire blueberry and observe the flavors of the blueberry.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the blueberry's features, aromas, sounds, and flavors.



Workbook #10–13

Cookbook (2–5 minutes)

Hand out the cookbooks and blueberry recipes. Explain that with each lesson students will receive a new recipe to add to the cookbook. Ask students if they have eaten blueberries at home. Do their families have blueberry recipes? Encourage students to try the recipe at home with their families.

Cultural Relevance

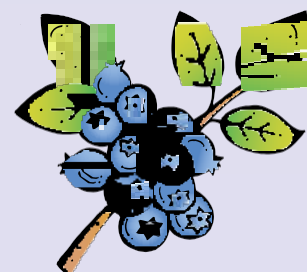
Think about the cultural connections this lesson has with students. Consider why this lesson is relevant to the specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?

Explain the word *savor*. Have a discussion with students about why it is fun to savor all of the flavors of the foods they eat. Paying attention to the aromas, textures, and tastes of food allows them to enjoy their food more and be aware of the food they are to eating.

Reminder: Be sure to check if your students have special diets or food allergies before the tasting.

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste





Extension activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary to fit individual students and classrooms.

Literacy

- Read *Blueberries for the Queen*, by John & Katherine Paterson (Harper Collins, 2009), a story of a young boy who delivers freshly picked blueberries to a real queen living in America during World War II.
- Read *Blueberry Mouse*, by Alice Low & David Michael Friend (Mondo Publishing, 2004), the story of a blue mouse who lives in a blueberry garden.

Math

- Estimate how many blueberries come in one container. In small groups, count the number of blueberries in one container. Explain that one serving size of blueberries is $\frac{1}{2}$ cup. Count how many blueberries fit into $\frac{1}{2}$ cup. Calculate how many cups of blueberries we would eat if we ate two servings.

Writing

- Have children write a cinquain poem about blueberries:
Title - 1 word
Description - 2 words
Action - 3 words
Feeling - 4 words (phrase)
Title - 1 word (synonym of original title)

Science

- Look at a blueberry under a microscope.
- Study how the earth's rotation around the sun affects seasons on different sides of the equator. Make conclusions about which hemisphere is growing blueberries during the current season.

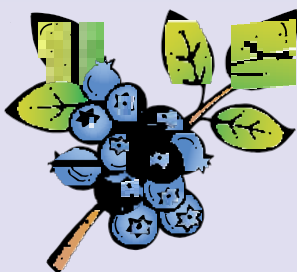
Social Studies

- Research the Native American practice of preserving blueberries in order to eat them all year.

art

- Experiment using blueberries as a dye or writing utensil.

Notes:



Roots and Fruits
LESSON — TOmaTOES
ChapTer 4





Time allotted

45 Minutes

Target audience

Grades 3-5

materials Included

- Nutrient chart
- Human body map
- Tomato cards

additional materials Needed

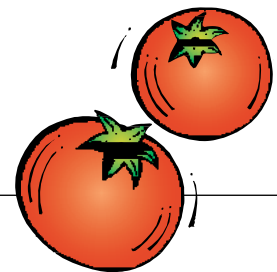
- U.S. map
- Enlarged photo of a tomato plant
- Tomato varieties prepared for tasting
- Name, location, and pictures (if available) of local farm that grew the tomatoes
- Napkins and plates
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

Set Up

- Wash and slice tomatoes prior to the lesson.
- Set out reusable plates.
- Set up nutrient chart, human body map, and U.S. map.

Learning Objectives

- Students will be able to state that tomatoes originated in South America and Mexico.
- Students will be able to state that the tomato growing season is June through September.
- Students will be able to explain that tomatoes are to be harvested when the fruit is firm and fully colored.
- Students will be able to describe the climate and conditions in which tomatoes are cultivated.
- Students will be able to state that tomatoes grow on a plant and are the fruit of the plant.
- Students will be able to list two nutrients found in tomatoes.
- Students will be able to identify the parts of the body the nutrients benefit.
- Students will be able to use adjectives to describe the flavor and texture of tomatoes.
- Students will be able to use a map to identify where tomatoes grow locally.



review previous Lesson (2 minutes)

Discuss the fruit or vegetable from the previous lesson. Review the color group, nutrient information and location the food came from. Ask students if anyone tried the recipe from the previous lesson. Allow time for students to share personal connections to the content that was covered in the previous lesson.

Introduction to Tomatoes (5 minutes)

Begin the lesson by showing and identifying today's food.



Workbook #1

Fruit or Vegetable? (5 minutes)

Have all students explore the inside of a tomato by opening it up with their hands. Teachers may choose to demonstrate this in front of the class instead. Invite students to share their observations. Point out that the tomatoes have seeds. Remind students that according to scientists, a plant part that contains seeds is called a fruit. Ask: Who can think of some other foods that we may call vegetables but are actually the fruit of the plant? Examples include peppers, pumpkins, and cucumbers.



Workbook #2



Fruit vs. Vegetable

The botanical definition of a fruit is the part of the plant that contains seeds. According to scientists, a pepper is therefore a fruit. The word vegetable is a culinary term used to describe plant foods with less sugar. Vegetables include plant parts such as leaves (lettuce), stems (asparagus), roots (carrots), flowers (broccoli), bulbs (garlic), seeds (peas and beans), and some botanical fruits (peppers, cucumbers, and tomatoes).

Tomato Facts

- Tomatoes were originally used by the Aztec Indians in Mexico.
- About 500 years ago, European explorers in Latin America enjoyed tomatoes and brought them back to Europe.
- The revolution of canning tomatoes led to the rapid spread of tomato use. In the 17th century, Italians began canning tomatoes in the region of Naples, and by the mid-century Americans also took to this practice.
- Today, the largest amount of wild tomato plants are found in the South American country of Peru.

Eating a rainbow (5 minutes)

Remind students that each week they will taste fruits and vegetables from different color groups. It is important to eat a “rainbow” of colors every day. Review that different colored foods provide different nutrients that are needed to keep the body healthy. Nutrients help the body grow, provide energy, keep the brain working at its best, and keep the body strong and healthy. Ask: What color is today’s food?



Workbook #3

Draw (5 minutes)

Give students a few minutes to draw a picture of a tomato in their workbooks. Have students pay attention to the color, texture, shape and size of the tomatoes.

Where Do Tomatoes Come From? (5–10 minutes)

Tell students that tomatoes originated in South America and Central America, specifically in Mexico. Use a map to show the region where tomatoes originated. Ask for personal connections to this region.

Explain to students that today tomatoes grow in the Midwest. Share with them the name, location and pictures (if available) of the farm that grew today’s tomatoes. Invite a student to place a tomato manipulative on the U.S. map, indicating where today’s tomatoes were grown.

Growing Tomatoes (5–10 minutes)

Cultivation:

Review the word *cultivation*. Ask students to imagine what a tomato plant looks like.

ask: *Do tomatoes grow on a bush, a tree, or in the ground?*

Show a picture of a tomato plant and explain that tomatoes grow on a plant. Ask students if the tomato plant reminds them of any other plant types.



Workbook #4

ask: *What part of the plant is a tomato?*

Determine together that tomatoes are the fruit of the plant because they have seeds.



Workbook #5



Climate

ask: *What kind of weather is best for tomato cultivation?*

Ask students questions about the climates in South America and southern Italy. Have students brainstorm the conditions in which tomatoes grow best. Ask students to share predictions based on what they already know.

- Tomatoes like warm, sunny weather.
- Tomatoes grow best in moist soil, but don't like too much water.

Seasonality

ask: *When are tomatoes harvested?*

Review the terms *growing season* (the period of the year that tomatoes can grow) and *harvest month* (the best time to pick tomatoes). Tomatoes grow best in the warmer summer months, typically from June to September. The best time to harvest the tomatoes is when the fruit is firm and fully colored. This timing will depend on the variety of the tomatoes.



Workbook #6-7

Nutrients & health (5-10 minutes)

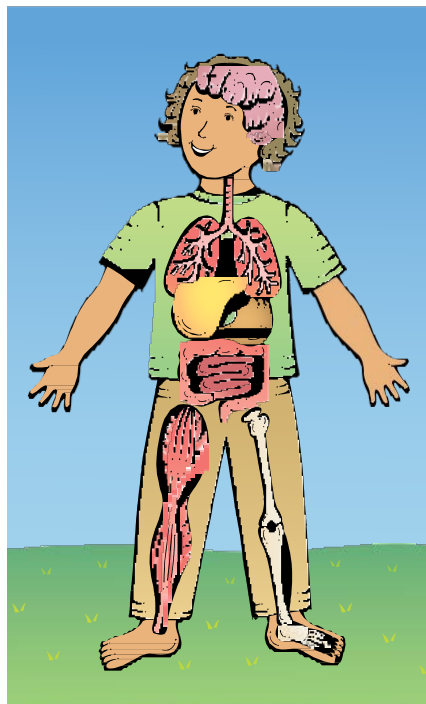
Say: *Today's food has many nutrients that benefit the body. We will focus on three nutrients today.*

antioxidants

ask: *Does anyone know why antioxidants are good for the body?*

Remind students that antioxidants are like superheroes in the body, fighting the bad things called free radicals. Free radicals are harmful substances that can float around the body and attack cells, possibly leading to cancer and other diseases. Antioxidants attack free radicals and keep the cells healthy. Antioxidants help prevent and repair damage in cells, and also enhance the immune system.

- Nutrient Chart—Invite a student to place a tomato manipulative on the nutrient chart.
- Human Body Map—Invite a student to place a tomato manipulative on the human body map.



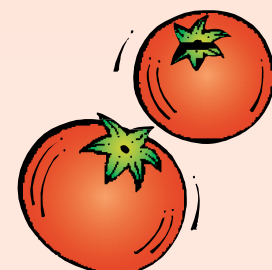
Nutrient Definitions:

antioxidants

- An antioxidant is a molecule capable of slowing or preventing the oxidation of other molecules. Oxidation reactions can produce free radicals, which start chain reactions that damage cells.
- Antioxidants may reduce premature aging, cancer, cataracts, and an array of degenerative diseases.

Vitamin C

- Vitamin C plays an important role in the formation of collagen, a protein that helps reinforce connective tissues that hold together structures of the body, and is the most abundant protein in the skin, bone, tendons, cartilage, and teeth.
- Vitamin C deficiency may cause scurvy, a painful disease that causes connective tissue to break down, and gums and joints begin to bleed.





Nutrient Definitions:

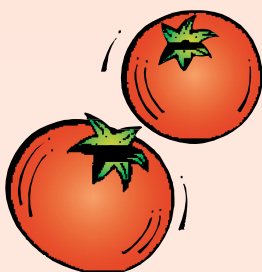
Vitamin a

- Vitamin A fights infections and bolsters immune function by maintaining skin cells mostly.
- The liver stores more than 90% of the body's Vitamin A and the remainder is deposited in tissue, lungs, and kidneys.

reminder: *Be sure to check if your students have special diets or food allergies before the tasting.*

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



Vitamin C

ask: *Does anyone drink orange juice when you have a cold?*

Do you know why? Explain that vitamin C is a nutrient that helps boost the immune system, and keep colds and sickness away. Explain that vitamin C also helps cuts heal and makes the gums, skin and teeth strong.

Vitamin a

Tomatoes also contain vitamin A, which is beneficial for vision and immune function. Vitamin A maintains good vision and supports a healthy immune system.



Workbook #8-9

Tasting (5-10 minutes)

As a class, review tasting manners. Complete the tasting as a class. Review the tasting words (adjectives) in the back of the workbook.

Have students wash their hands. Then hand out tomato pieces and encourage students to be mindful of the food they are tasting.

1. First instruct students to look at the features of the tomato and observe the texture of the tomato.
2. Next, have students smell the tomato.
3. Then, have students take a small bite of the tomato piece and listen for the sounds they hear when taking a bite.
4. Lastly, have students eat the entire tomato piece and observe the flavors of the tomato.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the tomato's features, aromas, sounds, and flavors.



Workbook #10-13

Cookbook (2-5 minutes)

Hand out cookbooks and tomato recipes. Ask students if they have eaten tomatoes at home. Do their families have recipes that include tomatoes? Share the tomato recipe with students. Encourage students to try the new recipe at home with their families.

Cultural relevance

Think about the cultural connections this lesson has with students. Consider why this lesson is relevant to the specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?

Extension activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary to fit individual students and classrooms.

Literacy

- Read *I Will Never Not Ever Eat a Tomato*, by Lauren Child (Candlewick, 2007), the story of Lola, a very picky eater, and her older brother Charlie, who uses creative means to help her eat her vegetables.
- Read *Laughing Tomatoes and Other Spring Poems/ Jíomates risuenos y otros poemas de invierno*, by Francisco X Alarcon (Children's Book Press, 2005), a bilingual book of poems about food, family, and dreams. Write individual poems and read them to the class.

Science

- Ask students to bring in labels from home from products that use tomatoes. Make a collage of all the different types of foods in which tomatoes are found.

math

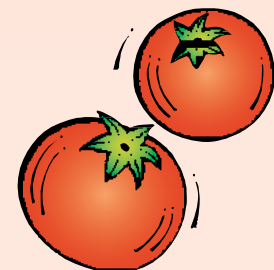
- Using the largest tomato you have, estimate the weight of the tomato by using a balance. Find items that weigh more, less, and the same as the tomato.
- Estimate the circumference of a tomato using string.

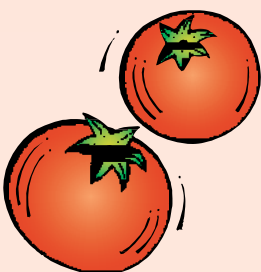
art

- Draw or paint pictures of the stages in a tomato's life cycle.

Writing

- Give students tomato recipes to look through. After looking through different recipes that contain tomatoes as a main ingredient, instruct students to write a story about a family or person that decides to cook this recipe.



**Notes:**

Roots and Fruits

Lesson — AppLes ChApter 5





time Allotted

45 Minutes

target Audience

Grades 3–5

Materials Included

- Nutrient chart
- Human body map
- Apple cards

Additional Materials needed

- U.S. map
- World map
- Enlarged photo of an apple tree
- Fresh, local apple varieties ready for tasting (preferably 2-3 different varieties for students to compare)
- Name, location, and pictures (if available) of local farm that grew the apples
- Napkins and plates
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

set Up

- Slice apples prior to lesson.
- Set out reusable plates.
- Set up U.S. map, nutrient chart, and human body map.

Learning objectives

- Students will be able to identify varieties of apples visually.
- Students will be able to state that apples originated in Europe and Asia (Eurasia).
- Students will be able to state that the growing season for apples is June through August.
- Students will be able to describe the climate and conditions in which apples are cultivated.
- Students will be able to explain that apples grow on a tree and are the fruit of the tree.
- Students will be able to list two nutrients found in apples.
- Students will be able to identify the parts of the body these nutrients benefit.
- Students will be able to use adjectives to describe the flavors and textures of apples.
- Students will be able to use a map to identify where apples grow locally.



review previous Lesson (2 minutes)

Review the color group, nutrient information, and location of cultivation for the previous lesson's food. Ask students if anyone tried the recipe from the previous lesson. Allow time for students to share personal connections to the content that was covered in the previous lesson.

Introduction to Apples (5 minutes)

Begin the lesson by showing and identifying today's food.



Workbook #1

Fruit or Vegetable? (5 minutes)

Have all students examine the inside of an apple by looking at slices of apples with seeds still attached. Teachers may choose to demonstrate this in front of the class instead. Invite students to share their observations. Point out that apples have seeds. Remind students that because apples have seeds, they are a fruit.

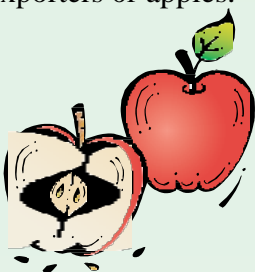


Workbook #2



Apple Facts

- In the Middle Ages, apples were peeled, cored, kept whole, hung out to dry, and stored.
- The apple was one of the first crops brought to North America by settlers from Western Europe and England.
- In Massachusetts, John Chapman (Johnny Appleseed) helped spread the growth of apple trees by collecting seeds at cider mills and then dispersing them in the countryside.
- American varieties of apples are distinct from those in Europe because of their interbreeding with Native American crabapples.
- When it is winter in the northern hemisphere, it is summer in the southern hemisphere. When local apples are scarce in the northern hemisphere because of winter, they are growing abundantly in the southern hemisphere. Countries in the southern hemisphere such as Australia, New Zealand, and Chile take advantage of the seasonal difference and are now major exporters of apples.



eating a rainbow (5 minutes)

Remind students that each week they will taste fruits and vegetables from different color groups. It is important to eat a “rainbow” of fruits and vegetables every day. Review that different colored foods provide different nutrients that help the body stay healthy. Nutrients help the body grow, provide energy, keep the brain working at its best, and keep the body strong and healthy.

Ask: *What color is today's food?*



Workbook #3

Draw (5 minutes)

Give students a few minutes to draw a picture of an apple in their workbooks. Have students pay attention to the size, shape, texture, and color of the apple.

Where Do Apples Come From? (5–10 minutes)

Apples originated in Europe and Asia where they first grew wild. Use a world map to identify Europe and Asia.

Explain to students that today many varieties of apples are grown in the Midwest. Share with students the name, location, and pictures (if available) of the orchard that grew today's apples. Invite a student to place an apple manipulative on the U.S. map, indicating where today's apples were grown.

Growing Apples (5–10 minutes)

Cultivation

Review the term *cultivation*. Ask students to think about how apples grow.

Ask: *Do apples grow on a tree, on a bush, or on the ground?*

Show a picture of an apple tree. Determine together that apples grow on trees.



Workbook #4

Ask: *What part of the plant is an apple?*

Determine together that apples are the fruit of the plant because they have seeds.



Workbook #5



Climate

Ask: Do apples grow best in warm or cool climates?

Have students make predictions based on what they already know.

- There are more than 7,500 known varieties of apples.
- Apples grow well in warm, sunny weather.

seasonality

Ask: When do apples grow, and when are they harvested?

Review the terms growing season and harvest month.

- Unlike other fruits, except possibly citrus, apples store for months while still retaining much of their nutritive value. Winter apples, picked in late autumn and stored just above freezing, have been an important food in Asia and Europe for millennia.
- The growing season for apples is June through October.
- The harvest month for apples depends on each variety but is typically in the fall months.



Workbook #6-7

nutrients & health

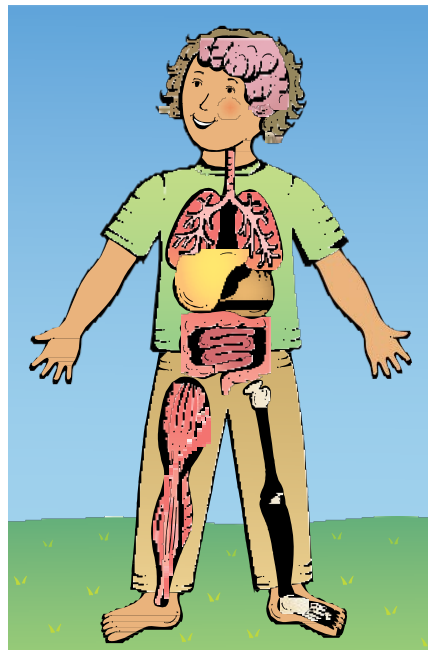
(5–10 minutes)

say: Today's food has many nutrients that benefit the body. We will focus on two nutrients today.

potassium

Apples contain potassium. Potassium helps keep muscles strong. Ask students to point to their muscles. Then ask if they remember the name of the very important muscle in the body that pumps blood. Potassium is good for the heart, which is the muscle that pumps blood throughout the body.

- Nutrient Chart—Invite a student to place an apple manipulative on the nutrient chart.
- Human Body Map—Invite a student to place an apple manipulative on the human body map.



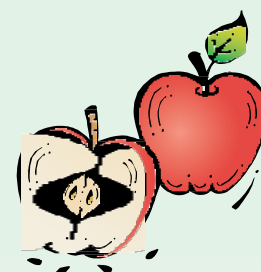
nutrient Definitions:

potassium

- Potassium is an element that is part of many minerals. It is necessary for the function of all living cells.
- A potassium deficiency can cause harm to the heart and body.

Fiber

- Fiber becomes glucose when absorbed by the body, which gives us energy.
- It enhances the feeling of fullness by delaying gastric emptying.
- It removes cholesterol by binding with bile in the intestine and causing it to be excreted.

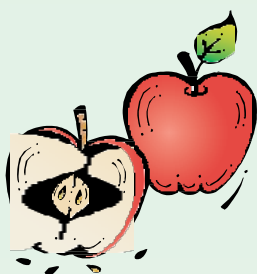




reminder: Be sure to check if your students have special diets or food allergies before the tasting.

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



Fiber

Apples are a good source of fiber. Fiber helps the body know when it is full during a meal. Fiber is the nutrient that the body needs to help move food through the digestive system. Fiber also helps to lower cholesterol, which reduces the risk of heart disease.



Workbook #8-9

tasting (5-10 minutes)

Review the tasting manners and tasting words. Highlight the word savor. Review what it means to “savor your food.” Have a discussion with students about why it is fun to savor all of the flavors of the foods they eat. Paying attention to the aromas, textures, and tastes of food allows them to enjoy their food more and be aware of the food they are putting into their bodies.



Have students wash their hands. Then hand out apples and encourage students to be mindful of the food they are tasting.

1. First, instruct students to look at the features of the apple and observe the texture of the apple.
2. Next, have students smell the apple.
3. Then, have students take a small bite of the apple and listen for what the apple sounds like when taking a bite.
4. Lastly, have students eat the entire apple and observe the flavors of the apple.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the apple’s features, aromas, sounds, and flavors. Students might compare different varieties and colors of apples, if available.



Workbook #10–13

Cookbook (2–5 minutes)

Hand out cookbooks and apple recipes. Ask students if they eat apples at home. Do their families have special apple recipes? Encourage students to try the new apple recipe at home with their families.

Cultural relevance

Think about the cultural connections this lesson has with students. Consider why this lesson is relevant to the specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?

extension Activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary to fit individual students and classrooms.

Math

- Distribute an apple to each student or small group. Instruct students to estimate and count the seeds in each apple. As a class, create a bar graph displaying the number of seeds in each apple. Calculate the mean, median and mode of seeds in an apple.

Literacy

- Read about and research Johnny Appleseed.
- Read *The Apple Pip Princess*, by Jane Ray (Candlewick, 2008), a story of three princesses competing to be the king's successor. One princess plants an apple seed that soon grows into an orchard for the kingdom to enjoy.

Writing

- Write a critique about the different varieties of apples tasted.
- Write a story about the journey of an apple seed, beginning inside the apple and eventually becoming a tree.

science

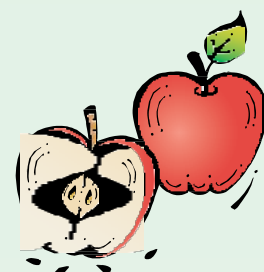
- Investigate the technique of grafting to produce new apple trees.
- Cook homemade applesauce using various types of apples.

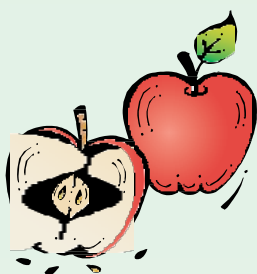
social studies

- As a class, use a ballot system to determine which apple variety was the most popular.
- Read *One Green Apple*, by Eve Bunting and Ted Lewin (Clarion, 2006), the story of a Muslim girl who accompanies her class on a field trip to an apple orchard, where she learns her first word in English: "apple."

Art

- Use apple halves or pieces as paint stamps.
- Create an apple core mobile. Have students cut a stem, apple top, center core, and apple bottom from construction paper. Use string or yarn to attach the pieces in order to create the appearance of the apple core that is left after someone eats an apple. Hang the apple core mobiles from the class ceiling.



**notes:**

Roots and Fruits

Lesson — Grapes Chapter 6





time allotted

45 Minutes

target audience

Grades 3-5

Materials Included

- Human body map
- Nutrient chart
- Grape cards

additional Materials needed

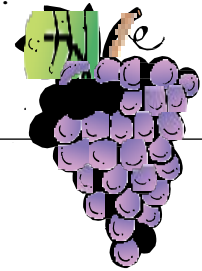
- U.S. map
- World map
- Enlarged photo of a grape vine
- Fresh local grapes for tasting, about 1 bag per class of 30 students
- Name, location, and picture (if available) of local farm that cultivated the grapes
- Fresh-pressed or all-natural grape juice
- Conventional grape juice with sugar added
- Copies of nutrition labels from both juice containers
- Napkins, plates, small tasting cups
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

set Up

- Wash the grapes prior to the lesson.
- Set out reusable plates.
- Set up human body map, nutrient chart, and U.S. map.

Learning objectives

- Students will be able to state that grapes originated in China.
- Students will be able to describe the climate and conditions in which grapes are cultivated.
- Students will be able to state that the grape growing season is July through October.
- Students will be able to state that the peak harvest month for grapes is August.
- Students will be able to describe the structure of a grape vine.
- Students will be able to explain that grapes are the fruit of the plant.
- Students will be able to list two nutrients found in grapes.
- Students will be able to identify the parts of the body the nutrients benefit.
- Students will be able to select adjectives to describe the flavor and texture of grapes.
- Students will be able to use a map to show where grapes grow locally.



review previous Lesson (2 minutes)

Review the color group, nutrient information, and location of cultivation of the fruit or vegetable highlighted in the previous lesson.

ask: *Did anyone try the recipe from the previous lesson?*

Ask students to share personal connections to the content that was covered in the previous lesson.

Introduction to Grapes (5 minutes)

Begin the lesson by displaying and identifying today's food as a class.



Workbook #1

Fruit or Vegetable? (5 minutes)

Have students explore the inside of one grape by opening it up with their hands. Teachers may choose to demonstrate this in front of the class instead. Invite students to share their observations. Point out that the grapes have seeds. Remind students that because the grapes have seeds, they are a fruit. Explain to students that some grapes are seedless, but they are still a fruit.



Workbook #2



Grape Facts

- There are more than 50 varieties of grapes that come in a range of colors: black, blue, golden, red, green, purple, and white. Some common varieties of grapes include Thompson, Flame, Ruby, Perlette, and Tokay.
- Grapes grow best in a location with good drainage. For this reason, grapes are often planted on rocky, sloping land.



eating a rainbow (5 minutes)

Remind students that each week they will taste fruits and vegetables from different color groups. It is important to eat a “rainbow” of fruits and vegetables every day. Review that different colored foods provide different nutrients that help the body stay healthy. Nutrients help the body grow, provide energy, keep the brain working at its best, and keep the body strong and healthy.

ask: *What color is today's food?*



Workbook #3

Draw (5 minutes)

Give students a few minutes to draw a picture of the grapes in their workbooks. Have students pay attention to the clusters of the grapes, and to the colors, textures, shapes, and sizes of the grapes.

Where Do Grapes Come From? (5–10 minutes)

Ask the class to make predictions about the origin of grapes. As one of the world's oldest cultivated fruits, the exact origin of the grape is not fully known. Experts believe, however, that grapes originated in western Asia, Egypt, and perhaps in China. About 400 years ago, the Spanish settlers brought grapes to America. Use a world map to show where grapes are thought to have originated.

Explain to students that today some grapes grow in the Midwest. Share with them the name, location and picture (if available) of the farm that grew today's grapes. Invite a student to place a grape manipulative on the U.S. map, indicating where today's grapes were grown.

Growing Grapes (5–10 minutes)

Cultivation

Review the word *cultivation*. Tell students to use what they know to make predictions about grape cultivation.

ask: *Do grapes grow on a bush, vine, or on the ground?*

Allow for thinking time. Determine that grapes grow on a vine. Show a picture of a grapevine.



Workbook #4

ask: *What part of the plant is a grape?*

Determine together that grapes are the fruit of the plant because they have seeds.



Workbook #5

Climate

ask: *Where do grapes grow?*

Do grapes like warm or cool climates? Have students make predictions based on what they already know.

- There are many different varieties of grapes. Depending on the type of grape, it may grow best in a warm or cooler climate.
- All varieties of grapes need sunlight.

seasonality

ask: *When are grapes harvested?*

Review the terms *growing season* (the period of each year that grapes can grow) and *harvest month* (the best time to pick grapes).

- The growing season for grapes in the Midwest is July through October. The best time to harvest a grape cluster is when the grapes at the bottom and in the middle of the cluster are ripe.
- The harvest month is typically August and September, depending on the variety.



Workbook #6-7

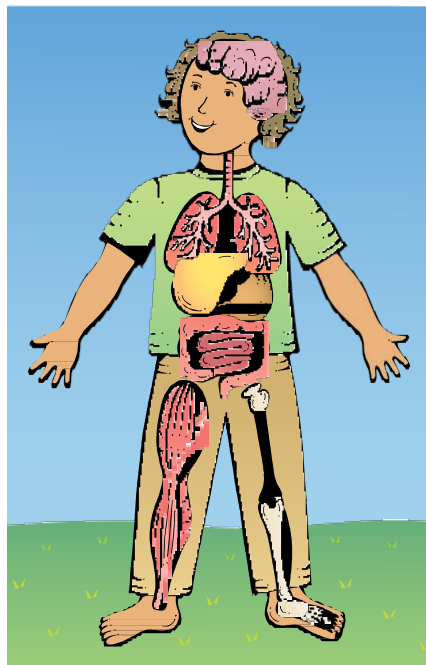
nutrients & health (5–10 minutes)

say: *Today's food has many nutrients that benefit the body. We will focus on two nutrients today.*

antioxidants

Grapes contain a lot of antioxidants. Antioxidants are good for all of the cells in the body. They fight free radicals, which are harmful substances that float around the body and cause negative reactions with cells. These negative reactions can cause diseases such as cancer. Antioxidants protect the cells from free radicals. This means that antioxidants can help stop cells from being damaged, which helps reduce the chance of diseases.

- Nutrient Chart—Invite student to place a grape manipulative on the nutrient chart.
- Human Body Map—Invite a student to place a grape manipulative on the human body map.



nutrient

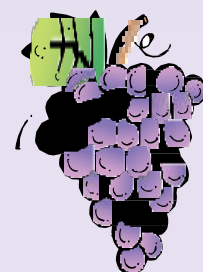
Definitions:

antioxidants

- An antioxidant is a molecule capable of slowing or preventing the oxidation of other molecules. Oxidation reactions can produce free radicals, which start chain reactions that damage cells.
- Antioxidants may reduce premature aging, cancer, cataracts, and an array of degenerative diseases.

Vitamin C

- Vitamin C plays an important role in the formation of collagen, a protein that helps reinforce connective tissues that hold together structures of the body and is the most abundant protein in the skin, bone, tendons, cartilage, and teeth.
- Vitamin C deficiency may cause scurvy, a painful disease that causes connective tissue to break down and gums and joints begin to bleed.

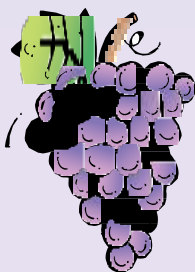




reminder: Be sure to check if your students have special diets or food allergies before the tasting.

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



Vitamin C

Grapes are also rich in vitamin C. Vitamin C is good for the immune system, which keeps the body healthy. Vitamin C helps keep colds away and is good for teeth and gum health. Review other fruits or vegetables that contain vitamin C.



Workbook #8-9

additional Information

Grapes contain measurable quantities of flavonoids. Flavonoids contain compounds that reduce harmful blood clotting and maintain healthy arteries.

tasting (5-10 minutes)

Review tasting manners and tasting words. Explain that grapes are used for different things. There are table grapes, which people usually eat as a snack or for lunch. There are wine grapes, which are used to make wine, a drink that adults drink. There are also juice grapes, such as Concord grapes, which are used to make grape juice.

Have students wash their hands. Then hand out the grapes and encourage students to be mindful of the food they are tasting.

1. First, instruct students to observe the features of the grape and the texture of the grape.
2. Next, have students smell the grape.
3. Then, have students take a small bite of the grape and listen for what the grape sounds like when taking a bite.
4. Lastly, have students eat an entire grape and observe the flavors of the grape.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the grape's features, aromas, sounds, and flavors. Students can compare different varieties of grapes, if available.



Workbook #10-13

Grape Juice taste test (10 minutes)

Ask students to raise their hands if they like to drink grape juice. Explain that some types of juice have added sugar and other ingredients that are not good for the body. Other juices do not contain added sugar or other ingredients. Juices that do not have added sugar are better for the body's health.

Distribute copies of nutrition labels from the conventional juice bottle and the natural juice bottle. Have students compare the nutrition labels, analyzing sugar content and added ingredients.



Label the juices Juice A and Juice B. Hand each student two cups. Allow students to taste Juice A and Juice B. Instruct students to predict which juice is natural and which is conventional. Take a class survey to determine which juice is preferred. Lastly, reveal the identity of Juice A and Juice B.

Cookbook (2–5 minutes)

Hand out cookbooks and grape recipes. Ask students if they eat grapes at home. Do their families have grape recipes? Encourage students to try the new recipe at home with their families.

Cultural relevance

Think about the cultural connections this lesson has with students. Consider why this lesson is relevant to the specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?

extension activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary to fit individual students and classrooms.

Literacy

- Read *First Day of Grapes*, by L. King Perez (Lee & Low Books, 2002), the story of a third grader who comes from a migrant family.
- Read *The Grapes of Math*, by Greg Tang (Houghton Mifflin, 2009), a book of math riddles involving food and animals.

Math

- Estimate how many grapes are in one bunch. Count the grapes to determine the accuracy of the estimates.
- Explain to students that 10 grapes have about 35 calories. Determine how many calories are in the bunch. Max ate 20 grapes. How many calories did he consume?

Writing

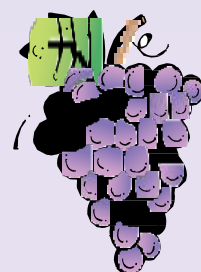
- Ask students to imagine they are food critics. Tell them to write a review on the different types of grapes tasted in the lesson.
- Create a Venn diagram of red and green grapes, comparing and contrasting the grapes using the five senses.

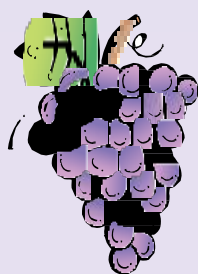
science

- Research the process in which grapes turn into raisins.
- Do a raisin and grape taste test, comparing their flavors, textures, and other unique qualities.

social studies

- Ask students to use the internet to determine countries that produce a lot of grapes. Instruct students to locate these countries on a world map.



[illegible]

Roots and Fruits

Lesson — PePPers **Chapter 7**





time allotted

45 Minutes

target audience

Grades 3-5

Materials Included

- Nutrient chart
- Human body map
- Pepper cards

additional Materials needed

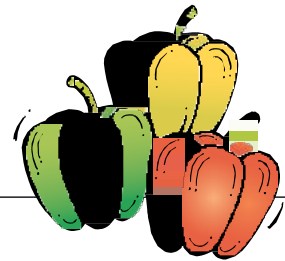
- U.S. map
- Enlarged photo of a pepper plant
- Fresh, local peppers for tasting (try to include as many color varieties as possible)
- Name, location, and pictures (if available) of local farm that cultivated the peppers
- Napkins and plates
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

set Up

- Wash and cut peppers prior to the lesson.
- Set out reusable plates.
- Set up nutrient chart, U.S. map, and human body map.

Learning objectives

- Students will be able to state that peppers originated in South America.
- Students will be able to describe the climate and conditions in which peppers are cultivated.
- Students will be able to state that the growing season for peppers is July through September.
- Students will be able to state that the harvest month for peppers is August.
- Students will be able to explain that peppers grow on a plant and are the fruit of the plant.
- Students will be able to list two nutrients found in peppers.
- Students will be able to identify the parts of the body the nutrients in peppers benefit.
- Students will be able to use adjectives to describe the flavor and texture of peppers.
- Students will be able to use a map to identify where peppers grow locally.



review Previous Lesson (2 minutes)

Discuss the fruit or vegetable from the previous week. Review the color group, nutrient information, and location the food came from. Ask students if anyone tried the recipe from the previous lesson. Allow time for students to share personal connections to the content that was covered in the previous lesson.

Introduction to Peppers (5 minutes)

Begin the lesson by showing and identifying today's food.



Workbook #1

Fruit or Vegetable? (5 minutes)

Have all students explore the inside of a pepper by opening it up with their hands. Teachers may choose to demonstrate this in front of the class instead. Invite students to share their observations. Point out that the peppers have seeds. Remind students that according to scientists, a plant part that contains seeds is called a fruit. Ask: Who can think of some other foods that we may call vegetables but are actually the fruit of the plant? Examples include tomatoes, pumpkins, and cucumbers.



Workbook #2

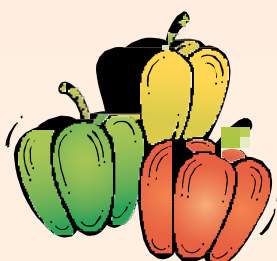


Fruit vs. Vegetable

The botanical definition of a fruit is the part of the plant that contains seeds. According to scientists, a pepper is therefore a fruit. The word vegetable is a culinary term used to describe plant foods with less sugar. Vegetables include plant parts such as leaves (lettuce), stems (asparagus), roots (carrots), flowers (broccoli), bulbs (garlic), seeds (peas and beans), and some botanical fruits (peppers, cucumbers, tomatoes).

Pepper Facts

- Peppers made up a very large part of the diet of people in South America and Central America. Fragments of peppers have been found in ancient ruins in Peru.
- When explorers like Christopher Columbus came to the Americas, he and his crew found peppers and eventually took them back to Europe, India, and other parts of Asia.



eating a rainbow (5 minutes)

Remind students that each week they will taste fruits and vegetables from different color groups. Review all of the different colored fruits and vegetables that they have already tasted. Discuss what students ate for lunch or for dinner the day before and ask them how many color groups were on their lunch tray or dinner plate.

ask: *What color is today's food?*

Peppers fit into many color groups: red, yellow, orange, green and even purple!

ask: *Are there any other fruits or vegetables that fit into multiple color groups?*

Examples include tomatoes, carrots, apples, and grapes.



Workbook #3

Draw (5 minutes)

As students observe their peppers, have them draw the pepper in their workbooks. Encourage students to observe the size, shape, colors, textures, and different parts of the pepper as they draw.

Where Do Peppers Come From? (5–10 minutes)

Have students make some predictions about the origin of the pepper. Tell students that peppers originated in South America.

Explain to the students that today peppers grow in the Midwest. Share with them the name, location and pictures (if available) of the farm that grew today's peppers. Invite a student to place a pepper manipulative on the U.S. map, indicating where today's peppers were grown.

Growing Peppers (5–10 minutes)

Cultivation:

Review the word *cultivation*. Ask students to imagine what a pepper plant looks like. Ask students how peppers grow. Do peppers grow on a bush, tree, or in the ground? Show pictures of a pepper plant, and explain that peppers grow on a plant. Ask students if the pepper plant reminds them of any other plant types.



Workbook #4

ask: *What part of the plant is a pepper?*

Determine together that the pepper is the fruit of the plant because it has seeds.



Workbook #5



Climate:

ask: *Do peppers like warm or cool climates?*

The pepper is a warm season vegetable. Pepper plants grow and produce fruit when the soil and air temperatures are warm.

It is dangerous for a pepper plant when nighttime temperatures fall below 60 degrees F. Daytime temperatures above 90 degrees F can also hurt the plant's ability to produce peppers.

seasonality:

ask: *When do peppers grow?*

- The general *growing season* for peppers is July through September.
- The *harvest month* for peppers in the Midwest is August.



Workbook #6-7

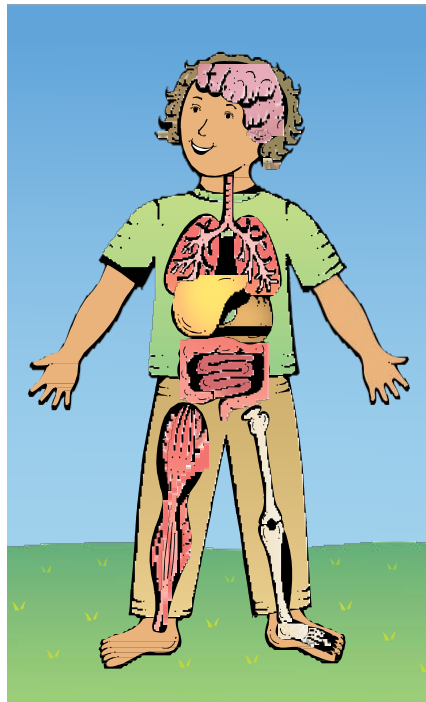
nutrients & health (5–10 minutes)

say: *Today's food has many nutrients that benefit the body. We will focus on three nutrients today.*

antioxidants

Peppers contain antioxidants. Point out the word antioxidants on the nutrient chart. Review that antioxidants are like superheroes in the body. Antioxidants keep cells healthy and help keep away diseases. Tell students that dark green, red, and orange fruits and vegetables have many important antioxidants. Ask them if they can think of any other fruits and vegetables that have antioxidants. Examples include tomatoes, broccoli, spinach, strawberries, blueberries, and peppers.

- Nutrient Chart—Invite a student to place a pepper manipulative on the nutrient chart.
- Human Body Map—Invite a student to place a pepper manipulative on the human body map.



Vitamin C

Hold up the vitamin C sign, and ask students how vitamin C benefits the body. Vitamin C helps keep colds away and helps keep teeth and gums healthy. Review what other foods contain vitamin C, such as blueberries, oranges, and limes.

nutrient

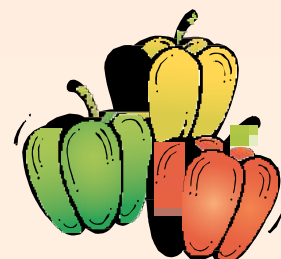
Definitions:

antioxidants

- An antioxidant is a molecule capable of slowing or preventing the oxidation of other molecules. Oxidation reactions can produce free radicals, which start chain reactions that damage cells.
- Antioxidants may reduce premature aging, cancer, cataracts, and an array of degenerative diseases.

Vitamin C

- Vitamin C plays an important role in the formation of collagen, a protein that helps reinforce connective tissues that hold together structures of the body and is the most abundant protein in the skin, bone, tendons, cartilage, and teeth.
- Vitamin C deficiency may cause scurvy, a painful disease that causes connective tissue to break down and gums and joints begin to bleed.





nutrient Definitions:

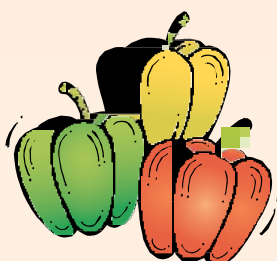
Vitamin a

- Vitamin A fights infections and bolsters immune function by maintaining skin cells mostly.
- The liver stores more than 90% of the body's Vitamin A and the remainder is deposited in adipose tissue, lungs, and kidneys.

reminder: *Be sure to check if your students have special diets or food allergies before the tasting.*

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



Vitamin a

Hold up vitamin A sign and review the ways in which vitamin A benefits the body. Vitamin A is good for the eyes, helping to maintain good vision. Vitamin A also supports a healthy immune system. Review what other fruits and vegetables have vitamin A. Examples include carrots, sweet potatoes, and red bell peppers.



Workbook #8-9

tasting (5-10 minutes)

Reinforce the importance of the tasting manners. Explain the significance of practicing manners while eating in a public place. Review the tasting words. Encourage students to use the tasting words outside school, in a restaurant setting or when tasting someone else's homemade food. Connect the tasting at school to eating out at a restaurant or at someone's home.

Have students wash their hands. Then hand out pepper pieces and encourage students to be mindful of the food they are tasting.

1. First, instruct students to look at the features of the pepper and observe the texture of the pepper.
2. Next, have students smell the pepper.
3. Then, have students take a small bite of a pepper piece and listen for the sounds they hear when taking a bite.
4. Lastly, have students eat the entire pepper piece and observe the flavors of the pepper.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the pepper's features, aromas, sounds, and flavors.



Workbook #10-13

Cookbook (2-5 minutes)

Hand out the cookbooks and pepper recipes. Ask students if they have eaten peppers before. Do their families have recipes that include peppers? Introduce students to the pepper recipe. Encourage students to try the new recipe at home with their families.

Cultural relevance

Think about the cultural connections this lesson has with students. Consider why this lesson is relevant to the specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?



extension activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary to fit individual students and classrooms.

Literacy

- Read *Harvesting Hope: The Story of Cesar Chavez*, by Kathleen Krull (Harcourt Children's Books, 2003), the story of the activist who marched to protest working conditions of migrant farm-workers.
- Read *A Fruit Is a Suitcase for a Seed*, by Jean Richards (First Avenue Editions, 2006), which describes how fruits of plants protect seeds and help them disseminate.

Math

- Estimate how many seeds are inside a bell pepper. Instruct students to count the seeds inside a bell pepper to test the accuracy of their estimate.

Writing

- Write a food critic article on the flavors of bell peppers.
- Create a Venn diagram comparing and contrasting the three different colors of bell peppers.

science

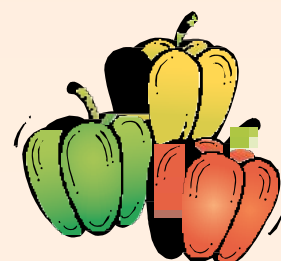
- Using magazine cutouts or pictures, have students create a "fruit salad" in order to assess their understanding of the definition of a fruit (any food that contains seeds).
- Compare the tastes of different types of peppers, including jalapenos, bell, and banana peppers. Discuss the spiciness of certain peppers.

social studies

- On the map, trace the route that peppers followed from South America to the students' hometown.

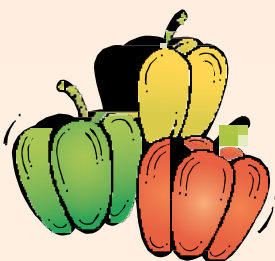
art

- Create pepper prints with paint by cutting peppers in half and using them as stamps.





notes:



Roots and Fruits

Lesson — Pears Chapter 8





time allotted

45 Minutes

target audience

Grades 3-5

Materials Included

- Nutrient chart
- Human body map
- Pear cards

additional Materials needed

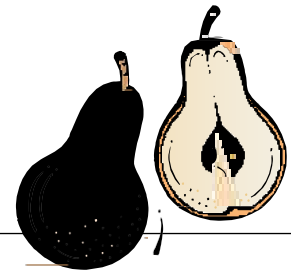
- U.S. map
- Enlarged photo of a pear tree
- Fresh local pear varieties ready for tasting
- Name, location, and pictures (if available) of local farm that cultivated the pears
- Variety of pears for display
- Napkins and plates
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

set Up

- Wash and cut pears prior to the lesson.
- Set out reusable plates.
- Set up nutrient chart, human body map, and U.S. map.

Learning objectives

- Students will be able to state that pears originated in Europe and Asia (Eurasia).
- Students will be able to describe the climate and conditions in which pears are cultivated.
- Students will be able to state that the pear growing season is August through October.
- Students will be able to state that the peak harvest month for pears depends on the pear variety.
- Students will be able to describe the structure of a pear tree.
- Students will be able to list two nutrients found in pears.
- Students will be able to identify the parts of the body the nutrients benefit.
- Students will be able to use a map to identify where pears grow locally.
- Students will be able to use adjectives to describe the taste and texture of pears.



review Previous Lesson (2 minutes)

Review the color group, nutrient information, and location of cultivation of the fruit or vegetable highlighted in the previous lesson. Ask students if anyone tried the recipe from the previous lesson. Allow time for students to share personal connections to the content that was covered in the previous lesson.

Introduction to Pears (5 minutes)

Begin the lesson by showing and identifying today's food.



Workbook #1

Fruit or Vegetable? (5 minutes)

Have all students explore the inside of a pear by opening it up with their hands. Teachers may choose to demonstrate this in front of the class instead. Invite students to share their observations. Point out that the pears have seeds. Remind students that because pears have seeds, they are a fruit.

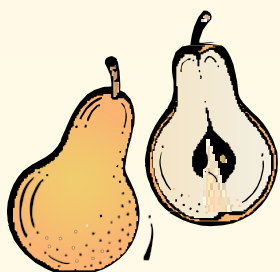


Workbook #2



Pear Facts

- During their long history, pears have been popular in both Asian and European cultures. Today, pears are commonly eaten as an appetizer or a dessert.
- In Italy they are eaten with Parmesan cheese; in France they are enjoyed with vanilla ice cream.
- Pears grow best in deep, well-drained loam soil with a lot of water.
- Pear trees are planted as one-year-old stalks and then severely pruned back, which helps shape the tree and control the size of the crop to prevent overbearing.
- There are more than 1,000 varieties of pears in the world today.



eating a rainbow (5 minutes)

Remind students that each week they will taste fruits and vegetables from different color groups. It is important to eat a “rainbow” of colors every day in order to ensure that the body gets a variety of nutrients. Review the nutritional benefits of the fruits and vegetables that students have studied.

ask: *What color is today's food?*



Workbook #3

Draw (5 minutes)

Give students time to draw a picture of a pear. Encourage students to observe the size, shape, color, and texture of the pear.

Where Do Pears Come From? (5–10 minutes)

Ask the class to make predictions of where pears come from originally. Pears are one of the oldest fruits in the world. Pears have been in existence for more than 7,000 years! Pears originated in Eurasia, a large landmass that is made up of Europe and Asia. Locate Eurasia on a map.

Explain to students that today pears grow in the Midwest. Share the name, location and pictures (if available) of the farm that grew today's pears. Invite a student to place a pepper manipulative on the U.S. map, indicating where today's peppers were grown.

Growing Pears (5–10 minutes)

Cultivation

Review the word *cultivation*. Ask students to think about how pears grow.

ask: *Do pears grow on a bush, a tree, or in the ground?*

Show a picture of a pear tree and explain that pears grow on trees.



Workbook #4

ask: *What part of the plant is a pear?*

Determine together that pears are the fruit of the plant because they have seeds.



Workbook #5

Climate

ask: *In what temperature do pears grow best?*

Pears grow best in an area that has hot days and cool nights.



seasonality

ask: *When are pears harvested?*

Review that the *growing season* is the time when pears grow and the *harvest month* is the period when pears are ready to be picked.

- The growing season for pears is April through September.
- The best time to harvest pears begins in August with a variety called Bartletts. Other varieties can be harvested in September and October.



Workbook #6-7

nutrients & health (5–10 minutes)

say: *Today's food has many nutrients that benefit the body. We will focus on two nutrients today.*

Fiber

Pears are high in fiber. Eating fiber is important because it helps to move food through the intestines and through the digestive system. Fiber helps the body know when it is full during a meal. Fiber is important for a healthy digestive system.

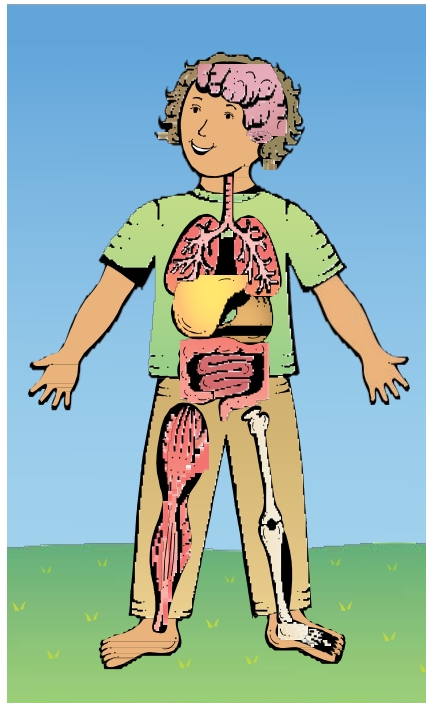
- Nutrient Chart—Invite a student to place a pear manipulative on the nutrient chart.
- Human Body Map—Invite a student to place a pear manipulative on the human body map.

Potassium

Pears contain a lot of potassium. Potassium is important to maintain a healthy blood pressure and is good for heart health. Potassium is also important for strong muscles. A healthy heart and strong muscles allow the body to easily run, jump and play.



Workbook #8-9



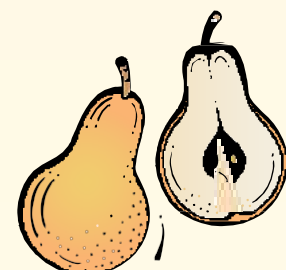
nutrient Definitions:

Fiber

- Fiber becomes glucose when absorbed by the body, which gives us energy.
- It enhances the feeling of fullness by delaying gastric emptying.
- It removes cholesterol by binding with bile in the intestine and causing it to be excreted.

Potassium

- Potassium is an element that is part of many minerals. It is necessary for the function of all living cells.
- A potassium deficiency can cause harm to the heart and body.

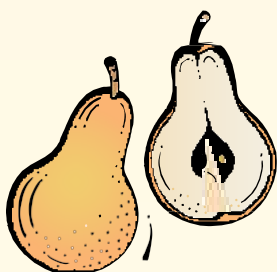




reminder: Be sure to check if your students have special diets or food allergies before the tasting.

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



tasting (5–10 minutes)

Review tasting manners and tasting words.

Have students wash their hands. Then hand out pear pieces and encourage students to be mindful of the food they are tasting.

- 1.First, instruct students to observe the features of the pear.
- 2.Next, have students smell the pear.
- 3.Then, have students take a small bite of the pear and listen for what the pear sounds like when taking a bite.
- 4.Lastly, have students eat an entire pear piece and observe the flavors of the pear.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the pear's features, aromas, sounds, and flavors. Students can compare different varieties of pears, if available.



Workbook #10-13

Cookbook (2–5 minutes)

Hand out cookbooks and pear recipes. Ask students if they have eaten pears at home. Ask if their families have recipes that include pears. Share the pear recipe with students. Encourage students to try the recipe at home with their families.

Cultural relevance

Think about the cultural connections this lesson has with students. Consider why this lesson is relevant to the specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?



extension activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary to fit individual students and classrooms.

Literacy

- Read *Too Many Pears*, by Jackie French and Bruce Whatley (Koala Books, 2003). Pamela the cow is obsessed with pears and eating them all. Something has to be done to stop her...
- Picture book activity to discuss literary elements identifying problem and resolution.

Math

- Explore the symmetry of a pear. Cut construction paper pears in half along different lines of division. Make a chart using other construction paper fruit shapes to show which fruits have symmetry and which do not.

Writing

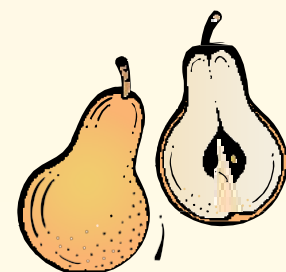
- Write a critique about the flavors, aromas, and textures of the pears tasted.
- Read *Did You Say Pears?*, by Arlene Alda (Tundra Books, 2006), and brainstorm your own list of homonyms and homophones.

science

- Create a Venn diagram comparing and contrasting the different varieties of pears focusing on five senses.

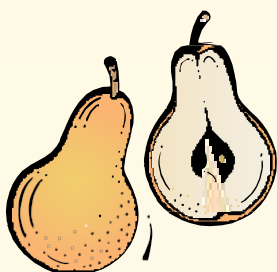
social studies

- Read *Apples to Oregon: Being the (Slightly) True Narrative of How a Brave Pioneer Father Brought Apples, Peaches, Pears, Plums, Grapes, and Cherries (and Children) Across the Plains*, by Deborah Hopkinson (Aladdin, 2008), the story of a family that travels across the Great Plains, bringing their fruit trees with them. Extend the lesson by studying pioneers and western expansion in the U.S.





notes:



Roots and Fruits

Lesson — eggpLant **Chapter 9**





time allotted

45 Minutes

target audience

Grades 3-5

Materials Included

- Nutrient chart
- Human body map
- Eggplant cards

additional Materials needed

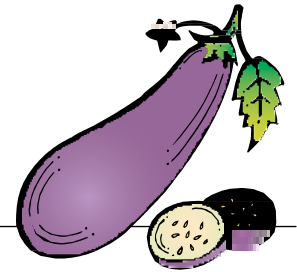
- U.S. map
- Enlarged photo of eggplant fruits on the plant
- Prepared eggplant for tasting
- Name, location, and picture (if available) of local farm that cultivated the eggplant
- Napkins and plates
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

set Up

- Wash, cut and cook eggplant prior to lesson.
- Set out reusable plates.
- Set up nutrient chart, U.S. map, and human body map.

Learning objectives

- Students will be able to state that eggplant originated in India.
- Students will be able to describe the eggplant growing season.
- Students will be able to describe the climate and conditions in which eggplant are cultivated.
- Students will be able to explain that the peak harvest month for eggplant depends on maturity (size, appearance, firmness).
- Students will be able to list two nutrients found in eggplant.
- Students will be able to identify the parts of the body the nutrients benefit.
- Students will be able to explain that the eggplant is the fruit of the plant .
- Students will be able to select adjectives to describe the taste and texture of eggplant.
- Students will be able to use a map to identify where eggplant grows locally.



review previous Lesson (2 minutes)

Review the color group, nutrient information, and location of cultivation for the previous lesson's food. Ask students if anyone tried the recipe from the previous lesson. Ask students to share personal connections to the content that was covered in the previous lesson.

Introduction to eggplant (5 minutes)

Begin the lesson by showing and identifying today's food. Have students guess the name of the fruit. Give hints if students have difficulty.



Workbook #1

Fruit or Vegetable? (5 minutes)

Have all students explore the inside of a eggplant by opening it up with their hands. Teachers may choose to demonstrate this in front of the class instead. Invite students to share their observations. Point out that the eggplant has seeds. Remind students that according to scientists, a plant part that contains seeds is called a fruit. Ask: Who can think of some other foods that we may call vegetables but are actually the fruit of the plant? Examples include tomatoes, pumpkins, and cucumbers.



Workbook #2

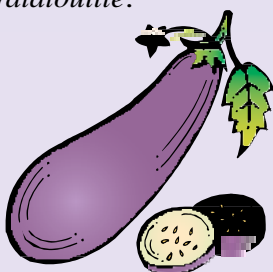


Fruit vs. Vegetable

The botanical definition of a fruit is the part of the plant that contains seeds. According to scientists, a pepper is therefore a fruit. The word vegetable is a culinary term used to describe plant foods with less sugar. Vegetables include plant parts such as leaves (lettuce), stems (asparagus), roots (carrots), flowers (broccoli), bulbs (garlic), seeds (peas and beans), and some botanical fruits (peppers, cucumbers, and tomatoes).

eggplant Facts

- Cultures in Asia used eggplant extensively because of its mild flavor and spongy texture.
- Eggplant was quickly integrated into local cuisines in China, India, Italy, France, the Middle East, Persia, Russia, the United States, Greece, and Turkey.
- The eggplant is the most consumed vegetable in the Middle East.
- Eggplant is popular in Greek *baba ghanoush*, Italian *eggplant parmesan*, and in the French vegetable stew, *ratatouille*.



eating a rainbow (5 minutes)

Remind students that each week they will taste fruits and vegetables from different color groups. It is important to eat a “rainbow” of fruits and vegetables every day. Review that different colored foods provide different nutrients that help the body stay healthy. Nutrients help the body grow, provide energy, keep the brain working at its best, and keep the body strong and healthy. Ask: What color is today’s food?



Workbook #3

Draw (5 minutes)

Give students a few minutes to draw a picture of the eggplant in their workbooks. Have students pay attention to the shape, texture, and size of the eggplant.

Where Do eggplants Come From? (5–10 minutes)

Have students guess the origin of eggplant. Eggplant originated in India. Share with students that eggplant became popular worldwide as it was introduced to new cultures.

Explain to students that today eggplant grows in the Midwest as well. Share with them the name, location, and pictures (if available) of the farm that grew today’s eggplant. Invite a student to place an eggplant manipulative on the U.S. map, indicating where today’s eggplant was grown.

growing eggplant (5–10 minutes)

Cultivation

Review the term cultivation. Encourage students to use what they know to make predictions about eggplant cultivation.

ask: *Do eggplants grow on a bush, on a vine, or right on the ground?*

Allow for thinking time. Determine together that eggplants grow on a plant close to the ground.



Workbook #4

ask: *What part of the plant is a pepper?*

Determine together that the pepper is the fruit of the plant because it has seeds.



Workbook #5

Climate

ask: *Where does eggplant grow?*

Considering the climate in India, have students brainstorm the conditions in which eggplant grows best. Show a picture of eggplant



growing. Eggplant thrives in warm, hot weather and is very susceptible to low temperatures.

seasonality

ask: *When is eggplant harvested?*

Review the terms *growing season* and *harvest month*.

- The growing season for eggplant is May through August
- The best time to harvest eggplant depends on the size, appearance, and firmness of the fruit.



Workbook #6-7

nutrients & health (5–10 minutes)

say: *Today's food has many nutrients that benefit the body. We will focus on two nutrients today.*

Fiber

Eggplant are a source of fiber.

ask: *Does anyone know why fiber is good for the body?*

Explain that fiber is good for digestion. Fiber helps the body know when it is full during a meal. Fiber is the nutrient that the body needs to help move food through the digestive system. Fiber also helps to lower cholesterol, which reduces the risk of heart disease.

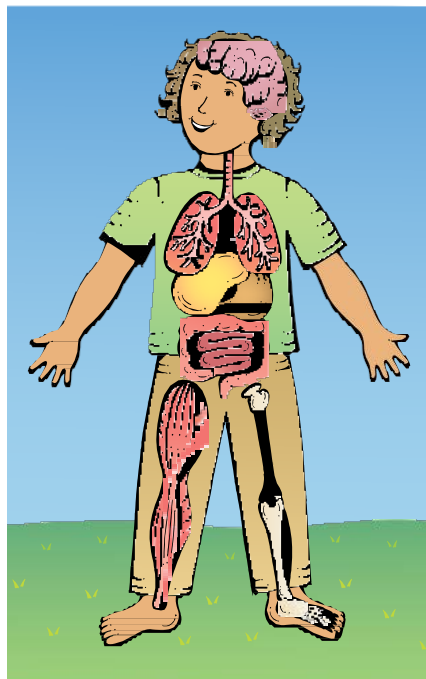
- Nutrient Chart–Invite a student to place an eggplant manipulative on the nutrient chart.
- Human Body Map–Invite a student to place an eggplant manipulative on the human body map.

potassium

Eggplant is rich in potassium. Potassium is good for the muscles and the heart. Potassium also helps maintain a normal blood pressure. Blood pressure is the pressure or force of the blood against the walls of the arteries, from the heart into the rest of the body. When the blood pumps out of the heart, it is delivering oxygen and nutrients to the rest of the body.



Workbook #8-9



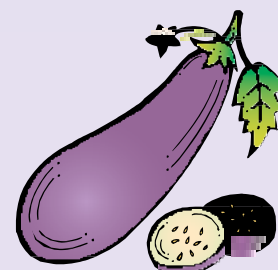
nutrient Definitions:

Fiber

- Fiber becomes glucose when absorbed by the body, which gives us energy.
- It enhances the feeling of fullness by delaying gastric emptying.
- It removes cholesterol by binding with bile in the intestine and causing it to be excreted.

potassium

- Potassium is an element that is part of many minerals. It is necessary for the function of all living cells.
- A potassium deficiency can cause harm to the heart and body.

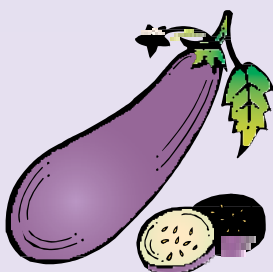




reminder: Be sure to check if your students have special diets or food allergies before the tasting.

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



tasting (5-10 minutes)

Review tasting manners and tasting words. Highlight the word savor. Review what it means to “savor your food.” Have a discussion with students about why it is fun to savor all of the flavors of the foods they eat. Paying attention to the aromas, textures, and tastes of food allows them to enjoy their food more and be aware of the food they are eating.

Explain to students that this tasting lesson is different, because eggplant is quite bitter when raw. Eggplant is always eaten after it is cooked.

Have students wash their hands. Then hand out the eggplant pieces and encourage students to be mindful of the food they are tasting.

1. First have students look at the features of the eggplant and observe the texture of the eggplant.
2. Next, have students smell the eggplant.
3. Then, have students take a small bite of the eggplant piece and listen for what the eggplant sounds like when taking a bite.
4. Lastly, have students eat an entire piece of eggplant and observe the flavors.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the eggplant’s features, aromas, sounds, and flavors.



Workbook #10–13

Cookbook (2–5 minutes)

Hand out cookbooks and eggplant recipes. Ask students who eats eggplant at home. Find out if any families have special eggplant recipes they enjoy. Encourage students to try the new eggplant recipe at home with their families.

Cultural relevance

Think about the cultural connections this lesson has with students. Consider why this lesson is relevant to the specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?



extension activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary for individual students and classrooms.

Literacy

- Sequencing activity: Choose a recipe that is simple, like Eggplant Parmesan, and scramble the steps for students to then place in sequential order. Have them draw/color the final product.
- Write an acrostic poem using the word eggplant. Write eggplant vertically. For each letter in the word eggplant, write a word that describes an eggplant.

Math

- Have students research different types of eggplant to find out how long each type is and how much each type weighs. Then have students create a chart showing the difference in size among the various types of eggplant.

Writing

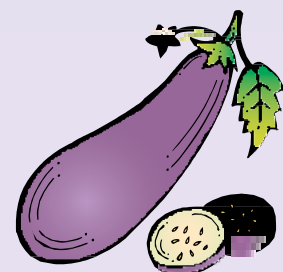
- Carve a face on the side of an eggplant. Instruct students to give the eggplant a name and write a creative story about the eggplant.

science

- In small groups, instruct students to use a balance to measure the weight of a variety of eggplants. Ask student to place the eggplant in order from lightest to heaviest. Ask students to think about how size relates to weight.
- Research different taste zones on the human tongue. What other foods would trigger a bitter taste?

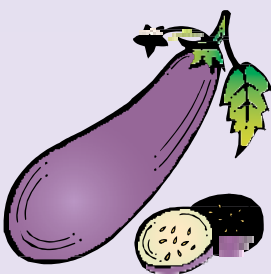
social studies

- Research Indian culture and how eggplant is used in traditional Indian cuisine.





notes:



Roots and Fruits

Lesson — Carrots **Chapter 10**





time allotted

45 Minutes

target audience

Grades 3-5

Materials Included

- Nutrient chart
- Human body map
- Carrot cards

additional Materials needed

- U.S. map
- World map
- Enlarged photo of carrots growing in the ground
- Fresh, local carrots for tasting (orange and another color if possible)
- Name, location and pictures (if available) of local farm that cultivated the carrots
- Carrot with green top to show
- Napkins and plates
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

set Up

- Cut and wash carrots prior to lesson.
- Set out reusable plates.
- Set up U.S. map, body map, and nutrient chart.

Learning objectives

- Students will be able to state that carrots originated in the Middle East and Central Asia.
- Students will be able to describe the climate and conditions in which carrots are cultivated.
- Students will be able to describe the carrot growing season.
- Students will be able to state that the peak harvest month for carrots is September.
- Students will be able to explain that carrots grow in the ground and are the root of the plant.
- Students will be able to list two nutrients found in carrots.
- Students will identify the parts of the body the nutrients benefit.
- Students will be able to use adjectives to describe the taste and texture of carrots.
- Students will be able to use a map to identify where carrots grow.



review previous Lesson (2 minutes)

Review the color group, nutrient information, and location of cultivation for the previous lesson's food. Ask students if anyone tried the recipe from the previous lesson. Allow time for students to share personal connections to the content that was covered in the previous lesson.

Introduction to Carrots (5 minutes)

Begin the lesson by showing students just the green top of a carrot. Invite students to guess what the food of the day is. Identify that it is a carrot. Show students varieties of carrots and discuss qualities of each type. Examples include Thumbelina, Cosmic Purple, orange and yellow carrots.



Workbook #1

Fruit or Vegetable? (5 minutes)

Tell students to use what they already know about fruits and vegetables to predict whether a carrot is a fruit or vegetable. Explain that since carrots do not have seeds, they are a vegetable.



Workbook #2



Carrot Facts

- Temple drawings from ancient Egyptian pyramids show a plant believed to be a carrot. That means the carrot has been around for at least 4000 years!
- The first carrot was not orange. It was purple! The earliest forms of carrots were white, purple, red, yellow, black, and green. Europeans actually grew the first orange carrot because they liked the color.
- As carrots grow larger underground they become less sweet.
- Healthy, long carrots grow best in loose, well-worked soil that is rich in humus.
- Carrots can grow split in two (like an upside down V) if there is a rock in the soil.
- Carrots are known for being a favorite of rabbits, but instead of digging up the roots, they usually just eat the exposed greens.



eating a rainbow (5 minutes)

Remind students that each week they will taste fruits and vegetables from different color groups. It is important to eat a “rainbow” of fruits and vegetables every day. Review that different colored foods provide different nutrients that help the body stay healthy. Nutrients help the body grow, provide energy, keep the brain working at its best, and keep the body strong and healthy. Ask: What color is today’s food?



Workbook #3

Draw (5 minutes)

Give students a few minutes to draw a picture of a carrot in their workbooks. Encourage students to pay particular attention to the texture, color, size, and shape of the carrot.

Where Do Carrots Come From? (5–10 minutes)

Invite students to make predictions of the carrot’s origin. The carrot traces its ancestry back thousands of years. The carrot was originally cultivated in the Middle East and Central Asia.

Use a world map to show the Middle East and Central Asia.

Explain to students that today some carrots grow in the Midwest. Share with them the name, location, and pictures (if available) of the farm that grew today’s carrots. Invite a student to place a carrot manipulative on the U.S. map, indicating where today’s carrots were grown.

Growing Carrots (5–10 minutes)

Cultivation:

Review the word cultivation. Encourage students to use what they know and what they observed about the carrot to predict how carrots grow.

ask: Do carrots grow on a bush?
Do carrots grow in the ground?

Explain that the carrot is a root vegetable. This means that carrots grow underground. Draw a picture of a carrot growing under the ground to further explain the concept of a root.



Workbook #4





ask: What part of the plant is a carrot?

Determine together that carrots are the root of the plant.



Workbook #5

Climate:

ask: Where do carrots grow?

Have students make predictions about the temperatures that are best for carrot growth.

- Carrots thrive best in climates with temperatures between 50–60 degrees with plenty of moisture.
- Carrots grow more abundantly in moist climates.

seasonality:

ask: When do carrots grow? When are they harvested?

Review the terms *growing season* and *harvest month*.

- The growing season is the period of each year that carrots can grow. The growing season for carrots is July through November.
- The harvest month, or the month when most carrots are harvested, is between September and November. The vegetable has matured, and is ripe or ready to be eaten. The harvest month depends on the region in which it is grown, and the particular variety of carrot. Most farmers harvest their carrots after about 3 months.



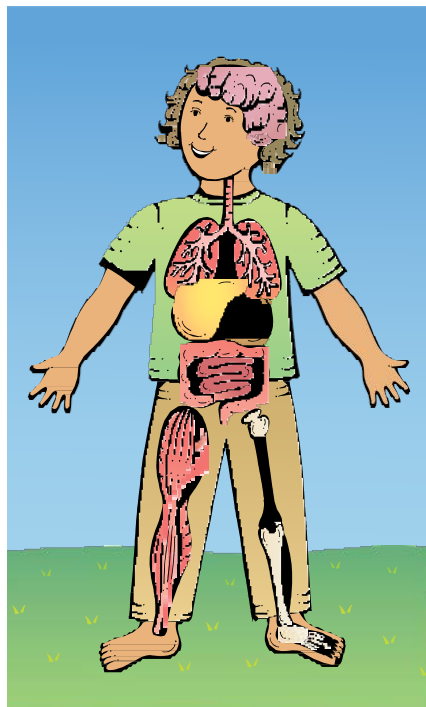
Workbook #6-7

nutrients & health (5–10 minutes)

say: Today's food has many nutrients that benefit the body. We will focus on two nutrients today.

Vitamin a

Carrots are good for the eyes because they have vitamin A. Other orange fruits and vegetables contain vitamin A as well, such as squash, yellow peppers, and oranges. Vitamin A improves eyesight by helping the eyes see more keenly and see at night. Vitamin A is also good for the immune system and cancer prevention.



nutrient Definitions:

Vitamin a

- Vitamin A fights infections and bolsters immune function by maintaining skin cells mostly.
- The liver stores more than 90% of the body's Vitamin A and the remainder is deposited in adipose tissue, lungs, and kidneys.

Fiber

- Fiber becomes glucose when absorbed by the body, which gives us energy.
- It enhances the feeling of fullness by delaying gastric emptying.
- It removes cholesterol by binding with bile in the intestine and causing it to be excreted.





reminder: Be sure to check if your students have special diets or food allergies before the tasting.

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



- Nutrient Chart–Invite a student to place a carrot manipulative on the nutrient chart.
- Human Body Map–Invite a student to place a carrot manipulative on the human body map.

Fiber

Carrots are a good source of fiber. Fiber helps the body know when it is full during a meal. Fiber is the nutrient that the body needs to help move food through the digestive system. Fiber also helps to lower cholesterol, which reduces the risk of heart disease.



Workbook #8-9

tasting (5-10 minutes)

Review the tasting manners and tasting words. Have students wash their hands and wait for everyone to get their carrots before doing the tasting together.

Hand out the carrot pieces and encourage students to be mindful of the food they are tasting.

- 1.First, instruct students to look at the features of the carrot and observe the texture of the carrot.
- 2.Next, have students smell the carrot.
- 3.Then, have students take a small bite of the carrot piece and listen for what the carrot sounds like when taking a bite.
- 4.Lastly, have students eat an entire carrot piece and observe the flavors of the carrot.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the carrot's features, aromas, sounds, and flavors.



Workbook #10–13

Cookbook (2–5 minutes)

Hand out cookbooks and carrot recipes. Ask students who eats carrots at home or at school. Ask students if their families have any special recipes for carrots that they especially enjoy. Encourage students to try this recipe at home with their families.

Cultural relevance

Think about the cultural connections this lesson has with students. Consider why this lesson is relevant to the specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?



extension activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary to fit individual students and classrooms.

Literacy

- Read *Stone Soup*, by Jon J Muth (Scholastic, 2003), an adaptation of the traditional folktale about building community by cooking soup that incorporates Chinese folklore.
- Read *Tops and Bottoms*, by Janet Stevens (Harcourt Children's Books, 1995), a story of a selfish bear who is tricked when he orders Hare to grow him food that grows on the top, bottom, or middle of the plants.

Math

- Measure and compare carrot lengths.
- Ask students to write story problems involving carrots that are eaten by rabbits. Model writing a sample story problem, such as "There were 25 carrots growing on Farmer Julio's land. Rabbits ate 10 carrots. How many were left?"

Writing

- Read *Carrots to Cupcakes: Reading, Writing, and Reciting Poems about Food*, by Susan M. Freese (Super Sandcastle, 2008), and write a class poem about carrots.

science

- Cut off the green tops of the carrots and immerse the ends in water. Wait until roots grow, and then plant in an indoor planter or garden. Discuss how roots help plants grow (by anchoring the plant and transporting water to the rest of the plant).

social studies

- Research the history of different colored carrots and find out how orange came to be the most commonly grown type.

art

- Save the tops of carrots with greens still attached and use these to make carrot stamps. Use with stamp pads or paint to make creative carrot creations.





notes:



Roots and Fruits

Lesson — spinach chapter 11





time allotted

45 Minutes

target audience

Grades 3–5

Materials included

- Nutrient chart
- Human body map
- Spinach cards

additional Materials needed

- U.S. map
- Enlarged photo of spinach growing on the ground
- Spinach prepared for tasting (raw or cooked)
- Name, location, and pictures (if available) of the local farm that grew the spinach
- Napkins and plates
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

set Up

- Wash and separate spinach leaves prior to the lesson.
- Set out reusable plates.
- Set up nutrient chart, U.S. map, and human body map.

Learning objectives

- Students will be able to explain that spinach originated in Persia (present-day Iran).
- Students will be able to describe the climate and conditions in which spinach is cultivated.
- Students will be able to state that the growing season for spinach is during the cool weather months (spring and fall).
- Students will be able to describe that the harvest month for spinach depends on the desired size of the leaves.
- Students will be able to state that spinach grows on the ground and is the leaf of the plant.
- Students will be able to list two nutrients found in spinach.
- Students will be able to identify the parts of the body the nutrients benefit.
- Students will be able to use adjectives to describe the flavor and texture of spinach.
- Students will be able to use the map to identify where spinach grows locally.



review previous Lesson (2 minutes)

Review the color group, nutrient information, and location of cultivation for the previous lesson's food. Ask students if anyone tried the recipe from the previous lesson. Allow time for students to share personal connections to the content that was covered in the previous lesson.

introduction to spinach (5 minutes)

Begin the lesson by showing and identifying today's food.



Workbook #1

Fruit or Vegetable? (5 minutes)

Have students examine the spinach to investigate whether it is a fruit or vegetable. They will not find any seeds, which means that spinach is a vegetable.



Workbook #2



spinach Facts

- Share this interesting fact with the students: Not only is spinach green, it is a prized plant because of its very deep green color—no other common plant produces such a strong green color. Spinach and spinach juice have often been used purely for color. An example of this is using spinach to make green pasta!
- Our name for spinach is derived from the Persian word *ispanai*, which means “green hand.”
- Before being utilized in European cuisine, spinach was used medicinally as a laxative, because of its oxalic acid content.
- Spinach shrinks greatly in volume when cooked, reducing to 1/10th the original volume when cooked!
- Spinach is grown across the United States from California to Florida. California grows over half of all the spinach grown in the United States. Texas is another large producer of spinach, growing about one-third of the total crop in the United States.



eating a rainbow (5 minutes)

Remind students that each week they will taste fruits and vegetables from different color groups. It is important to eat a “rainbow” of colors every day. Review that different colored foods provide different nutrients that are needed to keep the body healthy. Nutrients help the body grow, provide energy, keep the brain working at its best, and keep the body strong and healthy. Ask: What color is today’s food?



Workbook #3

Draw (5 minutes)

Give students a few minutes to draw a picture of spinach in their workbooks. Have students observe the shape, size, color, and texture of the spinach.

Where Does spinach come From? (5–10 minutes)

Tell students that spinach was cultivated over 2,000 years ago in Iran. Explain that spinach traveled to Asia more than 1,500 years ago and is now a large part of cooking in many Asian countries. Use a map to show the region where spinach originated. Ask for personal connections to this region.

Explain to students that today spinach also grows in the Midwest. Share the name and location of the farm that grew today’s spinach. Invite a student to place a spinach manipulative on the U.S. map, indicating where today’s spinach was grown.

Growing spinach (5–10 minutes)

cultivation:

Review the word cultivation with students. Ask students to make predictions based on what they already know about how spinach grows.

ask: *Does spinach grow on a tree, on a bush, or on the ground?*

Show pictures of spinach fields. Determine together that spinach grows on the ground.



Workbook #4

ask: *What part of the plant is the spinach?*

Determine together that spinach is the leaf of the plant.



Workbook #5



climate:

ask: What climate is best for spinach to grow in?

- Spinach is an annual plant that grows best in cool, damp weather and rich, moist soil.
- Spinach plants can be started with seed and can be harvested six to eight weeks later or when the largest leaves are six to eight inches long. They grow very low to the ground, like lettuce.

seasonality:

ask: When is spinach harvested?

Review the terms *growing season* and *harvest month*.

- The growing season is the period of each year that spinach can grow. The growing season of spinach is during the cool weather months (spring and fall).
- The harvest month for spinach, or the month when most spinach leaves are matured and ready to be eaten, depends on the desired size of the leaves.



Workbook #6-7

nutrients & health (5–10 minutes)

say: Today's food has many nutrients that benefit the body. We will focus on two nutrients today.

Vitamin a

Spinach is full of vitamin A. Vitamin A is important for good vision. Vitamin A helps keep eyes strong so that we can see well at night, and have good vision when reading books or playing sports. Vitamin A is also good for the immune system and helps keep bodies healthy by fighting off diseases and sickness.

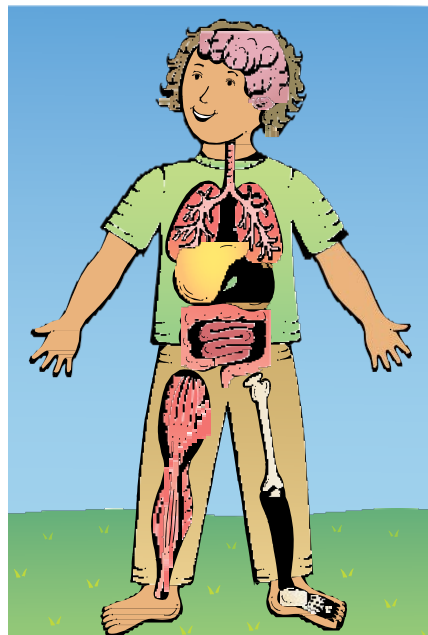
- Nutrient Chart–Invite a student to place a spinach manipulative on the nutrient chart.
- Human Body Map–Invite a student to place a spinach manipulative on the human body map.

Vitamin c

Spinach is also loaded with vitamin C. Vitamin C helps prevent colds and other sickness such as the flu. Vitamin C also helps our gums and teeth stay strong and healthy.



Workbook #8-9



**nutrient
Definitions:**

Vitamin a

- Vitamin A fights infections and bolsters immune function by maintaining skin cells mostly.
- The liver stores more than 90% of the body's Vitamin A and the remainder is deposited in adipose tissue, lungs, and kidneys.

Vitamin c

- Vitamin C plays an important role in the formation of collagen, a protein that helps reinforce connective tissues that hold together structures of the body and is the most abundant protein in the skin, bone, tendons, cartilage, and teeth.
- Vitamin C deficiency may cause scurvy, a painful disease that causes connective tissue to break down and gums and joints begin to bleed.





additional nutrients

calcium

Calcium is a mineral that is found in milk and other dairy foods. Ask students to name some calcium-rich food sources. Examples may include milk, yogurt, and cheese. Calcium is also found in a few dark, leafy vegetables such as spinach, broccoli, and kale. Some people are not able to drink milk because it makes them sick. Luckily, these vegetables have lots of calcium. Calcium also keeps bones strong.

iron

The air we breathe in contains oxygen. Oxygen needs to travel throughout the body to get to all of the muscles so that the body can move around and be strong. Iron helps oxygen travel to the muscles. Spinach has a lot of iron, which is common in meat, chicken, fish, eggs, and leafy greens. Without iron the body would feel very weak, so it needs iron to keep the body strong.

Fiber

Fiber helps the body know when it is full during a meal. Fiber is the nutrient that the body needs to help move food through the digestive system. Fiber also helps to lower cholesterol, which reduces the risk of heart disease.

reminder: Be sure to check if your students have special diets or food allergies before the tasting.

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



tasting (5–10 minutes)

Review tasting manners and tasting words.

Have students wash their hands. Then hand out spinach leaves and encourage students to be mindful of the food they are tasting.

1. Instruct students to look at the features of the spinach leaves and observe the texture of the spinach.
2. Have students smell the spinach.
3. Have students take a small bite of the spinach and listen for what the spinach sounds like when taking a bite.
4. Have students eat the entire leaf of spinach and observe the flavors of the spinach.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the spinach's features, aromas, sounds, and flavors.



Workbook #10–13

If desired, a sauce or dressing can be used to taste with the spinach. First have students try spinach plain. After the first tasting, offer a dressing or sauce such as cranberry relish or ranch dressing.



cookbook (2–5 minutes)

Hand out cookbooks and spinach recipes. Ask students if they eat spinach at home. Ask: Do your families have recipes with spinach? Encourage students to try the new recipe at home with their families.

cultural relevance

Think about cultural connections this lesson has with students. Consider why this lesson is relevant to specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?

extension activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary to fit individual students and classrooms.

Literacy

- Read *Green Power: Leaf and Flower Vegetables*, by Meredith Sayles Hughes (Lerner Publications, 2008), a non-fiction book about the history and benefits of green leafy vegetables.
- Read *The Vegetables We Eat*, by Gail Gibbons (Holiday House, 2008), a picture book identifying numerous types of vegetables and how they grow.

Writing

- Write a letter to younger grades, explaining the nutritional benefits of spinach and encouraging students to eat green, leafy vegetables.

social studies

- Discuss pop culture characters that promote healthy foods, such as Popeye's love for spinach. Compare them to unhealthy food habits of popular characters in today's media.

art

- Pound the color out of spinach by covering the leaves with wax paper and pounding them with a light mallet onto cotton fabric.

science

- Put spinach leaves in boiling water and observe the color changes that occur (from bright green to gray). Research chlorophyll and how cooking affects its color.



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Roots and Fruits

Lesson — Winter squash Chapter 12





time allotted

45 Minutes

target audience

Grades 3-5

Materials included

- Nutrient chart
- Human body map
- Winter squash cards

additional Materials needed

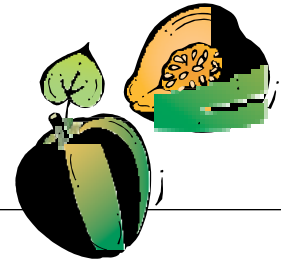
- U.S. map
- Prepared squash ready for tasting
- Variety of winter squash for showing
- Name, location, and pictures (if available) of local farm that grew today's squash
- Napkins, plates, forks
- Magnetic clips
- Hand washing supplies or proximity to sinks, soap, and water

set up

- Have winter squash washed and prepared prior to the lesson.
- Set out reusable plates.
- Set up nutrient chart, human body map, and U.S. map.

Learning objectives

- Students will be able to state that winter squash originated in Latin America.
- Students will be able to describe the winter squash growing season.
- Students will be able to describe the climate and conditions in which winter squash is cultivated.
- Students will be able to state that the peak harvest month for winter squash is September or October.
- Students will be able to list two nutrients found in winter squash.
- Students will be able to explain that winter squash grows on a vine and is the fruit of the plant.
- Students will be able to identify the parts of the body the nutrients benefit.
- Students will be able to use adjectives to describe the flavor of winter squash.
- Students will be able to use a map to identify where winter squash grows locally.



review previous Lesson (2 minutes)

Review the color group, nutrient information, and location the food came from. Ask students if anyone tried the recipe from the previous lesson. Allow time for students to share personal connections to the content that was covered in the previous lesson.

introduction to Winter squash (5 minutes)

Begin the lesson by showing students varieties of today's food. Students may recognize pumpkin but not associate it with squash. Take the time to allow students to examine the different varieties.



Workbook #1

Fruit or Vegetable? (5 minutes)

Have all students explore the inside of a squash by opening it up with their hands. Teachers may choose to demonstrate this in front of the class instead. Invite students to share their observations. Point out that the squash have seeds. Remind students that according to scientists, a plant part that contains seeds is called a fruit. Ask: Who can think of some other foods that we may call vegetables but are actually the fruit of the plant? Examples include tomatoes, peppers, and cucumbers.



Workbook #2

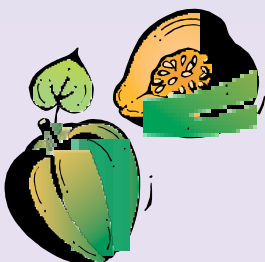


Fruit vs. Vegetable

The botanical definition of a fruit is the part of the plant that contains seeds. According to scientists, a pepper is therefore a fruit. The word vegetable is a culinary term used to describe plant foods with less sugar. Vegetables include plant parts such as leaves (lettuce), stems (asparagus), roots (carrots), flowers (broccoli), bulbs (garlic), seeds (peas and beans), and some botanical fruits (peppers, cucumbers, and tomatoes).

squash Facts

- Winter squash is durable and can last a long time. It is an integral food in Latin American cooking.
- The butternut, buttercup, and some varieties of pumpkin are commonly used in Central and South America and the Caribbean.
- The word squash derives from the Native American word askutasquash, meaning “eaten raw.”



eating a rainbow (5 minutes)

Remind students that each week they will taste fruits and vegetables from different color groups. It is important to eat a “rainbow” of colors every day. Review that different colored foods provide different nutrients that are needed to keep the body healthy. Nutrients help the body grow, provide energy, keep the brain working at its best, and keep the body strong and healthy. Ask: What color is today’s food?

 Workbook #3

Draw (5 minutes)

Give students a few minutes to draw a picture of a squash variety in their workbooks. Have them pay attention to the different shapes of each type of squash. Encourage students to observe the size, colors, and textures of the squash.

Where Do Winter squash Come From? (5–10 minutes)

Squash originated in Central and South America. Squash was a survival crop for the indigenous peoples of Central and South America, serving as both an ingredient and an edible cooked vessel. Use a map to show the region where winter squash originated. Ask for personal connections to this region.

Explain to students that today squash grow in the Midwest. Share with them the name, location, and pictures (if available) of the farm that grew today’s squash. Invite a student to place a squash manipulative on the U.S. map, indicating where today’s squash were grown. Mention that Illinois is the state that produces the largest amount of squash in the United States.

Growing Winter squash (5–10 minutes)

Cultivation:

Review the word cultivation. Ask students to think about how winter squash grow.

ask: Do winter squash grow on a bush, a tree, or in the ground?

Show a picture of a squash plant and explain that squash grows on a vine.

 Workbook #4

ask: What part of the plant is the squash?

Determine together that squash is the fruit of the plant because it has seeds.

 Workbook #5



Climate:

ask: *When do winter squash grow best?*

- Winter squash is a warm season crop. Its seeds won't germinate if the soil is cold, and young squash plants (called seedlings) are easily damaged by frost. Wait until there will be no more frosts before planting squash seeds.
- Despite its name, winter squash does not grow in the winter. Instead, if stored in a cool, dry place, winter squash fruits can be saved and eaten for several months into the winter.

seasonality:

ask: *When are squash harvested?*

Explain the terms *growing season* and *harvest month*.

- The growing season is the period of the year that winter squash grows. The growing season for winter squash is July to October.
- The harvest month for winter squash is September or October.



Workbook #6-7

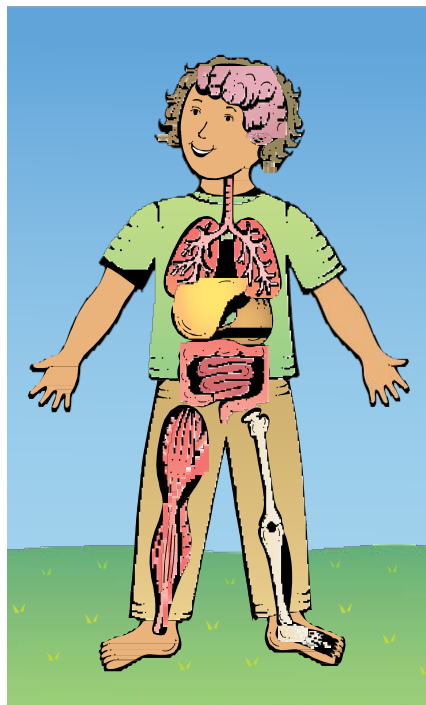
nutrients & health (5–10 minutes)

say: *Today's food has many nutrients that benefit the body. We will focus on two nutrients today.*

Vitamin a

Vitamin A is a nutrient found in orange fruits and vegetables like carrots, apples, peaches, and sweet potatoes, as well as leafy greens like spinach. It helps our eyesight stay strong and even help us see at night. Have students blink their eyes to think about eyesight. Vitamin A also helps with immunity and cancer prevention.

- Nutrient Chart—Invite a student to place a squash manipulative on the nutrient chart.
- Human Body Map—Invite a student to place a squash manipulative on the human body map.



**nutrient
Definitions:**

Vitamin a

- Vitamin A fights infections and bolsters immune function by maintaining skin cells mostly.
- The liver stores more than 90% of the body's Vitamin A and the remainder is deposited in adipose tissue, lungs, and kidneys.

Vitamin C

- Vitamin C plays an important role in the formation of collagen, a protein that helps reinforce connective tissues that hold together structures of the body and is the most abundant protein in the skin, bone, tendons, cartilage, and teeth.
- Vitamin C deficiency may cause scurvy, a painful disease that causes connective tissue to break down and gums and joints begin to bleed.

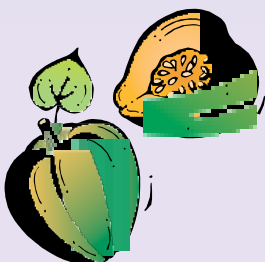




reminder: Be sure to check if your students have special diets or food allergies before the tasting.

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



Vitamin C

Review that vitamin C is a nutrient that helps boost our immunity, or keep our colds and sickness away. Explain that vitamin C also helps cuts heal and makes gums, skin, and teeth strong. Have students show off their gums by making a huge smile.



Workbook #8-9

tasting (5–10 minutes)

As a class, review tasting manners. Wait for everyone to get their portion of squash and do the tastings together. Go over adjectives in the back of the workbook. Discuss with students why it is fun and important to try new foods.

Have students wash their hands. Then hand out the winter squash and encourage students to be mindful of the food they are tasting.

1. First have students look at the features of the squash and observe the texture of the squash.
2. Next, have students smell the piece of squash.
3. Then, have students take a small bite of the piece of squash and listen for what the squash sounds like when taking a bite.
4. Lastly, have students eat the entire portion of squash and observe the flavors of the squash.

Have students use adjectives to fill in each sense box in the tasting section of the workbook. Encourage students to share their observations of the winter squash's features, aromas, sounds, and flavors.



Workbook #10-13

Cookbook (2–5 minutes)

Hand out cookbooks and squash recipes. Ask students if they have eaten squash at home. Do their families have squash recipes? Share the squash recipe with students. Encourage students to try the new recipe at home with their families.

Cultural relevance

Think about the cultural connections this lesson has with students. Consider why this lesson is relevant to the specific students that make up the class. Are there any family or personal connections, community connections, geographical connections, or school connections that can be drawn for students?



extension activities

All activities are general suggestions for elementary classrooms. Make modifications as necessary to fit individual students and classrooms.

Literacy

- Read *Seed Folks*, by Paul Fleischman (Audio Bookshelf, 2003), a short novel about an urban garden that brings the neighbors of all nationalities together.
- Read *Carlos and the Squash Plant/Carlos y la planta de calabaza*, by Jan Romero Stevens (Luna Rising, 1999), a story of a boy in New Mexico who refuses to take a bath after his work on the farm, until a squash plant sprouts from his ear.

Math

- Estimate how many seeds are in a winter squash. Make comparisons between the size of the squash and the amount of seeds.

Writing

- Pumpkin point of view: Have students pretend they are a pumpkin in a pumpkin patch not wanting to leave the patch. They need to write a paragraph to a prospective picker explaining why they should not be chosen to be carved into a jack-o-lantern, or mashed up into a pumpkin pie.
- Write a journal entry about the various ways your family eats squash.

science

- Plant a pumpkin seed and discuss the germination stages of seeds.
- Make baked pumpkin seeds to eat as a snack.

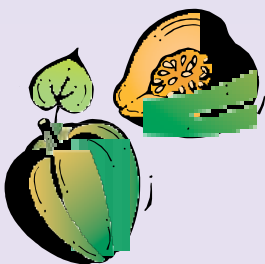
art

- Create Jack-o'-Lantern faces on mini squash or pumpkins.
- Read *Fast Food*, by Saxton Freymann (Arthur A. Levine Books, 2006), in which vegetables are sculpted and combined to look like cars and other modes of transportation. Create sculptures using slightly old squash and other vegetables.





notes:



Roots and Fruits

Lesson — honey **Chapter 13**





time allotted

45 Minutes

target audience

Grades 3-5

Materials Included

- Human body map
- Nutrient chart
- Honey cards
- Honeybee worksheet

additional Materials needed

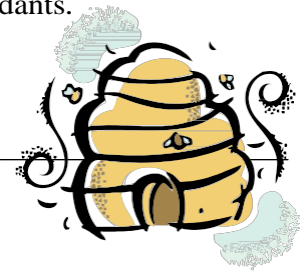
- U.S. map
- Children's book on honey bees
- Local honey (preferably a dark and light honey for taste testing)
- Wooden craft sticks (for tasting sticks)

set Up

- Have honey in a squeeze bottle for easy distribution.
- Have plates and wooden craft sticks ready for tasting.
- Set up U.S. map, human body map and nutrient chart.

Learning objectives

- Students will learn that bees are social insects, which means that they live and work together in a community.
- Students will learn that the community of bees is called a colony and a colony of bees lives in a hive.
- Students will learn that in a beehive there are three types of bees: the queen bee, the workers and the drones.
- Students will learn that bees pollinate flowers and crop plants, which helps give us our food.
- Students will learn that bees do a dance in front of other bees in the hive to communicate where flowers with rich sources of nectar are located.
- Students will learn that nectar is a sweet juice found in flowers, which bees eat and turn into honey.
- Students will learn that honey is produced all over the United States.
- Students will learn that honey is a source of antioxidants.



Introduction to honey (5 minutes)

Review fruit or vegetable from previous week. Explain that instead of learning about a fruit or vegetable, students will learn about a natural sweetener called honey. Ask students who has tried honey before. Ask students when they eat honey at home, and with what foods they eat honey. Ask students if they know where honey comes from. Have students share all that they know about honey. Have students brainstorm questions that they have about honey. After engaging students in the initial honey discussion, introduce the honey book.

share a Book (10-15 minutes)

There is a lot to know about honeybees and honey. Sometimes a good way to learn about something new is to start by reading a non-fiction book about that topic. Read a story such as *The Magic School Bus Inside a Beehive*, by Joanna Cole (Scholastic, 1998), stopping to ask questions and engage students in the story.



Honeybee worksheet



nutrient **Definitions:**

antioxidants

- An antioxidant is a molecule capable of slowing or preventing the oxidation of other molecules. Oxidation reactions can produce free radicals, which start chain reactions that damage cells.
- Antioxidants may reduce premature aging, cancer, cataracts, and an array of degenerative diseases.

probiotics

- Your body contains billions of bacteria and other microorganisms. Antibiotics are used to fight bad bacteria such as infections or disease but may also deplete good bacteria in the body. Probiotics are dietary supplements or foods that contain beneficial, or “good,” bacteria that are similar to those normally found in your body.
- Probiotics may provide some of the same health benefits that the bacteria already existing in your body do — such as assisting with digestion and helping protect against harmful bacteria.



Where Does honey Come From? (5 minutes)

Explain to students that honey comes from all over the world and all over the United States. Review that honey is made in a beehive. Explain that most of the honey in the United States is produced in California, Florida and South Dakota. Tell students where today’s honey came from. Show a picture of beekeepers that produced the honey. If possible, show picture of the bees that made the honey.

producing honey (5-10 minutes)

Review the time of the year honey is produced by bees and discuss why they do not make honey in the winter months. Review what ingredients go into making honey and the temperature conditions necessary for successful honey production. If helpful, go back to a particular section in the honeybee book to re-read and re-emphasize specific information.

nutrients & health (5-10 minutes)

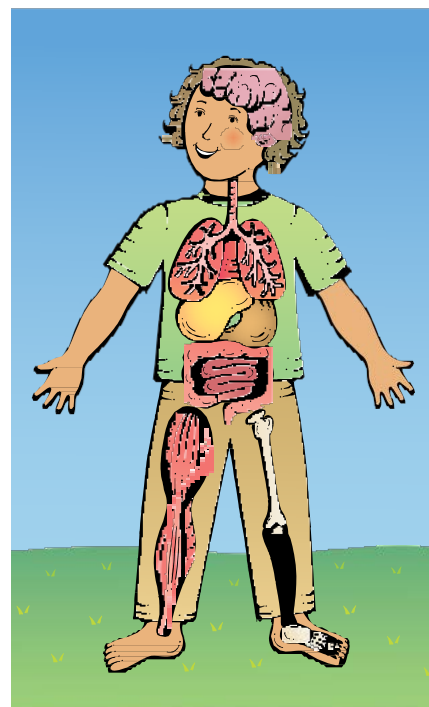
say: *Today’s food has many nutrients that benefit the body. We will focus on two nutrients today.*

Explain that many people like to add sweetener to certain foods and drinks. Honey is a healthier alternative than refined sugar or an artificial sweetener.

antioxidants

Honey is a source of antioxidants. Antioxidants are like the superheros in our bodies that fight bad cells and prevent diseases.

- Nutrient Chart-Invite student to place honey jar manipulative on the nutrient chart
- Human Body Map-Invite student to place honey jar manipulative on the human body map.



probiotics

Honey contains probiotics, which are good for digestive health. There are lots of bacteria in our body. Some bacteria are bad, but some bacteria in our body are good. Specifically, there are lots of bacteria in our digestive system. Probiotics help keep the good bacteria healthy and working well in the digestive system.



Dance Like a honeybee (5-10 minutes)

Honeybees communicate through dancing. In order to make honey, honeybees search for nectar in flowers. Bees cannot talk, so they use smell, taste and touch to communicate. When worker bees find an area with lots of flowers for nectar, they come back to the hive to tell the other worker bees where rich sources of nectar can be found. A worker bee does a “waggle dance” to tell the other bees where to fly to find the source of nectar.

Two students will communicate with each other using non-verbal communication in this activity. One student will be the “honey finder” and one student will be the “dancing bee.” Just like when a worker bee has found a good source of nectar, she will come back to the hive and dance to the other worker bees to tell them where the flowers are located. The way she dances tells them where to find the flowers.

1. Write the “secret language” (see below) on the board for all students to follow.
2. The honey finder leaves the room while the teacher hides the honey jar.
3. When the honey finder comes back into the room, the dancing bee does a “waggle dance” to tell the honey finder where to find the honey. Using the “secret language,” the dancing student dances to tell the honey finder student where the honey is located. (Remind students that bees cannot talk, so while the dancing student is dancing, everyone needs to be respectful and quiet so they can help the other student find the honey.)
4. The honey finder student uses the clues from the dance to find the honey jar.

Engage the class in a discussion about communicating without talking. Ask students if it was difficult and how they felt when they had to find the honey by watching a student dance.

Waggle Dance secret Language:

Waggle forward = walk forward

Waggle backward = walk backward

Wiggle right arm = move to the right

Wiggle left arm = move to the left

Spin around = turn around





reminder: Be sure to check if your students have special diets or food allergies before the tasting.

Use your Senses

- Look
- Smell
- Listen
- Touch
- Taste



tasting (5-10 minutes)

Show students two jars of honey. Ask students what they notice about the two types. Discuss how one honey is darker than the other. Explain to students that the different honeys came from bees that pollinated different types of flowers.

Have students wash their hands and then use the wooden craft sticks to do a taste test of the two different types of honey.

- 1.First, instruct students to look at the features of the honey and observe the texture of the honey.
- 2.Next, have students smell the honey.
- 3.Then have students take a small taste of the honey and notice the textures and flavors of the honey.

Have students describe the color, flavors, textures, aromas and viscosity of each honey.

Dangers to honeybees (5 minutes)

Review with students why honeybees are important for humans and plants. Honeybees not only make honey, but they are also important for plant growth. Without honeybees, fruit and vegetable plants could not grow and multiply. It is important that we protect honeybees and teach friends and family about why honeybees are important.

Explain some of the dangers to honeybees. When roads, homes and buildings are built, the plants and trees there are cut down. This loss of habitat makes it hard for honeybees to start new colonies. Honeybees and wild plants help each other survive. Fewer plants makes it harder for honeybees to get pollen. Without pollen and nectar from the flowers, honeybees cannot survive. Also, honeybees can die if they collect pollen from flowers that have been sprayed with pesticides. Organic farms do not use pesticides and are safe for all living things.

Closing (5 minutes)

Remind students that if they are interested in learning more about honeybees they can go to the public library for more information about honeybees. Have a brief discussion with students about the things they can do to protect honeybees. Ask students what is the most appropriate thing to do if they see a bee buzzing close to them or close to a friend. Ask students what they can do in a situation where they may feel scared of a bee. These topics are important to discuss with students, especially during the spring and summer when bees are active.

recommended reading

- *The Life Cycle of a Honeybee* by Bobbie Kalman, Crabtree Publishing Co., 2004
- *Bees* by Deborah Hodge, Kids Can Press, 2004.
- *Honey in a Hive*, by Anne Rockwell, Collins, 2005.
- *The Honey Makers*, by Gail Gibbons, HarperCollins, 2000.
- *Jump Into Science: Honeybees*, by Deborah Heiligman, National Geographic Children's Books, 2007.
- *The Magic School Bus Inside a Bee Hive*, by Joanna Cole, Scholastic, 1998.

additional honeybee Information:

- Up to 50,000 bees live in a hive.
- A bee is an insect that has 6 legs and three main body parts: the head, thorax and abdomen.
- The queen bee lays up to 1,500 eggs per day.
- The queen bee is the largest bee in the colony.
- Worker bees shape wax into comb. The wax is made inside their bodies and is excreted through tiny openings in their abdomen.
- In the honeycomb are thousands of little cells, all of them hexagons. Bees raise baby bees in the cells, store nectar and pollen in the cells, and make honey in the cells.
- Honey was the first dessert in history.
- Honey is a natural source of carbohydrates, which are good to consume before and after working out or playing sports.
- Bees pollinate flowers and crops by landing on a plant, where the pollen from the plant sticks to the bee and the bee flies to another plant. The bees carry pollen from one plant to another; this is called pollination.
- A round dance tells the worker bees that flowers for pollen and nectar are close to the hive.
- A waggle dance tells the worker bees that flowers for pollen and nectar are far from the hive. This dance also indicates which direction the flowers are located in relation to the hive.
- Students will learn that guard bees protect and guard the beehive from other bees.
- Students will learn that the queen bee's job is to lay eggs.
- Students will learn that the worker bees are all female bees who usually do not lay eggs and do almost all of the jobs in the hive such as; guard the entrance, clean the hive, build comb, make honey, fan wings to cool the hive, feed the baby bees, tend to the queen and collect pollen and nectar.
- Students will learn that the drones are male bees that mate with the queen bee.





- Students will learn that bees eat nectar from plants by sticking a long tube-like tongue, called the proboscis, into a flower and sucking up the nectar.
- Students will learn that bees change nectar into honey by adding chemicals that change the nectar sugars into honey sugars.
- Students will learn that bees are important because they make honey and they help fruits and vegetables grow by pollinating plants.
- Students will learn that honey contains probiotics, which are good for digestion and good health.
- Students will learn that honeybees face many dangers, which have led them to become endangered in many countries.

notes:

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honey Bee Worksheet

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BaCK sIDe

Roots and Fruits

LESSON — FarmEr IN thE CLaSSrOOm **ChaptEr 14**



Lesson preparation

In order to make the most of the Farmer in the Classroom visit, build upon students' prior knowledge, enhance connections between the farmer and students during the visit, and extend learning after the visit. Think about creative ways to engage students in a variety of activities that utilize their multiple intelligences. Connecting the learning strands of farming, environmentally friendly agriculture practices, nutrition, and local produce to core content areas can be fun and create meaningful learning opportunities for students.



Connecting with a Local Farmer

Visiting local farmers markets, grocery stores, and food co-ops are excellent ways to learn about local farmers in your area. Researching local farms at the library, reading community newspapers, and talking with neighbors are also ways to learn about local food resources.

After creating a connection with a local farmer who will visit your classroom, provide some background information on the school community, the specific group of students the farmer will be visiting, as well as lesson topics that have been and will be addressed in the Fresh from the Farm program. This will provide the farmer with a general idea of appropriate content to cover in the classroom visit.

Make sure to have clear communication with the farmer regarding the date and time of the presentation, the number of children attending, and any additional materials that may be needed during the presentation. If the farmer is bringing food to the classroom, be sure to address ahead of time any special dietary needs or allergy restrictions of your students.

Before the Visit

At an appropriate time, explain to students that a farmer will be coming to visit the classroom to discuss what life is like as a farmer. Activities that will activate students' prior knowledge before the farmer's visit include the following:

- As a class, complete a word web with the word farm or farmer.
- Have students write questions they would like to ask the farmer.
- Show pictures of farms and gardens.
- Read stories and poems about farms.
- Have students create an art project, which might take the form of a farm scene, collage, or drawing of a farm.

presentation preparation

Remind students of respectful listening when guests are in the classroom. Good listening skills ensure the presentation flows smoothly, the farmer feels respected, and students are able to gain the most from the presentation.

During the Visit

Introduce the farmer and give a brief introduction to the class. Allow appropriate time for the farmer to give the presentation and enough time for student questions. The format of the visit is up to the teacher and the farmer. A few activities the farmer may want to facilitate during the visit include the following:

- Telling the story and background of his or her farm.
- Reading a chosen story.



- Walking through school garden with students.
- Showing slide show of the farm.
- Addressing additional topics such as organic farming, local foods, environmentally friendly agriculture practices, healthy soils, or nutritious foods from the farm.
- Bringing in fruits and vegetables from the farm and discussing the cultivation of those foods.
- Bringing in tools used on the farm and discussing the function of the tools.
- Q & A with the farmer.

Extending the Visit

After the farmer has visited the classroom, extend students' learning. The memories created during the Farmer in the Classroom visit will remain in students' minds for months, if not years. The lessons students take away can be extended in further projects and educational activities. Here are some examples:

- Send student-made thank-you notes to the farmer. Encourage students to decorate the notes and write thoughtful messages thanking the farmer.
- Maintain correspondence with the farmer through student letters and classroom postcards to learn about what the farmer is experiencing on the farm during each season.
- Create opportunities for students to develop their own self-guided research project that allows them to investigate a question that came about during the visit.
- Continue to read developmentally appropriate literature about farming and make connections between the farmer's stories and the text.
- Facilitate writer's workshops with a farmer focus. Write letters to the farmer, create stories about life as a farmer, or write class newspaper articles about the featured farmer.
- Visit the local farmer's market and stop by the farmer's stand to say hello.
- Send a letter home explaining the Farmer in the Classroom visit. Provide information on the farmer, local farmers markets, and venues for local food. Encourage families to ask their children about the Farmer in the Classroom visit and take family trips to the farmers market.



Notes:

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Roots and Fruits

LESSON — ChEf iN thE CLaSSrOOm ChaptEr 15



Lesson preparation

The Chef in the Classroom is a program element that engages students with local chefs and the exciting profession of the culinary arts. To make the most of this experience, build upon students' prior knowledge. Create connections between the chef and literature, personal experience and academic content. Introduce a variety of activities after the chef has visited the classroom to capitalize on student interest and enthusiasm. Connecting the learning strands of nutrition, cooking, restaurants, local produce, and seasonality to core content areas will lead to meaningful learning opportunities in the classroom.



Connecting with a Local Chef

Visiting local restaurants, shopping at local produce markets, and reading restaurant reviews in newspapers are all ways to initiate the search for potential guest chefs. Look on restaurant websites or make calls to restaurants to see if they are already involved in any community outreach programs. Researching local restaurants and chefs at the public library and talking with neighbors can also be helpful. When considering which professional to invite to your classroom, ask if the chef uses local ingredients, cooks with seasonal foods, grows their own foods, highlights healthy dishes at the restaurant, and works with local farmers and markets. Finding a chef who shares a similar food philosophy as the Fresh from the Farm program helps reinforce the themes taught in the lessons as well as helps students learn about real chefs and restaurants in the community.

Once a connection has been made with an interested chef, provide background information on the school community and the specific group of students the chef will be visiting, as well as lesson topics that have been and will be addressed in the Fresh from the Farm program. Familiarize the chef with developmentally appropriate content for the particular grade level. Offer suggestions of presentation format and additional activities the chef can facilitate during the visit.

Maintain clear communication with the chef in planning the date and time of the presentation, the number of children attending, and any additional materials that may be needed during the presentation. Also be sure to address ahead of time any special dietary needs or allergy restrictions of your students.

Before the Visit

At an appropriate time, explain to students that a chef will be coming to visit the classroom to discuss what a chef does. Several activities that will activate students' prior knowledge before the chef's visit include the following:

- As a class, complete a word web using the word chef.
- Have students write questions they would like to ask the chef.
- Show pictures of chefs, restaurants and kitchens. Discuss local eateries and students' experiences with them.
- Read stories and poems about cooking, restaurants and chefs.
- Watch the movie *Ratatouille*.
- Ask students for personal connections to chefs and cooking. Students may have examples of cooking at home, favorite family recipes, favorite restaurants, or even chefs they know.
- Review manners and behavior expectations for student conduct during the guest's visit.



presentation preparation

Remind students of respectful listening when guests are in the classroom. Good listening skills ensure the presentation flows smoothly, the chef feels respected, and students are able to gain the most from the presentation.

During the Visit

Introduce the chef to the class and outline the planned sequence of events for the visit. Allow appropriate time for the presentation or activity and enough time for student questions. The format of the visit is up to the teacher and the chef. A few activities the chef may want to facilitate during the visit include the following:

- Telling the story and background of his or her restaurant or cooking experience.
- Reading a chosen story.
- Doing a cooking demonstration with students.
- Showing a slide show of the restaurant or kitchen.
- Addressing additional topics such as local foods, seasonality of foods, nutritious menu items, favorite recipes to cook, or working with local farmers.
- Q & A with the chef.

Extending the Visit

After the chef has visited the classroom, extend students' learning. Memories created during the Chef in the Classroom visit will remain in students' minds and allow you to expand on that knowledge and experience. Many projects and activities can extend what students learned from the Chef in the Classroom visit. Here are some examples:

- Send student-made thank-you note(s) to the chef. Encourage students to decorate their note(s) with relevant pictures and words. Write a thoughtful message thanking the chef for the visit.
- Maintain correspondence with the chef through student letters or classroom postcards. Students can learn about the seasonal foods used on the menu during certain times of the year, new dishes created by the chef, and any exciting news from the restaurant.
- Create opportunities for students to develop their own self-guided research project that allows students to investigate a question that emerged during the chef's visit.
- Continue to read literature about chefs, cooking, restaurants and food. Make connections between the chef's visit and the text.
- Cook basic snacks in the classroom. Connect cooking with math standards by incorporating measuring lessons and activities.





- Facilitate writer's workshops with a cooking focus. Writing restaurant reviews, creating menus, and writing stories about life as a chef all involve further work with the vocabulary and ideas of cooking.
- Create a classroom cookbook. Compile family recipes submitted by each student in the class.
- Have students design a menu for a restaurant using the knowledge they have gained from the previous Roots & Fruits lessons and from the chef's visit. Encourage students to create a seasonal menu, utilize local ingredients, or highlight a variety of colorful foods on their menu.
- Send a letter home explaining the chef visit. Provide information about the chef and restaurant. Encourage families to ask their children about the chef visit and take a family trip to a restaurant. Provide simple recipe ideas or tips for grocery shopping with children to encourage families to include students in the meal preparation process.



**Notes:**

Roots and Fruits

Lesson — Wrap-up Chapter 16





time allotted

45 Minutes

target audience

Grades 3–5

Materials Included

- Class Farm worksheet
- Final Assessment worksheet

additional Materials needed

- Props for harvest charades (including clothes and accessories are worn in different weather, such as hats, scarves, sunglasses, and jackets)
- Dried fruits (dried cranberries, apples, blueberries, cherries, raisins, etc.)
- Plates or napkins
- Markers, crayons or colored pencils
- Overhead projector (if accessible)
- Lined and construction paper

set up

- Draw farm scene on board, or use an overhead projector to project Class Farm worksheet on screen.
- Prepare mixture of dried fruits for snack. Add all fruits in a large baggie and mix.

Learning objectives

- Students will be able to identify the growing season of each fruit and vegetable studied throughout the curriculum.
- Students will be able to mime actions of harvesting the fruits and vegetables studied throughout the curriculum.
- Students will be able to identify a variety of dried fruits.
- Students will be able to explain why dried fruits are an accessible snack during the winter.



Introduction (5 minutes)

Review previous lesson. Engage students in a discussion about the things they have learned over the past several weeks. Explain to students that today will be a day to review all that they have learned about the cultivation of fruits and vegetables, and the nutritional benefits of colorful foods. Allow students to have time to share personal connections to what they have learned, or any stories of how they have eaten fresh foods at home. Encourage students to share all they have learned with their families at home.

harvest Charades (10-15 minutes)

Explain the rules of the game Charades. Tell students that they are going to play Harvest Charades, acting out the action of harvesting different fruits and vegetables that they have learned about throughout the curriculum.

Have students work in teams of 3-6 students. Assign each student a number within their group. This number designates ONE person from each team as the “speaker.” The “speaker” is the only student per team that can yell out their team’s guess of the harvest action. Each round, the teacher will call out a number to designate a new speaker. Students should be encouraged to discuss within their teams by whispering, then the speaker can yell out the team’s prediction. Having a speaker eliminates unnecessary yelling and allows the teacher to hear which team guesses correctly first.

The teacher will choose a student to be the actor. The teacher will give the student actor a slip of paper with a fruit or vegetable and the season in which it is harvested. The student actor can use props to help give clues about the season in which they are harvesting. The student will then act out the harvesting action without talking. The team that guesses the correct answer first gets a point.



Class Farm (10-15 minutes, during harvest Charades game)

On the board, draw a farm scene or use an overhead projector to project the Class Farm worksheet on the board. Hand out the Class Farm worksheet to all students. As students correctly guess the harvesting of each fruit and vegetable in the harvest charades game, fill in the blanks on the board indicating where this fruit or vegetable would be grown on the farm. Have students fill in the class farm worksheet as well.

Dried Fruit snack (5 minutes)

Depending on when Roots & Fruits lessons began, the last class will most likely be sometime in late fall or early winter. Because there are not many fresh fruits and vegetables growing locally, bring in a variety of dried fruits for tasting. Have students guess what dried fruits are in the bag and discuss why dried fruit is a good snack in the winter months. When local fresh fruits and vegetables are not available in the winter months, dried fruits can be a healthy alternative. Dried fruits last for much longer than fresh fruits and can be available when fresh fruits are not growing. One of the oldest ways to preserve food is leaving fruits out to dry in the sun. This is how people utilized fruits throughout the year before there were refrigerators or processed and frozen foods.

- As students are eating their dried fruit, they will work on the final assessment project.

Final assessment project (20-30 minutes)

Tell students that they have learned a lot about fruits and vegetables, healthy living and organic farming. It is now their chance to show all that they have learned. Hand out the Roots & Fruits Final Assessment handout. Call on students to read aloud one paragraph at a time. Students should choose one writing prompt to answer.

Closure (2-5 minutes)

Ask if any students would like to share their answers with the class. Remind students that they can share what they have learned with their families. Encourage students to be active in food shopping and cooking with their families, and to share their love for healthy foods with friends.





extension activities

rainbow on my plate

Pass out a paper plate for each student. Have students use crayons, markers or colored pencils to draw a healthy meal on their plate. After students have drawn their meal on the plate, ask students to count how many different color groups are on their plate. Use this as an assessment to see how well students understand the importance of a variety of colors to provide various nutrients in a meal.

roots & Fruits Jeopardy

Create a Roots & Fruits Jeopardy board with 5 different categories; for example, fruit or vegetable, color group, seasonality, nutrients and harvest. Have students work in teams to play the Jeopardy game. Give each team an opportunity to answer a question from a category of their choice. If they are not able to answer the question correctly, the next team has the opportunity to answer. Each team that answers a question correctly is given points. The team with the most points at the end of the game is the winner. This game is another informal assessment opportunity that engages students in a review of what was learned throughout the curriculum.





notes:



FaRM Worksheet

to Go here

Front sIdE

FarM Worksheet
to Go here BaCK
sIDe



Final Project

In the Fresh from the Farm class you have tasted new fruits and vegetables, plus learned why they are healthy and where they grow. You have learned a lot about fresh foods! Now it's time to write about what you have learned.

Please choose ONE story to write about:



1. Pretend you are a food critic for the newspaper. Write a story about tasting your favorite fruit or vegetable. Use creative tasting words in your story!

2. Pretend you are a doctor. Someone comes to you and says that they feel tired, lazy and unhappy. Write them a letter telling them how they may feel better if they eat colorful fruits and vegetables.



3. Pretend you are a farmer. Write a story about your life as a farmer. What fruits and vegetable do you grow? What do you do to take care of your farm?



Roots and Fruits
ConneCting the Standards
Chapter 17





how does roots & Fruits meet illinois Learning Standards?

Read below for more information on how components of Roots & Fruits help classrooms meet Illinois State Board of Education Science, Health, Social Science and Writing Learning standards for Early and Late Elementary school students.

illinois Learning Standard early elementary	roots and Fruits Component
WRITING STATE GOAL 3.C.1a Write for a variety of purposes including description, information, explanation, persuasion and narration.	Students are encouraged to use a variety of adjectives to describe the featured fruit or vegetable.
SCIENCE STATE GOAL 13.B.1d Identify and describe ways that science and technology affect people's everyday lives (e.g., transportation, medicine, agriculture, sanitation, communication occupations).	Students are expected to identify the plant parts that people eat. Teachers are encouraged to teach students the functions of each plant part.
SCIENCE STATE GOAL 12.A.1a Identify and describe the component parts of living things (e.g., birds have feathers; people have bones, blood, hair, skin) and their major functions.	Students are expected to identify the plant parts that people eat. Teachers are encouraged to teach students the functions of each plant part.
SCIENCE STATE GOAL 12.E.1b Identify and describe patterns of weather and seasonal change.	Students learn the climate and season that is best for growing the featured food.
SCIENCE STATE GOAL 17.C.1a Identify ways people depend on and interact with the physical environment (e.g., farming, fishing, hydroelectric power).	Students learn how farming brings food to our plates by discussing where and how the food grows. Farm field trips and guest farmers teach students the impact farming has on the environment and society.
SCIENCE STATE GOAL 17.C.1b Identify opportunities and constraints of the physical environment.	Students learn which climates and areas of the world are best for growing the featured food.
HEALTH STATE GOAL 22.A.1b Identify methods of health promotion and illness prevention (e.g., obtaining immunizations, hand washing, brushing and flossing teeth, eating practices, sleep, cleanliness).	Students learn the importance of washing hands and fruits and vegetables before consuming. Students will also learn healthy eating practices.
HEALTH STATE GOAL 22.B.1 Encourage and support others in making positive health choices (e.g., eating practices, cleanliness, safety practices).	Students learn how fruits and vegetables benefit their bodies.
HEALTH STATE GOAL 22.C.1 Identify sources and causes of environmental health risks (e.g., air, soil, sun, water, noise, food, chemicals).	Students learn the health risks associated with conventional farming with pesticides when participating in farm field trips.
HEALTH STATE GOAL 23.A.1 Identify basic parts of body systems and their functions (e.g., heart, lungs, eyes).	Students are expected to identify body parts and body systems that benefit from nutrients in the featured fruit or vegetable.
HEALTH STATE GOAL 23.B.1 Identify healthy actions that influence the functions of the body (e.g., cleanliness, proper diet, exercise).	Students learn how eating fresh fruits and vegetables benefit various body parts and body systems.
HEALTH STATE GOAL 24.B.1 Recognize how choices can affect health (e.g., not brushing/tooth decay, smoking/risk of cancer and heart disease).	Students learn that a healthy diet will result in a healthy body which will help them do well in and out of school.



Illinois Learning Standard Late elementary	roots and Fruits Component
SCIENCE STATE GOAL 12.B.2b Identify physical features of plants and animals that help them live in different environments (e.g., specialized teeth for eating certain foods, thorns for protection, insulation for cold temperature).	Students are expected to identify the plant part that encompasses the featured fruit or vegetable. This requires students to have an understanding of the parts of a plant. Teachers are encouraged to teach students the functions of each plant part.
SCIENCE STATE GOAL 12.E.2a Identify and explain natural cycles of the Earth's land, water and atmospheric systems (e.g., rock cycle, water cycle, weather patterns).	Students learn the climate and season that is best for growing the featured food.
SCIENCE STATE GOAL 13.B.2c Identify and explain ways that science and technology influence the lives and careers of people.	Students learn how farming provides food for homes, schools and businesses.
SCIENCE STATE GOAL 13.B.2f Analyze how specific personal and societal choices that humans make affect local, regional and global ecosystems (e.g., lawn and garden care, mass transit).	Students learn the risks to the local and regional environment caused by conventional farming with pesticides. Students will learn how organic farming supports natural ecosystems.
SCIENCE STATE GOAL 17.C.2a Describe how natural events in the physical environment affect human activities.	Students learn the climate and season that is best for growing the featured food. Students determine whether or not the local climate will allow for the food to be grown in their area.
SCIENCE STATE GOAL 17.C.2b Describe the relationships among location of resources, population distribution and economic activities (e.g., transportation, trade, communications).	Students will consider where food grows and how it arrives at schools, homes and businesses by investigating the local and conventional food system.
SCIENCE STATE GOAL 17.C.2c Explain how human activity affects the environment.	While on farm field trips, students learn possible risks to the natural environment caused by conventional farming with pesticides.
HEALTH STATE GOAL 22.A.2b Demonstrate strategies for the prevention and reduction of communicable and non-communicable disease (e.g., practicing cleanliness, making healthy food choices, understanding the importance of immunizations and regular health screenings).	Students learn the importance of washing hands and fruits and vegetables before consuming. Students learn that a healthy diet will help in the prevention of disease and chronic illness.
HEALTH STATE GOAL 23.C.2a Identify physical, mental, social and cultural factors affecting growth and development of children (e.g., nutrition, self-esteem, family and illness).	Students learn that a healthy diet promotes the development of a healthy body. Students will learn that with a healthy body, students can improve academics, extracurricular activities and daily activities.

Roots and Fruits

Literature connections chapter 18





Fruits and Vegetables across the curriculum

Math

- *Apple Fractions* by Jerry Pallotta, Cartwheel, 2003. Uses apples to teach basic fraction concepts. (Grades 3-7)
- *First Day in Grapes* by L. King Perez, Lee & Low Books, 2002. The story of a young boy from a migrant family who is bullied at his new school. His talent in math is ultimately what helps him face his tormentors. (Grades 1-4)
- *How Many Seeds in a Pumpkin?* by Margaret McNamara, Schwartz & Wade, 2007. Students count the seeds inside pumpkins by twos, fives, and tens in order to find out which size pumpkin will have the most. (Grades K-3)
- *Math Potatoes: Mind-Stretching Brain Food* by Greg Tang, Scholastic Press, 2005. A book of rhyming math challenges about different foods. (Grades 3-6)
- *The Grapes of Math: Mind-Stretching Math Riddles* by Greg Tang, Houghton Mifflin, 2009. A book of math riddles involving food and animals. (Grades 3-6)

Literacy

- *Blueberries for the Queen* by John & Katherine Paterson, Harper Collins, 2009. The story of a young boy who delivers freshly-picked blueberries to a real queen living in America during World War II. (Grades K-4)
- *Blueberry Mouse* by Alice Low & David Michael Friend, Mondo Publishing, 2004. The story of a blue mouse who lives in a blueberry garden. (Grades K-3)
- *Carlos and the Squash Plant/Carlos y la Planta de Calabaza* by Jan Romero Stevens, Luna Rising; Bilingual Edition, 1999. The story of a boy in New Mexico who refuses to take a bath after his work on the farm, until a squash plant sprouts from his ear. (Grades K-4)
- *I Will Never Not Ever Eat a Tomato* by Lauren Child, Candlewick, 2007. The story of Lola, a very picky eater, and Charlie, who uses creative means to help his sister eat her vegetables. (Grades K-5)
- *One Green Apple* by Eve Bunting and Ted Lewin, Clarion, 2006. The story of a Muslim girl who accompanies her class on a field trip to an apple orchard, where she learns her first word in English: "apple." (Grades 1-4)
- *Seed Folks* by Paul Fleischman, Audio Bookshelf, 2003. A short novel about an urban garden that brings neighbors of all nationalities together. (Grades 3-8)





- *Stone Soup* by Jon J Muth, Scholastic Press, 2003. An adaptation of the traditional folktale about building community by cooking soup that incorporates Chinese folklore. (Grades 1-4)
- *The Apple Pip Princess* by Jane Ray, Candlewick, 2008. The story of three brown-skinned princesses competing to be the king's successor. One princess plants an apple seed which soon grows into an orchard for the kingdom to enjoy. (Grades K-3)

Writing

- *Carrots to Cupcakes: Reading, Writing, and Reciting Poems about Food* by Susan M. Freese, Super Sandcastle, 2008. A collection of poems about food. (Grades K-4)
- *Did You Say Pears?* by Arlene Alda, Tundra Books, 2006. Colorful photographs accompany homonyms and homophones. (Grades K-3)
- *Laughing Tomatoes and Other Spring Poems/Jiomas risuenos y otros poemas de invierno* by Francisco X Alarcon, Children's Book Press, 2005. A bilingual book of poems about food, family, and dreams. (Grades K-8)

science

- *A Fruit is a Suitcase for a Seed* by Jean Richards, First Avenue Editions, 2006. Describes how fruits of plants protect seeds and help them disseminate. (Grades K-4)
- *Cool as a Cucumber, Hot As a Pepper: Fruit Vegetables* by Meredith Sayles Hughes, Lerner Publications, 2008. A non-fiction book about the history and benefits of fruit vegetables we eat, such as peppers, cucumber, eggplants, and squashes. (Grades 4-8)
- *From Seed to Plant* by Gail Gibbons, Holiday House, 1993. Describes in simple text the life cycle of a plant. (Grades K-3)
- *Green Power: Leaf and Flower Vegetables* by Meredith Sayles Hughes, Lerner Publications, 2001. A non-fiction book about the history and benefits of green leafy vegetables. (Grades 4-8)
- *Plant Parts Series: Roots, Seeds, Stems, Leaves, Fruits, and Flowers* by Vijaya Bodach, Capstone Press, 2008. A six book series that offers a short introduction to each plant part. (Grades K-3)
- *The Vegetables We Eat* by Gail Gibbons, Holiday House, 2008. A picture book identifying numerous types of vegetables and how they grow. (Grades 3-6)
- *Tops and Bottoms* by Janet Stevens, Harcourt Children's Books, 1995. The story of a selfish bear who is tricked when he orders Hare to grow him food that grows on the top, bottom, or middle of the plants. (Grades K-6)





- *What Do Roots Do?* by Kathleen Kudlinski, Northwood Books for Young Readers, 2007. A simple book that illustrates how roots benefit the plant. (Grades 1-4)

social studies

- *Apples to Oregon: Being the (Slightly) True Narrative of How a Brave Pioneer Father Brought Apples, Peaches, Pears, Plums, Grapes, and Cherries (and Children) Across the Plains* by Deborah Hopkinson, Aladdin, 2008. The story of a family that travels across the Great Plains, bringing their fruit trees with them. (Grades K-5)
- *Corn is Maize: The Gift of the Indians* by Aliko, Harper Collins, 1976. Tells the history of how Native Americans learned to grow, harvest, and use corn, helping it become one of America's most important vegetables. (Grades K-5)
- *Esperanza Rising* by Pam Munoz Ryan, Scholastic, 2002. The story of a girl who flees her home in Mexico for the United States during the Great Depression. (Grades 4-9)
- *Harvesting Hope: The Story of Cesar Chavez* by Kathleen Krull, Harcourt Children's Books, 2003. The story of the activist who marched to protest working conditions of migrant farmworkers. (Grades 3-6)
- *Peach Heaven* by Yangsook Choi, Farrar, Straus and Giroux, 2005. The story of a flood in 1976 in South Korea that led to peaches being carried by rainwaters to villages beneath the mountains. (Grades K-4)

art

- *Fast Food* by Saxton Freymann, Arthur A. Levine Books, 2006. Vegetables are sculpted and combined to look like cars and other modes of transportation. (Grades K-5)
- *How Are You Peeling? Foods with Moods* by Saxton Freymann and Joost Elffers, Arthur A. Levine Books, 1999. The authors use fruit and vegetable sculptures to portray various human emotions. (Grades K-5)
- *Market Day: A Story Told with Folk Art* by Lois Ehlert, Voyager Books, 2002. The author uses beautiful folk art from various countries in this story about a trip to the market. (Grades K-3)



Roots and Fruits
Contributors





Contributors

Seven Generations Ahead would like to thank everyone who contributed toward the development of the Roots & Fruits curriculum, and those who have helped to shape the program over the years.

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