

WHOLE KIDS FOUNDATION AND AMERICAN HEART ASSOCIATION

School Gardens Activity Guide

Dear Educator,

Welcome to the Whole Kids Foundation and American Heart Association's School Gardens Activity Guide! This guide contains 35 lesson plans with activities to engage your students in a fun and educational exploration of fruits, vegetables and healthy eating. The lessons are cross-curricular and support curriculum for Pre-K-5th grade. A variety of activities are included so you can pick and choose the learning objectives that are appropriate for your students.

A garden is a great resource to use when teaching students about healthy eating and agriculture. Even if you don't have an in ground garden, you can still complete the activities in this guide with your students. If this is your first time gardening with students, we recommend that you start small. Be sure to establish clear guidelines and safety procedures with your students so that everyone can have a positive learning experience.

Whole Kids Foundation® and the American Heart Association® are proud to work together to grow healthier kids.

SCHOOL GARDENS LESSON PLANS

Each lesson contains the following sections:

The recommended grade level, season and teaching setting (indoor or outdoor) is listed at beginning of each lesson.

- **Description:** A brief overview of the lesson objectives.
- **Background:** Information about the content in the lessons and key points or tips on how to plan the lesson.
- **Materials:** A list of what you will need to complete the lessons. Most materials are easy to find and some may be items that most students can bring from home.
- **Preparation:** A list of what needs to be gathered or prepared prior to the lesson.
- **Activity:** The steps for completing the lesson with your students. Some lessons are designed to present new information and others are designed to reinforce previous learning. We recommend that you read through the entire lesson before teaching it. There are lesson extensions that you may want to incorporate into your lesson as well.
- **Tying It Together:** Discussion questions to help students summarize their learning.
- **Digging Deeper:** Extension activities that incorporate the lesson's objectives.
- **Special Care:** Accommodations to help all students comprehend the content.
- **National Standards:** The National Content Standards addressed in each lesson. A detailed list of the standards by grade level is available at heart.org/gardenlessonplans.
- **Lesson Extensions:** Additional activities from other subject areas that can be incorporated into the lesson.
- **Literature Connections:** Books related to the lesson that can be shared with your students.
- **Home Connections:** Resources that can be shared with parents to reinforce the learning objectives at home. The list of resources is available at heart.org/gardenlessonplans.
- **Links:** A list of online resources to support the content in the lessons. The list of online resources is available at heart.org/gardenlessonplans.

SCHOOL GARDENS LESSON PLANS**TABLE of CONTENTS**

RECOMMENDED GRADE LEVEL	LESSON	PAGE NUMBER
Gardening and Botany		
Pre-K-4	Sprouting Seeds — A Seed Has a Coat	5
K-5	Composting: Healthy In + Healthy Out = Garden Goodness	11
K-2	Seasonal Gardening	17
Pre-K-2	Insect Cycles	26
2-5	Seed Packets — Things to Know Before You Grow	31
Pre-K-2	Colors, Shapes and ABC's in the Garden	36
3-5	Plant Families	42
1-5	Plants Are Needy	55
3-5	Root Study	60
1-5	Garden Bug — Friend or Foe?	66
2-5	Form and Function — Think Like a Botanist	71
3-5	The History of Herbs and Spices	79
K-2	Plant Parts That We Eat	82
Pre-K-5	Square Foot Garden Map	89
Nutrition		
K-5	Healthier Food Challenge	94
K-2	A Rainbow of Color	99
Pre-K-5	Eat Your Greens	103
Pre-K-2	A Garden's Food Groups	107
3-5	Celebrating Foods	114
2-5	Plant-Based Protein: A Study of Seeds, Nuts and Beans	118
K-5	A Food Critic in the Garden	121
5	Meal Plan for a Healthy Day	128
3-5	Healthy Balance	132

SCHOOL GARDENS LESSON PLANS

RECOMMENDED GRADE LEVEL	LESSON	PAGE NUMBER
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Consumer Education

2-5	Read Your Labels — Know Your Food	136
3-5	Nutrition and the Media	141
3-5	Produce Promotions	146
4-5	What's the Garden Worth	149
K-5	At the Grocery Store	152
3-5	Where Does Your Food Come From?	155

Agriculture

2-5	A Farmer's Life for Me	160
5	What Went Wrong?	166
K-2	Agriculture in My Life	171
3-5	Food from Around the World	178
Pre-K-3	Farm to Table	183
3-5	Regional Farming Maps	187

Sprouting Seeds — A Seed Has a Coat

Recommended Grade Level:

Pre-K-4

Season:

All

Indoor

Description:

Students will plant seeds that are quick starters in a variety of containers – plastic cups, 2 liter bottle on its side, peat cup, etc. Then, they will study the growth of their seed through the plant development process.

Background:

Learning about the growing process is a basis for science inquiry and data collection. Not only will students learn about the seed to plant process, they will learn about the unexpected, as seeds don't always sprout the way that they're supposed to. This concept also relates to their health. When people eat healthy, drink plenty of water, are physically active and get the right amount of sleep, they're more likely to grow healthy and strong. But sometimes this is not the case because factors such as disease, sickness or accidents occur. However, if we live healthy, we grow as healthy as we can.

Materials:

- Various planting containers (plastic cups, 2 liter bottle with a slit cut out of its side, peat cups, clear CD gem case, fingertips of a clear food handling glove, etc.)
- Soil
- Quick start seeds (lettuces, beans, alfalfa, etc.)
- Inside a Seed Sheet
- Sprouting Seeds Daily Growth Chart

Preparation:

1. Determine if this activity will be completed individually or in small groups, and gather the planting containers, soil and seeds for each student or group.
2. Make copies of the Sprouting Seeds Daily Growth Chart for each student. Students can also make the chart in their garden journal.

Activity:

1. Ask students what they know about seeds. Ask the students if they know how to plant a seed and what a seed needs to grow (soil, water, sunlight, nutrients). Make a K-W-L chart or list this on the board with their responses. A **K-W-L** chart is divided into three sections:

- What I **K**now
- What I **W**ant to Know
- What I **L**earned

2. Using the Inside a Seed Sheet, explain that seeds have different characteristics (shapes, sizes, hard, soft), but all have the same things inside them to turn into a plant. The process of growing from a seed to a plant is called germination. Inside every seed is an embryo (a tiny plant) and endosperm (small leaves that supply the embryo food). The outside of the seed has a seed coat, which protects the embryo. All seeds need moisture, oxygen and the right temperature to grow. Until they have these conditions, the seed remains dormant and does nothing. Once the seeds have the right conditions, the plant inside the seed starts to grow and pushes open the seed coat. Tiny leaves appear and push out of the soil.
3. Allow students to observe the different types of seeds and share some of the information on the seed packets. Younger students who are non-readers can compare the pictures that are on the seed packets and the teacher can point out and read some of the content that's included on seed packets.
4. Demonstrate how to plant a seed. Seeds shouldn't be buried deeply. The planting depth should be based on the size of the seed. For example, carrot seeds are planted shallow because they're small and lima beans are planted a little deeper because they're bigger. Information about the planting depth can be found on the seed packets.
5. Allow students to select their seed type and container and plant the seeds. After the seeds have been properly planted, have students water their seeds and put them in a sunny spot.
6. Then have students make predictions using their Sorting Seeds Daily Growth Chart. This chart can be placed in their garden journal so that the students can refer back to it as time goes by.
7. Over the next 24 days, have the students write about or draw a picture of their seed/plant each day and continue to fill out the Sorting Seeds Daily Growth Chart. On the last day, have students review their predictions and discuss the outcomes.
8. Plants can be sent home or planted in the garden or a pot outdoors.

Tying it Together:

1. What did we need to give the seeds so that they would grow into healthy plants?
Water, soil, sunlight, nutrients
2. If our needs or plant needs aren't met, what will happen?
We won't be healthy or the best way we can.
3. Did anything unexpected happen with your plant?
4. Which seeds grew the fastest?
5. Which seeds took the longest?
6. Why didn't all the seeds grow?

Special Care:

Some students who haven't mastered the art of writing can draw pictures on their Sprouting Seeds Daily Growth Chart. If you

have the technology, take pictures and use it for their data. You can also write what the student wants to say for each entry.

Digging Deeper:

- As the plants grow, students can sketch and label the parts of the plant at different stages of development (leaves, stem, roots, etc.).
- Compare different plants, containers and seed parts.
- Experiment with different amounts of light and water to make observations.

National Standards:**CCSS.ELA**

- Reading: Informational text: Key ideas and details.
- Writing: Text types and purposes.
- Writing: Research to build and present knowledge.
- Speaking and listening: Presentation of knowledge and ideas.

NGSS

- Interdependent relationships in ecosystems.
- Structure, function and information processing.
- Inheritance and variation of traits.

Lesson Extensions:

Math: Predict how many seeds will germinate (sprout), how long it will take to sprout, measure the growth each day, etc.

Science: Explore parts of the seed, plant parts, germination stages and make comparisons. Gather data on the growth rates using different containers, amounts of light and quantities of water.

Language Arts: Pretend that you're a seed. Write a narrative about what happens to you as you grow from a seed to a plant.

Literature Connections:

Water Weed and Wait by Edith Hope and Angela Demos

The Dandelion Seed by Joseph P. Anthony

The Tiny Seed by Eric Carle

Once There Was A Seed by Judith Anderson and Mike Gordon

From Seed To Plant by Gail Gibbons

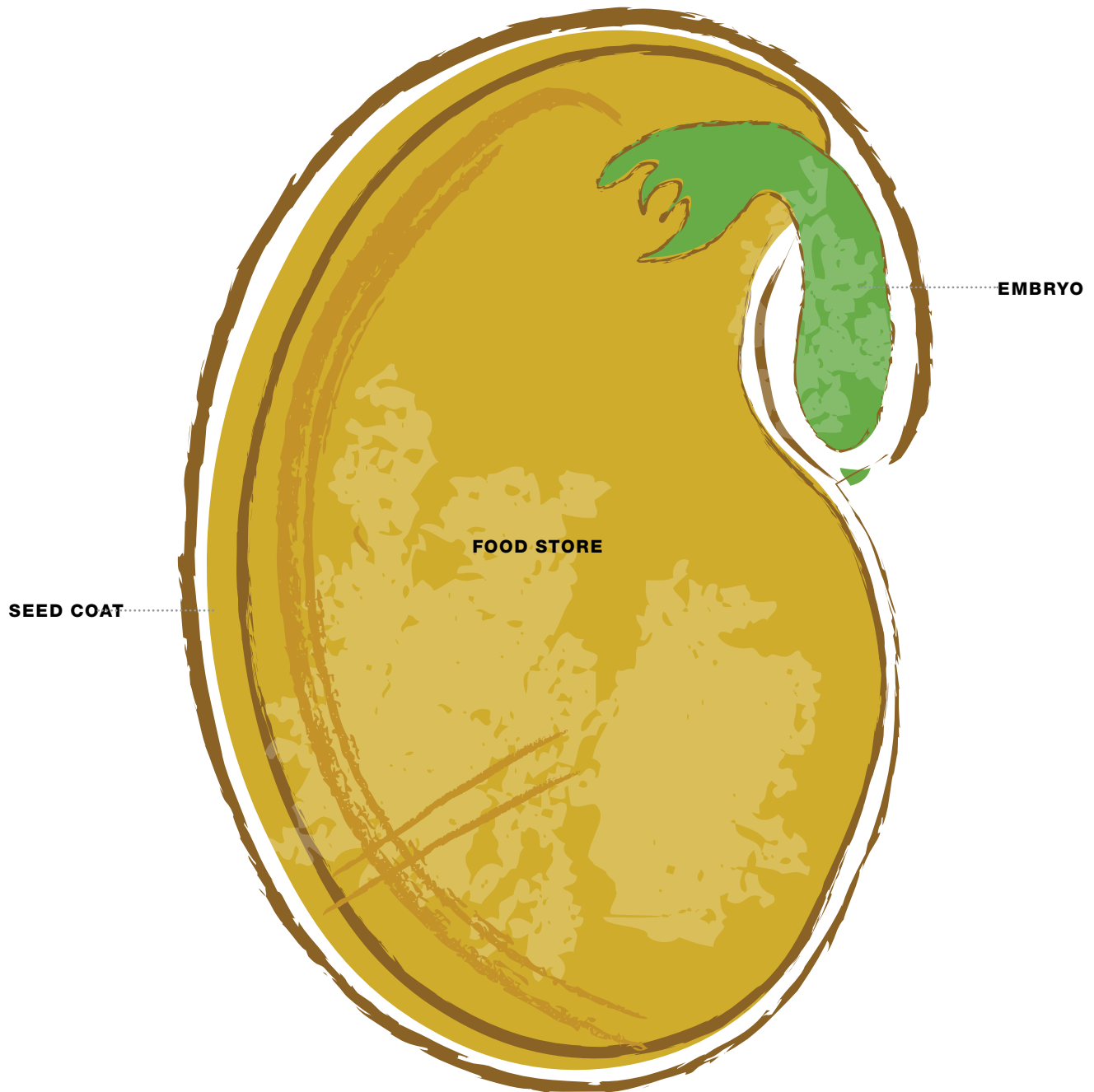
The Carrot Seed by Ruth Krauss

Seeds by Vijaya Khisty Bodach

A Seed Is Sleepy by Dianna Aston

Seeds Go, Seeds Grow by Mark Weaklan

Inside a Seed



Sprouting Seeds Daily Growth Chart

Seed Predictions

I planted _____ seeds.

I think my seeds will pop out of the soil on Day_____.

My seeds popped out of the soil on Day_____.

On Day 24, my plant will be _____ inches tall.

I think my seed will look like this on Day 24.

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
Day 7	Day 8	Day 9	Day 10	Day 11	Day 12
Day 13	Day 14	Day 15	Day 16	Day 17	Day 18
Day 19	Day 20	Day 21	Day 22	Day 23	Day 24

Recommended Grade Level:

K-5

Season:

Year Round

Outdoor

Composting: Healthy In + Healthy Out = Garden Goodness

Description:

Students create a class compost bin for the garden. Students collect food scraps from their breakfasts and/or lunches. Only certain types of healthier foods are collected (like inedible uncooked fresh fruit and vegetable peels, scraps and cores). Students will learn that leftovers of certain healthy foods they eat can also contribute to the health of their garden. Students will learn about the carbon/nitrogen cycle in compost (layering of brown and green material) to create a chemical reaction.

Background:

By creating compost, the students will learn the parts that make up the compost cycle. Many designs can be used to make a compost bin. This lesson uses a basic design for smaller scale composting. You can choose other designs or purchase one at a garden center. A compost pile needs: **nitrogen** that comes from fresh food scraps; **carbon** that comes from the brown layer from carbon rich brown items such as dried leaves or straw; **water** that helps the microbes and beneficial bugs convert the wastes to compost; and **air**. The students will learn that only certain healthy things can be put into the compost and how foods healthy for their bodies also create healthy benefits for the garden. This lesson may encourage students to increase their fruit and vegetable consumption and to care for the earth by reducing their waste and turning food waste into rich organic soil.

Materials:

- Plastic trash can with the bottom cut out
- Composting 101 Sheet
- Investigating Soil Worksheet (optional)
- Hand lens (optional)
- Compost thermometer to measure temperature (optional)

Preparation:

1. Remove the bottom of the trash can by cutting it off. Dig a hole about 10-12 inches into the ground and place the trash can in it. This will allow worms and microbes to interact with the compost and provide adequate drainage.
2. Collect dried leaves, newspaper, straw or other items that contain carbon to layer over food waste to create the brown layer. Reference the brown items in the Composting 101 Sheet for the items that contain carbon.

3. Determine what items will be allowed in the compost bin and how the items will be collected. Apple cores, orange and banana peels and melon rinds are examples of common food scraps from a school cafeteria. Produce with butter, salt or salad dressing should not be added; only fresh fruit and vegetable scraps.
4. As the compost pile builds, see the Compost Trouble Shooting Chart to make adjustments to the process.

Activity:

1. Gather the class and start a discussion on things they can do to help the environment, like recycling, picking up trash, not littering, conserving water, etc.
2. Explain composting to the students and tell them it's a way to reduce our trash while helping the garden at the same time.
3. Take them outside to the compost bin and explain how they will be contributing to the compost. Share with them things that can be composted and those that can't. Remind students that it's important for them to eat their healthy food before collecting items to add the compost bin.
4. Students come back to the classroom and create posters or flyers to show what items can be added to the compost bin. This can be placed in the cafeteria or classroom as a reminder. They can also write letters to their parents about composting and the importance of fruits and vegetables for their bodies and the garden.
5. Each day students will add the approved food scraps to the compost bin from their breakfasts and/or lunches. After the daily collection is deposited, add a small amount of the brown carbon layer. Once a week, the temperature of the compost will need to be monitored and then turned with a shovel or fork to add air. The ideal temperature is 120-160° Fahrenheit.

Tying it Together:

1. How are we helping the earth by composting?
Less trash goes to the landfills and compost creates healthy soil.
2. How do healthy food scraps contribute to healthy soil?
They contain nutrients and vitamins. They help plants grow just like they help our bodies grow and be healthy.
3. How are we helping our bodies by eating foods that can be composted?
Only certain healthy foods should be composted. Healthy foods have vitamins and nutrients that we need to be healthy. If it is easy to break down in the compost, it is easier for our bodies to digest.

Digging Deeper:

Make a worm composting bin using vermicomposting worms. Vermicomposting is the process of using worms and micro-organisms to turn food scraps into a nutrient-rich compost. To create a worm bin, use a large tub with a lid (at least 10-gallon sized). Drill several holes in the bottom for drainage and several along the top for air. Fill half of the tub with soil and add vermicomposting worms, which can be purchased at a local bait shop or by inquiring at a local plant nursery. Place a 3-inch layer of shredded newspaper on top of the worms. Pour water on top of the newspaper to moisten. Lift the moistened newspaper and place small amounts of the food scraps collected for the compost

below the newspaper to feed your worms. The food scraps should be placed in different locations in the bins to help you monitor the amount of food they're eating. The shredded newspaper should be replaced when there is a less than 3-inch layer covering your soil and worm.

Helpful Tips:

- Worms need moisture to breathe. Since worms don't have lungs, their skin has to stay damp for the exchange of oxygen coming into their bodies and carbon dioxide going out of their bodies. Continue to add water to the worm bin to keep the newspaper moist and damp.
- They are vegetarians. Do not add meat, cheese or dairy products. Only fruit and vegetable scraps with no additives should be added. If you have 1 pound of worms, you should feed them approximately 3 pounds of food scraps each week.
- Bury the food scraps in a new place every day. This will show the quantity of food that your worms are eating. If you add too much food, it will rot and start to smell. If you add too little, your worms will be hungry. Adding the right amount will make the worms happy and create rich amendments for your garden soil. This should be monitored weekly to see if the worms are eating the food.
- The worm bin can be located inside or outside. If your worm bin is kept inside, keep a tray or liner under it since there are holes in the bottom. If your worm bin is outside, find a shady and cool area to keep them. Worms do not like extreme temperatures. The worm bin should be kept in an area that is 50-80° Fahrenheit to keep them healthy.

Problem	Cause	Solution
Worms are dying	Too wet Too dry Not enough air	Add more shredded newspaper Moisten shredded newspaper Drill more holes
Bin stinks	Too much food Too wet	Do not feed for 2-3 weeks Add more shredded newspaper
Fruit Flies	Exposed food	Bury food in shredded newspaper

National Standards:

NGSS

- Interdependent relationships in ecosystems: Animals, plants, and their environment.
- Structure, function and information processing.
- Energy
- Matter and energy in organisms and ecosystems.

Lesson Extensions:

Language Arts: Write a narrative on the steps of making a compost and what it takes to turn food waste into garden magic.

Write a description of the process of the compost cycle and describe what happens at each step.

Explain why we only use certain food scraps in our compost.

Math: Track and record the number of students who composted each day.

Measure the compost temperature and record. The ideal temperature is 120-160°Fahrenheit.

Track the length of time it takes for the compost to be ready. The compost pile is ready when the ingredients are dark brown and has a slight earthy smell. This can take 3-6 months.

Science: Grow the same plants in soil with compost and soil without compost. Study and collect data on their growth. Make predictions and conclusions on what healthy compost does to help grow healthier plants.

After six weeks of building compost, take a look at different soil samples (sand, compost, garden soil). Have students use the Soil Investigation Worksheet to make observations about what is found in different soil types.

Literature Connections:

Compost Stew by Mary McKenna and Ashley Wolf

Composting: Nature's Recyclers by Robin Michal Koontz

What's Sprouting in My Trash? A Book About Composting by Esther Porter

Investigating Soil

Look at sand, garden soil and compost with a hand lens or magnifying glass. List and sketch what you observed.

<p style="text-align: center;">Sand</p>	<p style="text-align: center;">Garden Soil</p>
<p style="text-align: center;">Compost</p>	<p style="text-align: center;">Benefits of Compost</p>

Composting 101

Greens – Nitrogen Rich

- Fruits and vegetable scraps
- Bread and grains
- Coffee grounds
- Coffee filters
- Green garden waste
- Paper tea bags with the staple removed

Browns – Carbon Rich

- Nut shells
- Sawdust from untreated wood
- Hay and straw
- Yard trimmings (e.g., leaves, branches, twigs)
- Wood chips
- Leaves
- Shredded newspaper

What not to add to the compost pile:

- Aluminum, tin or other metal
- Glass
- Dairy products (e.g., butter, milk, sour cream, yogurt) & eggs
- Fats, grease, lard, or oils
- Greasy or oily foods
- Meat or seafood scraps
- Pet wastes
- Plastic
- Stickers from fruits or vegetables (to prevent litter)
- Black walnut tree leaves or twigs
- Yard trimmings treated with chemical pesticides
- Roots of perennial weeds
- Coal or charcoal ash
- Treated or painted wood

Troubleshooting Your Pile

Problem	Cause	Solution
Bad Odor- Rotten Smell	Not enough air or too much moisture	Turn pile and incorporate coarse browns (sawdust, leaves)
Bad Odor- Ammonia Smell	Too much nitrogen	Incorporate coarse browns (sawdust, leaves)
Pile does not heat up or decomposes slowly	Pile too small	Add more organic matter
	Insufficient moisture	Turn pile and add water
	Lack of nitrogen	Incorporate food waste or grass clippings
	Not enough air	Turn pile
	Cold weather	Increase pile size or insulate with straw or a tarp

Adapted from EPA Composting Fact Sheet and How to Guide. <http://www.epa.gov/waste/conserve/tools/greenscapes/pubs/compost-guide.pdf>

Recommended Grade Level:

K-2

Season:

All

Indoors

Seasonal Gardening

Description:

Students will study what produce can be grown during the four seasons of the year in their region. Students will play a matching game to review what they have learned about seasonal planting.

Background:

The seasons of the year offer different opportunities to grow produce in different parts of the country. Some regions can grow in the soil year round, while others need to grow indoors or in green houses for the winter. Fruits and vegetables taste better when they're in season and often are more affordable. It's important to know what your growing region is and to research what can be grown at different times of the year. The USDA has many helpful tips to help you know when to plant. <http://planthardiness.ars.usda.gov/PHZMWeb/>.

Materials:

- Seasonal Gardening Chart
- Large butcher paper divided into four sections labeled Winter – Spring – Summer – Fall
- Construction paper
- Scissors
- Glue or tape
- Produce Matching Game Cards

Preparation:

Determine how many groups the students will be divided into. Make copies of the Seasonal Gardening Chart for each group.

Activity:

1. Ask the class what they know about the seasons of the year.
 - What are the four seasons?
 - How is the weather during each season in your region?
 - What foods do you eat in the four seasons?

2. Explain that the four seasons of the year affect our everyday lives, from the clothes we wear to the food we eat. Some fruits and vegetables can only be grown during certain seasons of the year, while some can be grown all year long. This is why fruits and vegetables are grown in different places since the four seasons are different across the country. It's important to know what fruits and vegetables are in season:
 - Gardeners can plan what they'll plant according to the season, so they can have a good harvest.
 - Fruits and vegetables that are in season normally taste better and are more affordable.
3. Divide students into groups and pass out the Seasonal Gardening Chart. Discuss what can be grown at different times of the year and allow students to share some of their favorite fruits and vegetables for each season.
4. Have students draw a fruit or vegetable from each season that they will share on the class poster "Eating through the Four Seasons." Display the poster in the classroom or in the hallway.
5. Have students play a matching game using the produce pictures and cards. Students will match the picture of the produce to the name. Students can also separate the matched cards by season.

Tying it Together:

1. Pick a fruit or vegetable and ask students when the best time of the year to eat it is.
2. Why should you consider seasons when planting your garden?
If you plant at the wrong time, your plants won't grow properly and you won't have a good harvest.

Special Care:

Seasonal fruits and vegetables could be sketched for students and they could color and cut them out for the "Seasons in the Garden" poster.

Digging Deeper:

Compare types of plants that grow better in different seasons. Look for patterns. Which fruits and vegetables grow in winter? Spring? Summer? Fall?

National Standards:

CCSS.ELA: Text types and purposes.

CCSS.ELA: Research to build and present knowledge.

NGSS: Interdependent relationships in ecosystems.

Lesson Extensions:

Health: Bring in examples of fruits and vegetables that are fresh, canned, frozen and dried. Have students sample a taste from each. Ask students to decide which they like the best by writing their name on a sticky note and placing it on the board under the columns fresh, canned, frozen or dried. Create a class graph from the responses. Explain why food is packaged in different ways and that foods cost more when they aren't in season.

Math: Compare total number of plants that can grow at each season. Compare number of days to harvest by using seed packets or growing guides. Use the following website as a reference:
<http://www.gardening.cornell.edu/homegardening/scene0391.html>

Science: Students create a planting guide for what they would like growing in their “dream garden” during each season.

Literature Connections:







An Apple Tree Through The Year by Claudia Schnieper

The Curious Garden by Peter Brown







Secrets of the Garden: Food Chains and Food Web in Our Backyard by Kathleen Weidner Zoehfeld and Priscilla Lamont

Seasonal Gardening Chart

Fall Crops







	Brussels Sprouts		Apples
	Pumpkin		Sweet Potato
	Pear		Butternut Squash

Winter Crops







	Broccoli		Carrot
	Orange		Spinach
	Cauliflower		Kale

Seasonal Gardening Chart

Spring Crops

	Leeks		Fava Beans
	Lettuce		Asparagus
	Radish		Peas

Summer Crops

	Melons		Grapes
	Cucumbers		Summer Squash
	Corn		Tomato

Produce Matching Game Cards



Produce Matching Game Cards



Produce Matching Game Cards

Pumpkin	Brussel Sprouts	Apple
Broccoli	Sweet Potato	Cauliflower
Lettuce	Orange	Pear
Kale	Spinach	Asparagus

Produce Matching Game Cards

Peas	Radish	Butternut Squash
Carrots	Fava Beans	Leeks
Melon	Tomato	Summer Squash
Grapes	Corn	Cucumber

Recommended Grade Level:

Pre-K-2

Season:

Spring/Summer/Fall

Outdoor

Insect Cycles

Description:

Students will learn about and explore the stages of development for butterflies and ladybugs. They will label the stages of their lifecycles and learn about how butterflies and ladybugs evolve at each stage. Then, students will use magnifying glasses to search for insects in the garden and look for their different stages of development.

Background:

Learning about lifecycles and stages of development are a part of curriculum from Pre-K to 12th grade. Students who learn on a concrete level, while incorporating movement and application, are able to understand how cycles operate and build foundations that can be applied to the understanding of more abstract concepts. In this activity, students learn the lifecycles for butterflies and ladybugs and the needs of these insects during each stage. Students will compare this to the human lifecycle and what's needed throughout life.

Timing is important when looking for the stages of development for butterflies and ladybugs in the garden. Often while students are looking for various stages of these insects, they will stumble upon many other discoveries when armed with a magnifying glass and a little freedom in the garden.

Materials:

- Magnifying glasses
- Picture of a butterfly
- Picture of a ladybug
- Insect Lifecycle Handout
- Insect Part Chart (optional)

Preparation:

Make copies of the Insect Lifecycle Handout and the Insect Part Chart.

Activity:

1. Explain to students that many different insects live and grow in the garden and ask for examples of insects.
2. Explain that they will be learning about how butterflies and ladybugs change and grow during their lifetimes.
3. Show students a picture of a caterpillar and ask them to share what they know about it. Make a list of what they share. Repeat with a picture of a ladybug.
4. Hand out the Life Cycle Chart and project a copy on the board. As a group, label the steps of the cycles and discuss what happens at each stage. Explain that their growth goes in a circle or cycle.
5. Explain that these insects have needs, just like we do. They need food, pollen, water and a safe environment. Have students brainstorm what they need throughout life to grow healthy and strong (healthy food, water, exercise, sleep, a safe environment).
6. Tell students they get to go on a bug hunt to search for butterflies and ladybugs in each stage of their lifecycle. Give students magnifying glasses to explore the garden. If students find signs of the stages, they yell “Bingo” and can share their discovery with the class. Allow ample time for conversation and sharing about what they’re observing.

Tying it Together:

1. What did we discover?
2. What stages of the lifecycle did we find?
3. Where did you find the insects?
4. Which insects did we see the most?
5. Which did we see the least?
6. How are the needs of insects similar to ours?
They need food, vitamins, water and a safe environment.

Special Care:

Students can be paired with a “garden buddy” to explore and search.

Digging Deeper:

Expand the lesson to include different types of bugs and lifecycles (mealworms, crickets, ants, etc.).

National Standards:

NGSS: Interdependent relationships in ecosystems: Animals, plants, and their environment.

NGSS: Structure, function and information processing.

Lesson Extensions:

Math: Using the Insect Parts Chart, students compare the total number of bugs to the total number of wings, legs and antennae. They can also compare different populations of bugs in the garden.

Science: Students can go to the garden at regular intervals and record the number of insects that they see, collecting data over time.

Literature Connections:

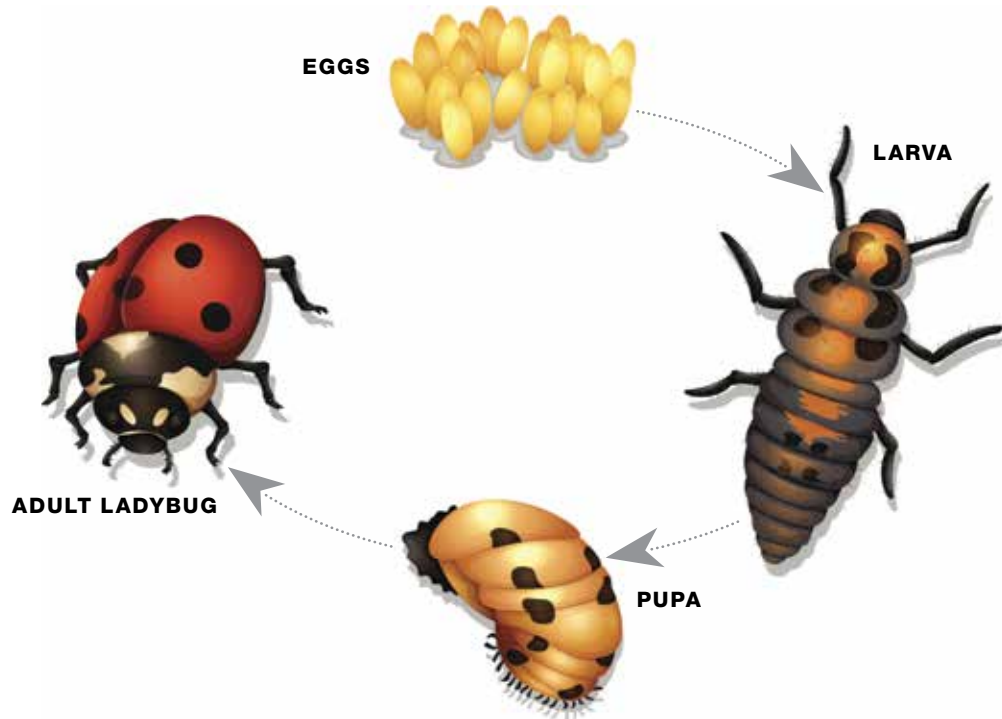
The Very Hungry Caterpillar by Eric Carle

The Very Grouchy Ladybug by Eric Carle

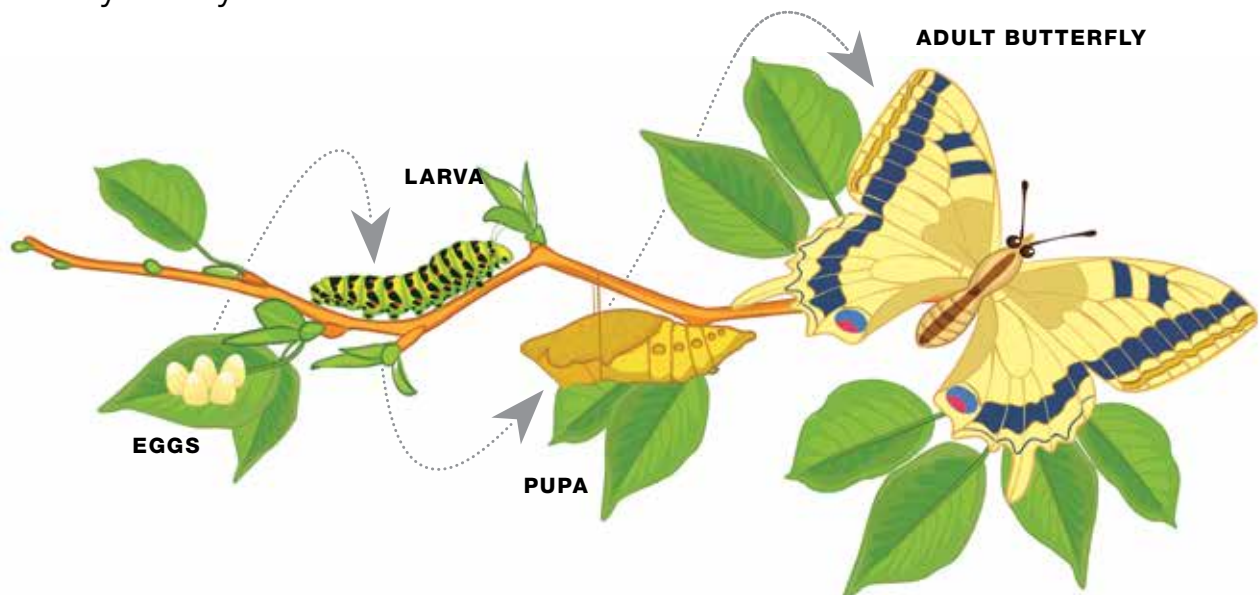
A Ladybug Larva Grows Up by Katie Marsico

From Caterpillar to Butterfly by Deborah Heiligman

Ladybug Lifecycle



Butterfly Lifecycle



Insect Parts Chart

Insect Name	# Found	# Wings	# Legs	# Antenna

Seed Packets — Things to Know Before You Grow

Recommended Grade Level:

2-5

Season:

All

Indoor/Outdoor

Description:

Students will research a plant or one that's growing in the garden, gathering information from seed packets and displaying the information using a rubric.

Background:

Learning about seeds and the steps that you need to take when planting is a great lesson in sequencing. Seed packets contain a wealth of information about the plant that grows from them. It's important that the directions on the seed packet are followed so that they grow and produce a large harvest. Review the directions with students. Like seeds, people who live healthy (healthy diet, exercise, sleep) can grow healthy and strong.

Materials:

- Several varieties of seed packets
- Things to Know Before You Grow Worksheet

Preparation:

Determine if students will complete the activity individually, with a partner or in a small group. Make copies of the Things to Know Before You Grow Worksheet for each student, partner or group.

Activity:

1. Explain to students that they'll be researching plants using seed packets as a reference. Seed packets have important information that helps gardeners know how to take care of their plants and help them grow in to healthy plants. Most seed packets have the following information:
 - Picture: A picture of the plant when it's full grown and ready for harvest.
 - Plant description: The common and scientific name of the plant, the plant height and days to harvest.
 - Planting directions: Directions normally include planting depth, spacing, sunlight requirements, indoor or outdoor planting, and basic care instructions.

2. Pass out seed packets and allow students to read the information on them. Have students share what they find on the seed packets. Ask students:
 - Why is it important to follow directions and how can that impact the success of their harvest?
If plants don't get what they need, they won't grow into healthy plants.
 - What directions should you follow as you grow to be healthy?
Eating healthy, exercising, sleep well, drinking water
3. Allow students to choose a plant that they would like to research from the seed packets. If you don't have enough seed packets for the number of students who want to research it, make copies of the front and back of the seed packet.
4. Pass out and review the Things to Know Before You Grow Worksheet.
5. Give students time to gather information and complete the Things to Know Before You Grow Worksheet. Have students share their worksheet with the class.

Tying it Together:

1. Why is it important to read the instructions on seed packets?
The seed packets tell you the important steps for planting and will help you get the best harvest.
2. What happens if we plant seeds too close to each other?
They become crowded and won't grow properly.
3. What happens if we plant them at the wrong time of the year?
They won't produce a plant or the best harvest.
4. Will our plants grow properly if we don't follow the directions?
No. Plants have things they need to grow properly just like humans do.
5. What do we need to help us grow healthy?
Healthy foods, exercise, sleep, drinking water.

Special Care:

The font of seed packets can be small. If you need larger font size for students, you can make an enlarged copy of the front and back or you could buy some larger seed packets with bigger lettering.

If you want to eliminate some of the information on the seed packets, highlight the information you want to include on a black and white copy of the seed packet to reduce the visual clutter and allow the student to focus on the information that they'll be researching.

Digging Deeper:

Using the app Aurasma, or another similar free app, students choose a plant growing in the garden. They research and gather information about the plant. Have them create a marker for the plant that the QR reader can scan. Then, have students create a video that links to the QR scan for their plant.

National Standards:**CCSS.ELA**

- Reading: Informational text: Key ideas and details.
- Writing: Production and distribution of writing.
- Writing: Research to build and present knowledge.

ISTE

- Creativity and innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
- Communication and collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
- Research and information fluency: Students apply digital tools to gather, evaluate, and use information.

NGSS

- Interdependent relationships in ecosystems.
- Inheritance and variation of traits.
- Structure, function and information processing.
- Matter and energy in organisms and ecosystems.

Lesson Extensions:

Health: Students create or share a healthy recipe that uses the plant as an ingredient.

History: Students can extend their research to include the origin, history and uses of their plants and make Produce Fact Sheets with the information.

Language Arts: Students take the information from their Things to Know Before You Grow Worksheet and write the information in a narrative form. Create a class book using all the worksheets.

Math: Make word problems using the information from the seed packets. Students can also make word problems that can be assigned to the class. Here are some examples:

- If the planting space is 1 inch apart, how long would your row be if you planted all the seeds in one row?
- If the seeds take 75 days until harvest and you planted today, when would your produce be ready?
- How many more days do carrots take to sprout than lettuce?

Science: Seed packets could be sorted into a variety of groups:

- Fruits/Vegetables/Flowers/Herbs
- Fall/Winter/Spring/Summer Crops
- Color

If it's planting time, have students plant their seeds in the garden or in indoor container gardens.

Literature Connections:

From Seed To Plant by Gail Gibbons

Oh Say Can You Seed? All About Flowering Plants by Bonnie Worth

Things to Know Before You Grow

PLANT NAME	
DAYS TO GERMINATION <i>(plant sprouts out of the soil)</i>	
DAYS TO HARVEST <i>(fruit or vegetable is ready to pick)</i>	
PLANTING DEPTH <i>(how deep to plant seeds)</i>	
PLANT SPACING <i>(how far apart to plant the seeds)</i>	
PLANT HEIGHT <i>(how tall the plant grows)</i>	
OTHER PLANTING TIPS	

Colors, Shapes, ABC's in the Garden

Recommended Grade Level:

Pre-K-2

Season:

Growing seasons in
your area

Outdoor

Description:

Students will learn about data collection and using different criteria for collecting information. Using one of the In the Garden worksheets or garden journals, the students will learn about organizing their space to investigate data including colors, shapes and ABC's in the garden.

Background:

For young learners, the garden is an exciting way to explore their world and is loaded with colors, shapes and ABC's. Being outside is an added health benefit for the students, because it gets them up and moving. By incorporating movement into their day, the students learn better and are more engaged during their learning activities. This lesson will introduce the concept of data collection and narrowing a search for information while learning in the garden.

Materials:

- In the Garden Worksheets:
 - Colors in the Garden
 - Shapes in the Garden
 - ABC's in the Garden
- Clipboards for worksheets

Preparation:

1. Make copies of the In the Garden Worksheet that you'll be using for each student. It is recommended to pick one concept at a time to explore.
2. A quick review of colors, shapes or ABC's may be needed. Some Pre-K and kindergarten students may not have mastered ABC's; so use a different worksheet.
3. Students can use the clipboards for their worksheets or tape/glue them in their journal to write down their discoveries.

Activity:

1. Walk into the garden and point out items that have the characteristics of what students will be exploring on their hunt (colors, shapes or ABC's). Show students several examples.
2. Tell the students that they will be exploring the garden looking for data about colors, shapes or ABC's. Explain that data is information that you collect.
3. Send the students out into the garden to gather data and record it on their In the Garden Worksheet.
4. When all students have finished, gather them in a central place or back in the classroom to share their findings.

Tying it Together:

1. What did we look for in the garden today?
2. What did we find out about colors, shapes or ABC's in the garden?
3. Which color, shape or ABC did we see the most?
4. Which color, shape or ABC did we see the least?
5. How does data collecting help us learn about things?

When we gather information and write it down, it helps us remember what we saw and we can share our information with others.

Special Care:

Younger students may not be able to write words or know their ABC's, colors and shapes. This activity could be done as a whole group and the teacher could collect the data for the group. In the classroom, the teacher could model how to organize the data on paper and students could participate in a group or in individual journals copying what the teacher writes down.

Digging Deeper:

Collect the same data during different seasons. Compare the results of what you find in the spring vs. fall or winter.

National Standards:

CCSS.ELA

- Foundational skills: Print concepts
- Foundational skills: Phonological awareness
- Foundational skills: Phonics and word recognition

CCSS.MATH

- Counting and cardinality
- Measurement and data
- Geometry

Lesson Extensions:

Language Arts: Make an alphabet book about ABC's in the garden.

Math: Look for different attributes: plants that have pointy, rounded or feathered leaves; plants that have seeds; bugs in the garden; etc.

Science: Collect data on other items in the garden: temperature of soil; compost; outdoor temperature; rainwater; height of plants; etc.

Social Studies: Take the students out to find "treasures" (healthy foods) in the garden. Then create a treasure map of the garden.

Literature Connections:

The Vegetable Alphabet Book by Jerry Pallotta, Bob Thomson and Edgar Stewart

Over Under in the Garden: An Alphabet Book by Pat Schories

Pick a Circle, Gather Squares: A Fall Harvest of Shapes by Felicia Sanzari Chernesky

Shapes in the Garden



Circle



Triangle



Rectangle



Square



Sphere



Cube



Cone



Cylinder

ABC's in the Garden

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

Colors in the Garden

Red	Orange
Yellow	Green
Blue	Purple

Recommended Grade Level:

3-5

Season:

All

Indoor

Plant Families

Description:

Students will explore some common plant families: Alliaceae, Asteraceae, Belliferae, Brassicaceae, Cicirbotaceae, Graminae, Leguminosae, Solanaceae. Using pictures, students will look at the characteristics and sort plants into the correct families. Students will discuss what they know about their characteristics and how that relates to members of their families.

Background:

Scientists group the different species of plants and animals into families according to their physical attributes. Knowing about the hundreds of plant families on earth can help gardeners grow and care for them. Characteristics of plants come from their family, just like characteristics of humans come from their families.

Materials:

- Plant Family Picture Cards
- Plant Family Characteristics Cards

Preparation:

1. Determine how many groups the students will be divided into.
2. Make copies of the Plant Family Pictures and Plant Family Characteristic Cards for each group.
3. Cut out the characteristic boxes and plant pictures into separate cards. Keep a copy of the entire sheet so you have an answer key.

It may be helpful to show the Plant Families website from the Helpful Links section before you begin this activity to acquaint the students to the study of plant families.

Activity:

1. Tell students that they will learn about the different ways scientists group plants by using their characteristics. Explain that characteristics are attributes that describe something.
2. Have students brainstorm different characteristics of plants. If students need help, ask how different plants look or grow.
3. Review the Plant Family Characteristic Cards as a group.

4. Break the class into groups of 4-6 students. Explain that their job is to sort the plant photos using the Plant Family Characteristic Cards.
5. Once they're finished, review the cards and pictures together to determine correct grouping of the plants.
6. Then, ask students to brainstorm characteristics about themselves, each other and their family members. Find common characteristics within the class.

Tying it Together:

1. Why would you need to be able to group plants into families?
Knowing about plant families can help you know what a plant looks like, where the seedpod will be, what the seeds will be like, how to germinate new seeds and what the seedling will look like. You will also know about the different growth needs for the plant.
2. How are plant families good for our healthy?
By eating different plant families, you can get the vitamins and minerals to be healthy.
3. How are plant families and human families the same?
Plant and human families inherit characteristics from their families.
4. What characteristics do you share with your parents? Siblings? Grandparents? Cousins?

Special Care:

You could write numbers on the back of the plant pictures so that each family had the same number. Students could check the back to sort them or use the numbers on the back to self-correct.

Digging Deeper:

Students can study and learn about the characteristics of less common plants.

National Standards:

NGSS: Inheritance and variation of traits.

NGSS: Structure, function and information processing.

Lesson Extensions:

Nutrition: Incorporate a taste test into the lesson. Bring fruits and vegetables from the different plant groups to taste and compare.

Science: Explore the study of taxonomy and grouping organisms. Use the following mnemonic device to help students learn the order that organisms are grouped.

King	Kingdom
Paul	Phylum
Came	Class
Over	Order
For	Family
Green	Genus
Salad	Species

Students research a plant family or other grouping in more depth and create a presentation.

Social Studies: Students research the origin of plants in a family and plot them on a map of the world.

Technology: Students create a Prezi or PowerPoint presentation to share the information that they learned from their study of plant families.

Literature Connections:

Botany Illustrated by Janice Glimn-Lacy

Plant Family Characteristics Cards

Alliaceae: Onion Family

Description:

These plants push up leaves from their base. They have long thin leaves. They grow swollen underground bulbs. They have long life cycles.

Growing Characteristics:

Cool weather helps grow their leaves. Hot, dry weather helps produce bulbs. They have very shallow roots.

The onion family grows well in rich organic soil. Many plants in this family are used to flavor the foods that we eat.

Examples: Onion, garlic, leek, chive

Umbelliferae: Parsley Family

Description:

The parsley family is scented and has hollow leaves. Most of these plants are herbs. Their flowers have five petals. Some grow underground. The plant parts we eat from this family can be roots, stems, leaves or flowers.

Growing Characteristics:

They are usually a cooler season crop. They like well-drained soil. Their seeds are slow to germinate, which means it takes longer to pop out of the soil.

Examples: Carrot, parsley, coriander, fennel, celery

Brassicaceae: Mustard Family

Description:

Their leaves have tiny waxy hairs. The flowers have four petals. Plants have a sulfur odor.

Growing Characteristics:

Grows in cool seasons. Has shallow roots. Requires little amounts of water. Thrives in soil with added compost.

Examples: Broccoli, cabbage, cauliflower, kale, mustard, radish

Graminae: Grasses and Grains Family

Description:

This family has thin, flat roots. It's a large group and many of the plants are crops grown by farmers.

Growing Characteristics:

They need a lot of nitrogen in their soil. The fruit grows on stalks.

Examples: Corn, rice, wheat, lemon grass

Cucurbitaceae: Gourd Family

Description:

The gourd family likes to climb on things. They have small curly tendrils and large leaves.

Growing Characteristics:

They're very fast growing and need to be kept moist with lots of added compost. They do best when grown on a trellis or a fence.

Examples: Cucumbers, melons, winter squash, zucchini, gourds, luffa

Asteraceae: Sunflower and Aster Family

Description:

They're a large flower. The head of the flower is made of tiny seeds. They're good pollinator attractors.

Growing Characteristics:

They grow fast with shallow roots. These plants have few pests and attracts many beneficial insects.

Examples: Lettuce, artichoke, calendula, zinnia, marigold, sunflower

Solanaceae: Nightshade Family

Description:

These leafy plants have a strong odor. The flowers have five petals and the fruit is a berry.

Growing Characteristics:

This plant family likes rich, damp soil and lots of organic matter. Some produce fruit and tubers (underground vegetables).

Examples: Tomato, eggplant, peppers, potato

Leguminosae: Pea and Bean Family

Description:

These plants are grown as food plants. The fruit splits open with seeds along one side.

Growing Characteristics:

Their leaves and seeds contain high protein that gives us energy when we eat them.

Examples: Soybean, chickpeas, green beans, alfalfa, peanut, sweet pea

Plant Family Picture Cards

Leguminosae Family

From top left corner to bottom right corner: green bean, peanut, bean, peas



Alliaceae Family

From top left corner to bottom right corner: leeks, onion, chives, garlic



Umbelliferae Family

From top left corner to bottom right corner: parsley, fennel, celery, carrots



Brassicaceae Family

From top left corner to bottom right corner: radish, cabbage, broccoli, kale



Graminae Family

From top left corner to bottom right corner: rice, corn, lemon grass, wheat



Cucurbitaceae Family

From top left corner to bottom right corner: luffa, melon, zucchini, cucumber



Asteraceae Family

From top left corner to bottom right corner: lettuce, artichoke, zinnia, sunflower



Solanaceae Family

From top left corner to bottom right corner: tomatoes, eggplant, peppers, potatoes



Recommended Grade Level:

1-5

Season:

All

Indoor/Outdoor

Plants Are Needy

Description:

Students will learn about the needs of plants and the nutrients they require for healthy growth. They will compare factors in plant development that can't be controlled (weather, pests and beneficial insects) and can be controlled (water, nutrients in soil, sunlight). They will apply what they learn about plants to factors that affect their health and discuss controllable and uncontrollable factors in their lives.

Background:

Plants need water, soil, nutrients and sunlight to grow. When plants are exposed to pests, disease or negative human impact, they don't grow well. There are things that we can and can't control in the garden. Like plants, humans need such as water, healthy foods, rest and exercise to grow healthy bodies. Some factors, such as genetics, can affect health but can't be controlled. This lesson will show students a connection between plant health and human health.

Materials:

- Plant Growth Scenarios
- My Healthy Habits Checklist

Preparation:

Students should already have been introduced to the concept that plants need water, sunlight and nutrients. They should also have background on what people need to be healthy. They'll be aware of some factors that can impact healthiness (diabetes, obesity, high blood pressure, etc.).

Activity:

1. Gather your students in a central spot and explain to them that there are things that can be "controlled" and "can not be controlled." Use these examples: *your stomach growls and you control it by eating; you want to play soccer on the playground, but it's night time (uncontrollable)*, etc. Have students brainstorm more examples.
2. Ask students what things can be controlled when growing plants (water, adding compost, pruning, etc.). Then, ask what things can go wrong in the garden (pests, weather, sunlight, disease). Explain that those things "cannot be controlled."
3. Explain to students that like plants, controllable and uncontrollable factors affect our health. When we control these factors, our bodies can stay healthy and strong. Give students a few examples of controllable

and uncontrollable factors and ask them to come up with examples.

- Controllable factors: Eating a healthy diet that includes fruits and vegetables, children being physically active for at least 60 minutes every day, not smoking, etc.
- Uncontrollable factors: Gender, age, family health history, genetics.

4. Students are given different scenarios to read or act out, showing things that can happen in the garden. The audience decides if the scenario can be controlled or not controlled.
5. After completing the scenarios, have students complete the My Healthy Habits Checklist. After one week discuss the checklist with the students to see if they reached their goals and what changes they can make in the future. Younger students that cannot write can draw their healthy habits in the checklist.

Tying it Together:

1. What did you learn about factors that can impact plant growth?

There are things that we can control in plant growth and things that we can't.

2. What things can be controlled?

Water, soil, compost

3. What can't be controlled?

Weather, pests, plant diseases

4. What can you control about your health?

Diet, physical activity, not smoking

5. What can you not control about your health?

Gender, age, family health history, genetics

Special Care:

Students can make a poster with pictures of controllable and uncontrollable factors in the garden. Poster can be shared with the class.

Digging Deeper:

Students can apply their knowledge to investigate plants in the garden looking for problems and healthy growth, to apply what they learned about controllable and uncontrollable factors.

National Standards:

NGSS: Structure, function and information processing.

NGSS: Interdependent relationships in ecosystems.

NGSS: Matter and energy in organisms and ecosystems.

NHES: Students will comprehend concepts related to health promotion and prevention to enhance health.

Lesson Extensions:

Language Arts: Write a composition about the importance of healthy lifestyle choices that you can control.

Literature Connections:

How Do Plants Grow by Julie K. Lundgren

A Seed in Need: A First Look at the Plant Cycle by Sam Godwin

My Healthy Habits Checklist

There are many things we can do to be healthy, like eating well, being physically active, visiting the doctor and getting enough sleep. Create a list of habits you can do to stay healthy. Then track your healthy habits for one week.

Healthy Habit	How many times you did this in a week
Example: <i>TRY A NEW FRUIT.</i>	✓✓✓

Garden Scenarios

1. A lot of water is around you.
2. Your sunshine is blocked by a taller plant.
3. You don't have any water and you're shriveling up.
4. Your roots are exposed out of the soil.
5. Aphids are all over you.
6. A leaf disease is attacking you.
7. Your growing space is too crowded.
8. Squirrels love to eat your fruit.
9. A basketball keeps landing on you when kids miss the basket.
10. You're too heavy at the top of the plant and your roots can't hold you up.
11. It's going to freeze overnight – and that means you could freeze and die.
12. Bunnies are nibbling your leaves.
13. Squash bugs are on you.
14. Ladybugs are eating aphids off of you.
15. The sprinkler doesn't reach you when it waters.
16. It's getting hot in the summer and you don't thrive in the heat.
17. A tree limb falls on you and breaks your stem.
18. Hail crushed your stalk and you're broken near the soil.

Recommended Grade Level:

3-5

Season:

All

Indoor

Root Study

Description:

Root vegetables are an important part of a healthy diet. Students will explore the function of roots by dissecting a radish. Students will keep a dissection log of their findings in their Garden Journal.

Background:

Roots serve four functions: absorb water, store nutrients, anchor the plant and store food. The three types of roots are:

- The **taproot** is the large main root that's longer and supports other roots.
- The **fibrous** roots are the stringy roots.
- The **root hairs** are the tiny structures that go between the soil and absorb water and nutrients.

Materials:

- Above or Below the Ground Sheet
- Variety of root vegetables (carrots, radish, jicama, onion)
- Whole radishes
- Radish cut in half lengthwise
- Paper plate or cutting boards for each small group
- Magnifying glass
- Garden Journals for dissection log
- Ruler
- Anatomy of a Radish Sheet

Preparation:

1. Gather several root vegetables (carrots, radishes, jicama, onion) from the garden or grocery store. Try to choose root vegetables that have their leaves and obvious root hairs.
2. Determine the number of groups. Gather enough radishes from the garden so each group will have one whole radish and one radish half. Radishes can be purchased from the store if no radishes are available from the garden.

Activity:

1. Review the parts of plants and their functions:
 - Roots: Absorb water, store nutrients, anchor the plant in the ground and store food.
 - Stems: Transport water and nutrients through the plant like a straw.
 - Leaves: Gather sunlight for the plant to make food.
 - Flowers: Produces fruit and attracts pollinators.
 - Fruit: Contains the seeds.
 - Seeds: Grow new plants.
2. Explain to students that the vegetables we eat come from different parts of the plant, including the roots, and root vegetables grow underground.
3. Explain the three types of roots:
 - The taproot is the large main root that's longer and supports other roots.
 - The fibrous roots are the stringy roots.
 - The root hairs are the tiny structures that go between the soil and absorb water and nutrients.
4. Play the game Above or Below the Ground. See the directions and answer key on page 61.
5. Show students the different types of root vegetables you've gathered from the garden. Ask students to share any other types of root vegetables they know. Students may say potato, but it's a tuber (thickened part of the stem).
6. Explain that they will be studying root vegetables by dissecting a radish and learning about how a root works. Review the Anatomy of a Radish Sheet with them.
7. Divide the students into groups and pass out the supplies: whole radish, radish cut in half, paper plate and the magnifying glass.
8. Have students start by sketching their whole radish in their journals. Demonstrate how to use the skin of the radish to shade in the coloring for the red part and use the leaves to shade in the leaf sketch for green. Have them also sketch the inside view of the radish that's cut in half. Have them label their drawings, including leaves, stem, tap root and root hairs.
9. Have students use the magnifying glasses to take a closer look at the radishes and write their observations in their Garden Journals. Have students draw a line down the middle of the paper and label one side "outside" and the other side "inside." Once finished, have the groups share their findings.

Tying it Together:

1. What are the functions of a root?
Absorb water, store nutrients, anchor the plant and store food.
2. Why do you think the radish is moist inside?
The root pulls in water from the soil.

3. How did water get inside the root?

Root hairs absorbed the water.

4. How does the water from the roots get to the rest of the plant?

The stem pulls the water from the roots.

5. What if the radish didn't have a root?

It wouldn't get water and nutrients and wouldn't grow properly.

6. What happens if we don't eat healthy food and water?

Our bodies wouldn't be healthy.

7. What do water and nutrients do to help plants and animals grow?

Nutrients give plants and animals energy and strength.

Water helps keep plants and animals hydrated and working properly.

Digging Deeper:

Use hydroponics (a jar of water) to grow a root vegetables and study the growth. Regrow root vegetables by using the tops of carrots, base of celery, top of leeks, etc. Place the tops in a shallow dish of water in a sunny window or under a grow light and refill with water as needed. Record the growth and gather data on the process. When it has grown and developed a root system, it can be transplanted into the garden.

National Standards:

NGSS

- Inheritance of variation of traits.
- Structure, function and information processing.
- Matter and energy in organisms and ecosystems.

Lesson Extensions:

Health: Conduct taste tests with root vegetables. Describe the tastes, including similarities and differences. Gather data about tastings (favorite root vegetable, least favorite, softest, crunchiest, etc.).

Math: Have students measure the weight, volume and length of the radishes and compare with the other groups.

Science: Compare other root vegetables by going through the same procedure as the radish. Then students will compare a carrot root to roots of grass to see the difference between the taproots of root vegetables and the fibrous roots of grass.

Literature Connections:

The Gigantic Turnip by Alesey Tolstoy

Stone Soup by Robert Moser

Tale of Peter Rabbit by Beatrix Potter

What are Bulbs and Roots? By Molly Aloian

What Do Roots Do? By Kathleen V. Kudlinski and David Schuppert

Above or Below the Ground?

This activity can be done individually or in a small or whole group.

Whole Group:

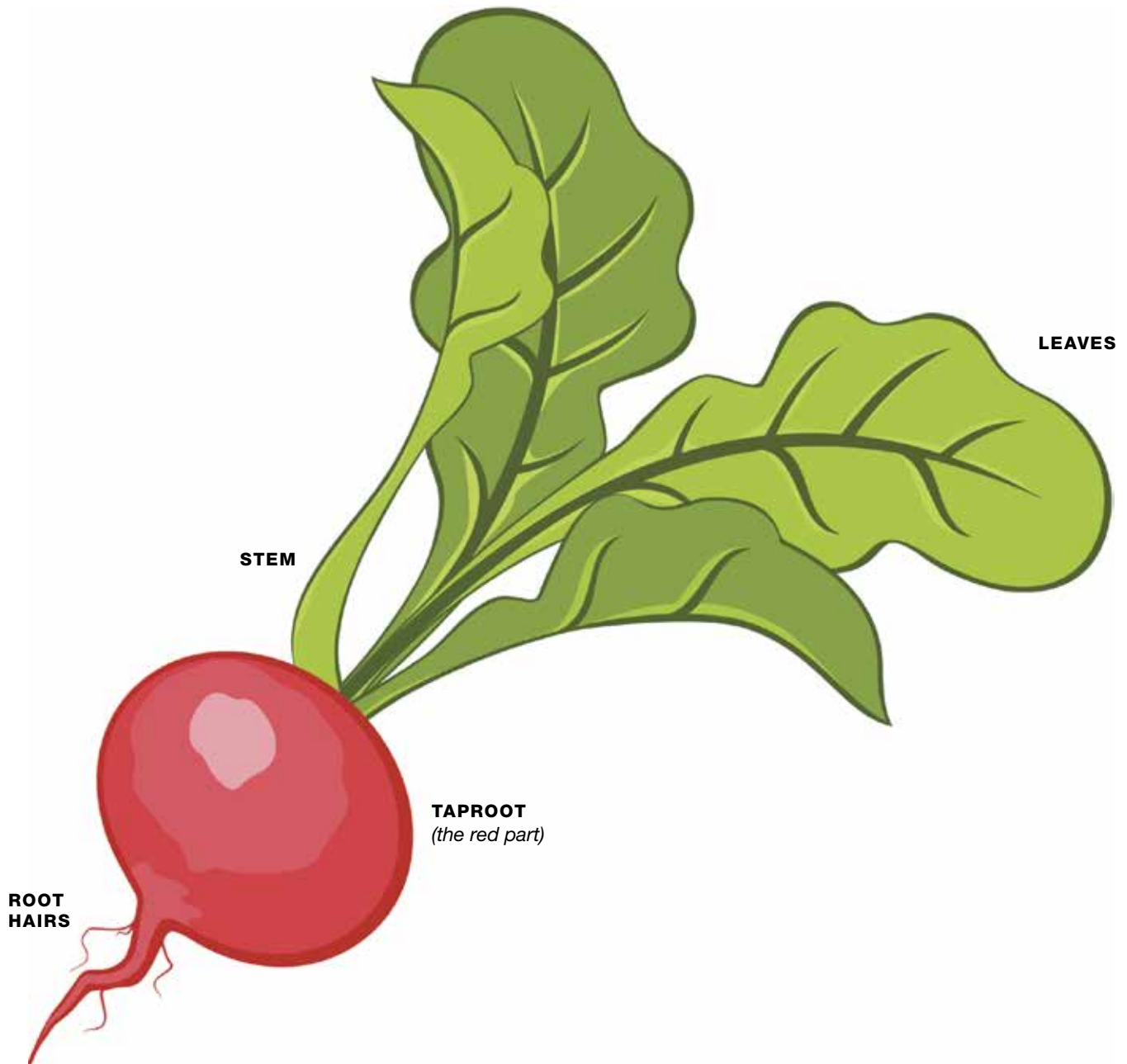
Read the list of fruits and vegetables. If the part that's eaten grows above the ground, students stand up. If the part that's eaten grows below the ground, students sit down.

Small group or individual:

A line is drawn down the middle of a piece of paper and labeled "Above the Ground" or "Below the Ground." Students make a list of as many fruits and vegetables that they can think of to fit each category. Students share the lists when they're finished.

Orange (above)	Turnip (below)
Tomato (above)	Apple (above)
Beet (below)	Cabbage (above)
Carrot (below)	Avocado (above)
Strawberry (above)	Cabbage (above)
Pear (above)	Horseradish (below)
Potato (below)	Cherry (above)
Cucumber (above)	Sugar Beet (below)
Cantaloupe (above)	Date (above)
Peanut (below)	Green pepper (above)
Pumpkin (above)	Radish (below)
Celery (above)	Banana (above)
Green Bean (above)	Cauliflower (above)
Onion (below)	Corn (above)
Lettuce (above)	Parsnip (below)
Broccoli (above)	Peach (above)
Squash (above)	Garlic (below)
Brussels Sprout (above)	Watermelon (above)

Anatomy of a Radish



Recommended Grade Level:

1-5

Season:

Spring/Fall

Outdoor

Garden Bug — Friend or Foe?

Description:

Students will learn about the common types of garden pests and friends. They'll discover the benefits and problems that bugs bring to the garden and search the garden for the creatures. After learning the definition of symbiosis (helpful bugs) and parasitic (harmful bugs), the students will predict where these bugs may be in the garden. They'll also learn ways to prevent these pests and how to encourage the beneficial ones. Students will also discuss healthy and unhealthy foods and how they affect their bodies.

Background:

Bugs are present in every garden and it may take close inspection to find them. Teach your students to turn over rocks, inspect the underside of leaves and to get on their hands and knees to see what's happening in the soil. Many interactions occur in the garden and the students will love to hunt for them. Garden bugs have helpful and harmful relationships and this can be explained through symbiotic (helpful) or parasitic (harmful) interactions. A symbiotic relationship is an interaction between two different organisms that help each other thrive. Parasitic relationship is an interaction where a plant or animal lives or feeds on another type of plant or animal and usually does damage or kills.

Materials:

- Garden Bug – Friend or Foe Insect Chart
- Garden Bug – Friend or Foe Insect Data Sheet (optional)
- Map of your garden space (you can provide a copy or have students draw a garden map)
- Clipboards or garden journal
- Magnifying glasses (optional)

Preparation:

1. Make copies of the Garden Bug – Friend or Foe Insect Chart for each student.
2. Draw a map of the garden and make copies for each student or have students draw a map of the garden in their garden journals.

Activity:

1. Explain a symbiotic and parasitic relationship to the students.
2. Give students a copy of the Garden Bug – Friend or Foe Insect Chart (this can go on a clipboard or taped into their garden journals) and the garden map (or have them draw a map of the garden).
3. Take students to the garden and allow them to explore the garden looking for the bugs in the chart. Explain to the students that the garden is home to these bugs and every bug has a purpose in the garden. Discuss which bugs are safe to touch and remind them to be respectful to the bugs and not harm or remove them from the garden.
4. Have students plot where they find the bugs on their garden map. Some of the bugs from the chart may not be present in your garden. If so, have students research and discuss the bugs they find in the garden to discover what it is and determine if the unknown bugs are harmful or beneficial to the garden.
5. Come together as a group and share what was found in the garden and determine if the bugs are friends (symbiotic) or foes (parasitic).
6. Explain to students that there are ways to attract good bugs and prevent pests in the garden.
 - To attract beneficial bugs:
 - Don't use pesticides. They kill bad bugs, but also the good ones.
 - Plant perennials and herbs that bloom throughout the growing season to attract bees, butterflies, birds and beneficial insects.
 - Provide water. All living things need water to live and grow.
 - To get rid of garden pests:
 - Add compost to the garden. Compost provides nutrients and improves the health of the soil and increases beneficial organisms. The more beneficial bugs that you have in your garden, the less harmful ones will come around.
7. Then discuss what types of foods are like friends and foes to our bodies. Ask students:
 - What foods are like friends to our bodies?
Healthier foods like fruits, vegetables, whole grains, low-fat dairy.
 - What foods are like pests or foes to our bodies?
Unhealthy foods like fried foods, sugary beverages, sugary foods.
 - Why is it important to eat healthy foods?
They help our bodies grow strong and be healthy.

Tying it Together:

1. What were some clues that you learned to look for when you searched for these bugs?
Leaf damage, yellow or brown leaves, leaves that look like they have been chewed.
2. What was the difference of a plant that had symbiotic bugs versus a plant that had parasitic bugs?
Plants with symbiotic bugs were green and growing well. Plants with parasitic bugs had damaged leaves and were not growing well.

Special Care:

Students can photograph or shoot a video of garden bugs to document them and then match them to the chart.

Digging Deeper:

Have the students inspect plants in their yard or neighborhood for the presence of bugs and make a list of what they discovered as a homework assignment.

National Standards:

NGSS

- Interdependent Relationships in Ecosystems.
- Structure, Function and Information Processing.
- Matter and Energy in Organisms and Ecosystems.

Lesson Extensions:

Language Arts: Students write compositions that explain the cause-and-effect relationships of a common garden bug and the plants that are their host, based on research and their discoveries in the garden.

Math: Using the Garden Bug – Friend or Foe Data Sheet, students tally the number of each type of bug (species and symbiotic/parasitic) in the garden. Compare collected data using fractions/decimals/percentages. For example: If 20 bugs are found and six of them are ladybugs, $\frac{6}{20}$ or $\frac{3}{10}$ or 3:10 or .3 or 30% are ladybugs. Students can create representations of symbiotic vs. parasitic bugs as well.

Science: Collect data for several different days or different seasons throughout the year. Make comparisons about what they find at different times and growing seasons in the garden.







Literature Connections:

Bugs In The Garden by Beatrice Alemagna







What Lives in the Garden? By John Woodward

Garden Bug – Friend or Foe Insect Chart

Beneficial Bugs in the Garden

		
Butterfly	Earthworm	Lacewing
		
Preying Mantis	Bee	Ladybug

Harmful Bugs in the Garden

		
Earwig	Billbug	White Grub
		
Sowbug	Thrips	Spittlebug

Garden Bug – Friend or Foe Insect Data Sheet

Beneficial (Symbiotic) Bugs "The Good Bugs"	Harmful (Parasitic) Bugs "The Bad Bugs"

Form and Function — Think Like A Botanist

Recommended Grade Level:

2-5

Season:

All

Indoor

Description:

Students will learn about the photosynthesis cycle in plants. Students will compare and contrast a plant grown in the dark for a week to another grown in light at regular intervals up to a month. Students will also discuss what they need to help them grow and be healthy.

Background:

Photosynthesis is the process in which green plants use sunlight, carbon dioxide and water to make sugar (food) and release oxygen into the air for us to breathe. Photosynthesis takes place in the green leaves of plants in tiny organelles called chloroplasts. Each chloroplast has chlorophyll, which absorbs sunlight and gives leaves their green color. Carbon dioxide is absorbed through small holes in leaves called stomata, and water is absorbed by the roots of the plant. Students will learn the needs of plants (water, light, air and nutrients) and how these elements contribute to the process of photosynthesis.

Materials:

- Two identical plants, planted in the same soil
- Water
- Garden journals
- Plant Parts Sheet
- Photosynthesis Cycle Worksheet (optional)
- Photosynthesis Vocabulary Worksheet (optional)

Preparation:

1. Review the photosynthesis cycle and Plant Parts Sheet.
2. Make copies of the Photosynthesis Cycle Worksheet and the Photosynthesis Vocabulary Worksheet for each student.

Activity:

1. Explain to students that all living things need food for energy. We grow food to eat and our bodies make the energy we need after we eat the food. Plants are also living things and need energy, but they make their own “food” for energy.
2. Then ask:
 - What are the different parts of a plant and what do they do?
Roots take in water and nutrients; stem transports the water and nutrients.
Leaves take in sunlight and water.
Flowers produce seeds and seeds make new plants.
 - What do plants need to grow?
Water, soil, sunlight, nutrients
 - What is photosynthesis?
The process that a plant uses to make its food and make oxygen for us to breathe.
3. Tell the students that you’re going to eliminate sunlight from the growth process of a plant to see what happens.
4. In their garden journals, have students draw and label Day 1 of the experiment and make predictions of what will happen during the experiment.
5. Over the next 14 days, water both plants each day, but leave one in the dark.
6. Check the plants on days 1, 4, 7, 11 and 14. Have students record their observations and draw the results for each day in their garden journals. Each time the data is recorded, talk about the changes and the differences in both plants.

Tying it Together:

1. What happened to the plant with no sunlight?
2. What happened to the plant with sunlight?
3. Since plants need sunlight to make food, what were the results of having no sunlight?
4. Could the plant in the dark create oxygen?
No, because it needs sunlight to make oxygen.
5. What were the results of having sunlight? Review the photosynthesis cycle.
Water + Light + Carbon Dioxide goes into the plant’s leaves. Then the plant makes sugar for food and oxygen for us to breathe.
6. Plants have needs that help them live and grow. What do we need to grow and be healthy?
Clean air, water, healthy foods like fruits and vegetables, physical activity, sleep

Digging Deeper:

Review the Plant Parts Sheet for a more in depth study of plant processes and stages of development.

Special Care:

Showing students a visual representation of learning concepts helps them assimilate new information. This model will help students gain a visual understanding of the steps of photosynthesis. Using a six-cup muffin pan, add each of the following items to one of the cups to show what is needed for photosynthesis:

- Sunlight: Two small yellow balloons that have been slightly inflated
- Carbon dioxide: Two small red balloons that have been slightly inflated
- Water

Then, place the muffin pan by a window that gets sunshine. After a few minutes, replace the items in the muffin pan with the following to represent the products of photosynthesis:

- Oxygen: Three small white balloons that have been slightly inflated
- Sugar: Three small sugar packets or fill three cups half way with sugar

Have students illustrate the model and label them in their journals or complete the Photosynthesis Cycle Worksheet.

National Standards:

CCSS.ELA: Writing: Text types and purposes.

CCSS.ELA: Writing: Research to build and present knowledge.

NGSS: Structure and properties of matter.

NGSS: Interdependent relationships in ecosystems.

NGSS: Energy

Lesson Extensions:

Science: Students can collect more plant data over time. Decide what to test (height, number of leaves, etc.) and observe and record data at regular intervals over a month.

Math: Add more plants to the mix to get a broader range of data. Use calculations to compare the growth rates of different plant or the mean, median and mode.

Language Arts: Publish data in a class scientific journal. Report on the development, growth and findings of the study. Students can work as a class or in small groups to summarize the data. Remind students to focus on the process and outcomes that occurred during the study.

Use the Photosynthesis Vocabulary Worksheet to show students' level of understanding of the key vocabulary words and concepts. Students can write a composition based on the data they collected, listing the process and outcomes of the experiment.

Career Investigation: Show students the Plant Scientists video clip and lead them in a discussion about the different types of plant scientists. Have students imagine they are plant scientists and brainstorm ways they can improve plants and agriculture.

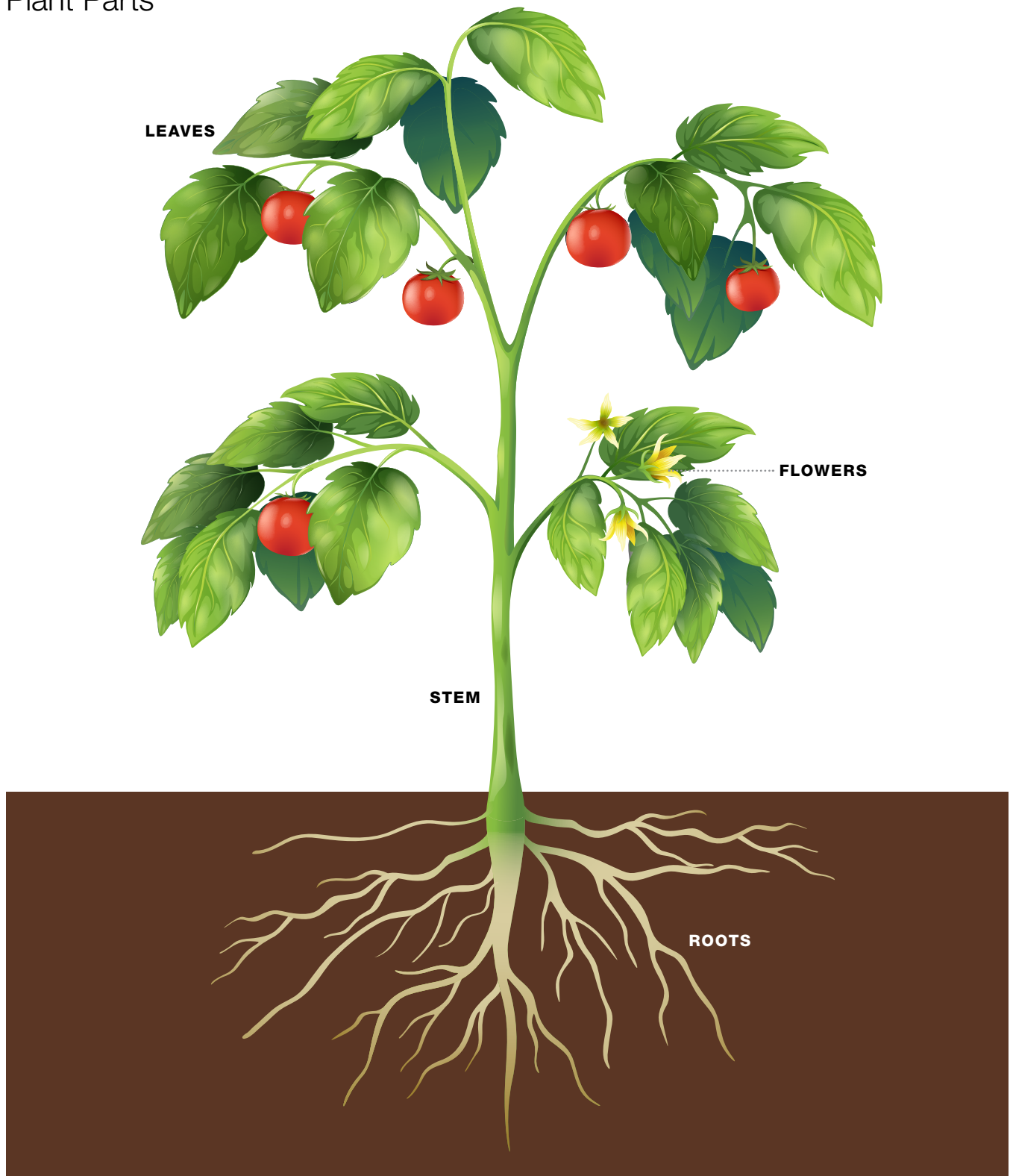
<https://www.youtube.com/watch?v=cBryPpsfcHU>

Literature Connections:

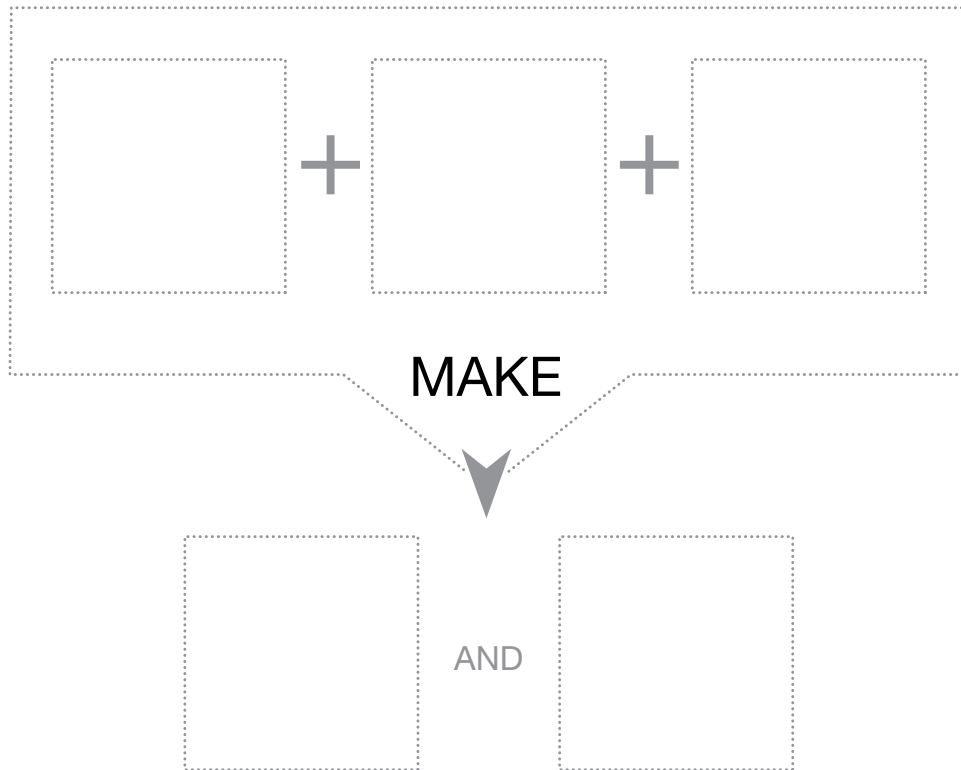
Photosynthesis by Torey Maloof

Photosynthesis: Changing Sunlight Into Food by Bobbie Kalman

Plant Parts



Photosynthesis Cycle

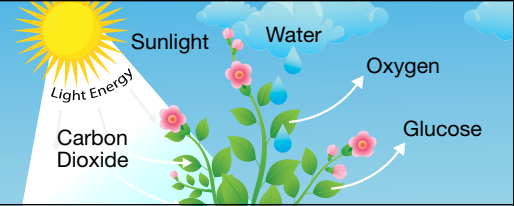


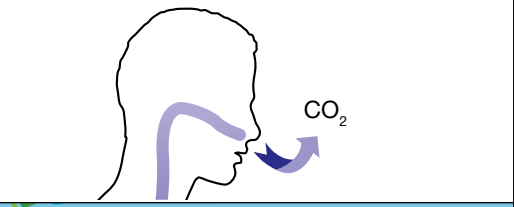

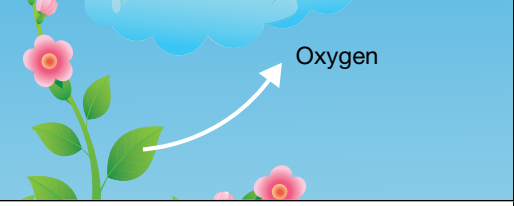
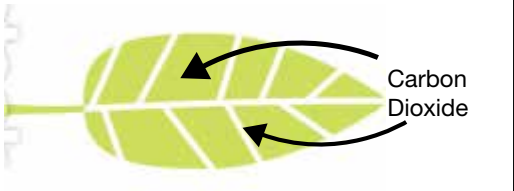


 sugar	 sunlight	 oxygen	 carbon dioxide	 water
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Photosynthesis Vocabulary

Vocabulary	What it means	What it looks like
Photosynthesis		
Chlorophyll		
Chloroplasts		
Carbon Dioxide		
Glucose		
Oxygen		
Stomata		

Photosynthesis Vocabulary Answer Key

Vocabulary	What it means	What it looks like
Photosynthesis	The way that plants make food or sugar. Uses sunlight, water and carbon dioxide.	 A diagram showing a plant with a sun in the background. Arrows labeled 'Sunlight' and 'Light Energy' point towards the plant. An arrow labeled 'Water' points to the plant. An arrow labeled 'Carbon Dioxide' points into the plant. Two arrows labeled 'Oxygen' and 'Glucose' point away from the plant.
Chlorophyll	Green color in plants that is formed using energy from sunlight.	 A simple illustration of a green leaf with a central vein and several smaller veins branching out.
Chloroplasts	Special parts of plant cells where photosynthesis takes place.	 An illustration of a plant with pink flowers. A dashed box highlights a small green oval labeled 'Chloroplasts' on one of the leaves.
Carbon Dioxide	The gas that we breathe out and plants take in and use during photosynthesis.	 A profile of a human head with an arrow labeled 'CO ₂ ' pointing out of the mouth, representing exhalation.
Glucose	The sugar that plants make and use for food.	 A diagram of a plant with an arrow labeled 'Glucose' pointing away from the plant, indicating the production of sugar.
Oxygen	The gas that plants make during photosynthesis that we breathe in.	 A diagram of a plant with an arrow labeled 'Oxygen' pointing away from the plant, indicating the release of oxygen.
Stomata	Really small holes in plants that take in carbon dioxide.	 An illustration of a green leaf with two arrows pointing towards it, labeled 'Carbon Dioxide', representing the intake of the gas through stomata.

Recommended Grade Level:

3-5

Season:

All

Indoor/Outdoor

The History of Herbs and Spices

Description:

Students will investigate scents and flavors to identify herbs and spices. They will learn how herbs and spices have helped cure illnesses throughout history and how herbs and spices are used today to help add flavor to food.

Background:

Using herbs and spices are a great way to add flavor to our food without using salt and other unhealthy ways to season food. However, throughout history many different cultures used herbs and spices to help prevent and treat illnesses because many modern day medicines had not been discovered and people only had access to plants. Knowledge about herbal medicine was passed down from generation to generation by word of mouth, since there were no written records at that time. Medicine men were a traditional healer among Native Americans, who used herbs and spices to treat illnesses. Chinese herbal remedies date to more than 5,000 years ago. Apothecaries were similar to modern day pharmacists. They stored and sold spices and herbs in shops, mixing ingredients to form remedies to sell to the public. Even today, some people still use herbs and spices to treat illness.

Materials:

- Computers with Internet access

Preparation:

Determine how to group students. This activity can be done individually; however, small groups can brainstorm and work together to discuss and prescribe the correct herbs or spices for specific historical ailments.

Activity:

1. Head out to the garden to sniff herbs and gather information about the different herbs growing in the garden. If herbs aren't available in your garden, you can purchase them at the grocery store (fresh or dried) or get small plants at a garden center. Students can share what they know about herbs.
2. Explain that people used many herbs and spices throughout history to prevent or treat illnesses and diseases. Review the information from the Background with the students. Explain that today herbs and spices are used to season food – a great way to add flavor without using salt.

3. Review the following list of herbs and spices with the students and have them pick one herb or spice that they want to research.

- Oregano
- Fennel
- Turmeric
- Cinnamon
- Mint
- Clove
- Basil
- Dill
- Ginger
- Sage
- Black pepper
- Rosemary
- Garlic
- Thyme
- Cayenne
- Parsley

4. Tell students that they're going to become historic garden doctors and research an herb or spice and how it was used historically. Have students share their findings with the class.

Tying it Together:

1. How have herbs and spices been used throughout history?
2. What are some herbs and spices in our garden and how can they be used today?

Special Care:

Students can sniff the herbs and match pictures of the herbs with the plants. They can sort the pictures into herbs that they think smell good and those that don't.

Digging Deeper:

Students can choose a herb or spice make an oil or vinegar infused herb dressing to take home.

National Standards:

CCSS.ELA: Reading: Informational text: Key ideas and details.

CCSS.ELA: Writing: Text types and purposes.

CCSS.ELA: Writing: Research to build and present knowledge.

NCSS: Time, continuity and change: Knowledge and understanding of the past enable us to analyze the causes and consequences of events and developments, and to place these in the context of the institutions, values and beliefs of the periods in which they took place.

NHES: Students will comprehend concepts related to health promotion and disease prevention to enhance health.

Lesson Extensions:

Language Arts: Create posters that highlight a herb or spice and advertise the benefits of including it in their diet.

Literature Connections:

The Yummy Alphabet Book: Herbs, Spices and Other Natural Flavors by Jerry Pallotta

Recommended Grade Level:

K-2

Season:

Summer/Fall

Outdoor

Plant Parts That We Eat

Description:

Students will observe a plant or weed that's pulled from the ground and learn about the functions of each part. They will apply what they learn to label plant foods that they eat by the part of the plant where it grows.

Background:

Food is relevant to everyone. When you connect the food that you eat to something that you study, learning sticks. Knowing more about food may help students be more willing to eat it; learning where fruits and vegetables come from may help students be willing to eat them more often!

Materials:

- Plant Part Cards
- Produce Cards

Preparation:

1. Determine how to group students. The students can be grouped in pairs or small groups.
2. Make copies and cut out Plant Part Cards and Produce Cards for each group. Put them in bags to make sets for small groups.

Activity:

1. Gather the students and head to the garden.
2. Explain that all fruits and vegetables come from a plant part.
3. Pull up a weed or a plant or two and discuss the parts of the plant and review the functions of each plant part.
 - Roots: Take in water and nutrients and anchors the plants in the ground.
 - Stems: Transport water and nutrients through the plant like a straw.
 - Leaves: Gather sunlight for the plant to make food.
 - Flowers: Produce fruit and attract pollinators.
 - Fruit: Contains the seeds.
 - Seeds: Grow new plants.
4. Ask students to name fruits and vegetables that come from roots, stems, leaves, flowers, seeds and fruit.

5. Divide them into small groups to play a game called What Am I Eating? Students use the Produce Cards and Plant Part Cards and work together to sort the produce into the plant part that they belong to. If the weather is nice and there is workspace outdoors, students can complete this activity outside. Use the answer key to check the students' answers.

- Roots – Carrots, radish, beets, turnips, sweet potato
- Stems – Asparagus, celery, wheat
- Leaves – Lettuce, cabbage, spinach
- Flowers – Broccoli, cauliflower
- Fruit – Apples, tomatoes, green peppers, pumpkin, peaches, cucumbers, lemon
- Seeds – Coffee beans, peanuts, peas, corn

Tying it Together:

1. What did we find out about plant parts?
2. What foods do we eat that come from roots? Stems? Leaves? Seeds? Flowers? Fruit?
3. What is your favorite food from a root? Stem? Leaf? Seed? Flower? Fruit?

Special Care:

Number the Plant Part Cards and the Produce Cards' corresponding numbers so that the students can check their answers and self-correct through matching.

Digging Deeper:

Groups of students can create a recipe using a plant part to share with the class.

National Standards:

NGSS: Interdependent relationships in ecosystems: Animals, plants and their environment.

NGSS: Structure, function and information processing.

NHES: Students will comprehend concepts related to health promotion and disease prevention to enhance health.

Lesson Extensions:

Language Arts: Write a composition or make a Venn diagram that compares and contrasts different parts of the plants and its functions.

Create Healthy Plant Part Posters (root power, stem power, etc.). Students will draw pictures of the produce from that plant part and list why it is good for their health.

Nutrition: Taste tests of different plant parts. Have students share their favorite recipe using produce from a certain plant part.

Science: Assign students the Plant Parts Worksheet as an in class or homework assignment.

Literature Connections:

Tops and Bottoms by Janet Stevens

Plant Parts by Richard Spilsbury and Louise A. Spilsbury

Plant Parts

Label each plant part. Next to each plant part in the picture, list a food that comes from each part.

ROOTS

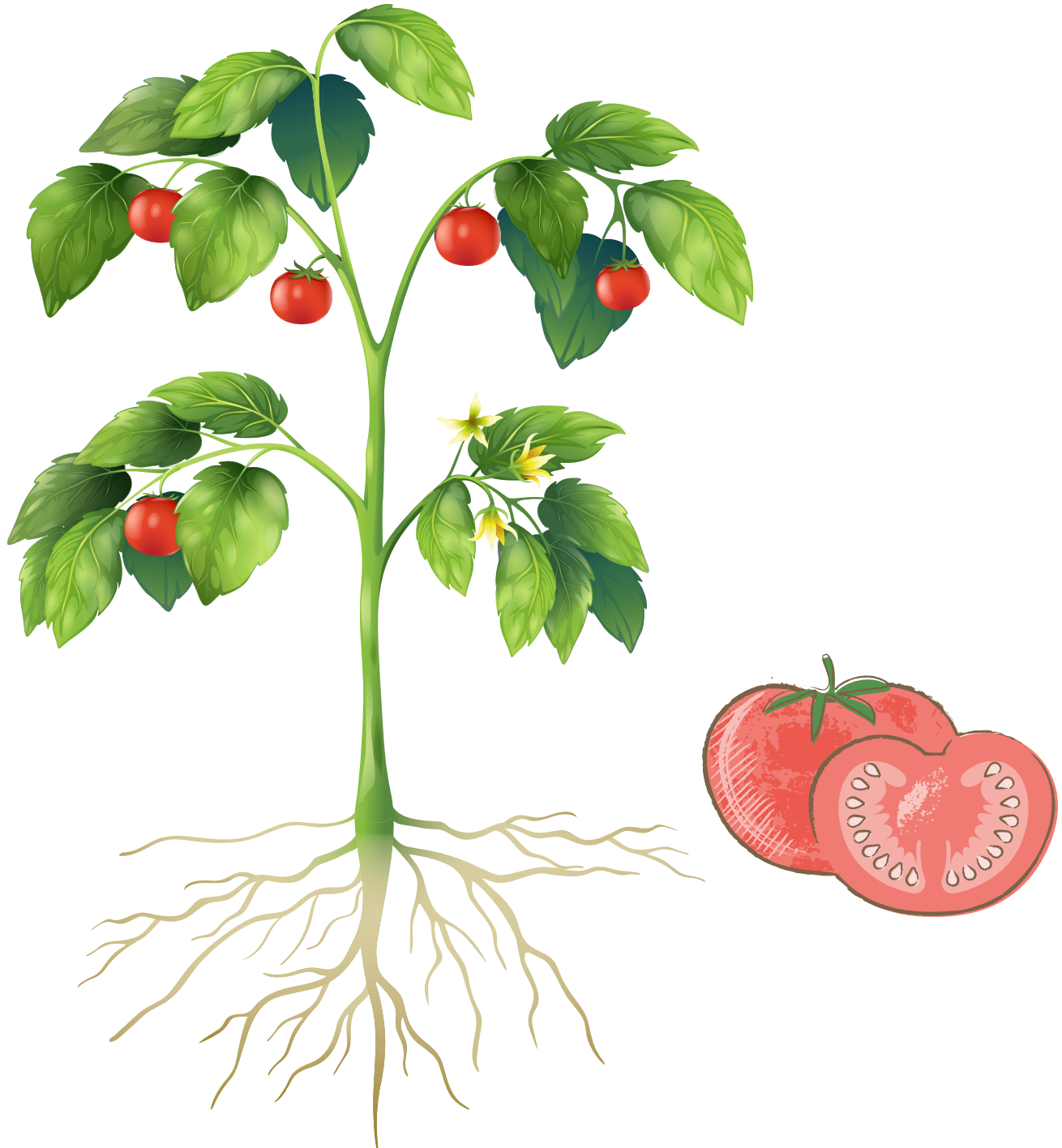
FLOWER

STEM

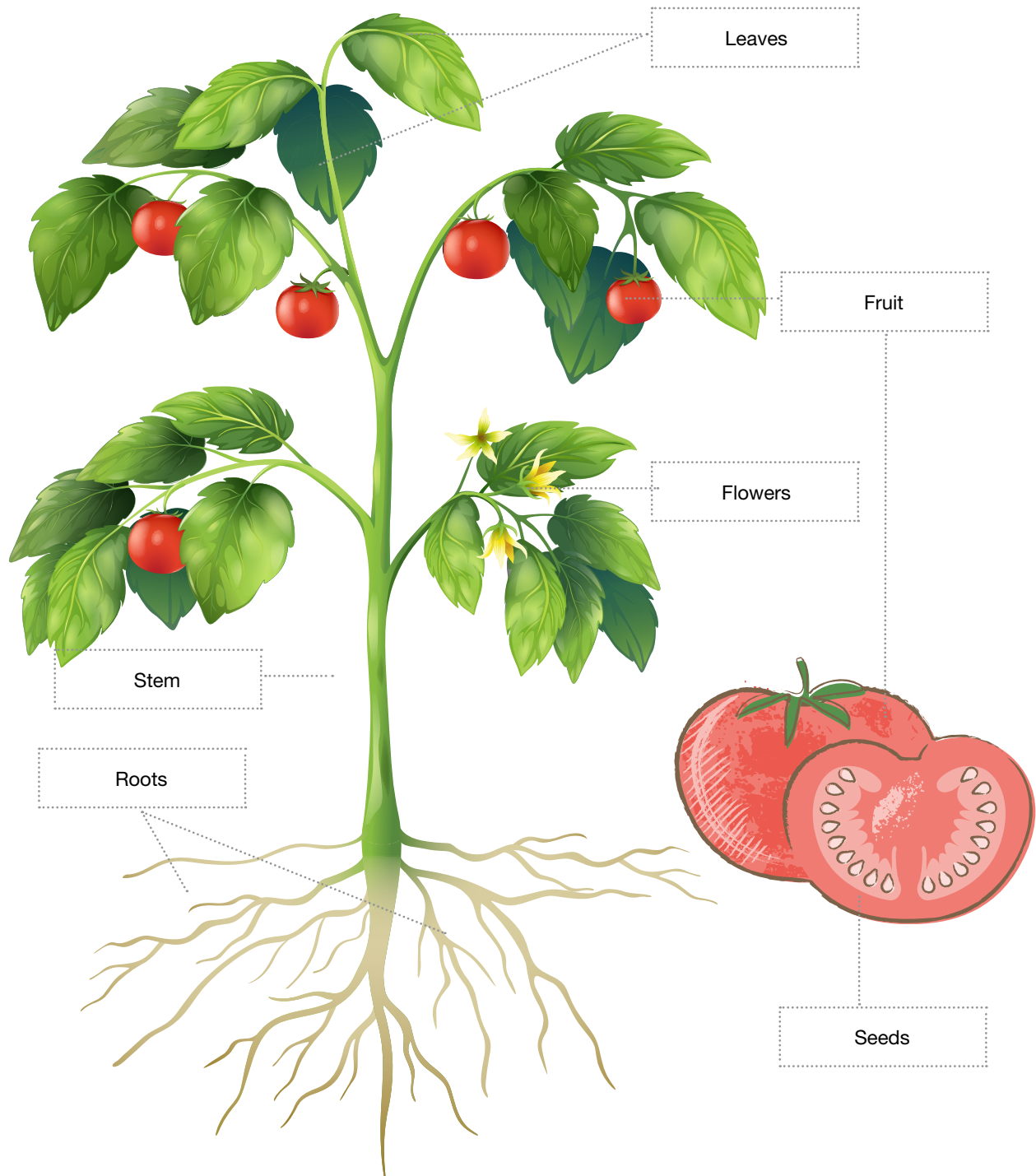
SEEDS

LEAF

FRUIT



Plant Parts Answer Key



Plant Part Cards

roots

stems

leaves

flowers

seeds

fruit

Produce Cards

 <p>Cucumbers</p>	 <p>Broccoli</p>	 <p>Carrots</p>	 <p>Lettuce</p>
 <p>Beets</p>	 <p>Cabbage</p>	 <p>Radish</p>	 <p>Lemon</p>
 <p>Tomato</p>	 <p>Turnips</p>	 <p>Spinach</p>	 <p>Green Peppers</p>
 <p>Corn</p>	 <p>Peas</p>	 <p>Pumpkin</p>	 <p>Coffee Beans</p>
 <p>Asparagus</p>	 <p>Peach</p>	 <p>Celery</p>	 <p>Cauliflower</p>
 <p>Wheat</p>	 <p>Apple</p>	 <p>Peanuts</p>	 <p>Sweet Potato</p>

Recommended Grade Level:

Pre-K-5

Season:

All

Indoor

Square Foot Garden Map

Description:

Using square foot gardening proportions (12" x 12"), students will explore number concepts, perimeter and area. Students will create a dream garden with their favorite produce using a planting chart. This activity can be applied to an outdoor raised bed by sectioning off with string.

Background:

Square foot gardening is easy. A raised bed is used and sectioned off in square foot grids. This technique produces the highest yield of crops for the space when the seeds are planted using the recommended quantities in each section. Guides give the specifics of how much to plant in each square foot.

Materials:

- Garden Plot
- Square Foot Garden Planting Guidelines
- Square Foot Dream Garden Worksheet
- Four rulers

Preparation:

Make copies of the Square Foot Garden Planting Guidelines and the Square Foot Dream Garden Worksheet for each student.

Activity:

1. Gather students and review the needs of plants (water, sunlight, nutrients, soil). Explain that plants also need the right amount of space to grow from seeds into healthy plants. When too many seeds are planted too close together, the plants will not grow properly and the harvest will be small.
2. Ask students how it feels when they're in a crowded environment (uncomfortable, hard to move or breathe). Explain that this is how plants also feel when they don't have enough space to grow. Square foot gardening helps plants have adequate space to grow healthy. Gardeners use rulers to make 12"x12" squares in their garden bed and plant a certain number of seeds in each square. Use the four rulers to demonstrate what a square foot looks like.

3. Pass out and review the Square Foot Garden Planting Guidelines. Tell students to notice the number next to each produce name. Explain that this number tells us how many of each type of plant should be planted in each square foot. Using a square foot planting guide helps gardeners grow the most produce possible for their garden. Have students share some of their favorite vegetables and herbs that are listed.
4. Give each student the Square Foot Dream Garden Worksheet and have them use the Square Foot Planting Guidelines to fill in the worksheet with fruits and vegetables that they would like to grow in a dream garden. When they have finished, have students share their gardens with the class.

Tying it Together:

1. What are the needs of plants?

Water, nutrients, soil and the right amount of space.

2. Why is it important to give plants space?

It helps them grow healthy and the plants will produce more fruits and vegetables.

Special Care:

Students can use the Drag and Drop Square Foot Planner website and count how many of each vegetable or fruit can be planted in each square. When you drag a picture to a square, it drops it into the planner with the number of plants that should be planted in each square.

<http://www.gardeners.com/on/demandware.store/Sites-Gardeners-Site/default/Page-KGPJS>

Digging Deeper:

Create a square foot garden in your plot. Students can use rulers to measure 12-inch increments around the perimeter of the raised bed. Using string and a staple gun, create your square foot grids. Plant seeds and plants. As time goes by, collect data on growth, success of harvest, etc.

National Standards:

CCSS.MATH: Mathematical practice.

NGSS: Interdependent relationships in ecosystems.

NGSS: Structure, function, and information processing.

Lesson Extensions:

Language Arts: Create gardens based on a theme (salsa, vegetable soup, history, color garden, etc.). Students can write a composition about the theme of their garden and why each plant was used and how it ties into the theme.

Math: The group collects data and shares the quantities of what students would plant in their dream garden. For example, number of kids who wanted to grow carrots, lettuce, etc.

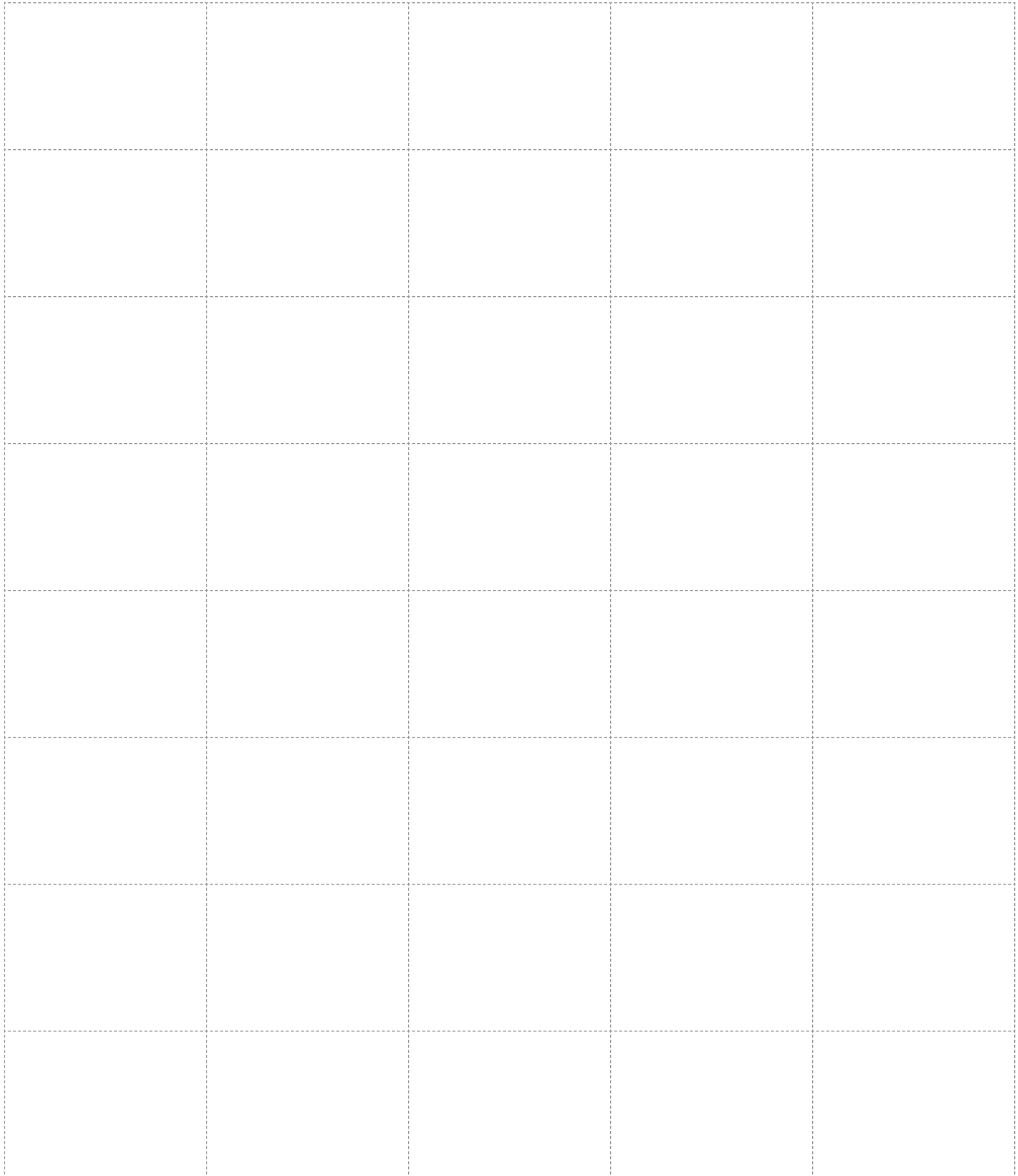
Practice number concepts: How many carrots can grow in a square foot? How many cucumbers? How many more carrots can be planted in a square foot than cucumbers?

Science: Use one square in the garden to overseed (put too many seeds in the square, not following planting recommendations). Compare the growth of a square that is seeded following planting directions and to the one with too many seeds. Observe and compare throughout the growing period.































Literature Connections:

All New Square Foot Gardening –The Revolutionary Way To Grow More In Less Space by Mel Bartholomew

Square Foot Dream Garden



Square Foot Planting Guidelines

 Beets 9	 Kale 1	 Melons 1	 Cucumber 1	 Cilantro 4
 Carrots 16	 Collards 1	 Squash 1	 Okra 1	 Basil 4
 Turnips 9	 Cabbages 1	 Tomatoes 1	 Peppers 1	 Oregano 4
 Radish 16	 Swiss Chard 4	 Artichoke 1	 Pumpkins 1	 Mint 4
 Small Onion 16	 Spinach 9	 Corn 4	 Parsley 4	 Horseradish 1
 Large Onion 9	 Green Beans 9	 Eggplant 1	 Green Onion 16	 Ginger 1

Source: Square Foot Gardening. University of Wisconsin Extension. <http://fyi.uwex.edu/garden2table/files/2010/07/square-foot-gardening082009.pdf>

Recommended Grade Level:

K-5

Season:

All

Indoor

Healthier Food Challenge

Description:

Students will get an unhealthy food and choose a healthier option. Students will learn about nutrition information they should consider when choosing foods, including calories, saturated and *trans* fat, sodium and added sugar.

Background:

Students' eating habits are influenced by many different factors, including food served at home and school and what they see and hear on food advertisements.

It's important for students to learn how to make healthy food choices based on the nutritional content of foods.

Materials:

- Healthier Food Challenge Cards

Preparation:

Determine how many groups the students will be divided into and make copies of the Healthier Food Challenge Cards for each group.

Activity:

1. Tell students they will how to make healthy choices to help them grow healthy and strong.
2. Brainstorm a list of healthy foods and unhealthy foods as a class.
3. Discuss what makes foods healthy and unhealthy. Discuss the following topics and how they affect health:
 - **Calories:** A calorie is the unit of measurement that describes the amount of energy your body gets from food. Calories are not bad for you, but it's important to eat the right amount and to be physically active every day for at least 60 minutes. Remember to try and get your calories from healthy foods like fruits and vegetables instead of junk food like chips, cookies or sodas.
 - **Sodium:** A diet that is high in sodium (salt) are not good for your health and can raise your risk for high blood pressure and heart disease. Sodium helps some foods stay fresh while they're in the grocery stores and your refrigerator or pantry. It's important to read nutrition labels and pick foods that have the least amount of sodium. It's also important to avoid adding salt to help season foods. You can season foods with herbs, spices and juice from citrus fruits like lemons instead of salt.

- **Fat:** There are 4 different types of fat. Saturated fats and trans fats are considered “bad fats” and should be limited. Most of these fats come from products from animals (beef, pork or chicken fat, butter, cheese, etc.) or from fried foods and some baked treats like cookies and pastries. The two types of fat that are better for you are monounsaturated fats and polyunsaturated fats. These fats help lower the risk for heart disease. They’re found in nuts and seeds, avocados, liquid vegetable oils and fatty fish (such as salmon, tuna, herring, lake trout, mackerel and sardines).
 - **Added Sugar:** Some sugars are naturally in our foods like in fruits, vegetables, milk and grains. Other types of sugars are sometimes added to foods and beverages like juice, sodas, candy and cookies and this is called added sugar. Eating and drinking too much added sugar can increase your risk of heart disease and should be limited. Remember, the next time you’re craving something sweet, reach for your favorite fruit.
4. Remind students that they should read the nutrition labels to know what’s in the foods they’re eating and to help them make good food choices.
 5. Divide the students into groups and have them play the Healthier Food Challenge game. This game is similar to concentration. Students will lay the cards face down and take turns matching the unhealthy food to one with similar ingredients that’s healthier. The student with the most matches is the winner.
 6. When the students have finished, discuss each pair of cards and what makes each food healthy or unhealthy.

Tying it Together:

1. What things can you do to eat healthier?

Make healthy choices by limiting foods with saturated and trans fat, added sugar, unhealthy calories and a lot of sodium.

2. Why is it important to eat a healthy diet?

Eating a healthy diet will help my body be healthy and grow strong.

3. How can you find out if a food is healthy or unhealthy?

You can read the nutrition label.

National Standards:

NHES: Students will demonstrate the ability to use decision-making skills to enhance health.

Lesson Extensions:

Health: Have students work with their parents and guardians to make their favorite recipe or meal healthier.

Language Arts: Write a composition about how eating healthy helps a person live healthier.

Math: Have students compare the number of calories of healthy and unhealthy foods with similar ingredients. For example, an apple vs. a slice of apple pie, baked potato vs. French fries, ice cream vs. yogurt, etc. Create a whole day of meals that involve healthy vs. unhealthy foods and look at the total calories that would be saved. Other nutrition information can be calculated as well (sodium, fat, sugar, etc.).

Literature Connections:

Garden To Table: A Kid's Guide To Planting, Growing and Preparing Food by Katherine Hengel
To Market, To Market by Nikki McClure

Healthier Food Challenge Cards

		
French Fries	Cookies	Whole Milk
		
Apple Pie	Donuts	Croissants
		
Nachos	Soda	Ice Cream
		
White Bread	Noodles	White Rice



Roasted Potatoes



Whole Grain
Graham Crackers



Skim Milk



Apple



Whole Grain Bagel



Whole Wheat Rolls



Carrots and Hummus



Water



Low Fat Yogurt



Whole Grain Bread



Whole Wheat Noodles



Brown Rice

Recommended Grade Level:

Pre-K-2

Season:

All

Indoor

A Rainbow of Color

Description:

Students will learn about the importance of eating a variety of fruits and vegetables and what it means to “eat a rainbow.” By learning the colors of the rainbow, they will learn the different types of foods found in each color and the benefits of eating different colored fruits and vegetables.

Background:

It’s important that we eat a variety of fruits and vegetables to support a healthy body. Each color on our plate gives us important vitamins and nutrients to support our health.

Materials:

- Seven different colored pieces of butcher paper 3-4 feet long
 - Red
 - Orange
 - Yellow
 - Green
 - Blue
 - Purple
 - White
- Markers or crayons
- Eating a Rainbow Food Diary (optional)

Preparation:

Determine how to use your space. Hang the seven pieces of butcher paper around the classroom. The paper can be hung on walls, placed on the floor or on tables. Students will be rotating to the seven pieces paper during the activity. If space is an issue, this activity could be done outside or in the hallway.

Activity:

1. Gather students in a central location and ask:
 - What are rainbows?
 - What are the colors of the rainbow?
Red, orange, yellow, green, blue, indigo, violet
 - What fruits and vegetables are in each color of the rainbow?
Note: A list can be made on the board or chart.
 - What are some fruits and vegetables that are not colors from the rainbow?
Mushrooms, potatoes, white onions, cauliflower, the inside of a banana.

- Do you think it's important to eat fruits and vegetables that are the colors of the rainbow? Why?
2. Explain that eating a variety of fruits and vegetables that are the colors of the rainbow is important to grow a healthy body. Fruits and vegetables have different types of vitamins and minerals that help keep our bodies healthy and working correctly. When you only eat certain types of foods, you may not be getting important nutrients that your body needs. You should fill half of your plate with fruits and vegetables at every meal.
 3. Tell the students they will be making posters about the colors of food they eat.
 4. Divide the class into seven groups, provide markers and let them rotate through the colors of the rainbow. Each student will draw and label, if they are able, a picture of a fruit or vegetable from each color group. Give students 3-5 minutes for each color before they rotate to the next.
 5. When they're finished, take a "gallery walk" with the class by moving around the room to see what was drawn on each color chart. If your students can't write the names of the produce on the charts, this would be a good time to take your marker and write the names under each fruit and vegetable.

Tying it Together:

1. What happens to our body when we eat a rainbow?
Eating the different colors gives our bodies different types of vitamins and minerals to help it grow healthy.
2. What would happen if we only ate one color of the rainbow?
We may not get all the nutrients and vitamins that we need.
3. Why do we need to eat foods from each color?
Each color helps our bodies in different ways.

Special Care:

If students need support drawing fruits or vegetables, stickers or stamps could be used while rotating through the colors so that they could add their input too.

Digging Deeper:

Assign the Eating a Rainbow Food Diary for classwork or homework.

National Standards:

CCSS.ELA: Writing: Research to build and present knowledge.

CCSS.ELA: Speaking and listening: Presentation of knowledge and ideas.

CCSS.MATH: Measurement and data.

NGSS: Interdependent relationships in ecosystems: Animals, plants and their environment.

NHES: Students will demonstrate the ability to use decision-making skills to enhance health.

Lesson Extensions:

Math: Pictures of fruits and vegetables can be sorted by color.

Literature Connections:

Planting A Rainbow by Lois Ehlert

The Vegetables We Eat by Gail Gibbons

Eating a Rainbow Food Diary

Draw and color the fruit or vegetable ate during the week.

	Breakfast	Lunch	Dinner	Snacks
Sunday				
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				

Eat Your Greens

Recommended Grade Level:

Pre-K-5

Season:

All

Indoor

Description:

Students will learn the importance of including greens in their daily diet. This lesson includes information about the health benefits of eating greens and the method of eating greens first to maintain a healthy diet.

Background:

Green foods are an important part of a daily diet. They offer many nutrients and vitamins and are low in calories. If you eat your greens first, you fill your stomach with healthy foods first, and may be less likely to overeat or eat large quantities of foods that aren't as nutritious.

Materials:

- Eat Your Greens Filmstrip
- Variety of leafy green produce

Preparation:

1. Gather a variety of leafy green vegetables from the garden. Have some whole produce to show students and prepare small portions for students to taste. If leafy greens aren't available in your garden, purchase them from the grocery store.
2. Make copies of the Eat Your Greens Filmstrip for each student.
3. If you use the Prezi app, plan how your students will access that.

Activity:

1. Begin the lesson by sharing the greens you've gathered. Ask students what they know about each and their favorite way to eat them. Allow time for students to share.
2. After you've discussed all of the greens, explain that green leafy vegetables have important vitamins and minerals that our bodies need to need to grow healthy and function properly. Leafy greens are low in calories and can be eaten in a variety of ways. Leafy greens are often eaten in salads, but they can also be used instead of bread for sandwiches and wraps, in smoothies with other fruits and vegetables or made into tasty "chips" like kale chips. Share with them the idea that if you eat your greens first, you'll fill up on food that's good for you and make sure your body gets the vitamins and minerals it needs.
3. Ask students to share some of their favorite TV commercials and discuss how advertising is used to persuade people to buy products. Jingles, slogans or music can help you remember a product that you see

on a commercial.

4. Tell them they will be creating an advertisement for “Eating Your Greens First” and their goal is to persuade kids to eat their greens.
5. Pass out the Eat Your Greens Filmstrip. Explain that students will use the filmstrip to draw what happens and what’s being said in each frame. Allow students ample time to complete their filmstrip.
6. When students are finished, allow them to share their filmstrips with the group.

Tying it Together:

1. What are the benefits of eating greens?
Leafy greens have important vitamins and minerals that our bodies need.
2. How can eating greens first support your health?
If you eat more of the healthy foods first, you may be less likely to overeat or eat large amounts of food that’s not as nutritious.

Digging Deeper:

If this lesson is delivered when the garden is growing, the class could head out in the garden to identify the greens.

Have students create PSA’s (Public Service Announcements) about the importance of eating greens. Students can perform their PSA or film and record them to share.

National Standards:

CCSS.ELA: Writing: Text types and purposes.

ISTE: Creativity and innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

NGSS: Interdependent relationships in ecosystems: Animals, plants, and their environment.

NGSS: Structure, function, and information processing.

NHES: Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks.

NHES: Students will demonstrate the ability to advocate for personal, family and community health.

Lesson Extensions:

Health: Taste test microgreens. Microgreens are the first green leaves of seedlings and can be grown quickly in your classroom. They’re also available at the grocery store. You can expand the taste test to include other types of green produce.

Science: Students keep a daily log of the green vegetables they eat throughout the week. At the end of the week, students can add up their greens and a “Green Hero” can be named.

Literature Connections:

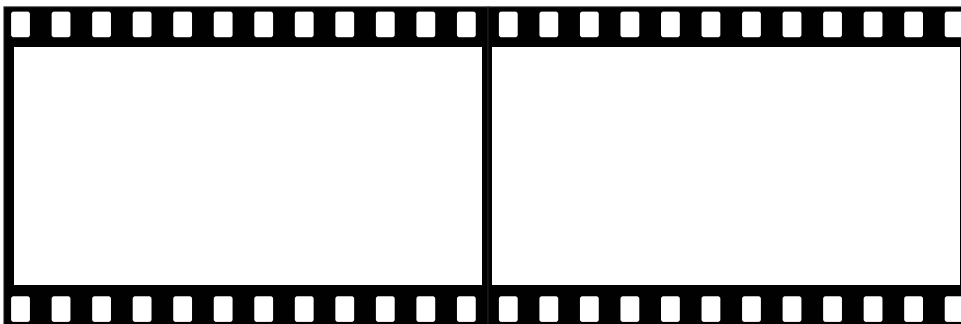
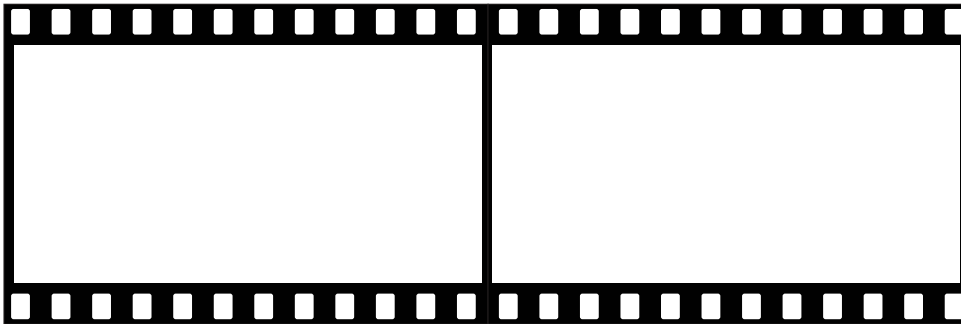
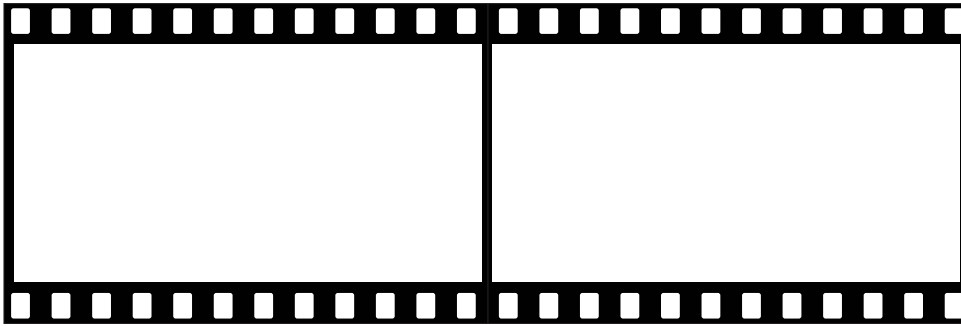
Eat Your Greens Goldilocks by Steve Smallman

The Three Greens by Rajesh Talwar

Harry Loves Greens by Laura Baldwin

Eat Your Greens Filmstrips

Create a TV advertisement to encourage kids to eat their greens. Use the filmstrip to draw what happens and what's being said in each frame. Bonus: Create a catchy jingle to help sell your idea.



Recommended Grade Level:

Pre-K-2

Season:

All

Indoor/Outdoor

A Garden's Food Groups

Description:

Students will learn about the food groups and explore those from the garden by using a game that matches descriptions of healthy produce, pictures and words.

Background:

It's important to connect what grows in the garden to children's daily lives. This lesson helps them make the connection from garden to tummy to yummy.

Materials:

Food Groups in the Garden Game: Produce pictures, words and descriptions

Preparation:

Determine if this activity will be completed as a class or in small groups and make copies and cut out the Plant Part Game pieces.

Activity:

1. Begin by asking students what they know about food groups and allow time to share. Review the food groups with the students:

- **Fruits:** Fruits have vitamins, minerals and fiber that are important for our bodies. Fruits may be fresh, frozen, canned or dried. You should fill half of your plate with fruits and vegetables at every meal.
- **Vegetables:** Just like fruit, vegetables have vitamins, minerals and fiber that are important for our bodies. Vegetables may be raw or cooked, frozen, canned or dried. You should fill half of your plate with fruits and vegetables at every meal.
- **Grains:** Grains include bread, pasta, oatmeal and rice. Whole grains have fiber and other important nutrients. When eating grains, always choose whole-grain (such as whole-wheat) products.
- **Dairy:** Dairy products are made from milk. Dairy products like milk, yogurt and cheese have calcium, protein and other important nutrients. Make sure to pick fat-free or low-fat dairy products.
- **Protein:** Foods made from meat, poultry, seafood, nuts, seeds and beans are in the protein food group. When eating meat, choose skinless poultry (like chicken) or fish.

2. Tell students that they will be learning more about food groups that come from the garden by playing a game called the Food Groups in the Garden. Give each student one produce card. Read the clues and have the students guess the produce. The students will hold up their picture when they think it matches the description being read.
 - a. Students who can read can work in a small group and match the picture with the name for each food as each description is read. Another alternative is to give each student one card (either produce name, produce picture or produce clue) and allow them to move around the room trying to match the three elements of their produce.
3. After the game is played, bring students together to sort the produce into fruit, vegetable, grains and protein groups.

Tying It Together:

1. What garden foods are in the vegetable group?
Green beans, potatoes, onions
2. What garden foods are in the fruit group?
Apples, oranges, strawberries
3. What garden foods are in the protein group?
Beans, peas, nuts
4. What foods are in the grain group?
Wheat, rice, quinoa
5. Why is it important to eat foods from all of these different groups?
Our bodies need nutrients from all the food groups to grow and be healthy. Eating foods from the garden helps us get the nutrients we need.
6. What would happen if you only ate one type of food group?
You would not get all of the nutrients that you need to grow and be healthy.

National Standards:

CCSS.ELA: Speaking and listening: Comprehension and collaboration.

CCSS.ELA: Speaking and listening: Presentation of knowledge and ideas.

CCSS.ELA: Language: Vocabulary acquisition and use.

NHES: Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.

Lesson Extensions:

Language Arts: Play Fruit and Vegetable Bingo.

www.wholekidsfoundation.org/downloads/hands-on/WKF-VeggieBingo1.pdf

Literature Connections:

Plants Feed Me by Lizzy Rockwell

Growing Vegetable Soup by Lois Ehlert

People Need Plants! by Mary Dodson Wade

Plants We Eat by Jennifer Colby

Rah, Rah, Radishes: A Vegetable Chant by April Pulley Sayre

Food Groups in the Garden Game

Produce Photos



Produce Names

Corn	Potato	Wheat
Quinoa	Green Beans	Peas
Carrots	Celery	Spinach
Tomato	Nuts	Black-Eyed Peas

Produce Descriptions

<p>When you eat this vegetable, you're eating a tuber, which is a swollen underground stem. These are delicious when baked. They grow under the ground.</p>	<p>These long, skinny vegetable pods grow on a vine. They are usually green, but can be different colors. They have Vitamin C.</p>	<p>When you eat this green vegetable, you're eating the leaves of a flowering plant. A famous cartoon character likes to eat this.</p>
<p>When you eat this vegetable, you're eating roots that farmers dug out of the ground. It can be yellow, purple, red or white but orange is the common color.</p>	<p>When you eat this vegetable, you're eating the part of the plant that attaches the leaves to the stem. This vegetable is light green. You have seen it spread with peanut butter or dipped in ranch dressing.</p>	<p>This grows on a vine, and people think of it as a vegetable. It's typically red. It's found in ketchup, salsa and pizza sauce. It's high in Vitamin C, which helps protect us from disease.</p>
<p>When you eat this vegetable, you're eating seeds. The varieties we eat are usually yellow or white and come canned, frozen and straight off the cob.</p>	<p>When you eat this plant, you're eating a seed. It has protein. These vegetables come packaged in a shell and are used in many different foods.</p>	<p>When you eat this grain, you're eating seeds that have been milled to produce flour or polished to remove the hull. This grain grows in a field and looks like tall grass.</p>
<p>When you eat these, you're eating a fruit from the legume group, but most people think it is a vegetable. These grow in a pod. They have potassium that helps to control the water and minerals in your body.</p>	<p>When you eat these, you're eating a legume. It has protein that helps your bones, muscles, skin and blood. In Southern states, these are eaten for good luck.</p>	<p>When you eat this grain, you're eating a seed that has fiber and protein. It is used by many people as an alternative to rice or pasta.</p>

Answer Key

<p>When you eat this vegetable, you're eating a tuber, which is a swollen underground stem. These are delicious when baked. They grow under the ground.</p> <p>Potato <i>Vegetable group</i></p>	<p>These long, skinny vegetable pods grow on a vine. They are usually green, but can be different colors. They have Vitamin C.</p> <p>Green Beans <i>Vegetable group</i></p>	<p>When you eat this green vegetable, you're eating the leaves of a flowering plant. A famous cartoon character likes to eat this.</p> <p>Spinach <i>Vegetable group</i></p>
<p>When you eat this vegetable, you're eating roots that farmers dug out of the ground. It can be yellow, purple, red or white but orange is the common color.</p> <p>Carrot <i>Vegetable group</i></p>	<p>When you eat this vegetable, you're eating the part of the plant that attaches the leaves to the stem. This vegetable is light green. You have seen it spread with peanut butter or dipped in ranch dressing.</p> <p>Celery <i>Vegetable group</i></p>	<p>This grows on a vine, and people think of it as a vegetable. It's typically red. It's found in ketchup, salsa and pizza sauce. It's high in Vitamin C, which helps protect us from disease.</p> <p>Tomato <i>Fruit group</i></p>
<p>When you eat this vegetable, you're eating seeds. The varieties we eat are usually yellow or white and come canned, frozen and straight off the cob.</p> <p>Corn <i>Vegetable group</i></p>	<p>When you eat this plant, you're eating a seed. It has protein. These vegetables come packaged in a shell and are used in many different foods.</p> <p>Peanut <i>Protein group</i></p>	<p>When you eat this grain, you're eating seeds that have been milled to produce flour or polished to remove the hull. This grain grows in a field and looks like tall grass.</p> <p>Wheat <i>Grain group</i></p>
<p>When you eat these, you're eating a fruit from the legume group, but most people think it is a vegetable. These grow in a pod. They have potassium that helps to control the water and minerals in your body.</p> <p>Peas <i>Protein group</i></p>	<p>When you eat these, you're eating a legume. It has protein that helps your bones, muscles, skin and blood. In Southern states, these are eaten for good luck.</p> <p>Black-Eyed Peas <i>Protein group</i></p>	<p>When you eat this grain, you're eating a seed that has fiber and protein. It is used by many people as an alternative to rice or pasta.</p> <p>Quinoa <i>Grain group</i></p>

Recommended Grade Level:

3-5

Season:

All

Indoor

Celebrating Foods

Description:

Food is a very important and necessary part of our lives. We use food in many different ways. Our family, culture, and community have an influence on the things that we eat. Food also plays an important part in how we celebrate. Students will explore cultural celebrations and the foods associated with them.

Background:

Food gives us healthy nutrients that helps our bodies grow and be strong. Our food choices are influenced by many different factors. For example, we eat what our parents provide and the region in which we live influences what types of foods are available. Our food choices are also influenced by our culture. Food is part of many holidays and celebrations. Some of these holidays and special celebrations include:

- **Lunar New Year** is one of the most important holidays for cultures across Asia such as the Chinese, Japanese, Koreans, Vietnamese and others. Family, ceremonies, fireworks, parades and traditional food is celebrated. An animal represents each new year.
- **Pow Wows** are North American Indian ceremonies that involve feasting, singing and dancing.
- **Cinco de Mayo** (the 5th of May) commemorates the Mexican army's victory over the French at the Battle of Puebla. Traditional food, dance and family are included in this celebration.
- **Kwanzaa** is a festival that many African-Americans observe Dec. 26-Jan. 1 to celebrate their culture, heritage, traditions and foods.
- **Ramadan** is the ninth month of the Muslim year, when fasting is observed from sunrise to sunset.
- **Mardi Gras** (in French) or Fat Tuesday is the last night of eating certain foods before the Christian fasting season of Lent.
- **Hanukkah** is a Jewish celebration that lasts eight days and includes traditional foods and lights intended to celebrate their faith.
- **Passover** is the Jewish spring festival that celebrates the freedom of the Israelites from Egyptian slavery.
- **Thanksgiving** is a U.S. national holiday observed on the fourth Thursday in November. Many people celebrate by giving thanks for all that they have and share a dinner or meal with family and friends.

Materials:

- Celebrating Foods Worksheet
- Computer with Internet access

Preparation:

Determine if this activity will be completed individually or in small groups and make copies of the Celebrating Foods Worksheet for each student or group.

Activity:

1. Explain to students that today they'll explore cultural holidays and foods eaten during the celebrations.
2. Ask students to think of celebrations and holidays that have food associated with them. As students share, write the celebrations and the foods on the board in two columns, celebration and food. Use the information in the background section if students aren't familiar with some of the celebrations. Some celebrations to consider are: Lunar New Year, Pow Wows, New Year's Day, birthdays, Cinco de Mayo, Christmas, Thanksgiving, Halloween, Easter, Valentine's Day, Kwanzaa, Ramadan, Mardi Gras, Hanukkah, Passover, Rosh Hashanah, etc.
3. After the list is complete, go through and look for healthy foods. If none are listed, have the students think of ways to make the food healthier or a substitution. Edit the list as students share.
4. Ask students what other celebrations are they familiar with and what kinds of food are served?
5. Pass out the Celebrating Foods Worksheet and tell students they'll choose a holiday and research about it using the questions on the worksheet.
6. When students have finished, collect and share their findings.

Tying it Together:

1. How do we learn what foods to eat?
Our families, culture, communities, personal taste, television
2. Why is it important to make healthy food choices, even during holidays and celebrations?
Healthy foods give our bodies the nutrients and vitamins to help us grow healthy and strong.
3. What are some ways to make holidays and celebrations healthy?

Special Care:

Students can draw pictures of the foods they use to celebrate and the teacher can scribe.

If students will not have access to computers with internet, create overview sheets for select holidays and celebrations.

Digging Deeper:

Compare and contrast two different celebrations and the foods that are eaten.

National Standards:

CCSS.ELA: Writing: Research to build and present knowledge.

NCSS: Culture: Human beings create, learn, share, and adapt to culture. Cultures are dynamic and change over time.

NCSS: Individual development and identity.

NHES: Students will demonstrate the ability to use decision-making skills to enhance health.

Lesson Extensions:

Health: Have students bring in holiday recipes with a healthy twist to share with the class.

Social Studies: In a small group, students research a holiday recipe that comes from a country or region of the world. Have students look at ways to make it healthier (baked vs. fried, low-fat milk vs. whole milk, etc.). Create a Healthy Holiday Recipe Book using the recipes.

Literature Connections:

Morning Meals Around The World by Maryellen Gregoire and Jeff Yesh

Kids Around The World Cook!: The Best Foods and Recipes from Many Lands

By Arlette N. Braman and Jo-Ellen Bosson

Celebrating Foods

Name of holiday:

Culture represented:

Where is it celebrated?

When is it celebrated?

Why is the holiday important to the culture?

.....

How is it celebrated?

.....

What are some of the traditional foods eaten?

.....

Are there ways you can make the foods healthier?

.....

Recommended Grade Level:

2-5

Season:

All

Indoor

Plant-Based Protein: A Study of Seeds, Nuts and Beans

Description:

Using beans, seeds and nuts, students will compare the nutrients found in each, including protein and fiber.

Background:

Seeds, nuts and beans are important sources of protein, fiber and healthy fats. Many people incorporate these into their diet to reduce their meat consumption. These foods often contain dietary protein and fiber. Protein helps build and maintain bones, muscles and skin. Fiber helps our bodies digest food properly.

Materials:

- Variety of seeds, nuts and beans
- Nutrition labels from various seeds, nuts and beans
- Seed, Nuts and Beans Comparison Chart

Preparation:

1. Determine if this activity will be completed individually or in small groups and make copies of the Seeds, Nuts and Beans Comparison Chart for each student or small group.
2. Make copies of the nutrition labels from the seeds, beans and nuts packages so students will have a variety of labels to use.

Activity:

1. Divide students into groups and pass out the packages of seeds, beans and nuts. Ask:
 - What do you know about seeds, beans and nuts?
 - What is your favorite type of seed? Bean? Nut?
 - How do you eat each?
2. Explain that seeds, beans and nuts contain protein and fiber. These foods often contain dietary protein and fiber. Protein helps build and maintain bones, muscles and skin. Fiber helps our bodies digest food properly. Many people eat seeds, bean and nuts in order to eat less meat, but still get the protein their body needs.

3. Pass out the Seeds, Nuts and Beans Comparison Chart and tell students they'll read nutrition labels to help them sort the foods from highest to lowest based on the grams of protein and fiber per serving.
4. Have students share their results when finished.

Tying it Together:

1. How does protein in food like seeds, nuts and beans help your body?
They contain protein that helps our bodies build and maintain bones, muscles and skin.
2. How does fiber help your body?
Fiber helps our bodies digest food properly.

Special Care:

If you have students with food allergies, use pictures of nuts and not the actual food.

Digging Deeper:

Have students make hummus from chickpeas. They can add different ingredients to a basic hummus and have a taste test. Students can add additional ingredients for variety (chipotle, jalapeno, black olive, garlic, etc.). You can find a hummus recipe at heart.org/recipes.

National Standards:

NHES: Students will demonstrate the ability to access valid information and products and services to enhance health.

NHES: Students will demonstrate the ability to use decision-making skills to enhance health.

Lesson Extensions:

Health: Have students create a healthy trail mix using nuts, seeds and dried fruit.

Math: Compare the nutrition information for seeds, nuts and beans using the mean, median and mode.

Science: Place a variety of seeds (flower and vegetable), nuts in their shell, beans and unshelled sunflower in a baggie. Give students hand lenses to observe and then decide if they're seeds, nuts or beans.

Social Studies: Have students choose a seed, nut or bean and research its origins and use by humans over time.

Seeds, Nuts and Beans Comparison Chart

Using the nutrition labels, sort the foods from highest to lowest based on the grams of protein and fiber per serving. List the name of the food and the amount that one serving provides.

Protein	Fiber

Recommended Grade Level:

K-5

Season:

All

Indoor/Outdoor

A Food Critic in the Garden

Description:

Students learn about the role of a food critic by listening to examples of food reviews and learning how to use sensory words to describe food. Using produce from the garden, students sample a variety of foods. They compare the different tastes, give ratings and collect data about their food as a class (number of likes for carrots, rank class favorites, etc.).

Background:

The terms food critic, food writer and restaurant critic can all be used to describe people who analyze food or restaurants and then publishes, posts or broadcasts the results of their findings. Restaurants can become popular or have to close their doors because of the opinions of these people. Since taste is a personal opinion, not everyone will feel the same way about the same food. It's important for students to try new foods and incorporate as many healthy fruits and vegetables in their diets as they can. Through this activity, students may be introduced to fruits and vegetables and hopefully will try a variety of healthy foods.

Materials:

- Variety of garden produce
- Food critic write-ups from the local newspaper
- Garden Food Critic Review Worksheet
- Food Critic Vocabulary (optional)
- Observation of Review Writing Worksheet (optional)
- Clipboards (optional)

Preparation:

1. Make copies of the Garden Food Critic Review Worksheet, Food Critic Vocabulary page and Observation of Review Writing Worksheet (optional) for each student.
2. Gather clipboards for each student if this activity will be completed outside. The activity can be done inside as well.
3. Choose five fruits or vegetables from the garden and prepare for the class. Wash, slice and pack the produce in plastic with zip tops so that they can be easily distributed. You can purchase produce from a grocery store if needed.

Activity:

1. Ask students to name the five senses (sight, hearing, taste, smell, touch) and how they use them every day.
2. Tell students that they will become food critics in the garden and ask what they know about food critics. Explain that food critics try different foods in restaurants and then write or broadcast about the food and their experience for others. When food critics do their reviews, they use their five senses and descriptive words to describe the food and restaurant.
3. Pass out clipboards or have students tape or glue their Garden Food Critic Review sheet in their journal.
4. Have the students locate the food that they will be sampling in the garden and observe the plant.
5. Give every student a sampling of each fruit or vegetable that comes from that plant. After they have tasted their sample, ask them to rate their opinion on the Garden Food Critic Review sheet. Repeat with the next four garden foods.
6. When they have tasted and reviewed all the produce, let students share their observations and opinions.

Tying it Together:

1. Did you use any of your senses when trying the fruits and vegetables?
2. Did anyone try something new today?
3. Which food did you like the best?
4. Which food did you like the least?
5. Why is it important to eat fruits and vegetables in our diet?
They provide us with nutrients and vitamins that help us grow strong.

Special Care:

For students who haven't mastered writing, they can draw a picture of the food on the Garden Food Critic Review Worksheet and rate it with stars.

Digging Deeper:

Students can work in groups to create a salsa that's judged for flavor, appearance and popularity.

National Standards:

CCSS.ELA: Writing: Text types and purposes.

CCSS.ELA: Writing: Research to build and present knowledge.

CCSS.ELA: Speaking and Listening: Presentation of knowledge and ideas.

NHES: Students will comprehend concepts related to health promotion and disease prevention to enhance health.

Lesson Extensions:

Language Arts: Students use the Observation of Review Writing Worksheet to plan their thoughts and create a food critic review on a healthy food of their choice. The Food Critic Vocabulary Sheet can help students use a descriptive vocabulary.

Math: Total the results of the Garden Food Critic Review sheets. Rank the foods in order of “most favorite” to “least favorite.”

Create a bar chart, listing the foods on the X-axis and the stars on the Y-axis.

Literature Connections:

Fizzy’s Lunch Lab: Nelly Nitpick, Kid Food Critic by Candlewick Press

Garden Food Critic's Review

Name of Critic: **Date:**

Directions:

- Taste-test foods from the garden.
- Describe the flavors (sweet, sour, bitter, spicy, bland, etc.).
- Rate the food on a scale from 1 to 5 by coloring in the stars.
- Tell what the stars mean:

★ = ★★ = ★★★ =

★★★★ = ★★★★★ =

1. (name of food) ★★★★★

Describe flavors:

2. (name of food) ★★★★★

Describe flavors:

3. (name of food) ★★★★★

Describe flavors:

4. (name of food) ★★★★★

Describe flavors:

5. (name of food) ★★★★★

Describe flavors:

Food Critic Vocabulary

Acidic	Dry	Icy	Purple	Sugary
Alluring	Dull	Interesting	Raw	Sweet
Aromatic	Earthy	Irresistible	Red	Syrupy
Awesome	Enticing	Juicy	Refreshing	Tan
Beautiful	Exciting	Leafy	Rich	Tangy
Bitter	Exquisite	Lean	Ripe	Tantalizing
Black	Eye-catching	Lumpy	Rough	Tart
Bland	Fibrous	Luscious	Round	Tasty
Blue	Fiery	Lustrous	Salty	Tempting
Bright	Firm	Mealy	Savory	Thick
Brittle	Flakey	Mellow	Scrumptious	Toasted
Brown	Flavorful	Mild	Sharp	Tough
Bumpy	Fluffy	Milky	Shiny	Unripe
Chewy	Fragrant	Moist	Simple	Velvety
Chilly	Freezing	Mouth-watering	Slick	Vibrant
Chunky	Fresh	Mushy	Smooth	Vivid
Clean	Frosty	Nice	Soft	Warm
Coarse	Fruity	Nutritious	Soggy	Watery
Cold	Fuzzy	Nutty	Sour	Wet
Colorful	Goopy	Orange	Sparkling	White
Cool	Gorgeous	Peppery	Speckled	Wilted
Creamy	Grainy	Pink	Spicy	Wrinkly
Crispy	Green	Pleasant	Springy	Yellow
Crumbly	Hard	Pleasing	Sprinkled	Yummy
Crunchy	Harsh	Pleasurable	Squishy	Zesty
Curly	Healthy	Plump	Steaming	Zippy
Delectable	Hearty	Piping	Sticky	
Delicate	Heavy	Prickly	Stringy	
Delicious	Hot	Pungent	Strong	

Observation of Review Writing Worksheet

Record any observations from the food critic's article read in class today. How did the food critic appeal to your senses?

Smell and Aromas	Taste and Texture	See	Touch and Feel	Hear

Food Critic Write-Ups

Colorful Fruit Salad

There are two loves in my life. One is my dog Sammie. The other is Colorful Fruit Salad. I can't begin to tell you how wonderful it is, but I'll try to describe what makes it so special. The first time I tried Colorful Fruit Salad, I was sick and had to stay home from school. My mom went to the store and brought back a huge grocery sack full of fruit. Several hours later, she put a bowl in front of me. I took a tiny spoonful and the amazing taste of grapes, apples, oranges, watermelon, blueberries and kiwi went down my throat. From then on, I was hooked. Now, I eat Colorful Fruit Salad as often as possible. I still haven't gotten tired of that cool, tingly feeling every time I put a spoonful of fruit in my mouth. I guarantee a great meal if you add Colorful Fruit Salad to your menu. It is refreshing, exciting and delicious!

Turkey Roll Up on a Whole Wheat Tortilla

I am a big fan of foods from south of the border. So when I heard what was being served for lunch, I was thrilled! I was in for a treat. The whole wheat tortilla was soft and tender, which is just perfect for holding a roll up together. The contents inside the tortilla were just as perfect. The turkey slices had a mouth-watering hickory smoke flavor that made me look forward to every bite. Vine ripe tomatoes, tender leafy lettuce and tiny pieces of shredded carrots added a beautiful color to the roll up. The combinations of all of these ingredients created a symphony in my mouth. I would recommend these wraps to anyone and can't wait to go back for more.

Recommended Grade Level:

5

Season:

All

Indoor

Meal Plan for a Healthy Day

Description:

Students will learn about different types of diets and create healthy balanced meal plans using specific dietary requirements.

Background:

People incorporate many different diets into their lives. Some diets are followed for health reasons (like diabetes or heart disease) and others for religious or cultural reasons. For example, some people eat kosher foods prepared according to Jewish law. Students may have heard about different types of diets or have family members who follow them. It's important for them to understand how to eat a balanced diet to get the nutrients their bodies need.

Materials:

- Four Types of Diets Sheet
- A Balanced Menu Worksheet

Preparation:

1. Determine how many groups the students will be divided into and how you will assign the diets.
2. Make copies of the A Balanced Menu Worksheet for each student or group.

Activity:

1. Tell them they'll research different diets that people follow for lifestyle or health reasons. Ask students to share diets they've heard of or used.
2. Share a brief introduction about the four diets being discussed today using the information from the Four Types of Diets Sheet. Reiterate that there are many types of diets. You will only be discussing four examples. Explain that no matter what type of diet a person follows, it's important to eat a balanced diet and for children to be physically active for at least 60 minutes every day.
3. Divide students into groups and assign a diet to each group.
4. Pass out the A Balanced Menu Worksheet to each group and explain that they'll use the information about their diet to develop a menu for a day.

5. Once finished, have students share their worksheets with the class. As they're sharing, ask them to discuss the similarities and differences between the diet and what they eat.

Tying it Together:

1. Which diet do you think is the most restrictive? Why?
2. Which diet would be the easiest to follow? Why?
3. What foods would you miss the most if you had to live by the diet you researched?
4. What are important things to remember if you follow certain diets?

It's important to eat a balanced diet so your body gets the nutrients it needs to be healthy and strong. It's also important for children to be physically active for at least 60 minutes every day.

Special Care:

Give students a copy of the Four Types of Diets Sheet to reference as they complete the A Balanced Menu Worksheet.

Digging Deeper:

Have students research the history of these diets and consider the pros and cons of eating each.

National Standards:

CCSS.ELA: Writing: Text types and purposes.

NHES: Students will comprehend concepts related to health promotion and disease preventions to enhance health.

NHES: Students will analyze the influence of family, peers, culture, media, technology, and other factors on health behaviors.

Lesson Extension:

Language Arts: Have students write a composition comparing the diet they studied to the type of foods they eat. Things to consider would be food choices, flavors, healthiness, restrictions, etc.

Four Types of Diets

Mediterranean Diet

The Mediterranean diet is based on the traditional foods of the countries surrounding the Mediterranean Sea. Fruits, vegetables, whole grains, legumes, fish and olive oil are the basis of this diet.

Vegetarians

Vegetarians are a group of people who choose not to eat meat and mostly eat fruits, vegetables, grains and nuts. Vegetarians must find ways to get certain nutrients such as protein and iron in their diets.

Vegans

Vegans are a group of people who chose not to eat anything that comes from animals including meat, eggs, and dairy products. Vegans eat other food sources to get nutrients like protein in their diet.

Paleo

Paleo comes from the word Paleolithic, which means, Old Stone Age. People who follow this diet try to eat the way stone aged ancestors may have by eating things that can be hunted (meat, fish) or gathered (eggs, berries, vegetables, nuts). This diet excludes grains, dairy and processed foods.

A Balanced Menu

In the boxes below, create a balanced menu using each of the five main food groups, which would fulfill the nutritional needs of someone following your assigned diet.

Diet Name:

Breakfast

I chose these foods to include in the breakfast because:

.....

Lunch

I chose these foods to include in the lunch because:

.....

Dinner

I chose these foods to include in the dinner because:

.....

Recommended Grade Level:

3-5

Season:

All

Indoor

Healthy Balance

Description:

Students will explore the importance of healthy eating and physical activity to maintain a healthy lifestyle. Students will collect calorie data for food and physical activity. Through the activity, students will gain an understanding of what it takes to keep their eating and physical activity in balance.

Background:

Most students can list healthy and unhealthy foods, but may not be aware of the energy it takes to burn the calories they consume. Introducing the concept of energy input and output can help students think about making healthier food choices and being physically active.

Materials:

- Computer with internet access
 - Food-A-Pedia <https://www.supertracker.usda.gov/foodapedia.aspx>
 - Physical Activity Calorie Chart
- Balancing Act Worksheet
- Balance scale (optional)

Preparation:

Determine if this activity will be completed individually or in groups and make copies for each student or group.

Activity:

1. Begin by showing students a balance scale and how it works. Demonstrate how to balance it and explain that when one side is heavier than the other it does not stay balanced.
2. Explain that maintaining a healthy balanced body is just like the scale and requires us to keep our calorie input (food intake) and calorie output (exercise) in balance. If it is not balanced, then people gain or lose weight. Everyone's body is different and burns calories differently based on age, gender, level of physical activity, and other factors. Our bodies burn calories even when we are not exercising by doing things like breathing and walking. But, it is important for everyone to eat the right amount of calories that body needs and for all children to be physically active every day for at least 60 minutes. Remember to try and get your calories from healthy foods like fruits and vegetables instead of junk food like chips, cookies or sugary sodas. If needed, remind students that a calorie is the unit of measurement used to describe the amount of energy your body gets from food.
3. Pass out the Balancing Act worksheet and Physical Activity Calorie Chart. Students are going to research the calories in different types of foods and the estimated number of calories burned during different types of physical activity using the

Food-A-Pedia website and the Physical Activity Calorie Chart. Have students choose 3 to 4 foods and physical activities and list them on the worksheet. Students will add the numbers for each column and to see the input/output balance. Students can make several lists and compare what it takes to balance different food and physical activity. Please note, the information from the Physical Activity Calorie Chart is for an adult. Reinforce that everyone's body is different and burns calories differently and the information in the chart is for an adult and being used as an example.

4. Once finished, have students come together as a group and share their results.

Tying it Together:

1. What did you find out about balancing food and physical activity?

Calories are important and help give our bodies energy. It is important to eat the right amount calories your body needs and for children to be physically active every day for at least 60 minutes. Calories should come from healthy foods like fruits and vegetables instead of junk food like chips, cookies or sodas.

2. Was it difficult to keep in it balance?

Answers will vary. Reinforce that everyone's body is different and burns calories differently based on age, gender, level of physical activity, and other factors. Our bodies are burning calories even when we are not exercising by doing things like breathing and walking. But, it is important for everyone to eat the right amount calories their body needs and for all children to be physically active every day for at least 60 minutes. Try and get your calories from healthy foods like fruits and vegetables instead of junk food like chips, cookies or sodas.

3. What can you do to make sure to keep your calories in balance?

Special Care:

If your students won't have access to the computers, find the calorie information for several foods and physical activities and provide the information to the students so they can complete the activity. If you do the activity as a class, project the websites on a screen for all students to see. Students can use calculators.

National Standards:

CCSS.MATH: Numbers and operations in base ten.

NHES: Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.

Lesson Extensions:

Language Arts: Write a composition about the "Balancing Act" we need with our diet and physical activity.

Math: Have students make calculations for the calories burned and consumed. They can also look at the data from different students' results to calculate range, mean, median and mode with the class lists of data using their input or output totals.

Home Connection:

Nutrition for Your Family Handout

Physical Activity Calorie Chart

Calories Used per Hour in Common Physical Activities		
Moderate Physical Activity	Estimated calories per 30 minutes	Estimated calories per hour
Hiking	185	370
Dancing	165	330
Bicycling (<10 mph)	145	290
Walking (3.5 mph)	140	280
Stretching	90	180
Vigorous Physical Activity	Estimated calories per 30 minutes	Estimated calories per hour
Running/jogging (5 mph)	295	590
Bicycling (>10 mph)	295	590
Swimming (slow freestyle laps)	255	510
Aerobics	240	480
Walking (4.5 mph)	230	460
Basketball (vigorous)	220	440

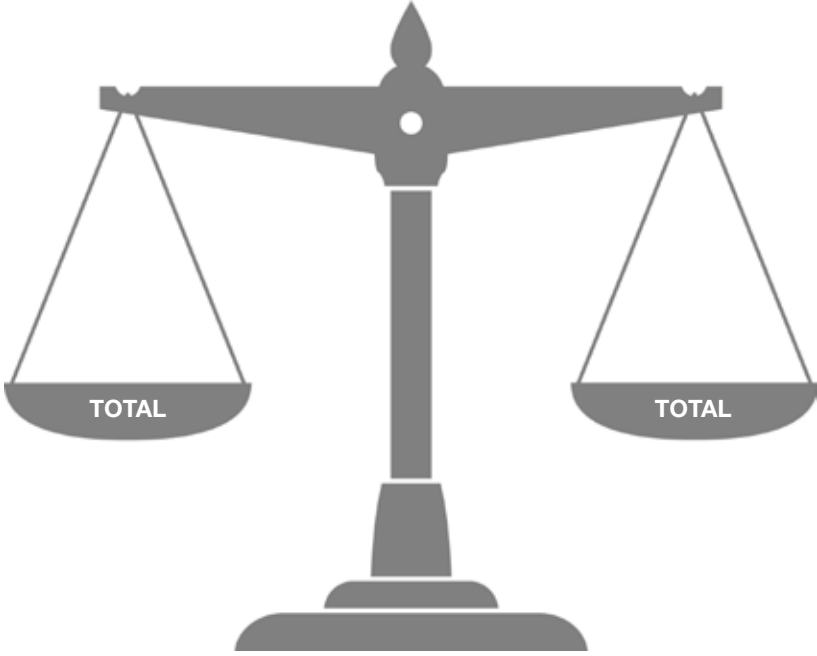
Source: Adapted from *Dietary Guidelines for Americans 2005*, page 16, Table 4

Balancing Act Worksheet

Foods

Physical Activities

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Nutrition for Your Family

Throughout the past few weeks, your child has learned about what constitutes a healthy diet and its effects to their bodies. You can reinforce what your children learned by modeling healthy behaviors at home. Below, you will find a chart that will help you understand how much of each food group your child should be getting daily.

	4-8 Year Olds		9-13 Year Olds		14-18 Year Olds	
	Boys	Girls	Boys	Girls	Boys	Girls
Milk*	2 cups		3 cups		3 cups	
Lean Meat/Beans	4 ounces	3 ounces	5 ounces		6 ounces	5 ounces
Fruit	1.5 cups		1.5 cups		2 cups	1.5 cups
Vegetables	1.5 cups	1 cup	2.5 cups	2 cups	3 cups	2.5 cups
Grains	5 ounces	4 ounces	6 ounces	5 ounces	7 ounces	6 ounces

*Milk should be fat-free or low fat (1%)

Here are some ideas to practice good nutrition at home:

- **Create a family grocery list/plan to eat at home:** Plan out one week’s worth of healthy meals as a family and then write out a shopping list to make all five to seven meals.
- **Pick truly rewarding rewards:** Don’t reward children with TV, video games, candy or snacks for a job well done. Find other healthy ways to celebrate good behavior like giving your child verbal praise and a hug, a trip to the zoo or a family picnic at the park during the weekend.
- **Make dinnertime a family time:** Get your kids involved in cooking and planning meals. Everyone develops good eating habits together, and the quality time with the family will be an added bonus.
- **Don’t buy unhealthy foods:** Out of sight, out of mind. If the chips and cookies aren’t around, your kids can’t eat them. They may resist at first, but when they get hungry, they’ll start munching the carrot sticks. Keep healthy foods on hand — water instead of colas or sugary drinks, and a bag of apples instead of a bag of chips.
- **Have healthy finger foods available:** Kids like to pick up foods, so give them foods they can handle. Fruit and veggie chunks (raw or cooked) are great finger food options.
- **Repeal the “clean your plate” rule:** Kids know when they’re full, so let them stop. Overeating is one of the major reasons we get too many calories.
- **Encourage kids to “eat their colors”:** This game works well with younger kids. Eating a variety of brightly colored foods provides a variety of nutrients.

Check out the American Heart Association’s recipe ideas and tips for eating healthy at heart.org/healthyliving.

Read Your Labels — Know Your Food

Recommended Grade Level:

2-5

Season:

All

Indoor

Description:

Students will learn how to read content, serving and portion sizes listed on nutrition food labels. Students will apply what they have learned to calculate the serving sizes for various produce from the garden and create nutrition labels for the produce.

Materials:

- Understanding Nutrition Food Labels Sheet
- Variety of foods with nutrition labels
- Fruit and Vegetable Nutrition Facts Charts
<http://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm063367.htm>
- Garden Nutrition Label Worksheet

Preparation:

1. Determine if this activity will be completed individually or in small groups.
2. Gather a variety of foods with nutrition labels.
3. Print and make copies of the Fruit and Vegetable Nutrition Facts Charts for each student or group.
4. Make copies of the blank nutrition labels for each student or group.

Activity:

1. Begin the lesson by asking students how they find out about the nutrition for the foods they eat. Allow discussion.
2. Pass out and review the Understanding Nutrition Food Labels Sheet. Explain that nutrition labels are listed on many things they eat. Nutrition labels have important information about the nutritional value of food you eat. Many food items also have an ingredient list that lists the ingredients in the food. Learning how to read nutrition labels and ingredient lists can help you make decisions about which foods and beverages are best for your heart health.
3. Pass out the food items with nutrition labels on them. Allow students time to explore and share the information they find on the product. Ask the following questions:

- What is the serving size?
 - How many calories does it have?
 - How much total fat? Saturated fat? Trans fat? Sugars? Sodium? Vitamin C? Etc.
4. Tell the students that produce from the garden doesn't have nutrition labels, so they will create nutrition labels for fruits and vegetables from the garden.
 5. Pass out the Fruit and Vegetable Nutrition Facts Charts. Review how to read the charts.
 6. Pass out the Garden Nutrition Label Worksheet and have students create labels for one vegetable and one fruit using the information from the Fruit and Vegetable Nutrition Facts Chart. Have students share their nutrition labels with the class when finished.

Tying it Together:

1. What did you find out about nutrition labels?
2. How does a nutrition label help you?

Nutrition labels have important information about the nutritional value of foods you eat. Learning how to read nutrition labels can help you make decisions about which foods and beverages are best for your heart health.

Special Care:

Highlighting specific information on the charts may help reduce visual clutter and help students narrow down the information they need to find.

Digging Deeper:

Create nutrition label stakes for the garden using the labels the students create. Laminate the labels and use wooden craft sticks to create the stakes.

National Standards:

NHES: Students will demonstrate the ability to access valid information and products and services to enhance health.

NHES: Students will demonstrate the ability to use decision-making skills to enhance health.

Lesson Extensions:

Language Arts: Have students write an essay comparing the health benefits of the two fruits or vegetables.

Math: Create word problems for students to use nutrition label knowledge. For example, if you eat $\frac{1}{4}$ of an apple, how many servings will that be?

Understanding Nutrition Food Labels

You can decide which foods and beverages are best for your heart health by learning how to read food labels.

Nutrition Facts	
Serving Size: 2/3 cup (55g) Servings Per Container: About 8	
Amount Per Serving	
Calories 230	Calories from Fat 72
% Daily Value*	
Total Fat 8g	12%
Saturated Fat 1g	
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 160mg	7%
Total Carbohydrate 37g	12%
Dietary Fiber 4g	
Sugars 1g	
Protein 3g	
Vitamin A	10%
Vitamin C	8%
Calcium	20%
Iron	45%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

1. Start here

2. Check the total calories per serving

3. Limit these nutrients

4. Get enough of these nutrients

5. Quick Guide for % Daily Value: 5% or less is low and 20% or more is high

1. Start with the serving information at the top of the label. The serving size will tell you the size of one serving and the total number of servings per container or package. If you eat two servings, you're getting twice the number of calories and nutrients.

2. Next, check total calories per serving. Pay attention to the calories per serving and how many servings you're really consuming if you eat the whole package. If you double the servings you eat, you double the calories and nutrients.

3. Limit these nutrients. The American Heart Association recommends limiting these nutrients: Based on a 2,000-calorie diet, no more than 11-13 grams of saturated fat, as little trans fat as possible, and no more than 1,500 mg of sodium.

4. Get enough of these nutrients. Make sure you get enough of beneficial nutrients such as dietary fiber, protein, calcium, iron, vitamins and other nutrients you need every day.

5. Quick guide to % Daily Value. The % Daily Value (DV) tells you the percentage of each nutrient in a single serving, in terms of the daily recommended amount. As a guide, if you want to consume less of a nutrient (such as saturated fat or sodium), choose foods with a lower % DV — 5 percent or less. If you want to consume more of a nutrient (such as fiber), seek foods with a higher % DV — 20 percent or more.

Garden Nutrition Labels

Make a nutrition label for one vegetable and one fruit from the garden.

Nutrition Facts	
Serving Size	
Amount Per Serving	
Calories	Calories from Fat
% Daily Value*	
Total Fat	
Saturated Fat	
Trans Fat	
Cholesterol	
Sodium	
Total Carbohydrate	
Dietary Fiber	
Sugars	
Protein	
Vitamin A	
Vitamin C	
Calcium	
Iron	
*Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.	
	Calories: 2,000 2,500
Total Fat	Less than
Sat Fat	Less than
Cholesterol	Less than
Sodium	Less than
Total Carbohydrate	
Dietary Fiber	

Nutrition Facts	
Serving Size	
Amount Per Serving	
Calories	Calories from Fat
% Daily Value*	
Total Fat	
Saturated Fat	
Trans Fat	
Cholesterol	
Sodium	
Total Carbohydrate	
Dietary Fiber	
Sugars	
Protein	
Vitamin A	
Vitamin C	
Calcium	
Iron	
*Percent Daily Values are based on a 2,000 calorie diet. Your daily value may be higher or lower depending on your calorie needs.	
	Calories: 2,000 2,500
Total Fat	Less than
Sat Fat	Less than
Cholesterol	Less than
Sodium	Less than
Total Carbohydrate	
Dietary Fiber	

Recommended Grade Level:

3-5

Season:

All

Indoor

Nutrition and the Media

Description:

Students will view popular food advertising on TV and in print ads and newspapers, and make observations about the types of foods and how they're advertised. Students will also discuss the healthfulness of these foods. They will learn about the components of an advertisement (slogans, jingles, catchy words, appealing pictures).

Background:

Commercials and advertisements are made to sell all kinds of products, including foods. It's important for people to analyze food products and advertisements to determine if they're good for their health.

Materials:

- Newspapers and magazines with food advertisements
- Food or beverage commercials (these can be found on YouTube)
- Chart, tablet or whiteboard to record information
- Advertisement Awareness Worksheet
- Foods on Television Worksheet (optional)
- Nutrition in the Media Worksheet (optional)

Preparation:

1. Select popular food advertisements (print and video) to share with students.
2. Make copies of the Advertisement Awareness Worksheet for each student.

Activity:

1. Begin the lesson by asking students to share some of their favorite commercials, jingles or slogans.
2. Explain that businesses use advertisements and commercials to get people to remember their products for a long time after they have seen them. Companies try to connect with people to get them to purchase their foods. It's important to analyze advertisements and commercials to determine if the product is good for your health.
3. Show the students some food advertisements as a group. Ask the students what makes them want to go buy the item from looking at the ad and who does the ad appeal to. List the responses on the board.
4. Give students magazines and newspapers to search for food advertisements and have them complete the Advertisement Awareness Worksheet. Students can choose advertisements for unhealthy and healthy foods.
5. Have students share their advertisements and observations when finished.

Tying it Together:

1. What did you notice about food advertising?
2. What types of foods were advertised most often?
3. How many advertisements did you find for food from gardens? Did that surprise you?
4. Do you think that the same type of food advertisements are shown on the TV shows that you watch when compared to the TV shows your parents watch?
5. Why do you think that?

Special Care:

Advertisements can be cut out and separated into healthy and unhealthy foods. These can be glued on construction paper to share with the class.

Digging Deeper:

Compare food advertising campaigns from decades ago to today. Look at how advertising has changed and how it has remained the same.

Lesson Extensions:

Math: Have students watch their favorite TV program at home and collect data on the types of advertisements shown during the program using the Foods on Television Worksheet. Students will bring the worksheet back to class to compare their data with the class. Compare the data using fractions, decimals, percentages, mean, mode, median and range.

Language Arts: Have students watch a television program at home looking for the nutrition aspects of the show by completing the Nutrition in the Media Worksheet.

National Standards:

NHES

- Students will analyze the influence of family, peers, culture, media, technology and other factors on health behaviors.
- Students will demonstrate the ability to access valid information and products and services to enhance health.
- Students will demonstrate the ability to use decision-making skills to enhance health.

Advertisement Awareness

Use an advertisement for a food or beverage product. Write complete sentences to answer the questions below.

1. Describe the advertisement that you saw. Cut the ad from the newspaper or magazine and attach it to this sheet.

.....

.....

.....

2. What emotion or feeling was used to help sell the product? Examples: happiness, sadness, love, excitement.

.....

3. What does the advertisement make you think that the product will do for you? Remember, this may be said with or without spoken words.

.....

.....

.....

4. Do you believe the product will do this? Why or why not?

.....

.....

.....

Foods on Television

Complete the worksheet by writing down the types of foods you see when watching a television show.

Name:

Time of Day: Length of time spent watching TV:

Programs watched:

Type of Food	Name of Food	Number of times you saw foods in this group
Fruit		
Vegetable		
Snack Food		
Fast Food		
Beverages		
Other		

Nutrition in the Media

The images we see on television programs may influence the choices we make in life. Watch a television show and look for the health choices the characters make.

Name:

1. Name of television programs watched:

.....

2. Plot or story line:

.....

3. Characters' names:

.....

4. Characters' food choices:

.....

5. Characters' physical activities:

.....

6. Did the characters make healthy choices?

.....

7. What would you change about the television show to send a healthy message?

.....

Recommended Grade Level:

3-5

Season:

All

Indoor/Outdoor

Produce Promotions

Description:

Students will gather information about the benefits of eating fruits and vegetables and create a media campaign (print ad or video commercial) to be shared with the class.

Materials:

- Fruit and Vegetable Fact Sheets
<http://snap.nal.usda.gov/resource-library/foods/fruits-and-vegetables#facts>
- Produce Promotion Research Sheet
- Presentation program: Prezi, PowerPoint, etc.
- Computers with Internet access
- Projector with presentation screen

Preparation:

1. Select popular food advertisements (print and video) to share with students.
2. Print out the Fruit and Vegetable Fact Sheet or allow students to access them on the Internet.
3. Make copies of the Produce Promotion Research Sheet for each student.
4. Prior to starting the lesson, pre-teach how to use the presentation programs if needed.

Activity:

1. Gather students around a presentation screen.
2. Tell them that they will be creating commercials and advertisements for the fruits and vegetables from their garden. Remind students that commercials and advertisements are made to sell all kinds of products, including foods.
3. Discuss the design elements that go into successful promotions, including imagery, jingles, slogans and catchy music.
4. Share examples of advertisements for healthy foods.
5. Pass out the Produce Promotion Research Sheet and discuss the required elements. Explain that each student will choose a fruit or vegetable from the garden and gather key facts to include in a print ad or video commercial promoting the produce.

6. Using the printed Fruit and Vegetable Fact Sheets or the website, allow students to complete their sheet and then create their advertisement or commercial.
7. Have students share their advertisements when finished.

Tying it Together:

1. What interesting facts or new information did you find out about your produce?
2. What did you learn about planning a presentation using research?
3. What went well with your presentation?
4. Did you face any challenges?

Special Care:

Print the Fruit and Vegetable Fact Sheets and highlight the key points to help narrow the research requirements.

Digging Deeper:

Upload the videos to YouTube or Vimeo to share with other classes at your school and parents. Celebrate your produce!

National Standards:

ISTE:

- Creativity and innovation: Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
- Communication and collaboration: Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
- Research and information fluency: Students apply digital tools to gather, evaluate, and use information.
- Critical thinking, problem solving and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

NHES:

- Students will analyze the influence of family, peers, culture, media, technology and other factors on health behaviors.
- Students will demonstrate the ability to access valid information and products and services to enhance health.
- Students will demonstrate the ability to use interpersonal communication skills to enhance health and avoid or reduce health risks.

Produce Promotion Research Sheet

Produce Name	Fruit or Vegetable	Country of Origin	People or Person connected with the produce?
Fact 1	Fact 2	Fact 3	Fact 4
Fact 5	Fact 6	Slogan	Jingle

Recommended Grade Level:

4-5

Season:

All growing seasons

Indoor/Outdoor

What's the Garden Worth

Description:

Students will learn about the value of the crops they're growing by comparing their produce in the garden to the value of produce at the grocery store.

Background:

Garden produce can be plentiful. We don't always take the time to keep track of the quantity that comes from the garden. The students learn the health benefits of eating fruits and vegetables from the garden and the value of garden produce. This can help your student gardeners appreciate the produce and value of their labor.

Materials:

- Garden Produce
**If no crops are growing or ready for harvest, you can give them different produce and weight scenarios that they can look up to compare.*
- Food Scale (If you don't have one, you can get an estimate by weighing a student, then weighing the same student with the produce and subtracting the student's weight.)
- Grocery Store Mailers
- What's The Garden Worth Worksheet

Preparation:

1. Determine if this activity will be completed individually or in small groups. Collect grocery store mailers for each student or group. Students can also bring grocery store mailers from home or you can make copies of one mailer.
2. Make copies of What's The Garden Worth Worksheet for each student or group.

Activity:

1. Tell students they will be learning about the value of the food they're growing in the garden.
2. Review the definition of agriculture with the students.
Agriculture is another word for farming and farm-related jobs. Agriculture makes grains, vegetables, fruit, meat and dairy products for people to eat all over the world. Agriculture is one of the oldest professions and began thousands of years ago. Agriculture is important and affects our everyday lives.

3. Explain that selling produce to grocery stores and other retailers is an important aspect of agriculture and helps get the food we eat from farm to table.
4. Take the class to the garden and harvest some produce that's growing.
5. Have students make a list of the produce collected and record the weight using a food scale.
6. In the classroom, pass out the grocery store mailers and the What's The Garden Worth Worksheet.
7. Instruct the students to use the mailers to calculate the value of their harvest and record it on their worksheet. Remind them that some produce may be listed by the pound, but some might be listed 3 for \$1.00. They may need to make secondary calculations.
8. Share results to check the calculations. If you're using different store mailers, the students' results may vary.

Tying it Together:

1. What did you learn about the value of our garden?
2. Were you surprised?
3. What crop would bring in the biggest profit?
4. Which would bring in the least?

Special Care:

Students could use calculators to total the value of the produce.

Specific produce and value per pound can be highlighted or circled on the grocery store mailer to help students identify the correct information.

Digging Deeper:

Using the grocery store mailers, have students determine which produce is the least and most expensive per serving. Then research the produce and brainstorm for reasons for the price.

National Standards:

CCSS.MATH: Measurement and data.

Lesson Extensions:

Math: Look at costs per pound for different produce. Rank the produce from the most expensive to the least expensive. Find the mean, median, mode and range of all the produce values.

Language Arts: Write a composition about the value and cost-saving benefits, as well as the health benefits that come with growing your own food.

What's The Garden Worth?

Produce	Total Pounds	Price Per Pound	Total Value (x total pounds x price per pound)

Recommended Grade Level:

K-5

Season:

All

Indoor

At the Grocery Store

Description:

The grocery store is a big part in everyone's life. The students will learn about mailers that promote weekly sales to entice customers to come to the grocery store to shop. Students will focus on healthy fruit and vegetable promotions in their mailers.

Background:

Weekly grocery store advertisements that come in the mail are a great way to integrate mathematics, nutrition, geography and money management in the classroom. Students will use these mailers to focus on healthy food choices at the store. They will create a healthy plate of food from the mailers and share what's on their plate and how it helps them grow strong and healthy.

Materials:

- Grocery store mailers
- Paper plates - one for each student
- Scissors
- Glue sticks
- Crayons or markers

Preparation:

1. Collect enough mailers for each student. Students can bring them from home or you can pick some up in the store. You can also make copies of one mailer if needed. Ensure that you are selecting mailers that include images of healthier foods like fruits and vegetables.
2. Students can share scissors, glue sticks and crayons or markers.

Activity:

1. Give each student a grocery store mailer and paper plate.
2. Explain that these mailers are sent in the mail each week to promote weekly sales and get people to come into the store to shop.
3. Allow students to look over the mailers and talk with each other about what they like and dislike about them.
4. Using the mailers, students will create a healthy meal by cutting out food items and gluing them to their plate. Remind students that they should fill half of their plate with fruits and vegetables.

5. Ask the students to look at the food groups (vegetables, fruits, protein, grains and dairy) that are present on their plate. On the back of the plate, the students can draw or list the foods by the food groups.

Tying it Together:

1. What did you find out about mailers?

Grocery store mailers are used by grocery stores to advertise sales and get people to come to their stores to shop.

2. What types of food are listed the most?

3. What fruits and vegetables seem to be in season right now?

4. Who is the target audience of the mailers?

Adults

5. Why?

Adults are usually the ones who shop at the grocery store.

Digging Deeper:

Compare the healthy and unhealthy foods that are included in the mailers. What items are on the front and back pages of the mailers? What do the pictures look like (big, small, in the center of the page)?

Ask the students to total the costs of their meals. Find out who had the most expensive meal and the least expensive meal. Ask students to take a look at those plates to see why one was the most expensive and the least expensive. Students will need to write down the price of each food item as they cut it out.

National Standards:

CCSS.MATH

- Operations and algebraic thinking.
- Measurement and data.
- Number and operations in base ten.

NCSS

- Human beings create, learn, share, and adapt to culture.
- Global connections have intensified and accelerated the changes faced at the local, national, and international levels.

NHES

- Students will analyze the influence of family, peers, culture, media, technology and other factors on health behaviors.
- Students will demonstrate the ability to access valid information and products and services to enhance health.
- Students will demonstrate the ability to use decision-making skills to enhance health.

Lesson Extensions:

Math: Give students a food budget for the week. Have them create a healthy meal plan for the week using their assigned budget.

Have students circle five items on a mailer and round those prices to the nearest dollar. Using that number, students determine what the item would cost if it were $\frac{1}{2}$ off, 25 percent off, etc.

Select “multiple deal” food items (ex: 4 for \$1.00) and have students calculate the cost of one of the items.

Pick a produce. Calculate the cost of 1 pound, 2 pounds, 3 pounds, etc.

Science: Gather data about the food groups that are present in grocery store mailers. Compare and contrast the numbers of foods represented from different food groups.

Social Studies: Have students pick a country and research what they eat. Have students analyze the similarities and differences between countries.

Literature Connections:

The Supermarket by Gail Saunders-Smith

Grocers Sell Us Food by Carol Greene

Where Does Your Food Come From?

Recommended Grade Level:

3-5

Season:

All

Indoor

Description:

Students will explore the origin of fresh fruits and vegetables by using food labels from produce that they bring from home. The origin of each child's food will be located on a world map. Students will compare the distances and determine whose food traveled the farthest and shortest distances.

Background:

We're living in a time when we can get almost anything we want at any time we want from around the world — including food. Finding out how far food travels to get to our plate is an interesting study of our world and food system. Tags, stickers and package information on fruits and vegetables will be used to learn how far the produce traveled to get to the store.

Materials:

- Produce in a package or with a tag or sticker on it
- Computer with Internet access
- Where Does My Food Come From Chart
- Where Does My Food Come From Map

Preparation:

1. Determine how many groups the students will be divided into and make copies of the chart and map for each group.
2. Prior to the lesson, ask your students to bring a fresh food item with a product of origin label on it. Bring extra produce for students who are unable to bring food from home.

Activity:

1. Divide students into groups and have them discuss the produce that they brought. Ensure each group has a variety of fruits and vegetables.
2. Tell students to look at the sticker, tag or package that the produce came in and share the things they notice. Explain that the tags, stickers and package information on fruits and vegetables help us know where our foods come from. Our foods are grown at farms all across the world and sometimes travel many miles to get

to our grocery stores. It is important that food is able to travel because certain fruits and vegetables may not grow or be in season in the local area. There are also many fruits and vegetables that are locally grown and purchasing locally grown produce can help support the community's economy, environment and provide produce that is in season. Today, we'll look at the origin of the produce and how far it traveled to get here.

3. Pass out the Where Does My Food Come From chart and map to each group.
4. Have students bring their produce to the computer and log on to the National Geographic mapmaker at <http://mapmaker.education.nationalgeographic.com>.
5. Explain how to use the mapmaker. Students will click "draw a polyline" in the options on the left side of the map and click on their location, and then on the location where their produce came from. The program will calculate the distance in miles and kilometers. Students will write down the produce name, country of origin and distance traveled in the chart.
6. Have students label where their produce came from on their Where Does My Food Come From Map by drawing a line from their town to the place where the produce came from. Have students write the distance that their produce traveled on the line.
7. After the data is collected, have students share their results with the class and determine longest and shortest distance traveled.

Tying it Together:

1. What findings surprised you?
2. Which produce traveled the farthest?
3. Which was closest to home?
4. Were there more fruits and vegetables from a certain region in the world?
5. What are possible reasons that food traveled so far?
Certain fruits and vegetables don't grow here or they may not be in season in our area.
6. How does climate affect where foods are grown?
Warm climates have longer growing seasons and more fruits and vegetables can be grown in those areas.

Special Care:

This activity can be completed as a class on an overhead so the students can watch how far each piece of produce traveled.

Digging Deeper:

Explore the benefits of buying local foods. Show students the video in the link [Buying Local](#) and list the pros and cons of local and worldwide produce.

National Standards:

CCSS.MATH: Numbers and operations in base ten.

ISTE: Research and information fluency: Students apply digital tools to gather, evaluate and use information.

NCSS: People, places and environments.

NGS: The patterns and networks of economic interdependence on Earth's surface.

Lesson Extensions:

Language Arts: Write a narrative from the produce's point of view, including information on how it was grown, who grew it, how it traveled from its country of origin to the market where it was bought and how it traveled from the grocery store to the plate.

Math: Compare the distances each student's produce traveled by ranking them in order of the farthest traveled and the closest to home. Calculate mean, median, mode and range of the distances that the produce traveled.

Science: How does climate of different locations impact the foods that can be grown? Compare and contrast the types of foods grown in places with different climates. Click on "layers" from the interactive map, then click on "add a layer." To learn more about different regions, click on the weather and climate tab on the left side of the window: <http://mapmaker.education.nationalgeographic.com/#/>

Social Studies: Take a look at what fruits and vegetables come from different regions of the world. Remove the labels, tags and stickers from produce and tape them on a world map to look at the data and make observations. What types of foods are grown in each region?

Literature Connections:

Hungry Planet by Peter Menzel and Faith D'Aluisio

How Did That Get In My Lunchbox?: The Story of Food by Christine Butterworth

Who Wants Pizza?: The Kids' Guide to the History, Science and Culture of Food by Jan Thornhill

Where Does My Food Come From?

Produce Name	Country of Origin	Distance Traveled

Where Does My Food Come From Map

Using the information from your Where Does My Food Come From Chart, draw a line from your town to the place where your produce came from. Write the distance the produce traveled on the line.



Recommended Grade Level:

2-5

Season:

All

Indoor

A Farmer's Life for Me

Description:

Students will explore the different types of farmers and jobs that bring food from the farm to the grocery store. They'll learn about the life of a farmer by creating skits from different scenarios farmers may experience.

Background:

Many occupations are involved with the products that we buy at the store. Most of the products begin with a farmer, who faces many obstacles and uncertainties. The success and failure of crops are a factor in what our prices for these products are at the grocery store.

Materials:

- Farmer Scenario Cards
- Farm to Table Cycle Chart
- Farm to Table Worksheet

Preparation:

1. Determine how you will divide students into groups. Make copies and cut out the Farmer Scenario Cards for the number of groups.
2. Make copies of the Farm to Table Worksheet for each student.
3. This activity can be completed in your garden to help students recreate a farm atmosphere.

Activity:

1. Begin the lesson by asking students what they know about farmers and allow them to share their responses.
2. Explain that farmers have a lot of responsibilities and face many different types of issues as they take care of their crops and animals to make a living. Farmers have to be good at growing crops and be prepared to handle unsuspected environmental conditions like the weather or changes in the soil. Use the Farm to Table Cycle Chart to show farmers' responsibilities and explain how food gets from the farm to our tables.

3. Review the different types of farmers and the people they work with to get food from the farm to the table.
- **Fruit or Vegetable Farmer:** A fruit or vegetable farmer grows produce for people to eat. Some of the produce is sent to groceries fresh and others are sent to factories to be added as ingredients into other products, or canned or frozen.
 - **Dairy Farmer:** A dairy farmer specializes in raising dairy cattle to make milk and cheese products.
 - **Cattle Farmer:** A cattle farmer raises cattle to produce meat.
 - **Poultry Farmer:** A poultry raises turkey, duck and chicken for eggs and meat.
 - **Pig Farmer:** A pig farmer raises pigs and hogs for meat.
 - **Fruit Tree Farmer:** An orchard farmer grows trees to produce fruit like apples, peaches and oranges.
 - **Wheat Farmer:** A wheat farmer grows wheat, a grain used to make bread and pasta like macaroni and spaghetti.
 - **Organic Farmer:** Organic farmers grow different types of fruits and vegetables without using pesticide chemicals.

Farmers may work with these professionals to get food from the farm to our tables:

- **Dairy Nutritionist:** A dairy nutritionist is an animal health professional who specializes in the nutritional needs of dairy cows. Nutritionists recommend the best diets for cows and monitor how cows respond to their feeding program.
 - **Safety Inspector:** A safety inspector helps keep people, the farm and farm products and environment safe. They make sure it is safe to eat the foods that come from farms.
 - **Marketing Manager:** A marketing manager advertises and sells farm products to grocery stores and factories that prepare farm products for us to eat.
 - **Accountant:** An accountant helps farmers keep track of how much money they spend on their farms and how much money they make from selling their produce and animals.
4. Tell students they are going to pretend to be farmers and experience some of the issues farmers face when growing crops and raising animals. Separate the students into small groups and give each group a scenario card. The students will create a skit explaining their problem and a solution to solve it.
5. After each skit, discuss the pros and cons of the solutions as a class. There are no right and wrong answers; so answers will vary.

Tying It Together:

1. What things surprised you about being a farmer?
2. What factors determine success or failure for farmers?
Weather, farming skills, price of food

Digging Deeper:

Have students research careers in agriculture. If possible, invite different types of agriculture professionals to speak to the class.

National Standards:

NCSS: People, places and environments: The study of people, places, and environments enables us to understand the relationship between human populations and the physical world.

NCSS: Production, distribution and consumption.

NHES: Students will comprehend concepts related to health promotions and disease prevention to enhance health.

Lesson Extensions:

Language Arts: Have students complete the Farm to Table Worksheet and write a narrative describing the process.

Literature Connections:

A Farmers Life For Me by Jan Dobbins & Laura Huliska-Beith

Jobs On A Farm (World of Farming) by Nancy Dickmann

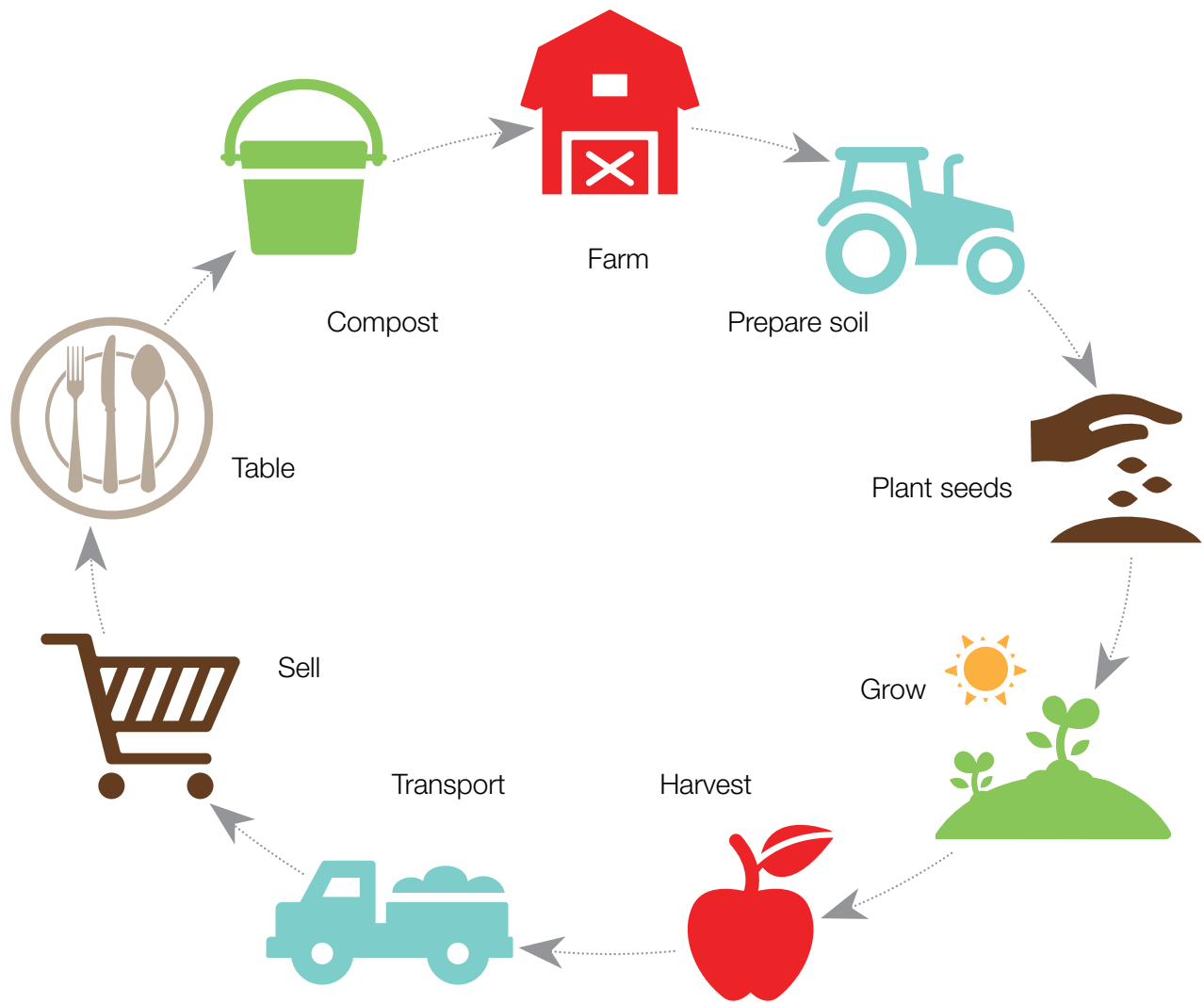
Milk: From Cow To Carton (Let's Read And Find Out Book) by Alike

Who Grew My Soup by Tom Darbyshire

Farmer Scenario Cards

<p>It is 3 a.m. Your horse is giving birth to a foal any minute and the veterinarian is 30 minutes away. What do you do?</p>	<p>After 15 years of farming in Texas, you want to relocate and farm in Ohio. How will you find out about what crops you should plant?</p>	<p>Weather forecasters are predicting heavy rains this week, but today the ground is dry. Should you water your crops or wait for the rain?</p>
<p>Your tractor just broke down. The weather predictions call for rain next week. How will you get your seeds planted before it rains?</p>	<p>You found a beetle eating your crops. What should you do?</p>	<p>You're working in the fields and the sky turns black as night. Is there a storm coming? What do you do?</p>
<p>You have to figure out how much money your farm made this year. What will you do?</p>	<p>Your green beans are not growing well this year. Their color is light green and the leaves have small black spots. What will you do to save your crops?</p>	<p>It's April 20 and the weather is still cold. Do you plant crops, like you do every year or wait?</p>
<p>You have a lot of receipts for farming supplies that you have been piling up on your desk. You need a quick, easy way to organize this information. What should you do?</p>	<p>Last year, you made a lot of money selling your corn. Should you only plant corn or should you plant different crops so that the soil stays healthy?</p>	<p>A cow broke its leg and needs care right away. There is no time to call for help. It is up to you!</p>

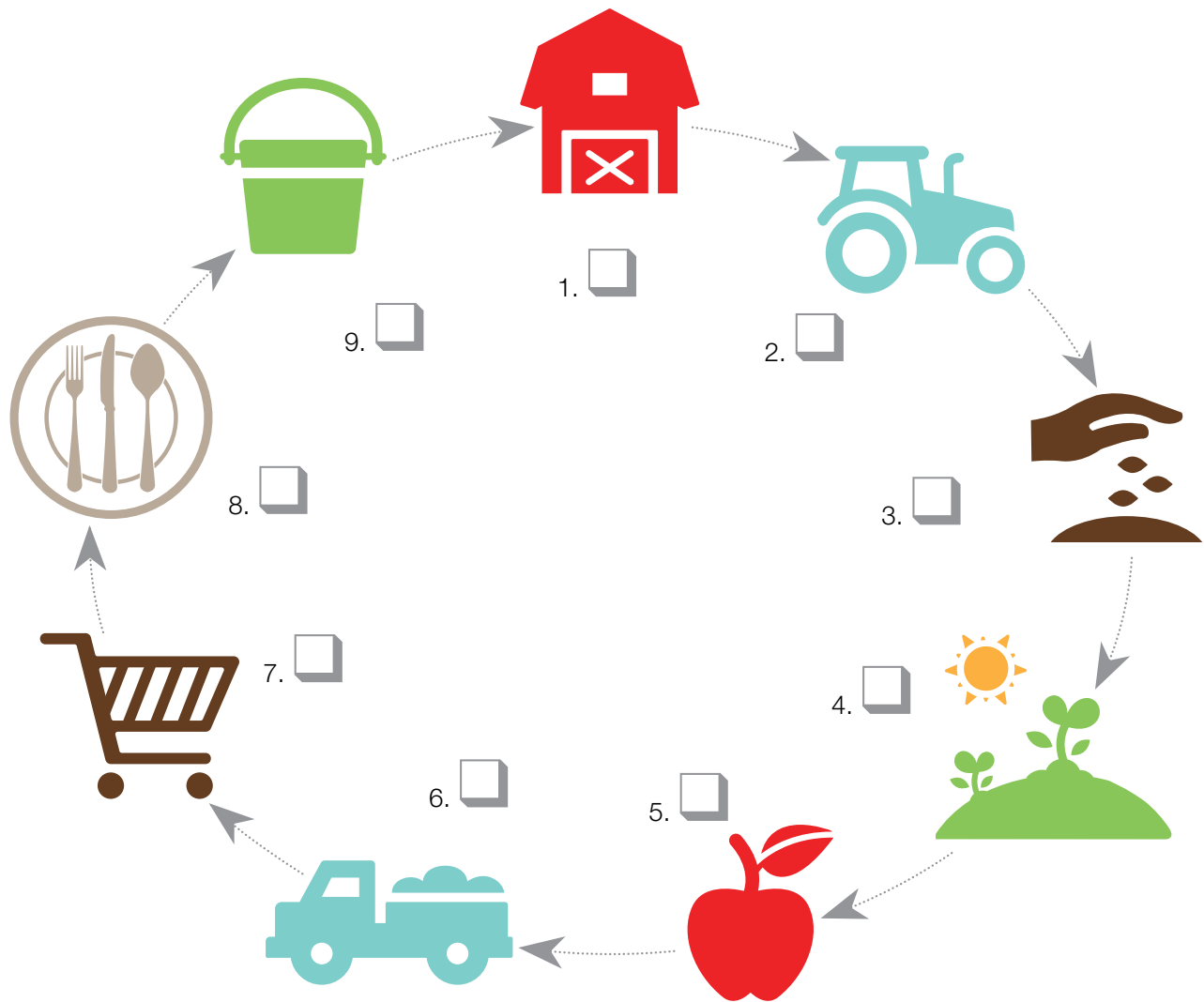
Farm to Table Cycle Chart



Farm to Table Worksheet

There are many steps to grow the foods we eat. Place the letters of the steps in the boxes.

- | | | |
|------------|-----------------|--------------|
| A. Harvest | D. Sell | G. Farm |
| B. Table | E. Prepare Soil | H. Transport |
| C. Grow | F. Plant seeds | I. Compost |



Recommended Grade Level:

5

Season:

All

Indoor

What Went Wrong?

Description:

Students will learn about farming and historical problems that have had an impact on crops. The failures of crops during the Irish Potato Famine, The Dust Bowl and World War 2 will be explored to learn about how we rely on food production and what can go wrong.

Background:

Crop failure due to weather and disease can cause problems for farmers, decrease availability and raise the price of food worldwide. A farm is not always successful. What can farmers do to prevent these problems from happening, or recover from the impact of problems that are encountered? Students will learn about historical farming tragedies and compare and contrast the events.

Materials:

- Video links of the Potato Famine, The Dust Bowl and World War 2
- Venn Diagrams (optional)

Preparation:

Make copies of Venn Diagrams for each student or have students draw a Venn Diagram on paper.

Activity:

1. Gather your students in a central location where they can view the video presentations.
2. Ask students what they know about problems that have created crisis in food production in world history. Explain that they will be learning about three major food crisis in history:
 - **The Irish Potato Famine:** During the 1840's, Ireland suffered from a food disaster. The word famine means shortage of food. During that time, potatoes were the main source of food and more than a quarter of Ireland's population died or left the country because of the famine. The famine was caused because the country's potatoes caught a disease and no one knew how to cure the disease.
 - **The Dust Bowl:** During the 1930's, severe drought and dust storms hit the Great Plains region and damaged the farmland and agriculture. During the 1920's, many farmers were turning the native grassland into crop fields to be used for farming. They were unknowingly causing damage to the land. When the drought struck in the mid-1930's, the winds picked up the loose topsoil and caused thick black dust clouds. Thousands of farmers and their families were forced to move because their farms had been

destroyed and they could no longer provide for their families. In 1935, the federal government created the Soil Conservation Service and put plans in place to try and save the grasslands. They planted more grass and trees and set restrictions on some farming practices.

- **World War II:** The war caused shortages of many things that people used every day, including food, clothing and gasoline. To give troops needed supplies, the U.S. government set up the Food Rationing Program in 1942. Every American was given a ration book that contained stamps for rationed items like sugar, meat and canned goods. Once a person used up their ration stamps for the month, they could not buy any more of that type of food.

3. Show the video clips and allow time for discussion.
4. Pass out the Venn Diagram Worksheet or have students draw Venn diagrams. Students use this as a graphic organizer to compare and contrast the three agricultural events and their similarities and differences. Each event is placed in its own circle. They will write the similarities in the overlapping circles for the events and the differences in the individual circles for the events.
5. Have students share their diagrams when they're finished.

Tying it Together:

1. What could have been done to overcome these tragedies?
2. What can be learned from them?

Natural disasters can affect food production and it's important to take care of the land.

3. Can disasters like this happen today?

Yes.

4. How do they happen?

Droughts, floods, tsunamis and other natural disasters can cause major food production problems in the world.

Special Care:

Print pictures of the three events so students can write sentences or words about their thoughts on the events.

Digging Deeper:

Learn about soil conservation and preserving topsoil. Discuss how that could have helped people during the Dust Bowl.

<http://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.organic/organic-farming-conserving-topsoil>

National Standards:

CCSS.ELA: Writing: Research to build and present knowledge.

NCSS: Production, distribution, and consumption.

NGS: The processes, patterns, and functions of human settlement.

Lesson Extension:

Language Arts: Have students choose one of the events to research and write a composition.

Literature Connections:

Out of the Dust by Karen Hesse

Black Potatoes by Susan Campbell Bartolletti

Don't You Know There is a War on? By James Stevenson

Links:

Irish Potato Famine

<http://www.pbslearningmedia.org/resource/foa10.soc.k-6.histus.verysadper/a-very-sad-period-in-irish-history/>

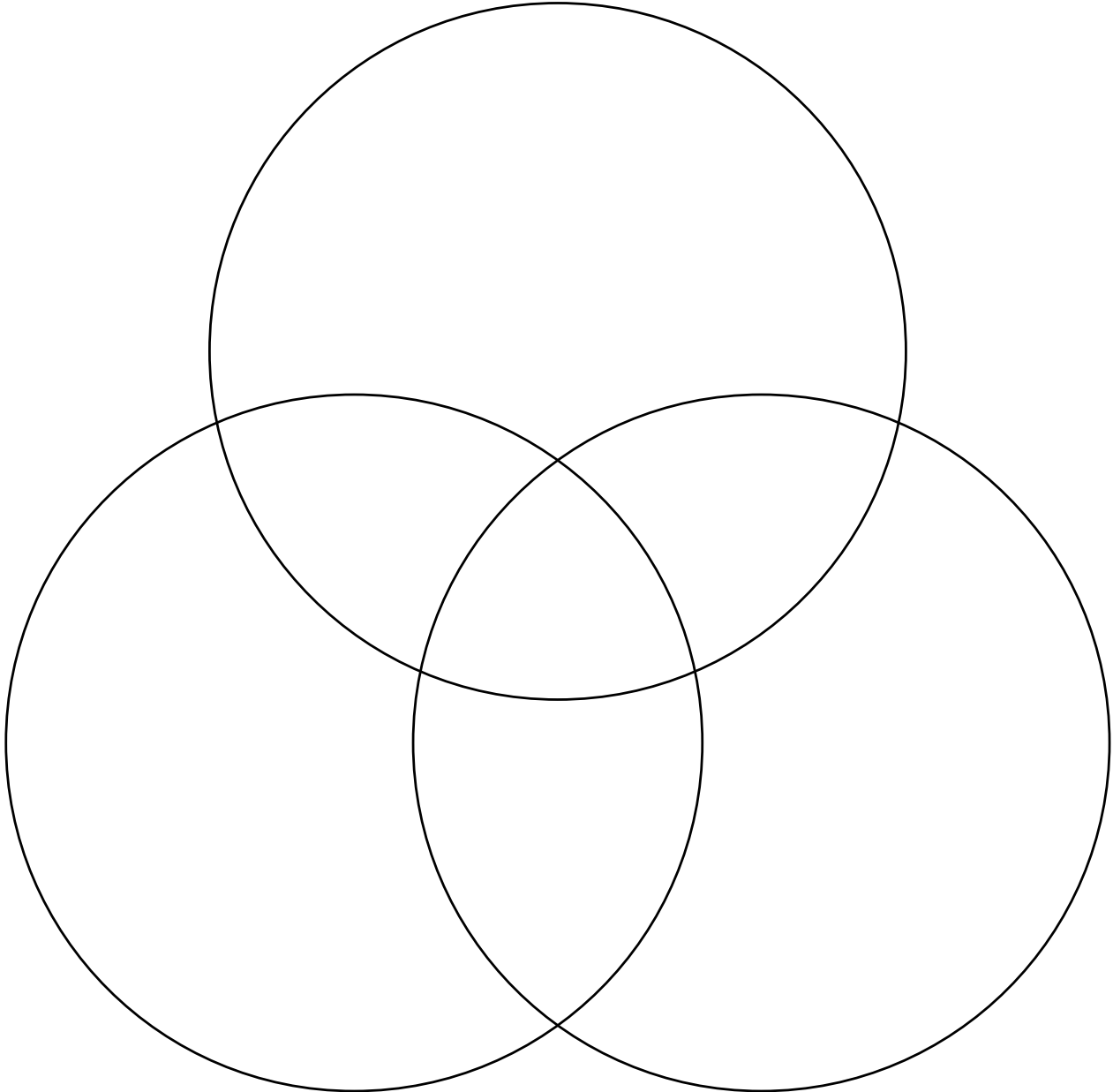
Food Rationing World War II

<http://www.pbslearningmedia.org/resource/f8a74f29-d299-4d96-be73-e117d5313fea/rationing-during-world-war-ii-world-war-ii-stories/>

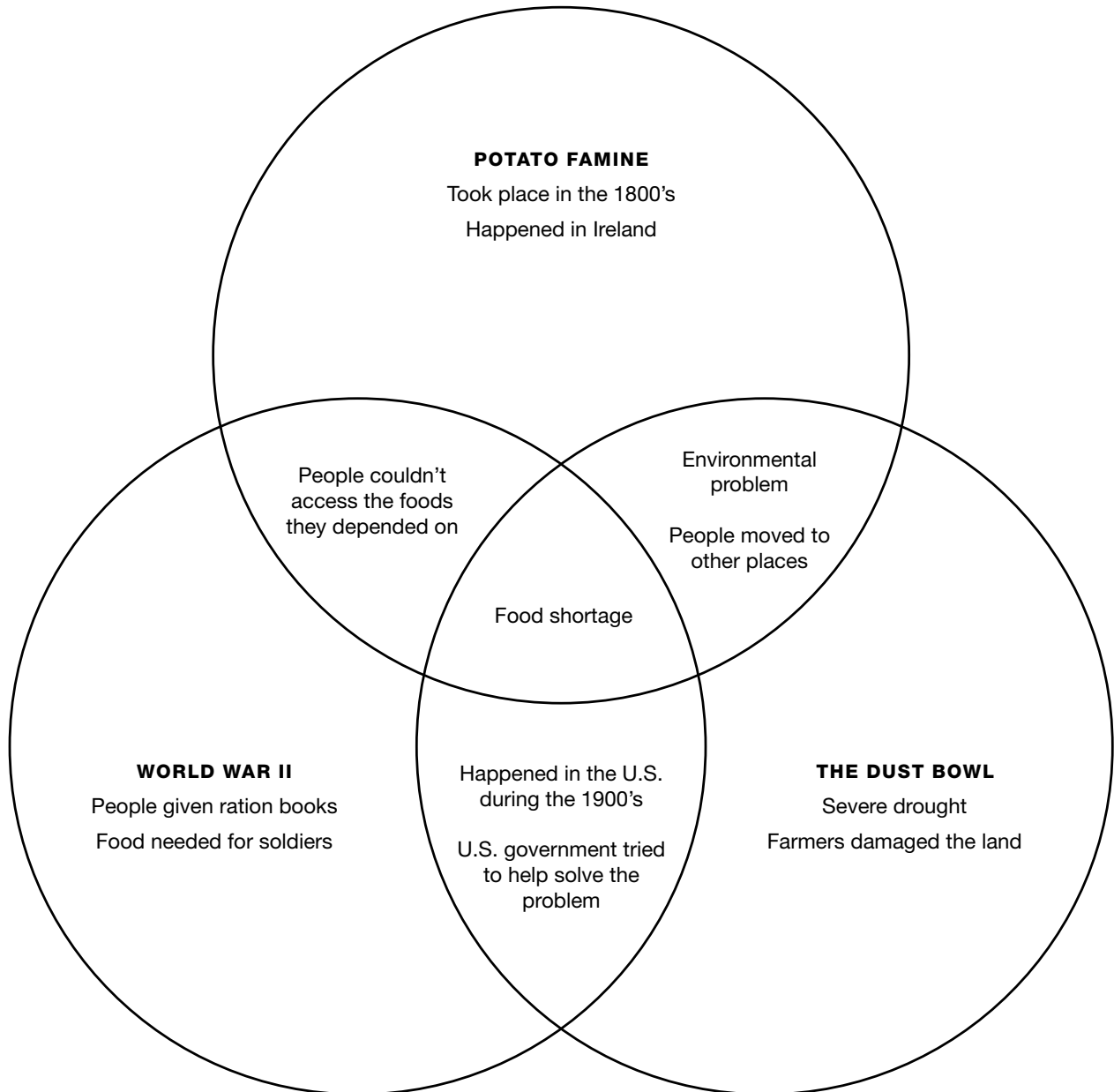
Documenting The Dust Bowl

<http://www.pbslearningmedia.org/resource/lang14.soc.ushist.dustbowl/documenting-the-dust-bowl/>

Venn Diagram



Venn Diagram Example



Agriculture in My Life

Recommended Grade Level:

K-2

Season:

All

Indoor

Description:

Students will use a visual organizer to learn how everyday products are related to agriculture and farms.

Background:

Agriculture is a part of our lives in many ways. From the pillow filled with feathers to the soap made from oils, agriculture is about more than just what we eat.

Materials:

- Agriculture in My Life Worksheet
- My Farm Web Worksheet
- My Farm Web Pictures
- Scissors (optional)
- Glue or glue sticks

Preparation:

1. Determine how many groups the students will be divided into and make copies of the Agriculture in My Life and My Farm Web worksheets for each group.
2. Make copies of the My Farm Web Pictures for each group and cut out the pictures. Older students may cut out their own pictures.

Activity:

1. Begin the lesson by asking students what kinds of things we use every day and where we get these things.
2. Explain that most of the things we use every day comes from the farm. Agriculture is farming the soil for growing crops and raising animals to provide food and other important products we use every day. All agriculture begins on many different types of farms. Tell students that today they'll be exploring nonfood products that come from the plants and animals we eat.
3. Pass out the Agriculture in My Life Worksheet and tell students to make a list of the agricultural products they use in one day. Allow time for students to complete their list; once completed, have students share their list. You can reference the Agriculture in My Life examples and check their work.
4. Pass out the My Farm Web pictures and worksheet and tell students they'll create a farm web. Walk students through the activity:

- Explain that agriculture begins on farms so the picture of the farm will go in the middle. Have students glue the farm in the middle circle.
- Next, ask which pictures will go in the circles closest to the farm. The pictures of the corn, trees, cotton, wheat and cows will go closest to the farm because they're grown or raised on a farm.
- Last, ask students what things go farthest away from the farm. These pictures go farthest away from the farm because factories take things from the farm and make them into products that we use every day.

Tying it Together:

1. Name some products that come from agriculture.
2. What would happen if we didn't have agriculture and farms?
We wouldn't have the foods and important products that we use in our daily lives.
3. How do farmers help us stay healthy?
Farmers grow foods that help our bodies grow healthy and strong.

Special Care:

Younger students can draw pictures on their Agriculture in My Life Worksheet or the class can brainstorm a list together and put the responses on the board.

Older students can work in groups to complete the My Farm Web Worksheets.

Digging Deeper:

Students explore what food and nonfood products are a part of their lunch in the school cafeteria. Some examples may include paper for napkins, cardboard for milk, bread for a sandwich, meat from a turkey, milk from a cow, etc.

National Standards:

CCSS.ELA: Writing: Text types and purposes.

NCSS: Production, distribution and consumption.

NGSS: Interdependent Relationships in Ecosystems.

NHES: Students will analyze the influence of family, peers, culture, media, technology and other factors on health behaviors.

Lesson Extensions:

Language Arts: Have students draw a picture of the type of farmer they would want to be and include the crops they would grow. Students who have mastered writing can write about the reasons they want to be that type of farmer.

Literature Connections:

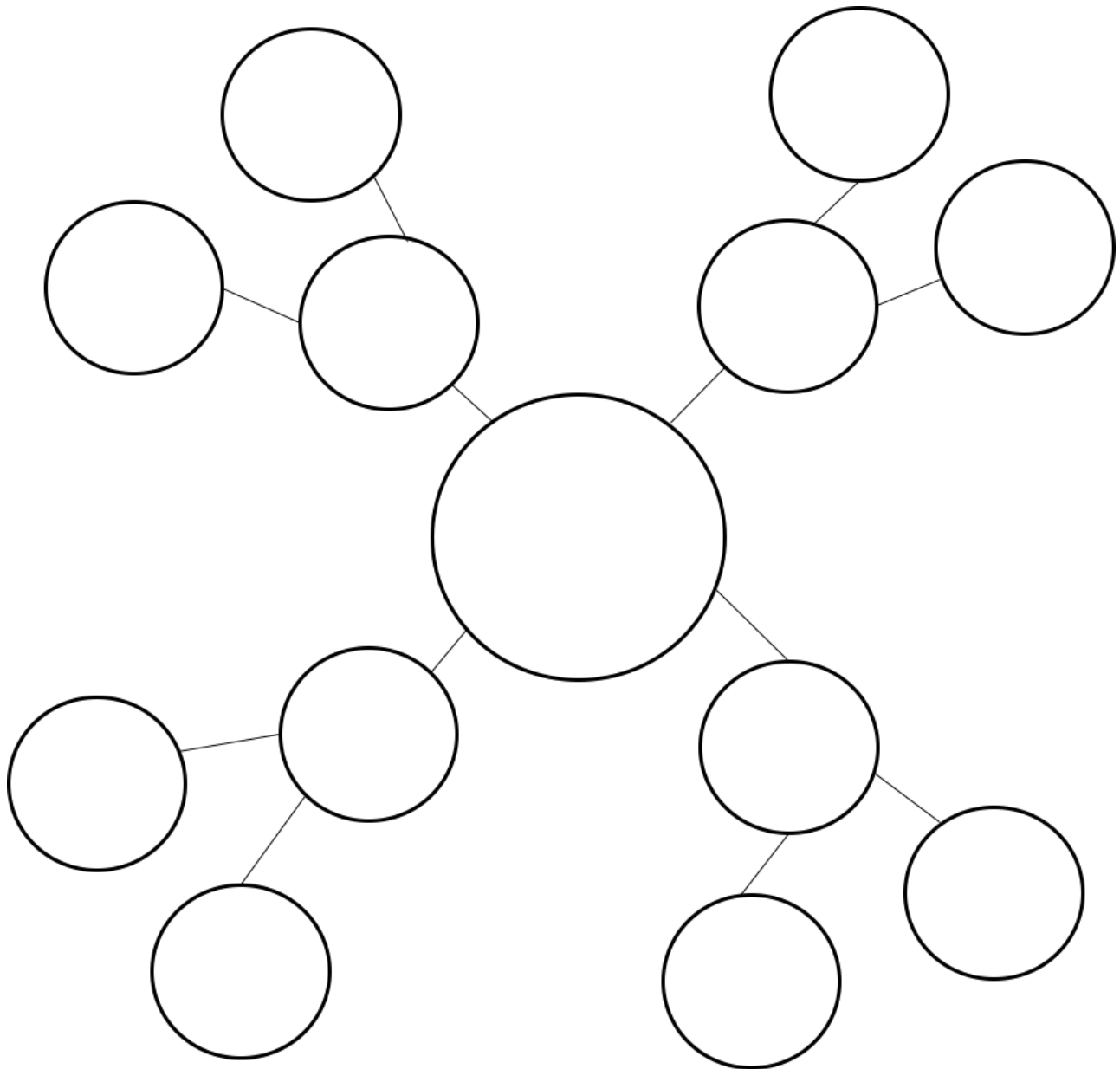
Milk: From Cow to Carton (Let's Read And Find Out Book) by Aliki

Agriculture in My Life

Make a list of the agricultural products that you use in a day.

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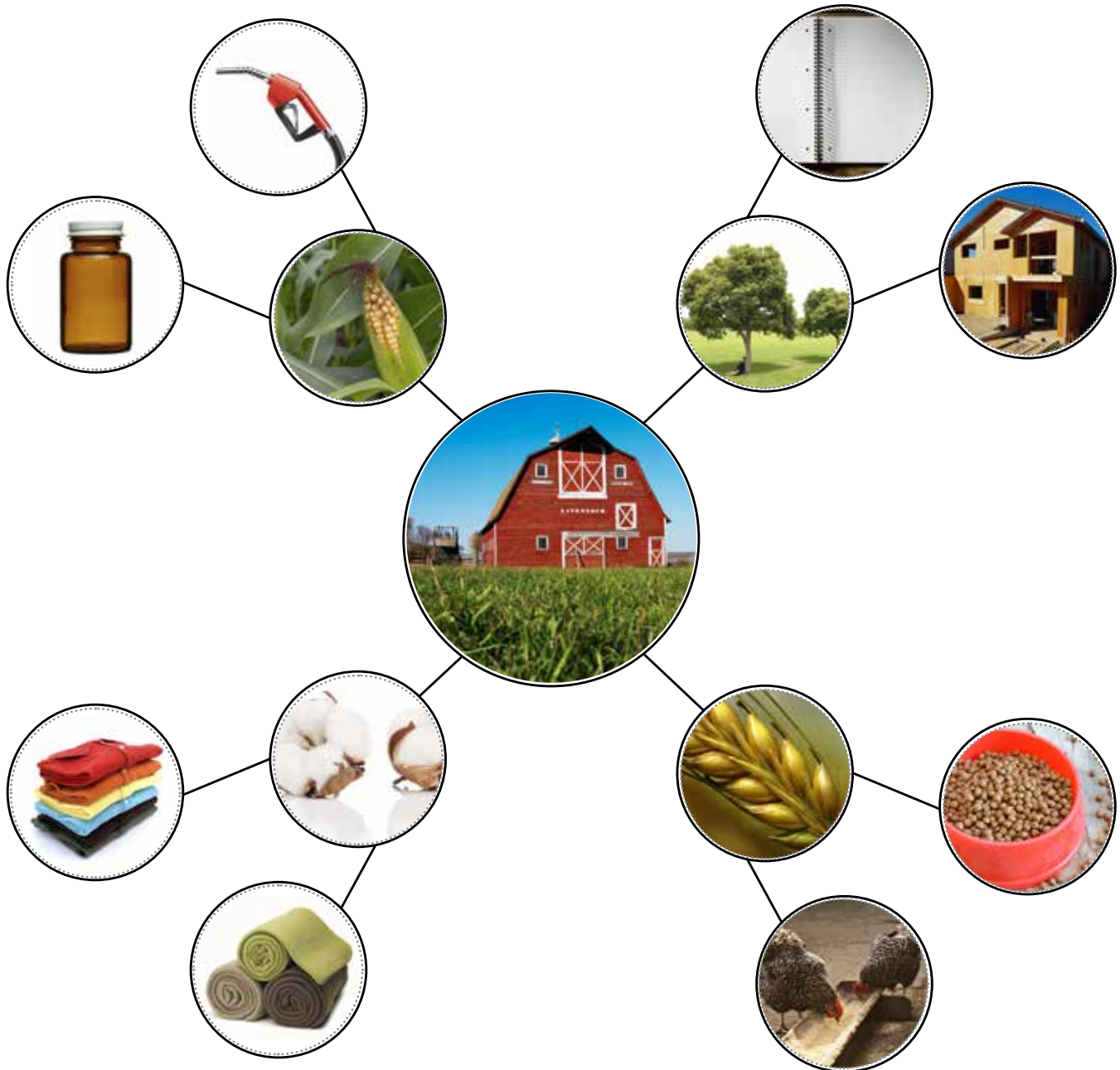
My Farm Web



My Farm Web Pictures



My Farm Web Answer Key



Recommended Grade Level:

3-5

Season:

All

Indoor

Food from Around the World

Description:

Students will research the origin of foods from around the world and how produce was introduced to countries throughout history. They'll explore fruits and vegetables native to the Americas and see how many they have tried and choose ones that they would like to try.

Background:

With many supermarkets, farmers markets and personal gardens, most people have access to a variety of fruits and vegetables from all over the world. However, this wasn't always the case. During the Age of Exploration, food started to travel the globe. This lesson will show students that a variety of fresh produce was not always readily available like it is today.

Materials:

- World Map
- Stickers or sticky notes to use as location markers
- History of Food Explorers
- Native Foods of the Americas Worksheet
- Fun Facts Monthly Calendar

Preparation:

Make copies of the Native Foods of the Americas for each student.

Activity:

1. Gather the students around a world map.
2. Explain that they'll learn about the history of foods and read the History of Food Explorers. As different regions of the world are read, have different students attach a sticky note with the foods that come from that region on the world map.
3. Pass out the Native Foods of the Americas Worksheet and explain that the fruits and vegetables are native to North and South America. Instruct students to circle the foods they have tried and underline the foods they have not tried.
4. When students are finished, have them share their responses and discuss the fruits and vegetables they would like to try.

Tying it Together:

1. How did explorers help spread fruits and vegetables around the world?

They would go search the lands for fresh foods to keep them healthy and then bring them back to their home country.

2. What places around the world have some of your favorite fruits and vegetables come from?
3. How many different fruits and vegetables have you tried? Many or a few?
4. What can you do to eat more fruits and vegetables?
5. Why is it important to eat a lot of fruits and vegetables?

Fruits and vegetables have important nutrients and vitamins that help our bodies grow healthy and strong.

National Standards:

NCSS: Culture: Human beings create, learn, share and adapt to culture.

NGS: The patterns and networks of economic interdependence on Earth's surface.

Lesson Extensions:

Math: Use the data from the individual student worksheets to look at mean, median, mode and range on favorite fruits and vegetables. Rank fruits and vegetables in the order of preference of the class.

Social Studies: Have students research a fruit or vegetable that came from another country and write a report about when it arrived to the United States, how it got here and who was responsible for bringing it.

Health: Have students sample some of the fruits and vegetables from the Native Foods of the Americas Worksheet.

Literature Connections:

Morning Meals Around The World by Maryellen Gregoire and Jeff Yesh

Kids Around The World Cook!: The Best Foods and Recipes from Many Lands
by Arlette N. Braman and Jo-Ellen Bosson

History of Food Explorers

Many of the foods we eat have traveled all around the world. Many foods started leaving their native countries and traveling the world during the Age of Exploration in the 14th and 15th centuries. Explorers were seeking valuable spices to bring back to their countries to sell. Spices were valuable during that time because methods to preserve food made some taste bad. During their search for spices, many explorers found many other types of foods and began to bring them back to their native lands.

Many of the foods we eat today traveled around the world as sailors stopped to look for fresh foods to survive. They couldn't preserve fresh fruits and vegetables for a long time, so they had to eat salted meat, dried fish, unleavened bread and biscuits. They needed the Vitamin C found in fresh produce so they wouldn't develop a disease called scurvy. Scurvy made their gums bleed and joints swell. They brought back tomatoes, potatoes, bananas, Indian corn, chocolate and tea from the New World to their countries.

Here are the suspected origins of some common foods that we eat:

- Bread is made from wheat, which is native to the Middle East.
- Tomatoes are native to Central America.
- Potatoes are native to South America.
- Oranges are from China and other parts of Asia.
- Apples are native to the mountainous regions of Central Asia.

Fresh fruits and vegetables are just as important for our health today as they were for the explorers. We only have to explore the produce shelves in the grocery stores to find new fruits and vegetables.

Adapted from Oregon Agriculture in the Classroom. <http://AITC.oregonstate.edu>.

Native Foods of the Americas

This list of foods are native to North America, Central America and South America.

1. Circle the foods from the list below that you have eaten.
2. Underline the foods that you have never tried before.

Pinto Beans

Blackberries

Blueberries

Corn

Grapes

Cranberries

Huckleberries

Peanuts

Peppers

Pineapples

Prickly Pear

Pumpkin

Squash

Strawberries

Sunflower

Artichoke

Sweet Potato

Tomatoes

Wild Rice



Fun Facts Monthly Calendar

Got the broccoli blues? Bored with bananas? The good news is there are many different fruits and vegetables that can help you get the recommended daily amount. Use this calendar to try new fruits and vegetables every month. Talk with your family and come up with your own ideas to add!

Month	Fruits	Vegetables	Fun Fact and Tip
January	Kiwifruit Pear	Celery Spinach	Kiwifruit was named by the people of New Zealand after their national bird the kiwi. Try adding kiwifruit to fruit salad.
February	Orange Tangerine	Carrot Turnip	Turnips were carved and used as lanterns before pumpkins became the Halloween tradition. Try adding turnips and carrots for a new take on mashed potatoes.
March	Apricot Avocado	Corn Swiss Chard	The avocado is actually a large berry and is sometimes called an alligator pear. Add avocado slices to your sandwich, or scoop it right out of the peel with a spoon!
April	Banana Mango	Asparagus Snow Pea	A less sweet type of banana often used in cooking is called a plantain. Make fruit kabobs with bananas, mangos and your other favorite fruits.
May	Honeydew Melon Strawberry	Artichoke Green Bean	The average strawberry has more than 200 seeds. Add strawberries to a salad for a hint of sweetness.
June	Blackberry Watermelon	Cucumber Summer Squash	Squash is actually a fruit, not a vegetable, because it contains the seeds of the plant. Try growing summer squash in your garden.
July	Cantaloupe Plum	Sugar Snap Pea Tomato	Tomatoes are eaten more than any other fruit or vegetable in the United States. Tiny cherry or grape tomatoes are a fun and delicious snack.
August	Cherry Peach	Okra Zucchini	Peaches are botanically related to almonds. They both make a great addition to whole-grain cereal or oatmeal.
September	Pineapple Pomegranate	Bell Pepper Butternut Squash	The pineapple got its name because it looked like a pine cone. Make a healthy pineapple salsa to serve with fish or chicken.
October	Apple Grape	Brussel Sprouts Cauliflower	Brussels sprouts are named for the capital of Belgium. Try roasted Brussels sprouts chips for a healthy, crunchy snack.
November	Cranberry Pear	Broccoli Cabbage	Not all pears are pear-shaped; some types look more like apples. Add sliced pears to sandwiches and salads.
December	Clementine Grapefruit	Kale Sweet Potato	A sweet potato is not a potato at all; it's more closely related to a carrot. Try baked sweet potato fries for a healthy side dish.

Recommended Grade Level:

Pre-K-3

Season:

All

Indoor

Farm to Table

Description:

Students will learn about the ingredients in foods that come from the farm by playing a matching game. Small groups will pick one fruit and one veggie to make a lists of bi-products created by the produce.

Background:

We rely on farmers to start the food production process by growing fresh produce. Produce grown on farms are used in products that we serve on our table. Learning about what produce goes into making our food gives students a springboard for connecting the farmer to the foods they eat each day.

Materials:

Farm to Table Game Cards

Preparation:

Determine how many groups the students will be divided into. Make copies and cut out the Farm to Table Game Cards for each group.

Activity:

1. Begin the lesson by asking students where they get their food and allow for discussion. Most students will say things like “my mom and dad,” “grocery store” or “lunch box.”
2. Explain that everything we eat has ingredients that come from the farm. Farmers start the food production process by growing fresh produce that’s sent directly to stores or to factories to be prepared in different ways before going to the store. When we shop in grocery stores, we can find produce in many different forms. It may be fresh and looks the way it does when it’s grown on the farm. If it’s sent to a factory for preparation, it may be cut up and put into cans or frozen in bags. Produce is even dried by removing the water. Produce can be eaten by itself or used as an ingredient in other types of foods. It’s important that we eat the right amount of fruits and vegetables each day. At each meal, you should fill at least half of your plate with fruits and vegetables. Today, we will learn about fruits and vegetables that go into some of the food products we eat.
3. Divide students into groups and pass out the Farm to Table Game Cards. Students can play different variations of the game:
 - Concentration Game: All the cards are turned upside down and students take turns selecting two cards. If they get a match, they get to keep the match and continue playing. If they don’t, then the next student takes a turn.

- Matching Game I: All of the cards are turned with the picture facing up and students pair the produce with the product match. This variation works well with younger students.
- Matching Game II: If you're playing as a class, give one card to each student and have them go around the room to find their match.

Tying it Together:

1. Why are farmers important to our lives?

They start the food production process and grow healthy foods for us to eat.

2. What are some other products that come from the farm?

Dairy products, meat, cotton, wool, grains, eggs, etc.

3. What are some healthy foods that farmers grow for us to eat?

Digging Deeper:

Have students choose two fruits and two vegetables and make a list of healthy foods that come from them.

National Standards:

CCSS.ELA: Speaking and listening: Comprehension and collaboration.

CCSS.ELA: Speaking and listening: Presentation of knowledge and ideas.

NCSS: Production, distribution and consumption.

Lesson Extensions:

Language Arts: Students draw pictures of healthy foods from the farm. Older students can write a paragraph of the process of how their food gets from the farm to the table.

Social Studies: Learn about farming and food around the world with the book *Hungry Planet – What The World Eats*, by Peter Menzel

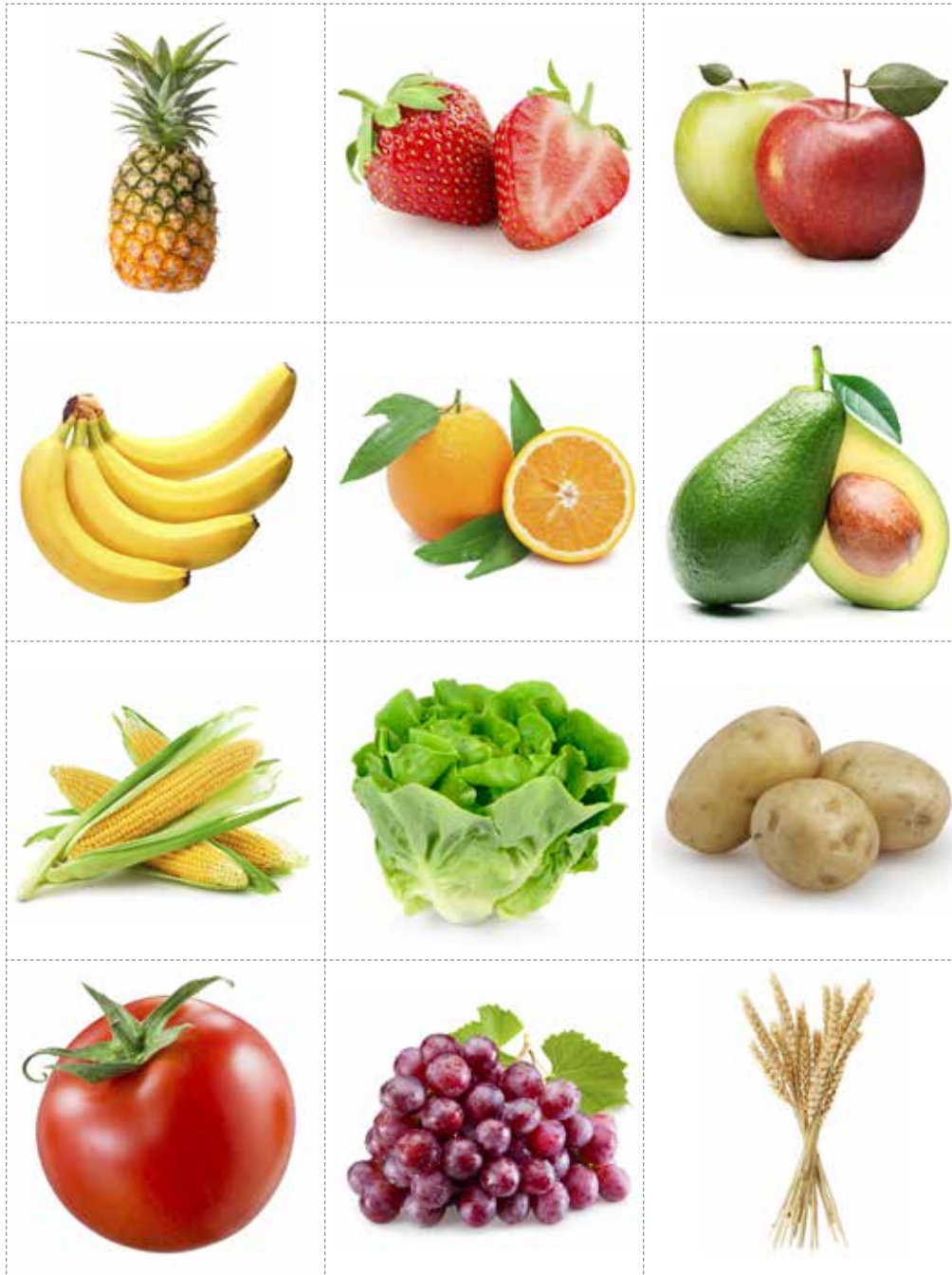
Literature Connections:

Food From Farms (World of Farming) by Nancy Dickman

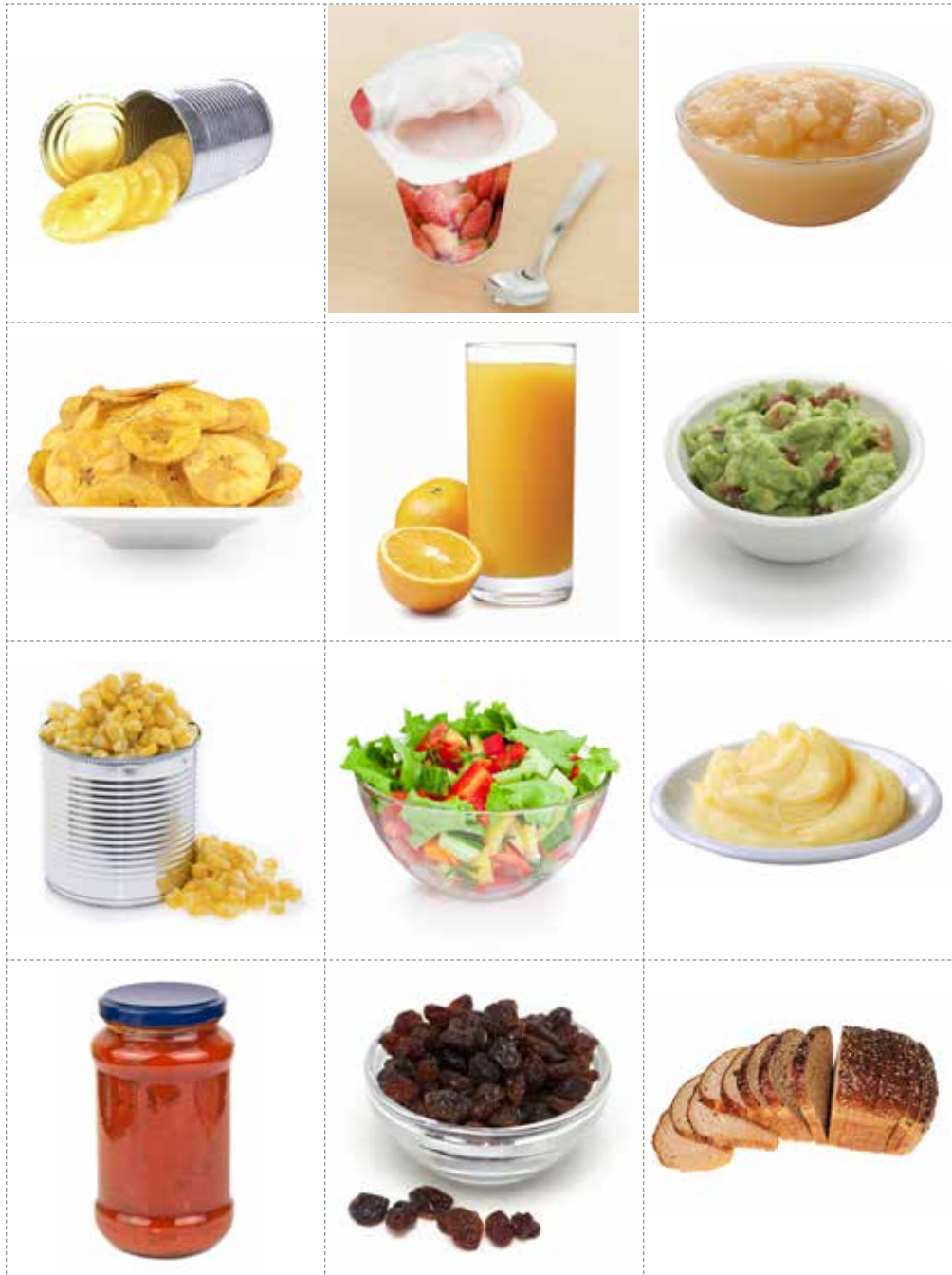
Home Connection:

Have students pick a vegetable or fruit and search their pantry or refrigerator to find as many products as they can that are made from their assigned vegetable or fruit. Have students share their findings with your class the next day.

Farm to Table Game Cards



Farm to Table Game Cards



Recommended Grade Level:

3-5

Season:

All

Indoor

Regional Farming Maps

Description:

Students will use a graphic organizer to gather information about agriculture grown in different regions of the United States.

Background:

More than 2.2 million farms in the United States produce billions of dollars worth of food that's exported around the world. If we didn't have farmers, our current food system would be very different and healthy fruits and vegetables we need wouldn't be as plentiful. Students will learn about data collection through researching state agricultural facts.

Use the following website for more background information on agriculture:

<http://www.fb.org/newsroom/fastfacts/>

Materials:

- State Agriculture Fact Sheets
https://www.agclassroom.org/kids/ag_facts.htm
- State Agriculture Facts Worksheet
- Computers with Internet access
- Major Crops Grown in the United States Chart (optional)

Preparation:

1. Provide computers with Internet access. If computers aren't available, make copies of the State Agriculture Fact Sheets.
2. Make copies of the State Agriculture Facts worksheet for each student.

Activity:

1. Gather the class in the computer lab or area in the classroom.
2. Ask students what they know about agriculture.
 - What is agriculture?
 - What agricultural things do they use in their daily lives?

3. Explain that agriculture is another word for farming and farm-related jobs. Agriculture makes grains, vegetables, fruit, meat and dairy products for people to eat all over the world. Agriculture is one of the oldest professions and began thousands of years ago. Agriculture affects our everyday lives.
4. Tell students they'll be researching information about agriculture in different states.
5. Have students pick a state to research using the State Agriculture Fact Sheets (online or printed). Pass out the State Agriculture Facts Worksheet and explain the information that they'll be gathering.
6. Allow time for them to do research.
7. Have students use the information from their State Agriculture Fact Sheets to create a poster that shows information about what's farmed in their state. Display the posters in the classroom or hallway.

Tying it Together:

1. What did you learn about agriculture in your state?
2. What similarities and differences did you notice between your state and some of the other states?
3. Was there anything that surprised you?
4. What was the most interesting fact that you learned?
5. What healthy foods come from the state that you researched?

Special Care:

Students can use a map to color and draw the different produce grown in their state.

Digging Deeper:

Students can choose a food crop from their state and find a healthy recipe that can be prepared and shared.

National Standards:

CCSS.ELA: Writing: Text types and purposes.

ISTE: Research and information fluency: Students apply digital tools to gather, evaluate and use information.

NGS: The patterns and networks of economic interdependence on Earth's surface.

Lesson Extensions:

Math: Using the data from Major Crops Grown in the United States chart, students can make calculation comparisons. For example, graph the dollar amount from each crop, rank the crops from most to least amount harvested, compare using mean, median, mode and range, etc.

Language Arts: Students write a composition using the information they found with their research.

Social Studies:

Students can work together on different regions of the United States, combine their data and report on what they found in their regions.

- Northeast
- Southeast
- Midwest
- Southern States
- Rocky Mountain States
- Pacific Northwest

State Agricultural Facts

State Name	State Flower	State Tree
Nickname	Population	State Capitol
Highest Dollar Crop	Other Crops Grown	How many different crops are grown?
Total Farmland	Average Farm Size	How Many Farms

Major Crops Grown in the United States

Major agricultural crops produced in the United States in 2011.

Crop	Harvested Area (million acres)	Profit (\$ billion)
Corn	84	63.9
Soybeans	73.8	37.6
Hay	55.7	6.7
Wheat	45.7	14.6
Cotton	9.5	8.3
Rice	2.6	2.9

Source: EPA Major Crops Grown in the United States. <http://www.epa.gov/oecaagct/ag101/cropmajor.html>