

Seed to Plate

A six-lesson curriculum to promote healthy eating through increased awareness of how food is grown and prepared

For use in grades two through eight



Produced by Jones Valley Urban Farm



2011

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About Jones Valley Urban Farm

Jones Valley Urban Farm (JVUF) is a 501(c)(3) non-profit organization that in the last ten years has successfully transformed over three acres of vacant downtown property into an urban teaching farm and initiated education programs serving thousands of adults, children, and students across Birmingham and Alabama. In our first ten years, JVUF was pioneering a new field and working to reinvent the concept of urban food production. During this time, the organization established more than 25 community/school gardens, led local reform efforts in school-based nutrition—including the removal of all deep-fat fryers from Birmingham City Schools, educated over 4,000 students through our K-8 program, and trained over 800 cafeteria and childcare workers in healthy food preparation.

As we enter our next ten years of growth, our goal is to establish a permanent education center for food, agriculture, and nutrition. JVUF's aim is to use this center as a resource for schools and teachers, helping them adapt their curriculums to meet both the learning and health needs of students in the 21st century. While many stakeholders within the field of education accept the idea of incorporating innovation and creativity in everyday curricula, it remains a difficult task for teachers given the daily demands of classroom learning. In response, JVUF is working to develop curriculums and materials that meet traditional academic standards while making room for lessons in problem solving and inquiry-based learning. By using an urban teaching farm as a basis for learning, JVUF has the ability to replace passive learning with active learning and help children and students develop the ability to think critically and creatively about core subject matter. We consider our work an investment in the future—one where Alabama children and students improve their health and wellness through a greater understanding of agriculture, food, and nutrition. For more information about JVUF, please visit our website at www.jvuf.org.

About Seed to Plate

Prompted by the award of a 2006 USDA Community Food Project grant, a diverse group of specialists convened to create Seed to Plate, an experiential education program intended to generate positive experiences with healthy food and influence people to make healthier food choices. Several years and thousands of children later, Seed to Plate is a thriving field trip program for students in grades kindergarten through eight. Groups visit our farm and partner kitchen for hands-on activities in growing, preparing, and eating healthy food. Demand continues to grow, accompanied by teacher requests for lessons to use in their own classrooms. This curriculum is a response to that need. Each lesson comprises garden and nutrition activities and healthy snacks strung together by a common theme. Lessons are correlated to National Health Education Standards (NHES) and National Science Education Standards (NSES). It is our fervent hope that Seed to Plate allows you to teach children how to prepare healthy soil to grow healthy plants to produce healthy food to make healthy people to build healthy communities.

Beginning a Garden

A school garden is a powerful resource for students and teachers alike. A garden provides a dynamic environment for observation, discovery, and experimentation. Interdisciplinary lessons in this living laboratory encourage students to become active participants in the learning process. Educational benefits of school gardens have been well-documented by researchers and include:

- Increasing positive attitudes towards fresh fruits and vegetables and towards nature and the environment
- Improving knowledge of nutrition concepts
- Improving science achievement
- Developing cooperation, self-understanding, communication, and positive behavior



Though school gardens can vary considerably based on the setting and needs of the users, the basic steps to start and sustain a garden are the same. JVUF recommends the following work plan for beginning a school garden:


1. **Promise.** Write a statement explaining why you think the garden is a good way to meet school/student/teacher/community needs. Your “pitch” for getting support for a garden should be clear and simple.
2. **Permission.** Support of the principal and other school leaders is critical to developing a garden that is sustainable.
3. **People.** Recruit a small planning group of parents, teachers, students, school staff, and community volunteers to plan the scope of the garden.
4. **Plans.** Plan how the garden will be used and maintained throughout the school year and over school breaks. Consider when it will be used, who will use it, how it can be integrated into the existing curriculum, and how plants will be used. A master plan of priorities will help the group identify goals, objectives, and intended outcomes of the garden and ensure long-term relevance and use.
5. **Pencils and plots or pots?** Plan the physical space in a way that supports the programmatic plans made. There are countless educational garden designs available in books and on the internet for gardens of all sizes and budgets. Choose elements that engage and inspire members of the school community and promote experiential learning among students.
6. **Pennies, planks, plants, and people.** Develop a resource list, budget, materials, and labor force to install and maintain the garden. Plan for upcoming seasons, lessons, events, and school breaks. Seek Master Gardener volunteers to help plan seasonal crop rotations and companion plantings.
7. **Pleasure and pride.** Promote, recognize, and enjoy garden successes! For example, plan a cafeteria taste-test of garden-grown produce; site special projects and events in the garden; and encourage students to take ownership of garden planting and projects.

How to Get the Most from This Curriculum

The activities in this curriculum, intended for students in grades two through eight, can be adapted for your students' level of background knowledge, cognitive abilities, and fine motor skills. Each lesson includes activities to be completed in the garden and in the kitchen. Suggested discussion questions are shown in bold text.

Each lesson is planned for approximately two hours and thirty minutes, but timing will vary depending on use of suggested discussions, games, recipes, and other activities.

Lesson 1

 2.5 hrs

Lesson Procedure

INTRODUCTION (20 mins)

Introduce students to the garden or farm and to staff. Give a brief history of the garden, such as how long it has been in existence, who planted it, who cares for it, what purpose it serves in the community, and how

WASHING (10 mins)

Transition to the kitchen. **What do students know about hand washing?** Discuss importance of proper hand washing with soap and warm water, using the song "McDonald" as a guideline for how long

Adapt the activities for your climate and the current season. For example, plants could be grown in a sunny window during the cold months in northern states. Refer to your local Cooperative Extension Service for information about your particular region.

Lessons are correlated to National Health Education Standards (NHES), National Science Education Standards (NSES), and State of Wisconsin Nutrition Education Standards (NES). Standards are listed on lesson opener pages.

Some lessons specify the use of food packages, magazines, or other household items. Refer to the red *Lesson Materials* box on each lesson opener page and begin gathering needed supplies.

Standards

NHES 1 Health promotion and disease prevention to enhance health
NHES 3 Access valid information, products, and services to enhance health
NHES 6 Goal-setting skills to enhance health
NES 1 Concepts related to and connections between food choices, eating habits, activity, and healthy growth
NES 2 How to keep food safe for consumption and how to prepare food safely
NES 4 Personal health promotion and disease prevention, and practice behaviors to promote health, prevent disease, and reduce health risks
NES 6 Appreciate and classify food and demonstrate an interest and appreciation for a variety of foods
NSES 6 Personal health

Lesson Materials

1. **Harvesting tools** (clippers, buckets, etc.)
2. **MyPlate poster**
3. Age-appropriate **books and magazines**, or computers with internet access
4. **Recipes and ingredients**
5. **Food preparation tools** (kid-safe knives, cutting boards, etc.)

Notes and Resources

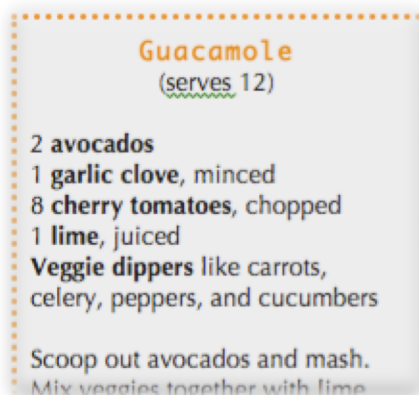
If you don't have a poster of MyPlate, you can easily draw one on a marker board or butcher paper. Refer to <http://www.choosemyplate.gov/>.

Refer to Teacher Background Information on pp. 8-9 for lesson content support.

Relevant teacher background information for all lessons is provided on pp. 8-9 and referenced on all lesson opener pages.

Each lesson includes recommended recipes. Use as many of the recipes as you like, or choose other recipes you know. Consider copying the recipe pages and placing them in clear gallon-size zipper bags to keep them clean in the kitchen.

Use whatever ingredients are available in your garden and get remaining ingredients from another source. Consider adapting recipes to make the best use of produce available in your garden.

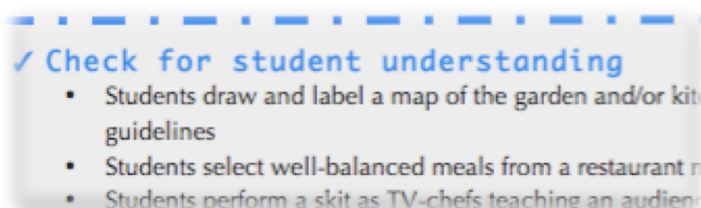


Recipes indicate the number of sample servings made.

Students can help with most parts of snack prep. Assign each student a task to complete, like chopping or blending.

Emphasize that students can tell the recipes are healthy because they contain fresh fruits and vegetables, whole grains, and heart-healthy fats and they lack excessive salt, sugar, and solid fats. Students can calculate the nutrition content of the recipes by using an internet search engine to find a nutrition data calculator, where they enter the ingredients and quantities in the recipe.

A variety of assessment options are provided in the blue *Check for student understanding* box. One or two of the activities can be assigned as appropriate, or students can choose which assessment activity to complete.



Goal:

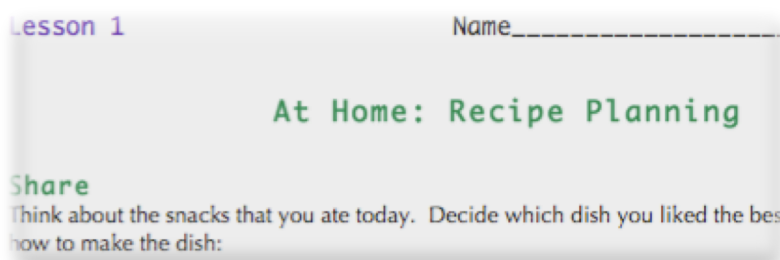
Students will be able to work with tools safely in the garden and the kitchen to prepare healthy foods that fit into a balanced meal.

Objectives:

- To justify reasons for safety guidelines
- To classify foods into the food groups and create a balanced meal (cognitive)
- To state the benefit of fruits and vegetables (cognitive)
- To work confidently in the garden and kitchen
- To use proper techniques for harvesting

Use the lesson objectives, outlined in the blue box on the lesson opener page, for guidance in evaluating student mastery of key concepts in the lesson assessments, including the *At Home* activities. Class discussion of completed assessments can also be valuable.

The *At Home* activities at the conclusion of each lesson extend the lessons to student families. They can be collected and evaluated according to lesson objectives.



Teacher Background Information

Edible Plant Parts

Is a squash a fruit or a vegetable? What about a potato? Rhubarb? Mushroom? Seed to Plate focuses on herbaceous angiosperms, or vascular flowering plants. Plants are composed of cells, which make up tissues, which make up organs, which work together in systems. Plant systems perform the functions necessary for plant life: absorbing and transforming energy; growing new tissues for different functions; and reproducing to form new plants. There are six basic plant organs: roots, stems, and leaves, which make up the root and shoot systems; and flowers, fruits, and seeds, which make up the reproductive system. Each organ has a specific structure and function. Roots absorb water and minerals and store energy. Fruits develop around a fertilized egg (a seed) to protect it and help disperse it. The term “vegetable” is nonspecific and merely refers to any edible plant part. For example, celery (stem), broccoli (flower), snow peas (fruit), spinach (leaf) and carrot (root) may all be referred to as vegetables. The term “fruit” applies only to plant parts that develop around fertilized seeds, such as tomato, apple, peach, or squash. When students aren’t sure if a plant part is a fruit or a vegetable, encourage them to cut it open to see if it contains seeds or vascular bundles (for example, the stringy part of celery) that carry nutrients through a stem. And in case you are wondering, squash is a fruit, potato is a tuber (an adapted stem tissue), rhubarb is a stem, and a mushroom isn’t a plant at all but a fungus.

The Soil Ecosystem and Soil Components

An ecosystem is all of the organisms in a place interacting with their nonliving environment. The soil is a thriving ecosystem filled with diverse organisms that play critical roles in the soil, such as breaking down organic debris, filtering water, and degrading environmental contaminants. Soil has five basic components: (1) parent material; (2) soil biota, or single- and multi-cellular organisms; (3) oxygen; (4) water; and (5) organic material, or organism waste, including dead and decomposing organisms. The parent material is small rock or mineral particles, held together in aggregates such as clumps, plates, and crumbs, which determine soil texture, structure, drainage, and chemistry. The pore space between the soil aggregates forms the habitat for plant roots and soil biota. The soil biota help cycle carbon, nitrogen, oxygen, water, and other resources through the environment. Water and oxygen are required by soil biota and are necessary for some chemical reactions. Organic material provides a source of nutrients for soil biota as well as additional habitat and nutrients to be used by plants. Plants and animals, as well as the soil biota, change the structure and chemistry of the soil as they interact with each other and their environment. The USDA’s Natural Resource Conservation Service offers additional background information on soil and free lesson plans.

Enriching Soil

“Rich” soil means soil with a high level of certain plant nutrients. Plants, like people, need some nutrients in large amounts (macronutrients) and some in smaller amounts (micronutrients). Plant macronutrient elements are: C, H, O, N, P, K, S, Ca, and Mg. Testing the soil means either testing physical properties like texture, structure, and drainage or testing chemical properties like levels of available nutrients or pH. Chemical soil tests can be performed to determine whether critical soil macronutrients (especially N, P, and K) are present in sufficient amounts for plant growth. If soil is deficient in any of these elements, soil amendments can be made to adjust pH and nutrient levels. Soil amendments include composting, mulching, companion planting, and adding fish emulsion, bone meal, or alfalfa meal. At Jones Valley Urban Farm, we practice sustainable farming using organic methods to enrich soil and deter pests. Excellent resources for organic gardening and soil amendment appropriate to specific garden needs are available at no charge through your local Cooperative Extension Service, or online at www.csrees.usda.gov/Extension.

Compost and How It Works

Composting is nature's way of recycling organic wastes, carbon-containing waste that comes from living or once-living things. Organic waste creates a habitat for soil organisms, which move into the compost and consume the waste, breaking it down into simple parts. The end result is humus, a carbon-rich, fiber-rich mixture of nitrogen, phosphorus, and potassium, which the micro-organisms have converted into nutrient forms that plants can use. The humus can be used as a soil conditioner, a fertilizer, and mulch for the garden. Anyone can make compost – either outdoors in a compost pile or bin or indoors in an aerated plastic tub. For outdoor compost, the right ingredients will attract the soil organisms to come inhabit the compost. For indoor compost, red wiggler worms, *Eisenia foetida*, should be added.

Food Handling and Safety

Food must be protected from any potential sources of contamination or spoilage. Exposure to bacteria, fungi, parasites, or viruses can cause food to spoil. Spoilage can occur if foods are left too long at unsafe temperatures or are prepared on unclean work surfaces or with unclean hands or utensils. Always ensure that work surfaces are cleaned before and after use. Hands should be washed with soap and warm water before preparing food and after touching any potentially contaminated surfaces. Utensils and other implements should be clean before use. Raw meats should be kept separate from other foods and cooked thoroughly before eating. Foods should be held at safe temperatures, which means hot food should remain above 140°F and cold food below 40°F. Foods should not be left to rest between these temperatures. Leftover food should be stored promptly and used within seven days. Food with visible mold or other growth, or food that smells “off”, should not be eaten. When in doubt, throw it out.

Healthy vs. Processed Foods

Healthy foods include fruits and vegetables, whole grains, lean protein, low-fat dairy, plant fats, and high-fiber foods. Healthy foods can be fresh or minimally processed, such as frozen or canned. These foods are high in nutrients the body needs to grow and stay healthy. Processed foods have been altered from their original state, typically with some depletion of nutrients. These foods are often packaged and include chips, boxed or microwave dinner, and many sweets. Fast food is another example of highly processed food. A whole food is typically healthier than its processed counterpart. For example, an orange is more nutritious than orange juice. Processed foods are sometimes preferred for their convenience. In this case, choosing minimally processed foods like frozen chopped vegetables can be a good option. Many healthy foods can also be prepared quickly and simply. Choosing healthy foods over processed foods can help a person maintain good overall health.

Balanced Meals

A balanced meal provides the different nutrients the body needs, including proteins, carbohydrates, fats, vitamins, and minerals, in the right proportions. MyPlate illustrates guidelines for a balanced meal. Fruits and vegetables have vitamins and minerals that strengthen the body and help protect from illness. They also provide some energy. Grains provide energy, too. Protein and dairy foods provide building material for growth and strength. Fats are used for building some structures in the body and are needed for healthy brain development.

Healthy Cooking Methods

Raw or lightly cooked foods typically retain nutrients better than fried or overcooked foods. Cooking foods with little or no added fat is ideal. When using fat, choose heart-healthy fats like olive or canola oil. Avoid butter, lard, or shortening. Healthy cooking methods include boiling, steaming, roasting, sautéing, grilling, and baking. Avoid cooking foods too hot or too long. Limit the addition of toppings like cheese or creamy dressing. Avoid adding too much sugar or salt. Vinegars, herbs, and spices can add flavor without adding sugar, fat, and salt.

Age-appropriate Nutrition

Overnutrition, or excessive food consumption, is a significant public health problem in the U.S. and is increasing in children. Eating all foods, especially fats and sweets, in moderation and choosing appropriate portion sizes can help a person avoid overnutrition. A school's child nutrition director can provide current guidelines on proper portion sizes and nutrient requirements for your students' developmental needs.

Seed to Plate

Unit Plan

	Lesson Title	Lesson Goal	Standards
Lesson 1	Rules, Tools, and Healthy Fuels	Students will be able to work with tools safely in the garden and the kitchen to prepare healthy foods that fit into a balanced meal.	NHES 1, 3, 6 NES 1, 2, 4, 6 NSES 6
Lesson 2	Edible Rainbows	Students will be able to explain how healthy soil can grow a colorful variety of nutritious plants that meet the body's needs.	NHES 3, 6 NES 1, 4, 6 NSES 2, 4, 6
Lesson 3	Weeds and Needs: Junk Food vs. Healthy Food	Students will be able to apply strategies for limiting weeds in the garden and junk food in the diet.	NHES 3, 6 NES 1, 3, 4, 6 NSES 2, 6
Lesson 4	Too Much, Too Little, Just Right	Students will be able to relate using resources wisely and limiting waste to maintaining the health of the environment and the body.	NHES 1, 4 NES 1, 3 NSES 3, 6
Lesson 5	Building Blocks in Plants and People	Students will be able to analyze the break down and build up of materials in plants, people, and the environment.	NSES 3, 4, 6
Lesson 6	Food Systems	Students will be able to evaluate the components of the food system that connect garden produce to prepared meals.	NHES 2, 4 NES 3 NSES 6



Rules, Tools, and Healthy Fuels

Goal:

Students will be able to work with tools safely in the garden and the kitchen to prepare healthy foods that fit into a balanced meal.

Objectives:

- To justify reasons for safety guidelines (cognitive)
- To classify foods into the food groups that make up a balanced meal (cognitive)
- To state the benefit of fruits and vegetables in daily diet (cognitive)
- To work confidently in the garden and kitchen (affective)
- To use proper techniques for harvesting with clippers, washing hands, and using kitchen knives (psychomotor)

Standards

NHES 1 Health promotion and disease prevention to enhance health

NHES 3 Access valid information, products, and services to enhance health

NHES 6 Goal-setting skills to enhance health

NES 1 Concepts related to and connections between food choices, eating habits, activity, and healthy growth

NES 2 How to keep food safe for consumption and how to prepare food safely

NES 4 Personal health promotion and disease prevention, and practice behaviors to promote health, prevent disease, and reduce health risks

NES 6 Appreciate and classify food and demonstrate an interest and appreciation for a variety of foods

NSES 6 Personal health

Lesson Materials

1. **Harvesting tools** (clippers, buckets, etc.)
2. **MyPlate poster**
3. Age-appropriate **books** and **magazines**, or computers with internet access
4. **Recipes** and **ingredients**
5. **Food preparation tools** (kid-safe knives, cutting boards, etc.)

Notes and Resources

If you don't have a poster of MyPlate, you can easily draw one on a marker board or butcher paper. Refer to <http://www.choosemyplate.gov/>.

Refer to Teacher Background Information on pp. 8-9 for lesson content support.

Lesson 1



2.5 hrs

Lesson Procedure

INTRODUCTION (20 mins)

Introduce students to the garden or farm and to staff. Give a brief history of the garden, such as how long it has been in existence, who planted it, who cares for it, what purpose it serves in the community, and how the food is used. Give an overview of garden guidelines.

Name game: Students take turns naming something found in a garden that begins with the same letter as their first name. Discuss the roles of these objects in the garden.

GARDEN TOUR (20 mins)

Tour the garden. **What do students notice?** Point out features and objects, explaining their roles in making the garden a productive place. Things to show and discuss include:

- Garden beds
- Tool shed
- Water system (rain barrel, hose, sprinkler, etc.)
- Compost

Emphasize guidelines, such as the proper places to step and how to handle plants, giving justification to help students understand.

Human play-dough game: Assign groups of students to create garden objects or cycles using their bodies. For example, ask a group of four students to model a tomato plant that grows, produces fruit, and dies. Other suggestions include: tool shed, water cycle, and water collection system.

HARVESTING (15 mins)

Discuss the parts of plants that are eaten: roots, stems, leaves, flowers, fruit, and seeds. Demonstrate the proper way to harvest produce. Emphasize safe handling of tools like clippers. Using the appropriate tools, harvest the produce to be used in the snack.

WASHING (10 mins)

Transition to the kitchen. **What do students know about hand washing?** Discuss the importance of proper hand washing with soap and warm water, using the song “Old McDonald” as a guideline for how long to wash. Wash hands. Then wash the harvested produce.

KITCHEN TOUR (10 mins)

Show students around the kitchen, pointing out tools and areas used for food storage, preparation, and clean up. Discuss safety guidelines, including food safety.

Kitchen categories game: Sitting in a circle, students establish a rhythm of slapping legs twice, clapping twice, and snapping twice. Speaking on the snaps, the first person names a kitchen category, such as fruits or utensils. The person next to them should then name an item in that category, followed by the next person, and so on. Continue taking turns until someone misses naming an item on the snap when it is their turn. Then the game begins again with the next person naming a new category.

BALANCED MEALS DISCUSSION (15 mins)

Display MyPlate poster. Beginning with fruits and vegetables, brainstorm what students already know about the different food groups. Discuss the role of each food group in the body. Students look through books and magazines, or use an internet search engine, to identify foods from each portion of the plate. Emphasize good sources of each food group, such as fresh produce, whole grains, and low-fat dairy. Emphasize that foods in the fruits and vegetables group can be grown in a garden. Together, agree on a symbol that conveys the role of each food group in the body. For example, fruits and vegetables help protect

Lesson 1

the body, so a shield could represent fruits and vegetables. Continue using the selected symbols throughout subsequent lessons.

KNIFE USE AND SNACK PREP (25 mins)

Describe snack to be prepared. Demonstrate proper handling of kid-safe knives. Assign students tasks with the knives and help them work with their produce. Prepare all parts of snack.

SNACK AND FOOD CLASSIFICATION (15 mins)

Serve the snack in small portions. While eating snack, prompt students to classify the ingredients into the food groups in a balanced meal, as shown on MyPlate.

GOAL SETTING (5 minutes)

Explain that goals can help us practice eating a healthy diet. Guide students in setting goals for eating fruits and vegetables over the next week, reminding students that fruits and vegetables strengthen and protect the body. Emphasize realistic goals students feel they can achieve. Establish a follow-up time for

the goals and discuss progress on that occasion.

CLEAN UP (15 mins)

Instruct students on appropriate ways to clean up, such as safely storing leftover food, placing vegetable scraps in compost, handling knives carefully, and cleaning all surfaces used. Clean the kitchen workspace.



✓ Check for student understanding

- Students draw and label a map of the garden and/or kitchen, with captions about safety guidelines
- Students select well-balanced meals from a restaurant menu, justifying their selections
- Students perform a skit as television chefs teaching an audience about working safely in the kitchen
- Students perform a skit teaching a neighbor how to properly wash their hands or demonstrate another skill learned
- Students play charades with garden and kitchen tasks
- Students describe a healthy snack
- Students explain the importance of fruits and vegetables in the diet
- Students refer to the school lunch menu and explain whether today's lunch is a balanced meal, including reasoning
- Students list the foods they ate for breakfast or lunch and classify them into the MyPlate food groups

Lesson 1

Recommended Recipes

Fruit and Veggie Stackers

(serves a group)

Make layers of a **whole-grain cracker** or **pita bread** triangle + 1 tsp low-fat **cream cheese** or **peanut butter** + a slice of **fruit** or **veggie**, like grapes, apples, bananas, tomatoes, or cucumbers.

Tip: See who can make the best-tasting or most colorful combo.

Fruity Smoothies

(serves 8)

2 C fresh or frozen **peaches** or berries
1 ½ C skim or low-fat **milk** or orange juice
1 fresh or frozen **banana**, sliced

Blend all ingredients in blender until smooth and thick.

Tip: Try substituting plain soymilk if desired.

Tip: Emphasize the natural sweetness of the fruit. Brainstorm other foods that can be sweetened with fruit instead of sugar, such as breakfast cereal.

Pita Pizzas

(serves 16)

2 medium **tomatoes**, diced
1 clove **garlic**, minced
2 Tbsp **olive oil**

Small handful of fresh **herbs**, like basil, thyme, oregano, and parsley

1 C diced **veggies**, like spinach, squash, and bell peppers

1 C shredded low-fat **mozzarella cheese**

4 **whole-grain pita breads** or flat breads

Preheat oven to 400°. Mix tomatoes and garlic with a drizzle of olive oil and herbs. Spread sauce on pitas. Sprinkle with veggies and cheese. Bake at 400° until cheese is melted, about 8 minutes.

Tip: Suggest that students arrange the veggies to make funny faces or patterns on the pizzas.



Guacamole

(serves 12)

2 **avocados**

1 **garlic clove**, minced

8 **cherry tomatoes**, chopped

1 **lime**, juiced

Veggie dippers like carrots, celery, peppers, and cucumbers

Scoop out avocados and mash. Mix veggies together with lime juice. Serve with veggie dippers.



Tip: Not enough avocados to go around? Mix in some low-fat cottage cheese.

Tip: Guacamole is a popular salad in Latin American cuisine. Look at the sticker on the avocado to see which country it came from. **What other Latin American dishes are students familiar with?**

Yogurt Dip

(serves 16)

1 C low-fat **vanilla yogurt**

1 **lime** or orange

Fruit dippers like apples and pears

Grate the zest (the colored part of the peel) of the lime and squeeze the juice. Stir zest and juice into yogurt. Serve with fruit dippers.



Tip: Focus on calcium! Calcium is needed for muscle movement and sending messages in the body. Most calcium is stored in bones and teeth. Brainstorm good sources of calcium, like low-fat milk, low-fat yogurt, low-fat cheese, salmon, spinach, broccoli, almonds, and figs.

At Home: Recipe Planning

Share

Think about the snacks that you ate today. Decide which dish you liked the best. Draw or describe how to make the dish:

Tell your family about the dish. Does it sound like something they would like?

Plan

Think about fresh fruits and vegetables that your family eats. What is your favorite fruit or vegetable to eat? Name or draw it here:

Choose at least one fruit or vegetable that you and your family could prepare together. Find a recipe for the food. You might look in cookbooks at your home or the library, ask a friend, or search the internet for a good recipe.

Act

Make the dish with your family. Draw or describe the dish here:

How did your family like the dish? Draw or describe their reactions here:

Would you make this dish with your family again? Why or why not?

Edible Rainbows

Goal:

Students will be able to explain how healthy soil can grow a colorful variety of nutritious plants that meet the body's needs.

Objectives:

- To describe methods for enriching soil (cognitive)
- To state the benefit of eating fruits and vegetables of various colors (cognitive)
- To distinguish between cooking methods that help foods retain nutrients and those that deplete nutrients (cognitive)
- To model a colorful snack or meal (psychomotor)

Standards

NHES 3 Access valid information, products, and services to enhance health

NHES 6 Goal-setting skills to enhance health

NES 1 Concepts related to and connections between food choices, eating habits, activity, and healthy growth

NES 4 Personal health and disease prevention, and practice behaviors to promote health, prevent disease, and reduce health risks

NES 6 Appreciate and classify foods and demonstrate an interest and appreciation for a variety of foods

NSES 2 Properties of objects and materials

NSES 4 Properties of earth materials

NSES 6 Personal health

Lesson Materials

1. **Spades**
2. Plastic **cups**
3. **Butcher paper**
4. **Water**
5. Age-appropriate **books** and **magazines**, or computers with internet access
6. **Harvesting tools** (clippers, buckets, etc.)
7. **Marker board** or butcher paper
8. **Recipes** and **ingredients**
9. **Food preparation tools** (kid-safe knives, cutting boards, etc.)
10. **Talking totem** (ball, potato, or orange)
11. **Broccoli**
12. **Pot** with **lid** and **steamer basket**
13. **Egg**
14. **Frying pan**

Notes and Resources

Refer to Teacher Background Information on pp. 8-9 for lesson content support.

Lesson 2



2.5 hrs

Lesson Procedure

REVIEW (10 mins)

Welcome students back to the garden. Prompt students to summarize garden and kitchen guidelines. Try to recall the garden words that matched each student's name in the name game.

MUD MURAL (15 mins)

Students use spades and cups to collect soil samples of different colors and textures from around the garden site. On a large piece of butcher paper, students can use water to "finger paint" with their dirt and make a mud mural. **How does soil look, feel, and paint?**

ENRICHING SOIL (15 mins)

How does soil support plant growth?

Prompt students to brainstorm what is in the soil. Discuss soil components with an emphasis on how soil meets plant needs, such as by providing water and nutrients.

Where do the nutrients in soil come from?

Show how soil can be enriched with more nutrients by touring the garden and pointing out examples of composting, crop rotation, and cover crops, describing the methods as you go. If possible, students help with a task like building a compost heap; applying compost, bone meal, egg shells, or fish emulsion to beds; making compost tea; or scattering seed for a cover crop. Emphasize how the action will benefit plants by providing nutrients in a form that the plants can use.

PLANT PARTS SCAVENGER HUNT (10 mins)

Explain that different plant parts store different nutrients in plants. Name different plant parts (roots, stems, leaves, flowers, fruit, and seeds) and ask students to locate edible examples of each. Use the garden if possible, or use books and magazines or an internet search engine if garden plants are not sufficient. Remind students that many of

the nutrients in different plant parts come from the soil.

Plant parts game: Form students into small groups. Name different produce plants. In groups, students decide who will play which part and model the plant with their bodies.

HARVESTING (10 mins)

Harvest produce of numerous colors for use in the snack. Emphasize that fruits and vegetables come in a variety of colors and that different colored foods often contain different nutrients.

WASHING (10 mins)

Transition to the kitchen. Review hand washing guidelines and wash hands and harvested produce.

RAINBOW MODEL (10 mins)

Explain that eating meals and snacks with a lot of color variety is a good way to be sure to get all the vitamins and minerals the body needs. Draw a rainbow on a marker board and brainstorm fruits and vegetables for every color of the rainbow.

Tasty trio game: Students sit in a circle and the first student names a healthy food. The next two students name different colored foods that go well with the first food. For example: celery + peanut butter + raisins.

SNACK PREP (20 mins)

Review safety guidelines and knife use. Lead students in preparing the healthy snack that features at least five fruits and vegetables of various colors. Emphasize the recommended 5-9 servings of fruits and vegetables each day.

SNACK AND COLOR COUNTING (15 mins)

While eating snack, ask students to count

how many different colors are present. Emphasize the value of eating fruits and vegetables raw to conserve all of the nutrients. Guide students in setting goals for color variety in their meals or snacks over the next week.

Alphabet soup game: Students sit in a circle and one person holds the talking totem. He or she says, “I’m thinking of garden produce that starts with the letter ____.” They pass the talking totem to the right and the next person must name an example that starts with that letter. Continue passing the totem until a student is stumped. The next student begins the next round by naming a new letter. This game can help students think of fruit and vegetable examples beyond those they might be most familiar with eating.

COOKING METHODS MODELING (20 mins)

Display or suggest cooking implements, such as a frying pan, a pot of water, and a microwave. **What associations do students have with each implement? What other cooking methods are students familiar with?** List cooking methods on a marker board. Explain that cooking affects the nutrients in foods. Put a bunch of broccoli on to steam. Cook just until bright green and crisp-tender and remove half the broccoli. Students

sample correctly steamed broccoli. Allow the remainder to cook until the broccoli is pale and the water is green. **Why is the broccoli pale and the water green?** Sample again and compare the two differently steamed broccolis. Emphasize that some of the nutrients have been cooked out of the food and are now in the water instead, because the food cooked too long. Then ask a student to crack an egg into a bowl. **What is the raw egg like?** Heat a frying pan and ask a student to dump the egg into the hot pan and cook it. **How does the cooked egg differ from the raw egg?** Emphasize that heat changes the proteins in the egg and that in some cases, high heat can ruin nutrients. Refer back to the list of cooking methods, prompting students to cross through the methods they think involve cooking too long or too hot. Remind them of the raw foods in their snack. Discuss ways students could aim for healthier food preparation methods over the next week, such as by helping make a salad at home or ordering grilled instead of fried at a fast-food restaurant.

CLEAN UP (15 mins)

Store all leftover food, deliver kitchen scraps to compost, and clean the kitchen workspace.

✓ Check for student understanding

- Students read restaurant menus and choose colorful, healthfully prepared dishes they would like to order, justifying their choices
- Students work in small groups to perform “mad scientist” skits in which they teach the audience about enriching soil
- Students print images from the internet and paste onto paper plates to make a well-balanced meal featuring at least five different colors
- Students design a daily menu plan that includes at least five servings of colorful fruits and veggies
- Students create pictures of gardens or farms using at least five different colored crayons, markers, colored pencils, or paints
- Students share nutritious recipes they make at home with their families, justifying healthy ingredients and cooking methods

Lesson 2

Recommended Recipes

Fresh Rainbow Salad Bar

(serves a group)

Create a salad bar with fresh **veggies**, **fruits**, and **condiments**. Students build their own rainbow salads.

Tip: What other healthy foods could be included in a salad bar?

Rainbow Fruit Salad

(serves 12)

- 1 **apple**, chopped
- 1 **pear**, chopped
- 1 **peach**, chopped
- 1 **banana**, chopped
- 2 Tbsp **orange juice**

Combine fruit and toss with orange juice.



Cucumber Yogurt Dressing

(serves 16)

- 1 C peeled, chopped **cucumber**
- 3 Tbsp low-fat **plain yogurt**
- 2 Tbsp **olive oil**
- 1 tsp **balsamic vinegar**
- ¼ tsp **salt**
- ¼ tsp **black pepper**
- ¼ tsp dried **dill**

Combine ingredients in blender or food processor and blend until smooth. Serve as a salad dressing or with **veggie dippers**.

Basil Pesto

(serves 16)

- ½ C **sunflower seeds**
- ½ C grated **Parmesan cheese**
- 2 **garlic cloves**, minced
- ½ C **olive oil**
- 4 C packed fresh **basil leaves**
- ½ tsp **salt**

• Toast sunflower seeds at 350° for 8 minutes. Combine seeds, cheese, garlic, and oil in blender or food processor and blend until no large chunks remain. Gradually add basil and blend until smooth. Season with salt.



• **Tip:** A toaster oven is an easy way to toast the seeds.

• **Tip:** Basil pesto is a great pasta sauce or dip for whole-grain bread or crackers.

• **Tip:** Use basil pesto as a pizza sauce on whole-grain pita crust. Sprinkle with a little low-fat shredded cheese and bake at 400° for 8 minutes or until cheese is melted.

Rainbow Pasta Salad

(serves 18)

- 8 oz **whole-wheat** or tricolor **spiral pasta**
- ½ C chopped **tomatoes**
- ½ C chopped **broccoli florets**
- ½ C chopped **cucumbers**
- ½ C chopped **carrots**
- ½ C chopped **bell pepper**
- ½ C **corn** kernels
- ½ C **basil pesto** or Italian dressing

• Cook the pasta according to package directions. Rinse under cold water. Add chopped vegetables and toss with dressing.

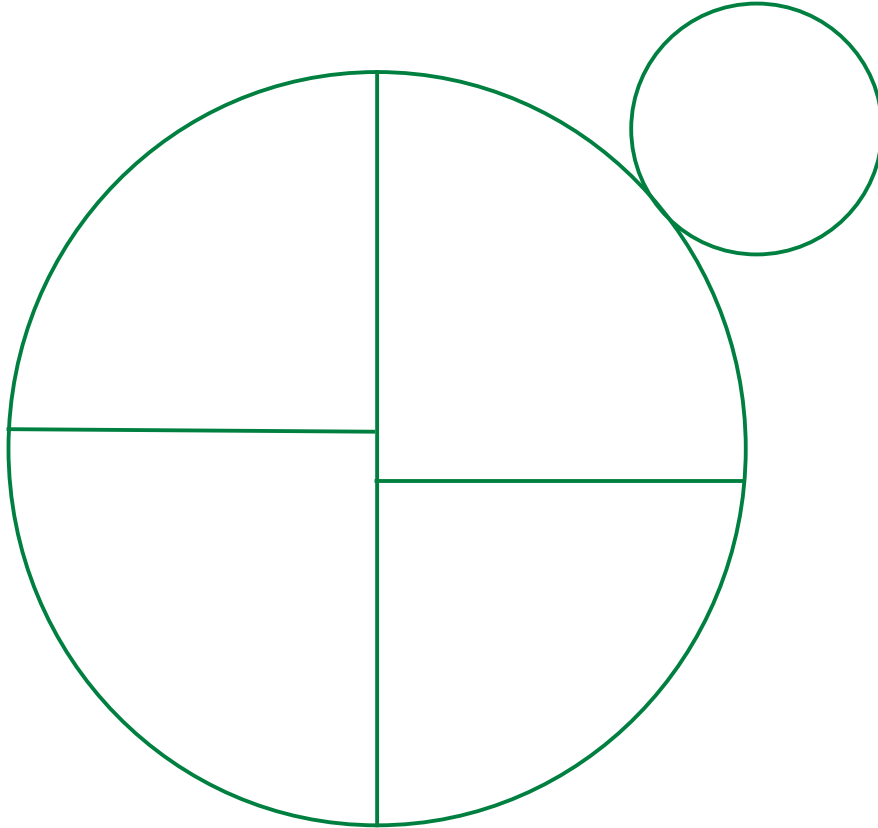


• **Tip:** What rainbow pasta salads would students make with their favorite veggies and dressings?

At Home: Color a Colorful Meal

Draw

Imagine a yummy meal made up of nutritious foods that are at least five different colors. Color the meal on the balanced plate below. See how many different colors you can use! Next to each space, add adjectives describing the foods, such as “hearty”, “baked”, or “crunchy”.



Share

Share your colorful picture with your family. Explain how the variety of colors means that the meal provides different nutrients that your body needs.

Act

Next time you eat together as a family, count the number of colors on your plates. Write the number here: _____. List the cooking methods for the meal here: _____. List two things you’d be willing to try next time to make your meal more colorful or to use healthier cooking methods:

- 1.
- 2.

Weeds and Needs: Junk Food vs. Healthy Food

Goal:

Students will be able to apply strategies for limiting weeds in the garden and junk food in the diet.

Objectives:

- To explain how weeds compete for resources in the garden (cognitive)
- To distinguish between healthy foods and processed foods high in added sugar, fat, or salt (cognitive)
- To interpret nutrition labels (cognitive)
- To plan meals based on healthy foods (cognitive)
- To effectively rid a garden crop of weeds (psychomotor)

Standards

- NHES 3** Access valid information, products, and services to enhance health
- NHES 6** Goal-setting skills to enhance health
- NES 1** Concepts related to and connections between food choices, eating habits, activity, and healthy growth
- NES 3** Critical thinking and practical reasoning skills to address food choices, nutrition, and health concerns
- NES 4** Personal health promotion and disease prevention, and practice behaviors to promote health, prevent disease, and reduce health risks
- NES 6** Appreciate and classify foods and demonstrate an interest and appreciation for a variety of foods
- NSES 2** Properties of objects and materials
- NSES 6** Personal health

Notes and Resources

Refer to Teacher Background Information on pp. 8-9 for lesson content support.

Lesson Materials

1. **Gloves** for weeding
2. **Harvesting tools** (clippers, buckets, etc.)
3. **Apple**
4. Container of **applesauce**
5. **Boxed** or frozen **dinner**
6. Assorted **nutrition labels**
7. Regular (not diet) **soda can** or bottle
8. **Sugar packets**

9. Tape

10. Big take-out **beverage cup**
11. **Refined white flour**
12. **Whole-wheat flour**
13. Bottle of **olive oil** or canola oil (half empty is best)
14. Canister of **hydrogenated shortening**, such as Crisco

15. Package of fatback

16. **Recipes** and **ingredients**
17. **Food preparation tools** (kid-safe knives, cutting boards, etc.)
18. Small **cards with words related to nutrition, food groups, and MyPlate**
19. **Timer**
20. **Marker board**

Lesson 3



2.5 hrs

Lesson Procedure

REVIEW (5 mins)

Welcome students back to the garden.
Review content by asking students how a colorful diet can help keep them healthy.

WEEDING (10 mins)

Walk around the garden and surrounding areas, prompting students to identify weeds.

What do students know about weeds?

Emphasize that weeds compete with crops for resources like water, nutrients, soil space, and sunlight. Predict the consequences of weeds in a garden and highlight the value of removing weeds. Guide students in differentiating between weeds and food plants in a selected garden bed.

Demonstrate the proper way to remove weeds by the roots so they can't grow back. Weed the specified area of the garden.

Should the pulled weeds be added to the compost pile? Explain that weeds can take over a compost pile and discard the weeds in a trash bin instead. Show examples of other weed-control methods, such as ground cloth or mulch, if possible.

HARVESTING (10 mins)

Harvest garden produce for use in the day's snack.

WASHING (10 mins)

Transition to the kitchen. Wash hands and harvested produce.

HEALTHY FOODS IDENTIFICATION (20 mins)

Display an apple and a package of applesauce. **How are they alike and different? Are they healthy? How can you tell?** Guide students in drawing the conclusion that the apple is a healthier choice because it still contains all the nutrients and doesn't contain any added ingredients. Point out that some nutrients may be lost in making applesauce. The

applesauce may also have added sugar. Use the nutrition label and ingredients list to show how to determine if it has added sugar. Then display a boxed dinner and ask students to describe it. Guide students in interpreting the nutrition label. Emphasize that the boxed dinner contains added sugar, fat, and salt, as well as some ingredients that are not even foods. Distribute assorted nutrition labels and guide students in classifying foods as healthy foods or junk foods based on the information in the labels. (Note that nutrition information is based on a 2,000-calorie diet for adults, and children's needs may vary. Check with your school's child nutrition director for guidance.) Focus on correct identification of fresh, whole, and minimally processed foods such as produce, beans, nuts, whole grains, fresh dairy, and fresh meats.

SUGARY SODA MODEL (10 mins)

Display a regular soda can or bottle. **Is it a healthy food or a junk food?** Students read the nutrition label to identify the amount of sugar in the can. Using the formula [4 grams sugar = 1 teaspoon sugar = 1 sugar packet], determine the equivalent number of sugar packets in the can. Tape that number of sugar packets together in a strip. **Are students surprised by the length of the strip? Why or why not?** Then show a big take-out cup with the volume labeled on the bottom. Determine the equivalent number of sugar packets in the cup if it were filled with the same soda. To do this, determine the number of cans the cup would hold and multiply that number by the number of sugar packets in the can. Make another sugar packet strip to illustrate the sugar content in a soda this size. Discuss times when students might drink too much soda. **How might this prevent them from getting all the nutrients they need?** Discuss healthier

beverage options, such as water, milk, or unsweetened tea. Guide students in setting goals to limit their sugary drink intake to an appropriate amount over the next week.

WHOLE GRAINS OBSERVATION (5 mins)

Pass around samples of refined white flour and whole-wheat flour. **How do the flours look, feel, and smell?** Compare the nutrition labels. Highlight student observations to emphasize that whole-wheat flour still contains all of the nutrients in the wheat, unlike white flour, and that whole grains are more nutritious than refined grains. **What are some whole-grain foods students like?** **How can students replace some refined-grain foods in their diet with whole-grain foods?**

HEALTHY FATS MODEL (5 mins)

Present containers of oil and shortening and a package of fatback. **What do students observe about the three fats?** Open the lid of the shortening (leave the cap on the oil) and turn both containers upside down. **What do students observe?** Compare the nutrition labels, focusing on saturated fat. Emphasize that liquid fats, or plant fats, are healthier than solid fats, like animal fats or processed fats, because they do not clog blood vessels.

SNACK PREP (30 mins)

Review safety guidelines and knife use. Lead students in preparing the healthy snack that

contains fresh produce, whole grains, and healthy fats.

SNACK AND HEALTHY FOOD

IDENTIFICATION (15 mins)

While eating snack, guide students in counting all of the snack ingredients that are fresh, whole, or unprocessed foods. Identify whole grains and healthy fats. Refer to ingredient nutrition labels. **How can processed junk foods crowd out healthier foods in the diet?** Compare junk foods to weeds that compete for garden resources.

CLEAN UP (15 mins)

Store all leftover food, deliver kitchen scraps to compost, and clean the kitchen workspace.

HEALTHY FOOD MENU (15 mins)

Students draw or describe a one-day menu of foods they like for a diet rich in healthy foods. Share with the group, if time allows.

Nutrition pictionary game: Divide students into two teams. A member of the first team draws a word card. The student has 45 seconds to illustrate the word (no words, numbers, or gestures!) on the marker board while their teammates try to guess. If they guess correctly, they earn a point. If they do not, the opposing team has 30 seconds to try to guess the word and steal the point. Then it is the second team's turn to draw and guess. Play continues.

✓ Check for student understanding

- Students draw pictures of their lunches and suggest how to swap out junk foods, if any, for healthier foods that would be more nutritious
- Students compile recipes for a meal that includes fresh produce, whole grains, and healthy fats
- Students write haiku poems about healthy foods in the diet
- Students work in groups to create television ads or raps promoting healthy foods, such as whole grains or fresh produce
- Students use nutrition labels to classify foods as healthy or junk foods, providing justification
- Students record what they eat the following day, circling fresh or whole foods and underlining junk foods

Lesson 3

Recommended Recipes

Hummus Dip

(serves 16)

- 1 can **garbanzo beans**, rinsed and drained
- 1 can **white beans**, rinsed and drained
- 2 cloves **garlic**
- $\frac{1}{4}$ C **olive oil**
- $\frac{1}{4}$ C **lemon juice**
- Salt** to taste
- Veggie dippers** like carrots and peppers

Place beans and garlic in blender or food processor and blend until smooth, adding a little water if necessary. Gradually add olive oil. Add lemon juice and season with salt. Serve with veggie dippers.



Tip: This dip originated in the Middle East. **What other Middle Eastern or Mediterranean foods are students familiar with?**

Tip: Emphasize the value of beans in the diet. Beans are inexpensive and are packed with lean protein and fiber. **What beans do students like best?**

Tip: Use on a sandwich in place of mayonnaise, which is a processed food high in fat.

Un-Soda

(serves a group)

- Unsweetened **soda water**
- 100% juice**, such as orange, grape, or pineapple

Pour a glass three-fourths full of soda water and top it off with $\frac{1}{4}$ C 100% juice for a refreshing drink.

Tip: How is this a healthier choice than regular soda? Pass around a soda can and a juice bottle so students can observe the sugar contents specified in the nutrition labels. Emphasize that even 100% juice is high in sugar and should be limited.

Tip: Emphasize the role of water in keeping the body healthy. Both plants and people need plenty of it, especially in warm weather. Water is always a healthy beverage choice!

Corn Salsa

(serves 16)

- 2 ears of **corn** (or use drained canned or frozen)
- 1 can **black beans**, rinsed and drained
- 1 small **red onion**, finely diced
- 1 small **tomato**, diced
- 1 small **bell pepper**, diced
- 1 **lime**, juiced
- Small handful of fresh **cilantro**, chopped
- Salt** and **pepper** to taste
- Whole-grain dippers** like crackers, pita chips, tortilla chips, or rice cakes

Cook corn in boiling water for four minutes. Cool until the corn can be handled easily, then scrape the kernels from the cob with a knife. Combine with the remaining vegetables. Add lime juice, cilantro, and salt and pepper to taste. Serve with whole-grain dippers.

Tip: Corn has been grown by Native Americans for centuries. Discuss other nutritious foods grown by Native Americans, such as beans and squash.

Tip: Which types of vegetables do most students eat? Emphasize that frozen vegetables are nutritionally similar to fresh vegetables and are healthy choices. Canned vegetables without salt or other additives are a good option when fresh or frozen vegetables are not available.

Whole-Wheat Crackers

(serves 20)

- 1 ½ C **whole-wheat flour**
- 1 ½ C **white flour**
- 1 tsp **salt**
- 1/3 C **olive oil**
- 1 C cold **water**
- Salt, pepper**, and **herbs** for sprinkling

Preheat oven to 350°. Mix flours and salt. Add oil and mix with a fork. Add water and mix until blended. Divide into four balls and knead each on the counter for several minutes. Flour the counter and a rolling pin and roll each ball out as thin as possible. Transfer dough to a lightly floured baking sheet. Mark individual crackers with a knife, but do not cut all the way through the dough. Prick with a fork and sprinkle lightly with salt, pepper, and herbs. Bake at 350° for 25 minutes, until crisp and golden. Cool and break apart into individual pieces.

At Home: Kitchen Raid

Plan

Healthy foods include the following: fruits, vegetables, beans, whole grains, low-fat dairy, and lean, unprocessed meats. Processed foods, or junk foods, are often high in added sugar, fat, and salt. For example, potato chips and cookies are processed foods. Prepared meals like frozen dinners are often junk foods, too, because many of them contain few nutrients and are high in sugar, fat, and salt.

List or draw some fresh, healthy foods that you like to eat:

Classify

Choose one pantry shelf, food cabinet, or refrigerator shelf in your family's kitchen. With the help of a family member, look through the foods on that shelf. In the space below, make a list of the healthy foods and a list of the junk foods on the shelf.

How many different healthy foods did you find? How many junk foods? Of which type of food is there more? Which type of food does your family buy more frequently?

Recommend

Think about the junk foods in your family's kitchen. When does your family typically eat them? Think about meals at home, meals on the run, snacks, and desserts. Make recommendations for three junk foods in your kitchen that you could replace with healthy foods in the future. List or draw them here:

Junk food:

1.

2.

3.

Healthy food:

1.

2.

3.

Too Much, Too Little, Just Right

Goal:

Students will be able to relate using resources wisely and limiting waste to maintaining the health of the environment and the body.

Objectives:

- To identify resources plants and people need for growth (cognitive)
- To predict consequences of using resources excessively or wastefully (cognitive)
- To differentiate appropriate portion sizes (cognitive)
- To apply personal responsibility in caring for garden and self (affective)
- To plant and care for seeds and seedlings (psychomotor)

Standards

NHES 1 Health promotion and disease prevention to enhance health

NHES 4 Interpersonal communication skills to enhance health and avoid or reduce health risks

NES 1 Concepts related to and connections between food choices, eating habits, activity, and healthy growth

NES 3 Critical thinking and practical reasoning skills to address food choices, nutrition, and health concerns

NSES 3 Characteristics of organisms; Structure and function in living systems; Regulation and behavior

NSES 6 Personal health; Populations, resources, and environments

Lesson Materials

1. **Potting soil mix**
2. **Soil test kits**
3. Fast-germinating, seasonally appropriate **seeds**
4. **Cups**
5. **Take-home instructions** for seedling care
6. **Harvesting tools** (clippers, buckets, etc.)
7. **Portion size models** (baseball, deck of cards, light bulb, dice, spoon)
8. **Measuring cups and spoons**
9. Assorted **nutrition labels**
10. **Recipes and ingredients**
11. **Food preparation tools** (kid-safe knives, cutting boards, etc.)
12. **Food advertisements and food packages**

Notes and Resources

For soil testing, grades 2-3 use capsule chemistry kits and grades 4-8 use Lamotte kits. Kits can be purchased from a garden store or a science teacher supply company.

Your local Cooperative Extension Service can recommend appropriate seeds. Instructions for seedling care can be copied from seed packets.

Refer to Teacher Background Information on pp. 8-9 for lesson content support.

Lesson 4



2.5 hrs

Lesson Procedure

REVIEW (5 mins)

Welcome students back to the garden. Review content by asking students to list healthy foods they've eaten that day or week.

GARDEN NEEDS TOUR (10 mins)

Take a walk around the garden. For each object, supply, or structure encountered, prompt students to explain how it is used to grow healthy plants. **What resources do plants need to grow? How are these needs met?** If possible, point out methods for recycling resources, such as a rain barrel, a compost pile, or recycled planting containers. Discuss sunlight as a valuable energy source. If available, show examples of plants that have been over- or under-watered. Emphasize the importance of conserving resources and using only as much as is needed. **What are some negative consequences of wasting resources?** Relate to the waste of food, water, fossil fuels, and money.



SOIL TESTING (20 mins)

Remind students that the nutrients in soil help grow healthy plants. Show students how to identify fertilizer numbers on a package of potting soil mix. Work together to test soil chemistry for N, P, K, and pH.

Explain that people need similar nutrients: N (nitrogen) for tissue and muscle growth, P (phosphorous) for bone growth, and K (potassium) for muscle functioning.

PLANTING SEEDS (15 mins)

Students plant their own seeds with the potting soil mix in individual cups to take home with them. **How will students provide the resources needed for growth?** Provide printed instructions for plant care.

Right light game: Students pretend to be plants. Call out various light conditions: full sun, partial sun, and indirect light. For each light condition, students run to an area of the garden with the right lighting. Then, observe light conditions in the garden and identify plants that thrive in each light condition. Tomatoes, peppers, squash, corn, eggplant, and basil are full-sun loving. Leafy greens, peas, beans, beets, turnips, and carrots, are suited to partial sun. Asparagus, leeks, and mint prefer indirect light.

HARVESTING (10 mins)

Harvest garden produce for use in the day's snack.

WASHING (10 mins)

Transition to the kitchen. Review hand washing guidelines and wash hands and harvested produce.

PORTION SIZE ILLUSTRATION (10 mins)

Prompt students to suggest resources people need for growth. **What happens when people get too much or too little of a resource?** Emphasize the benefits of eating well for active living and disease prevention, including eating in moderation. Name common foods and prompt students to draw or model what they think is an appropriate serving size of that food. Use portion visuals

to illustrate appropriate serving sizes:

- Cup of cereal, leafy vegetables, or yogurt or a piece of fruit: a baseball
- Meat, poultry, fish: a deck of cards
- Medium potato: a light bulb
- Teaspoon of butter or another high-fat spread: a die
- Tablespoon of peanut butter or dressing: a spoonful

Demonstrate sizes of measuring cups and spoons, emphasizing that these are often the guides on nutrition labels. Pass around nutrition labels and guide students in identifying portion sizes.

SNACK PREP (30 mins)

Review safety guidelines and knife use. Lead students in preparing the healthy snack. Focus on limiting waste and recycling or composting where appropriate.

SNACK AND SERVING SIZE DISCUSSION (15 mins)

Serve the snack in appropriate portion sizes.

While eating snack, brainstorm times students might eat more than they need, such as at a party or a buffet, or when someone else serves their plate. Invent solutions to help students control their portion sizes. Rehearse scenarios so that students can practice the strategies.

CLEAN UP (15 mins)

Store all leftover food, deliver kitchen scraps to compost, and clean the kitchen workspace.

RESISTING EXCESSIVE PORTIONS (10 mins)

Show examples of food advertisements and food packages. Students sort images into two groups based on whether image depicts an appropriate or excessive portion size.

How can media sometimes encourage people to eat too much? How might peer behaviors affect portion sizes? Guide students in making personal plans for how they can resist influence from media, friends, or family to eat more than they need.

✓ Check for student understanding

- Students draw and label a garden map to show how plants get the resources they need for growth
- Students create a one-page how-to guide for taking care of their seedlings, with emphasis on resources the seedlings need to survive
- Students select objects of their choice to represent appropriate serving sizes for favorite foods
- Students identify television, magazine, or billboard advertisements that depict or encourage excessive portion sizes and describe how they would modify the ads to encourage responsible eating
- Students draw a plan for a small garden that conserves resources and recycles
- Students list the resource needs that plants and people have in common

Recommended Recipes

Roasted Broccoli

(serves 10)

- 1 bunch **broccoli**
- 3 Tbsp **olive oil**, divided
- Salt** and **pepper** to taste
- $\frac{1}{4}$ C **Parmesan cheese**

Preheat oven to 425°. Spread broccoli on baking sheet greased with 1 Tbsp olive oil. Drizzle with remaining 2 Tbsp olive oil and sprinkle with salt and pepper. Roast broccoli at 425° for 20 to 25 minutes. Toss with Parmesan cheese.



Tip: Emphasize that limiting toppings like cheese, dressing, or sauce helps prevent adding too much sugar, fat, and salt.

Flavored Water

(serves a group)

- Ice**
- Water**
- Slices of orange**, lemon, or lime
- Berries**
- Cucumber slices**
- Fresh **mint**

Make two or three pitchers of ice water. Use different combinations of citrus fruit, berries, cucumbers, and mint to make colorful, lightly flavored water. A few handfuls of fruit or veggie slices per pitcher is enough.



Tip: Discuss “empty calories” in soda and talk about how flavored water can be a good alternative when you want something refreshing to drink.

Fruit Salsa

(serves 20)

4 C chopped **watermelon**

2 **apples**, chopped

2 C **blueberries**

1 Tbsp **lemon juice**

2 Tbsp **berry jam**

Whole-grain dippers like crackers, pita chips, or cinnamon chips

Combine fruit. Mix lemon juice and jam. Toss fruit with jam mixture. Serve with whole-grain dippers.



Tip: What are some other fruits or vegetables that could be used to make a tasty salsa?

Sweet Potato Fries

(serves 20)

2 **sweet potatoes**

2 tsp **olive oil**

½ tsp **cinnamon** or 2 tsp fresh rosemary

Preheat oven to 425°. Cut sweet potatoes into cubes. Drizzle with olive oil. Toss with cinnamon or rosemary. Spread on a baking sheet and roast at 425° for about 25 minutes.

Tip: Sweet potatoes are more nutritious than Irish (white) potatoes and keep you feeling full longer.

When could students choose sweet potatoes instead of Irish potatoes?

Cinnamon Chips

(serves 16)

4 **whole-wheat tortillas**

Canola oil or canola cooking spray

2 Tbsp **sugar**

½ tsp **cinnamon**

Preheat oven to 400°. Cut tortillas into wedges. Brush both sides with oil. Mix sugar and cinnamon in a bag. Add tortilla wedges and shake until coated. Spread on baking sheet. Bake at 400° for 8 minutes, flipping chips half way through baking time.

Tip: Emphasize that occasional small servings of treats can fit into a healthy diet. Cinnamon chips can be a good choice for a treat because they contain whole grain and are not too high in added sugar. **What are some other sweets that are good choices for a treat?**

At Home: Plan a Recycled Garden

Plan

Your seedling will eventually outgrow its cup and need a new home. Using recycled containers is a way to limit waste. Plan how you could use a recycled container, such as a clean, empty food container, for your plant. Think of a place you can put the plant in its new container, such as in a sunny window, on a porch or patio, or in a yard. Consider access to sunlight and water for your plant. Draw your recycled garden here:

Construct

Save the recycled container from its previous use. Ask a family member to help you poke holes in the bottom of the container so that the soil can drain. Fill the container with soil so that you'll be ready to transplant when your seedling is big enough.

Transplant

When your seedling is growing beyond the size of its cup, transplant it into your recycled garden at home. Water the transplanted seedling. Talk to your family about the value of using recycled materials in your new garden. Draw or describe some other resources that you could conserve or recycle at home:

Building Blocks in Plants and People

Goal:

Students will be able to analyze the break down and build up of materials in plants, people, and the environment.

Objectives:

- To analyze the components of the soil ecosystem (cognitive)
- To explain how materials are recycled in natural systems (cognitive)
- To relate small building blocks in plants to small building blocks in people (cognitive)
- To describe the human body as an ecosystem (cognitive)
- To recycle waste materials to make something functional (psychomotor)

Standards

NSES 3 Organisms and environment; Structure and function in living systems

NSES 4 Properties of earth materials

NSES 6 Personal health

Lesson Materials

1. **Spades**
2. **Marker board** or butcher paper
3. **Hand lenses**
4. 2-liter **soda bottle**
5. **Scissors**
6. **Paper towels**
7. **Tape**
8. **Mesh** or **screen**
9. **Heat lamp** (opt.)
10. **Soil thermometer** (opt.)
11. **Harvesting tools** (clippers, buckets, etc.)
12. Small container of **spoiled milk**
13. **Recipes** and **ingredients**
14. **Food preparation tools** (kid-safe knives, cutting boards, etc.)
15. LEGO or similar-type **building blocks**

Notes and Resources

Refer to Teacher Background Information on pp. 8-9 for lesson content support.

Lesson 5



2.5 hrs

Lesson Procedure

REVIEW (5 mins)

Welcome students back to the garden. Review content by discussing whether any students made an effort to choose healthy-size portions based on last week's lesson.

TURNING TRASH INTO TREASURES (20 mins)

Provide students with an assortment of waste materials, such as clean containers, cardboard, plastic bags, and aluminum foil.

What would happen if the waste materials were thrown in the trash? How could this be prevented? Challenge students to use the "trash" to build something useful. Provide construction materials such as tape, glue, and pipe cleaners. Suggested "treasures" to build include pencil holders, garden pots, picture frames, or toys. When students are finished, discuss how they've recycled materials to give them new purpose. **How does nature recycle? How do our bodies recycle?**

BUG HUNT (10 mins)

Demonstrate the proper way to hold a spade. Ask a student to model safe handling of the tool(s). Distribute tools and guide students in digging up a little topsoil in a designated area. Explain that an ecosystem is all the living things in a place and their nonliving surroundings. Use the marker board to create a group diagram of the soil ecosystem. Using hand lenses, students explore the soil and record anything they find on the diagram. Fill in other things that students can't see but know are there, such as air, water, and nutrients. Discuss the things recorded on the diagram. **What are the roles of small living things in the soil ecosystem?** Emphasize relationships among living things, such as food webs. Discuss cycles that occur, including water, carbon, and nitrogen cycles.

BUILD A BERLESE FUNNEL (15 mins)

A Berlese funnel can be used to identify small living things in a soil sample. Cut the top section off a 2-liter soda bottle. Place some wet paper towels in the bottom of the bottle. Remove the cap from the top section and invert the section so the open top of the bottle points down into the bottom of the bottle like a funnel. Tape the sections together so the top will not fall in. Place a piece of mesh or screen in the top of the funnel. Add a scoop of soil on top of the mesh. Place the entire Berlese funnel under a heat lamp or outside in the sun. Check the bottle after several hours or the following day to see what bugs have dropped from the soil sample through the funnel. Students examine bug life with hand lenses. Discuss how much life exists in a small soil sample, reminding students that there are many more living things too small to see with their eyes.

COMPOST PILE TOUR (10 mins)

Bring some vegetable scraps to the compost pile. **What happens to food waste that is added to compost?** Dig into the edge of the pile a bit so that students can observe the contents. **What do they see, smell, and feel in the pile?** If the compost pile is active, feel the pile for heat. **Where does the heat come from?** Measure the temperature with a soil thermometer, if possible. Discuss the community of small living things responsible for the composting process. Emphasize that waste materials in the compost pile are broken down into small building blocks by decomposers. The process gives off heat and leaves rich soil for use in the garden.

Anagrams game: Students agree on a word related to gardening, cooking, or growth of plants or people. Write the word on the marker board. Students brainstorm other words that can be formed from the same

Lesson 5

letters in that word. For example, *compost* can be used to form *top* and *cost*. Record the new words and emphasize that the same letters are rearranged to make something new. When students cannot think of any more anagrams, begin with a new word.

HARVESTING (10 mins)

Harvest garden produce for use in the day's snack.

WASHING (10 mins)

Transition to the kitchen. Wash hands and harvested produce.



BODY ECOSYSTEM DISCUSSION (5 mins)

Present a sample of spoiled milk. Students share their observations of appearance and smell. **What has happened to the milk?** Explain that the milk is spoiled because too many harmful bacteria have grown. Predict what would happen if someone were to drink it. **How do harmful bacteria affect the body?** Survey students about whether they think there are any helpful bacteria in their bodies. Discuss how the body is an ecosystem that includes small living things, just like soil or compost. Discuss how

bacteria help break down the food people eat so that it can be used by the body.

SNACK PREP (30 mins)

Review safety guidelines and knife use. Lead students in preparing the healthy snack.

SNACK AND CYCLING DISCUSSION (20 mins)

While eating snack, discuss how the nutrients in the foods students eat are being transferred to their bodies. **How do plant foods connect people to the soil ecosystem?**

Build up and break down game: Students work in small groups. Each group gets a bag of LEGO blocks. Students observe the blocks given to each group. Groups have two minutes to build something out of their blocks. Ask students to compare and contrast the different groups' structures. Then students disassemble their structures into individual blocks again. Students compare each groups' blocks. Discuss how similar materials were used to build different structures, which were then broken back down to similar building blocks. Emphasize that the building blocks in plants and people are similar, but they are arranged in different ways. The materials can be broken down, such as when a person digests an apple, and rearranged to form new materials in the human body.

CLEAN UP (15 mins)

Store all leftover food, deliver kitchen scraps to compost, and clean the kitchen workspace.

✓ Check for student understanding

- Students make dioramas showing the components of the soil ecosystem
- Students use art supplies to illustrate the composting process
- Students draw self-portraits that include the living things in their digestive systems
- Students write songs, raps, or chants about small living things in the garden and the body
- Students create a map or web to show how the same building blocks can pass through soil, plants, and people

Recommended Recipes

Yogurt Ranch Dip

(serves 12)

- 1 C low-fat **plain yogurt**
- 2 tsp **lemon juice**
- 1 tsp **Dijon-style prepared mustard**
- 1 tsp chopped fresh **parsley**
- 1 tsp chopped fresh **chives** or scallions
- Veggie dippers** or **whole-grain dippers**

Whisk together yogurt and lemon juice until smooth. Whisk in remaining ingredients. Serve with veggie dippers or whole-grain dippers.

Tip: Discuss how yogurt is made with the help of small living things, bacteria, that change the building blocks of milk into new materials. These probiotics, or “good bacteria”, differ from the “bad bacteria” that make us sick.

Yogurt Parfaits

(serves 16)

Layer the following in a bowl:

- 1 qt low-fat **vanilla yogurt**
- 2 C **whole-grain oat granola**
- 1 ½ C sliced **fruit** or berries

Tip: Try topping with nuts or seeds for extra protein.

Tip: Set up a sundae bar so students can go down the line and assemble their own parfaits in small cups or bowls.

Cottage Cheese

(serves 12)

- 1 gal **skim milk**
- ¾ C **vinegar**
- ½ tsp **salt**

Heat milk to 120°. Remove from heat and add vinegar. Stir 1 to 2 minutes, until curds form. Cover and let rest for about 30 minutes. Pour the cheese into a colander lined with cheesecloth. Drain for 5 minutes, then rinse the cloth-covered cheese under running water until cool. Mix in salt.

Tip: Serve this plain or as a dip for fruit, veggie, or whole-grain dippers. It can also be used to prepare other recipes.

Tip: Discuss how vinegar helps rearrange the building blocks of milk to make curds that stick together and separate from the whey.

Mushroom Omelet

(serves 8)

- 2 tsp **olive oil**
- 1 C **mushrooms**, chopped
- 4 **eggs**
- 1 Tbsp **milk**
- Salt** and **pepper** to taste
- $\frac{1}{4}$ C **cheese**

Heat oil in a skillet and add the mushrooms. Cook, stirring, for 2 minutes. Beat eggs together with milk. Sprinkle with salt and pepper. Pour over mushrooms. Cook without stirring until the top is set, gently lifting the edges so that uncooked egg can flow to the bottom. When set, sprinkle with cheese, fold in half, and slide onto a plate.

Tip: Try using homemade cottage cheese in this recipe.

Tip: Discuss the role of mushrooms as decomposers in the ecosystem. Mushrooms break down waste nutrients into forms that can be reused by other living things.

Helpful “Bugs” Taste Test

Have samples of different foods for students to taste. Students share their reactions to each food. Discuss how the foods are made.

Bleu cheese is a cheese with a certain type of mold added to it. The mold is responsible for the blue-green crevices running through the cheese and also for the distinctive flavor. The mold is related to antibiotics, drugs that help fight harmful bacteria in the body.

Sauerkraut is a German cabbage dish made by sprinkling salt over chopped cabbage and pressing the water out. The cabbage then ferments in the salty water, developing a strong sour taste.

Tip: Students can also sample the raw ingredients – milk and cabbage – so they can taste how the foods have changed.

At Home: Composting

Construct

Composting is a way to recycle some of your kitchen waste. Compost requires four basic ingredients: brown stuff, green stuff, air, and water. Read the instructions below for the two types of composting, and work with your family to set up the type you decide is best for you.

Outdoor Compost Pile

1. Outdoors in a bin or pile, layer nitrogen-rich green stuff, like grass clippings and vegetable scraps, with carbon-rich brown stuff, like dry leaves, coffee grounds, soil, sawdust, or straw. You should have much more brown stuff than green stuff.
2. Water the pile occasionally and use a pitchfork, rake, or shovel to mix it up and add air. This makes the right habitat for the soil community that will break down the compost.

Indoor or Outdoor Worm Bin

1. Get a shoebox or larger size plastic bin with a lid.
2. Use a hammer and nail, or an electric drill, to poke lots of air holes on the sides of the bin near the top.
3. Tear newspaper into strips, moisten with water, and place the strips loosely in the bottom of the bin.
4. Add a few handfuls of soil or potting mix and a small container of red wiggler worms (available at most bait shops). Cover the bin.
5. Add some kitchen waste, chopped into tiny pieces, to the bin each day. Stir the compost once a week. If it is very dry, sprinkle in a little water, but don't make it soggy.

Compost

These are good things to put in your compost:

Uncooked vegetable scraps
Eggshells
Coffee grounds
Grass clippings or dry leaves (outdoor)
Wet newspaper strips (indoor)

These are things that don't go in compost:

Meat
Oils or other fats
Dairy products
Pet wastes
Weeds

Recycle

When the compost is broken down, it is ready to be recycled into the soil ecosystem. An outdoor compost pile will be broken down into humus in about a month, or longer in cold weather. When you can no longer see the separate parts of the mixture, and it looks dark and fluffy, the compost is ready. A worm bin will start to look granular on top in a few weeks. When you see these worm casings on top of the pile, they are ready to be scooped off and used. Here are some ways to use your compost:

- Sprinkle into pots of houseplants
- Sprinkle onto potted plants outdoors
- Sprinkle onto an herb garden or a kitchen garden
- Apply to flower beds or shrub beds

Food Systems

Goal:

Students will be able to evaluate the components of the food system that connect garden produce to prepared meals.

Objectives:

- To describe farms, the food industry, and the digestive system as examples of systems (cognitive)
- To list steps involved in producing common foods for consumers (cognitive)
- To identify ways to strengthen a local or regional food system (affective)
- To analyze the role of marketing and advertising in personal food choices (affective)

Standards

NHES 2 Influence of family, peers, culture, media, technology, and other factors on health behaviors

NHES 4 Interpersonal communication skills to enhance health and avoid or reduce health risks

NES 3 Critical thinking and practical reasoning skills to address food choices, nutrition, and health concerns

NSES 6 Personal health

Lesson Materials

1. Small **model car**
2. **Marker board** or butcher paper
3. Food system **role cards**
4. **Potato**, orange, or apple
5. **Stopwatch**
6. **Harvesting tools** (clippers, buckets, etc.)
7. **Food packaging** from products marketed towards kids, such as sugary cereal and sweet snacks
8. **Computer** with internet access (opt.)
9. **Recipes** and **ingredients**
10. **Food preparation tools** (kid-safe knives, cutting boards, etc.)

Notes and Resources

To increase relevance of the food system model, consider finding some real data on the quantity of potatoes (or oranges or apples) produced and consumed each year in the U.S.

You may want to locate food commercials on video-sharing websites prior to the class session if you plan to show video ads during the food marketing discussion.

Role cards for the food system game are found in the Lesson 6 Appendix on p. 47.

Refer to Teacher Background Information on pp. 8-9 for lesson content support.

Lesson 6



2.5 hrs

Lesson Procedure

REVIEW (5 mins)

Welcome students back to the garden. Review content by discussing how plants and people are made up of similar building blocks.

FOOD SYSTEM DISCUSSION (10 mins)

Show students a small model car. Ask them to identify the different parts and their roles.

How do the parts work together?

Emphasize that a car is a system of parts working together as a whole. **What are some other systems students are familiar with? How is the garden a system?** Walk through the garden and ask students what happens to the produce grown there. **How is the garden part of a bigger system?**

Brainstorm what happens to the food grown on larger farms. Prompt students to think about the food one step at a time: **where does it go first and what happens second and then what?** Emphasize production, processing, distribution, and consumption of the food.

FOOD SYSTEM MODEL (30 mins)

Students agree on a common food to discuss, such as pizza or a sandwich. Brainstorm all the steps that take place to produce the food and get it to the students' plates. Students create a group map of the steps on a marker board. Prompt students to consider growing ingredients, processing, packaging, transporting, storing, and selling.

Food system model: Students line up shoulder to shoulder to represent the food system. Explain that each student represents a different player in the system and they are going to model the process by which food moves from a farm to their plates. Pass out the food system cards (found in the lesson appendix) to assign each student a role. The student at one end is Farmer and the student

at the other end is Hungry Person. Note that cards are numbered and should be distributed in order. For fewer students, remove the less essential roles as you see fit. For more students, assign some roles to two students. Ask each student to state his or her role in the food system. Give Farmer a potato to pass through the food system line. If possible, provide some real data about annual potato production in the U.S. Time students while they pass the potato from Farmer to Hungry Person. Record the time on a marker board. Discuss a player or two that could be most easily removed from the food system. The student steps out and the gap closes. Time the potato again and record the time. Repeat until only Farmer and Hungry Person remain. Reflect on the times recorded on the marker board, imagining that each second represents one day. Help students draw conclusions about the length of time and the number of players involved. **What are some benefits to a shorter supply chain? What are some ways to reduce the number of players in the food system to make the supply chain shorter? How can growing foods locally or shopping at farmers markets simplify the food system? How does the food system affect the environment?** Discuss reducing the use of fossil fuels, improving the quality and nutritional value of food, reducing costs, and reducing packaging waste. Site examples of the local food system, if possible.

HARVESTING (10 mins)

Harvest garden produce for use in the day's snack.

WASHING (10 mins)

Transition to the kitchen. Wash hands and harvested produce.

FOOD MARKETING DISCUSSION (20 mins)

Discuss some favorite cereals, snacks, or other packaged foods. Prompt students to describe a familiar food box or package.

What do students typically notice when they pick up packages of food? What makes them choose one item over another?

Introduce the concept of food marketing and discuss how food companies encourage people to buy their products, showing some food packages targeted towards kids as examples. If possible, you may want to show preselected video advertisements also. On food packaging, show how to identify where the product is made and what it is made from. Then discuss foods that aren't packaged, typically fresh, whole, unprocessed foods. **How are these foods marketed?**

SNACK PREP (30 mins)

Review safety guidelines and knife use. Lead students in preparing the healthy snack.

SNACK AND DIGESTION TRACING (20 mins)

While eating snack, consider how the food moves through the digestive system of the body. Create a map of the system on a marker board. Emphasize that each organ of the digestive system has a role in helping the body get the nutrients it needs from the food

you eat. **How are the digestive system and the food system alike and different?**

Story chaser game: Students sit in a circle and the teacher names a prepared food, such as spaghetti or vegetable soup. The first student speaks one sentence about the first step in producing that food. The next student speaks one sentence about the next step in producing the food and so on. Continue through a description of the production and digestion of the food.

CLEAN UP (15 mins)

Store all leftover food, deliver kitchen scraps to compost, and clean the kitchen workspace.



✓ Check for student understanding

- Students work in small groups to perform skits about how a favorite food moves through the food system or the digestive system
- Students redesign a familiar food package to make the most important information more accessible to consumers
- Students create marketing strategies (billboards, jingles, commercials, etc.) for favorite foods grown in the garden
- Students write letters to local businesses suggesting how the businesses could contribute to a local food system
- Students list foods their families eat that are produced locally, regionally, nationally, and internationally

Recommended Recipes

Flavored Popcorn

(serves 16)

- ½ C **popcorn** kernels
- 2 Tbsp **vegetable oil**

Heat oil in a large pot over medium heat. Add popcorn. Partially cover and shake over medium heat until popping slows to a few seconds between pops. Divide among three bowls and flavor with:

1. **Cinnamon**
2. Shredded **cheese**
3. **Salt, garlic powder, and oregano**

Tip: Explain that popcorn is a whole grain and involves minimal processing and packaging.

Tip: The popcorn pot should be shaken by an adult. Be cautious of the escaping steam.

Applesauce

(serves 12)

- 5 cooking **apples**, peeled, cored, and chopped
- $\frac{3}{4}$ C **water**
- 1 Tbsp **lemon juice**
- $\frac{1}{2}$ tsp **cinnamon** (opt.)



Combine apples and water in a medium saucepan. Cover and cook over medium heat for about 20 minutes, until apples are soft, stirring frequently. Uncover. Mash with a fork or potato masher. Add remaining ingredients and stir. Remove from heat and serve warm.

Tip: Discuss how homemade applesauce has a shorter supply chain than canned applesauce.

Tip: Emphasize that no added sugar is needed if you use naturally sweet apples.

Berry Freezer Jam

(makes 4 half-pint containers)

- 4 C fresh or frozen (thawed) **strawberries** or other berries
- $\frac{1}{2}$ C **sugar**
- 1 Tbsp **lemon juice**
- 1 $\frac{1}{4}$ C unsweetened **apple juice**
- 1 (1.75-oz) package (or 3 Tbsp from a jar) powdered **low- or no-sugar pectin**

Crush berries to make 3 C. Mix crushed fruit with sugar and lemon juice. Let stand. Place apple juice in a saucepan and bring to a boil. Sprinkle in pectin. Boil for 1 minute, stirring frequently, and remove from heat. Carefully add to strawberries and stir for 3 minutes. Use a ladle to scoop the jam into clean half-pint glass or plastic freezer containers, leaving $\frac{1}{2}$ -inch of headspace at the top. Screw on lids and let jam cool before storing in freezer for up to one year. Jam keeps for three weeks in refrigerator.



Tip: Discuss how home food preservation has been an important part of survival throughout history. Home food preservation allowed people to store fruits and vegetables from the summer harvest to eat during the winter, when less food was available.

Tip: Consider making enough for each student to take a jar home, but make multiple batches, rather than increasing the recipe to make one large batch. The jam may not gel properly if amounts are increased. Consider making batches with different berries or a mixture.

Crunchy Toasted Cheese Sandwich

(serves 16)

- 8 slices **whole-grain bread**
- 2 C mixed chopped **vegetables**, such as tomato, bell pepper, celery, carrot, and zucchini
- $\frac{1}{2}$ C shredded **cheddar cheese**

Preheat broiler. Mix veggies and cheese. Top bread slices with spoonfuls of the cheesy vegetable mixture, spreading to edges. Broil for about 4 minutes or until cheese melts.



At Home: International Grocery Cart

Shop

Next time you go to the grocery store or food mart, look for foods that were grown or produced in other countries. You might want to look in the fresh produce section, in the foreign foods section, or in the vinegars and sauces section. List some foods you find that come from other countries.

Food:

Country:

Think

How does the food system make it possible for you to eat foods not grown close to where you live?

In what ways is this a good thing? Explain.

Cook

Think about your class discussion of some foods that are grown or produced in your region of the country. List some of these foods here:

Plan a meal based on foods that are grown or produced close to where you live. Describe the meal:

Prepare the meal with your family. Are the foods you've prepared a common part of your family's diet? Explain.

Lesson 6 Appendix

<p>1 Farmer A person who grows and harvests food on a farm</p>	<p>2 Activist A person who communicates with politicians about forming laws for food production</p>
<p>3 Lobbyist A person hired by a food company to talk to politicians about passing laws that benefit their interests</p>	<p>4 Politician A person who passes laws about how food is produced</p>
<p>5 Researcher A person who researches how food should be produced, distributed, and consumed</p>	<p>6 Financial Worker A person who lends the farmer money or provides insurance for the farmer to grow food</p>
<p>7 Seed Manufacturer A person who makes seeds</p>	<p>8 Tool Manufacturer A person who makes farm tools like tractors and shovels</p>
<p>9 Truck Driver A person who drives a truck full of seeds or tools to a warehouse or store where the goods can be sold</p>	<p>10 Shelf Stocker A person who stocks seeds and tools on the shelves in a store</p>
<p>11 Farm Hand A person who helps the farmer grow and harvest food</p>	<p>12 Truck Driver A person who drives a big truck carrying the harvested food from the farm to the processing plant</p>
<p>13 Food Processor A person who washes, cuts, mixes, bags, and boxes food from the farm</p>	<p>14 Truck Driver A person who drives a big truck carrying the processed food to a distribution center</p>
<p>15 Distributor A person who directs which stores sell the food</p>	<p>16 Advertiser A person who designs the logos, boxes, trucks, and signs that advertise the food to the public and make people want to buy the food</p>
<p>17 Truck Driver A person who drives a big truck carrying the packaged food from the distribution center to stores</p>	<p>18 Shelf Stocker A person who puts the food on shelves in stores</p>
<p>19 Cashier A person who sells the food to customers in stores</p>	<p>20 Customer A person who buys the food</p>
<p>21 Cook A person who prepares food for eating</p>	<p>22 Hungry Person A person who eats the food that was prepared</p>

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