

Lesson 1

Use Your Five Senses



Lesson Summary



Overview

Garden detectives use their five senses to give them clues about fruits and vegetables that will be grown in the garden. As part of this lesson, the garden detectives taste fruits and vegetables featured in the curriculum and identify adjectives that describe them, as well as discover the edible parts of plants.



Lesson Extensions

A science-oriented lesson extension gives the detectives the opportunity to examine seeds to learn more about how plants grow.



Key Messages

Be a great garden detective! Discover what fruits and vegetables are sweetest, crunchiest, and juiciest. Share what you learned with your family.

Fruits and vegetables are parts of plants that we eat. What are some leaves, roots, seeds, stems, and taproots that you eat?



Garden Connection

Have the class vote on the fruits and vegetables they want to grow in the class garden based on the tasting activity.



School Food Service Connection

Collaborate with school food service to obtain and prepare fruits and vegetables featured in the curriculum for the tasting activity. Serve prepared fruits and vegetables in the classroom or in the cafeteria.



Home Connection

Send the family newsletter home to parents/caregivers. It contains a parent volunteer form. Encourage parents to prepare a fruit and/or vegetable dish with their child and to complete the activity sheet together.



Community Connection

Invite the Cooperative Extension Service to visit your classroom to talk about school gardens.

Main Lesson: Use Your Five Senses

Standards Addressed

Science

Standard C, Life Science: *Develop an understanding of the characteristics of organisms, life cycle of organisms, and organisms and environments.*

English/Language Arts

Standard 2, Writing: *Write informative/explanatory texts to examine a topic and convey ideas and information clearly.*

Learning Objectives

Students will be able to:

1. Identify leaf lettuce, spinach, Swiss chard, beets, carrots, strawberries, and raspberries/blackberries.
2. Describe the sensory characteristics of selected fruits and vegetables.
3. Explain which part of the plant each fruit/vegetable represents.

Time Required

100 minutes

- 50 minutes instruction
- 50 minutes taste-testing

Materials

- An example of each Garden Detective fruit and vegetable in its complete form, i.e., head of leaf lettuce, bunch of Swiss chard, bunch of spinach, whole carrots, beets with stems, strawberries, and raspberries/blackberries
- Samples of each of the following, rinsed under running water and prepared:
 - Spinach
 - Leaf lettuce (2-3 varieties such as romaine, red leaf)

- Carrots, cut into sticks
- Swiss Chard, wilted/sautéed with oil and garlic (see recipe in Teacher Background Information)
- Beets, roasted, peeled, and sliced (see recipe in Teacher Background Information)
- Strawberries
- Blackberries/raspberries
- Low-fat or fat-free salad dressing(s), e.g., low-fat ranch or Caesar dressing
- Low-fat or fat-free vanilla yogurt
- Several plastic spoons for serving
- Paper plates and napkins
- Plastic forks
- Index cards
- **Fruit and Vegetable Flash Cards** (in Appendix D and on CD-ROM)
- Masking tape to secure **Fruit and Vegetable Flash Cards** to the board
- *Garden Detective Journal* cover (in Appendix D and on CD-ROM), one per student
- Two-pocket folders with prong fasteners for *Garden Detective Journals*, one per student
- Glue

- Overhead projector or computer with Liquid Crystal Display (LCD) projector and screen
- *Overhead/Slide 1.1, Parts of the Plant*
- *Overhead/Slide 1.2, The Garden Detectives' Tasting Code*
- *Student Handout 1.1, Stay Healthy: Wash Your Hands!*
- *Student Handout 1.2, The Garden Detectives' Tasting Code*
- *Student Handout 1.3, The Five Senses*

Preparation

- Prepare selected fruits and vegetables by cleaning them and cutting them into bite-size pieces. See if your school food service or a local chef or grocery store could assist you with this task.
- Prepare to quickly set up tasting table of featured fruits and vegetables (see Step 5).
- Wash the surface of the desk or tables with hot, soapy water. Sanitize with a solution of 1 tablespoon of unscented liquid chlorine bleach per gallon of water.
- Write the name of each featured fruit and vegetable to be tasted on individual index cards.
- Print *Garden Detective Journal* covers and glue covers to pocket folders.
- Duplicate a copy of *Student Handouts 1.1, 1.2, and 1.3* on three-hole-punched paper for each student.
- Prepare a transparency of *Overhead/Slide 1.1*, if needed. Prepare a transparency of *Overhead/Slide 1.2*, if you prefer to project *The Garden Detectives' Tasting Code* instead of duplicating *Student Handout 1.2*.
- Prepare *Fruit and Vegetable Flash Cards* (Appendix D) by separating them; laminate the *Flash Cards*, if desired.
- Write the following headings on the board: Root, Stem, Leaf, Flower, Fruit, Seed.

Instructional Process

STEP 1

Introduce students to the Garden Detective Fruits and Vegetables (spinach, leaf lettuce, Swiss chard, etc.). Explain that today the class is beginning an exciting new gardening unit. We will all become garden detectives and search for clues that help us understand where fruits and vegetables come from and how they help us grow and stay healthy.



Tell students:

Some of the things we'll be doing are:

- Planting and taking care of a garden
- Preparing and tasting fruits and vegetables that we grow
- Learning more about fruits and vegetables and sharing what we learn with family and the rest of the school
- Putting together a class cookbook of favorite fruit and vegetable recipes
- Creating commercials (Public Service Announcements) about the fruits and vegetables we're growing for the whole school
- Sharing what we grow with our families at a harvest celebration called the Sleuths' Mystery Dinner

Distribute the *Garden Detective Journals* to students. Review the message on the cover:

- **Be a garden detective!** Discover what fruits and vegetables are sweetest, crunchiest, and juiciest. Share what you learned with your family.

Explain that the *Journal* is the place where students can keep all their garden detective papers in one place.



We are going to get started by learning something more about fruits and vegetables that we may grow in our garden.

Hold up the individual fruits and vegetables (in the following order) and ask students to tell you what the name of the fruit or vegetable is. As each fruit/vegetable is identified, write its name on the board:

- Leaf lettuces (2-3 varieties)
- Carrots
- Strawberries
- Spinach
- Swiss chard
- Beets
- Raspberries/blackberries

STEP 2

Discuss fruits and vegetables as plant

parts. Explain to students that when we eat fruits and vegetables, we eat specific parts of the plant that grows in the garden.

Project *Overhead/Slide 1, Parts of a Plant* onto a screen. Review pertinent characteristics of each plant part, referring to the parts of the plant you have written on the board:

Root: Grows underground; can be a fleshy taproot that we eat (e.g., carrot, turnip) or a diffuse set of roots; transports water from the soil to the stems to the leaves

Stem: Aboveground; attaches to root and leaves; carries water from roots to leaves

Leaf: Usually green, grows aboveground

Flower: Aboveground; attached to stem

Fruit: Aboveground; attached to stem; contains seeds

Seed: What you plant; contains food for the plant

Note that some plant parts are not edible.

Distribute the *Fruit and Vegetable Flash Cards*, one per student. As you call on each student, he or she should bring his or her card to the front of the room and hold it up. The student should announce the name of the fruit or vegetable and what part of the plant it comes from. Then the student should place the card on the board in the correct category. Continue until every student has placed his or her *Fruit/Vegetable Flash Card* on the board.

Your completed chart should look something like this:

Root	Stem	Leaf	Flower	Fruit	Seed
Carrot	Celery	Spinach	Broccoli	Tomato	Beans (all types—green and dried)
Beet	Asparagus	Leaf Lettuce	Cauliflower	Apple	Peas (green and black-eyed)
Radish		Swiss Chard		Strawberry	Corn (kernels)
Turnip		Kale		Cucumber	Lima Beans
Potato		Collard Greens		Raspberry	Lentils
Sweet Potato		Romaine Lettuce		Banana	
Parsnips		Bok Choy		Blackberry	
Onion		Cabbage		Orange	
		Brussels Sprouts		Peach	
				Pear	
				Kiwi	
				Cantaloupe	
				Mango	
				Grapes	
				Squash (all types)	
				Okra	
				Peppers	

**Tell students:**

- Today they will have a chance to taste some of these fruits and vegetables. Circle the fruits and vegetables that they will taste and point out which part of the plant each one represents.

STEP 3

Distribute *Student Handout 1.1, Stay Healthy: Wash Your Hands!* Review the following key points with students.

**Ask the students:**

- How many seconds should we wash our hands for? (20 seconds, or the time it takes to sing one verse of “Old MacDonald Had a Farm.”)
- Why should we wash our hands for 20 seconds? (To be sure we get them thoroughly clean.)
- Why should we turn off the faucet with a paper towel, if one is available, after we have washed our hands? (So that we don’t pick up new germs from the faucet.)
- What should you not do after washing your hands? (Actions such as rub eyes, sneeze, cough, touch door knob, touch face, touch your friend’s arm, etc.)
- What should you do when you touch something else? (Wash your hands again.)

Have all students wash and dry their hands, according to the guidelines.

STEP 4

Distribute *Student Handout 1.2, The Garden Detectives’ Tasting Code* to students. You may also wish to project *Overhead/Slide 1.2, The Garden Detectives’ Tasting Code*, onto the screen so that it is easy for everyone to see. Review the elements of the code with the class.

STEP 5

Set up tasting table of featured fruits and vegetables. Place clean and cut-up versions of each fruit and vegetable on paper plates (one fruit or vegetable per plate) on a table at the front of the classroom or in the cafeteria. Put the index card on which you’re written the name of the fruit and vegetable in front of each plate. Put plastic forks, paper plates, and napkins on the table at the beginning of the row of plates.

STEP 6

Invite students to taste the featured fruits and vegetables. In small groups, have students approach the table, take a fork, paper plate, and napkin, and place one piece of each fruit and each vegetable on their plate, then return to their seats. Tell students not to taste anything until told to do so.

When all students have filled their plates, distribute *Student Handout 1.3, The Five Senses*, to each student. Review the five senses—taste, touch, look, sound, and smell. Our sensory organs (mouth, skin, eyes, ears, and nose) help us learn about the world. Explain to students that they will taste each fruit and vegetable and then think of some adjectives to describe it. Write the following terms on the board: Taste, Feel, Sight, Sound, Smell.



Ask the students:

- Ask students to suggest some adjectives that might describe the sensory qualities of food, e.g.:

Taste	Feel	Sight	Sound	Smell
Sweet	Firm	Color (green, orange)	Crunchy	Fresh
Sour	Soft	Shiny	Squishy	Earthy
Salty	Rough	Skinny	Crackly	Sweet
Bitter				

Have students taste each fruit and vegetable in the following order:

- Leaf lettuces (2-3 varieties)
- Carrots
- Strawberries
- Spinach
- Swiss chard
- Beets
- Raspberries/blackberries



Ask the students:

Before tasting each fruit/vegetable, ask students:

- What is the name of this fruit or vegetable?
- What part of the plant is it?
- Who has eaten _____ before?
- How do you think this fruit/vegetable is normally eaten? In a salad? On a sandwich? In lasagna or pasta? On a taco? With rice?

Have students taste the fruit/vegetable and then complete the portion of *Handout 1.3, The Five Senses* that corresponds to it. Before continuing to the next fruit or vegetable, ask for volunteers to share some of the adjectives that they wrote on the handout.

Now have an adult circulate around the room with a container of salad dressing and a container of yogurt. Give each student who desires them a teaspoon of dressing and a teaspoon of yogurt into which they can dip their remaining portions of vegetables and fruits.

Remind students that they are garden detectives and are in the process of discovering what fruits and vegetables are sweetest, crunchiest, and juiciest. Ask them to share what they learned in class today with their family.

Remind students to put all the handouts from this lesson in their *Garden Detective Journals*.

STEP 7

Vote on fruits and vegetables to grow.

Have students vote on which fruits and vegetables they would like to plant in their class garden.

Teacher Background Information

Welcome to the Tasting Table

Vocabulary

Detective: A person whose business is solving mysteries and gathering information that is not easy to get.

Flower: The part of a plant that forms fruits with seeds inside after it has been pollinated and fertilized.

Fertilization: The physical union of male and female parts of the plant to create a seed.

Fruit: The fleshy part of a plant that forms from the flower and contains seeds.

Garden: A plot of earth used to grow vegetables, fruit, or flowers. Gardens come in many forms, including containers, raised beds, and in-ground.

Leaves: The food-making factory of a plant. Leaves are usually green, flat to catch light, and attached to a stem.

Pollination: The spreading of pollen from the male parts to the female parts of a flower, resulting in the production of seeds and fruits. Wind, water, and insects can help pollination occur.

Root: The part of the plant that grows underground and anchors the plant. It moves nutrients and water from the soil to the leaves. It can store food that is produced by the leaves.

Seed: The part of the plant found inside a fruit. Seeds are planted to grow new plants.

Senses: The ways our bodies receive information about the environment. The five senses include sight, hearing, touch, smell, and taste.

Stem: The main structure of a plant that holds up the limbs, leaves, and flowers. Stems carry water and nutrients up through the plant. They can carry food throughout the plant to where it is needed.

Taproot: The main root of a plant which grows vertically in the ground. It may have secondary roots growing from it. In some vegetables, e.g., carrots and turnips, the taproot is the edible part of the plant.

Vegetable: The edible part of a plant, which may be a leaf, root, or stem. Many vegetables we eat are actually fruits because they contain seeds.

Many of the students you teach may never have tasted fruits or vegetables fresh from the garden. Many may have only very limited exposure to fruits and vegetables. Some may think they don't like vegetables very much at all!

Giving children opportunities to taste fruits and vegetables is the key to getting them to enjoy them. It may take several tastings for children to learn to enjoy the taste of vegetables, but research shows that children that taste a fruit or vegetable on many occasions start to like it over time. Therefore, it is important to continue to provide these opportunities for tasting unusual flavors. Most likely children will begin to include more fruits and vegetables in their diet as they have opportunities to taste them.

Tasting Guidelines

There are some things you should keep in mind when preparing your classroom for tasting. First, establish some general guidelines or class rules for tastings with your students. Both *Student Handout 1.1, Stay Healthy: Wash Your Hands!* and *Student Handout 1.2, The Garden Detectives' Tasting Code*, should be reviewed with students before tasting activities begin. You may also wish to post a hand-washing poster (e.g., http://www.fightbac.org/storage/documents/kids_activities/6steps_handwashingposter.pdf) in the classroom and by the sink.

Second, be sure to collaborate with school food service. In addition to possibly helping with obtaining and preparing foods for tasting, they can help you comply with your district's food handling requirements for classrooms.

Why Is Your Role So Important?

Teachers are important role models for students. As a role model, you are a person whose behavior is imitated by others. This curriculum provides many opportunities for you to taste and like fruits and vegetables, both in the classroom and in the cafeteria. Your students will be more willing to taste and like nutrient-packed fruits and vegetables when they see you modeling these behaviors. So let your students see you enjoy fruits and vegetables. Participate in classroom tastings. Bring fruits and vegetables in your lunch and snacks. Visit students in the school cafeteria and point out how delicious the fruits and vegetables being served look.



Recipes

Wilted Swiss Chard

Preparation Time: 10 minutes

Cooking Time: 20 minutes

Ingredients:

- 2 ½ pounds Swiss chard
- 1 medium onion, chopped
- 3 cloves garlic, finely chopped
- 1 cup lower sodium chicken stock
- ⅛ teaspoon salt
- ⅛ teaspoon pepper

Preparation:

1. Wash hands and clean your work area.
2. Trim the Swiss chard stems to within 2 inches of the leaf.
3. Rinse the leaves and attached stems under running water and put them in a colander to drain.
4. Roughly chop the greens.
5. In a large Dutch oven over medium heat, cook the onion and garlic for about 2 minutes.
6. Add the greens in batches, stirring each batch as it wilts, before adding more.
7. Add 1 cup chicken stock and cook, covered, stirring once or twice, until tender, about 10 minutes.
8. Sprinkle with the salt and pepper.

Yield:

30 1 tablespoon servings

Refrigerate cut fruits, vegetables, and cooked foods promptly. Do not leave at room temperature for longer than 2 hours (or 1 hour in temperatures above 90° F).

Roasted Beets

Preparation Time: 15 minutes

Cooking Time: 30 minutes

Ingredients:

- 15 medium-sized fresh beets
- 1 tablespoon olive oil

Preparation:

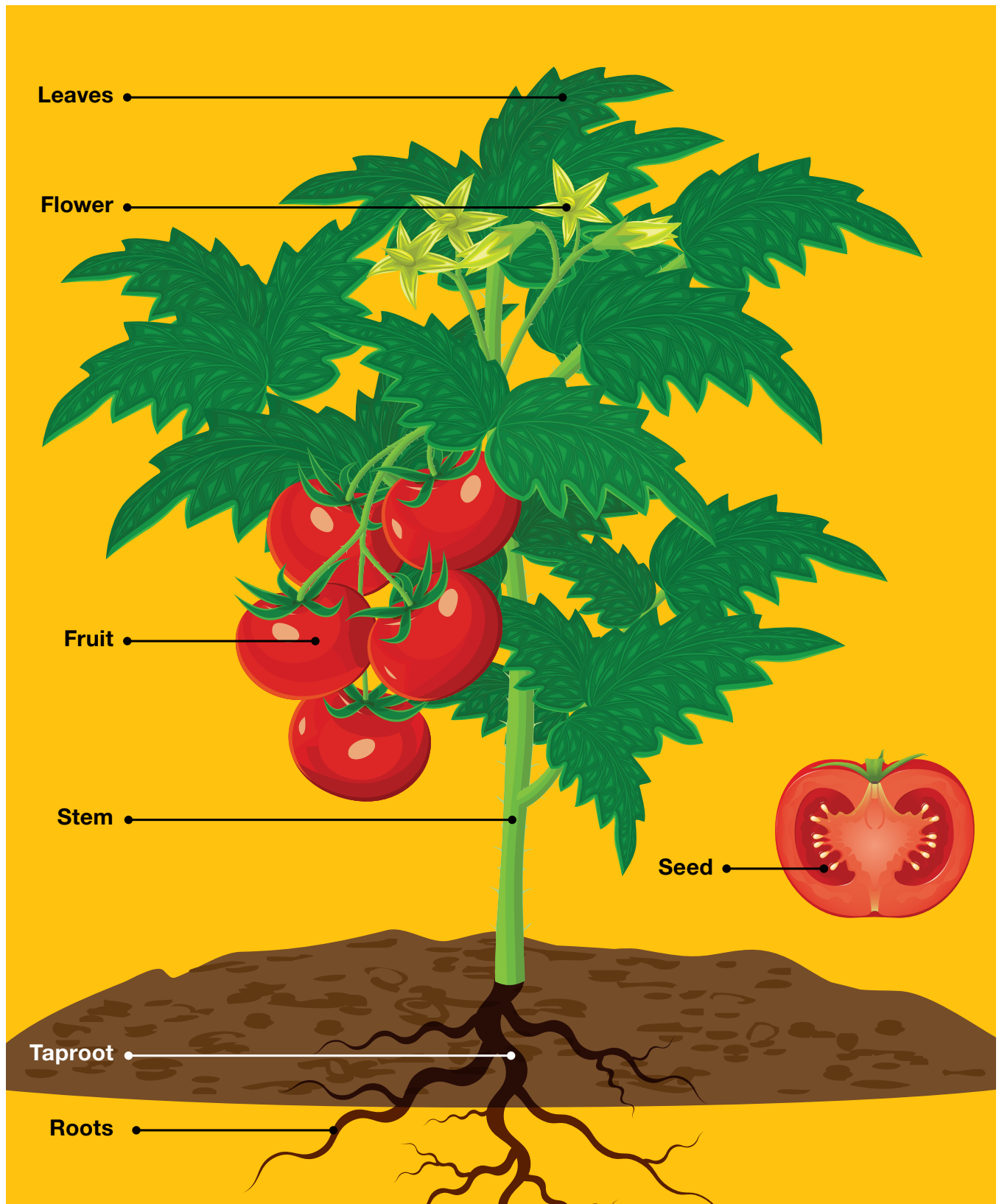
1. Wash hands and clean your work area.
2. Preheat oven to 375° F.
3. Scrub beets with a vegetable brush under running water and cut off tops (beet greens could be used in place of Swiss Chard in the Wilted Swiss Chard Recipe, if desired).
4. Put beets on a large piece of aluminum foil.
5. Drizzle the beets with 1 tablespoon of olive oil before roasting. For even roasting of the beets, fold the foil over them and crimp the sides closed. Place beets on a rimmed baking sheet or in a baking pan.
6. Roast beets until tender—about 30 minutes for small beets and up to an hour for large beets. Check for tenderness.
7. Using oven mitts, remove beets from oven when tender.
8. Let sit until cool enough to handle. When beets are cool enough to handle, unwrap from the aluminum foil. Slip off beet skin by rubbing with your fingers or use a small paring knife.
9. Cut beets into wedges for tasting.

Yield:

30 servings, 1/2 beet each

Refrigerate cut fruits, vegetables, and cooked foods promptly. Do not leave at room temperature for longer than 2 hours (or 1 hour in temperatures above 90° F).

Parts of the Plant



The Garden Detectives' Tasting Code



The Garden Detectives' Tasting Code

- As garden detectives, we encourage everyone to try a small taste. If you do not like something today, try it again another day. Sometimes preparing foods in different ways will change how it tastes. Sometimes you learn to like a new food.
- You do not have to swallow something that you don't like.
- If you don't like the taste of something:
 - Remove the food politely from your mouth with a napkin.
 - Quietly put the napkin in the waste can.
- Since everyone needs to make his or her own decision about how something tastes, please do not make faces or say unpleasant things about food. Remember that the faces you make or the words you say may hurt the feelings of the person who prepared the food or of someone else who likes the food.

Stay Healthy: Wash Your Hands!



Name: _____ Date: _____

Washing your hands helps keep you healthy by keeping germs from spreading from one person to another.

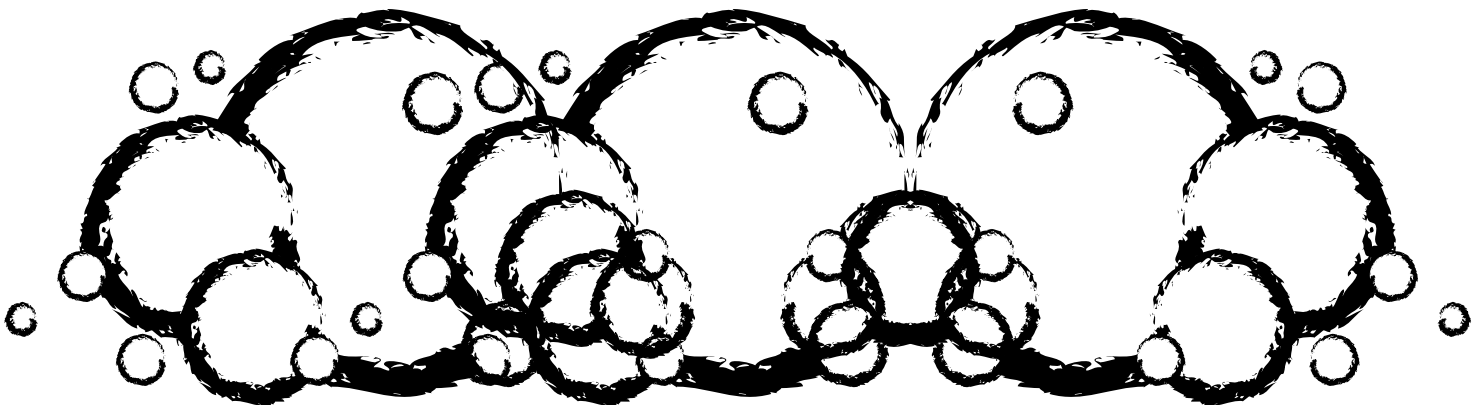
Always wash your hands before:

- Preparing food
- Eating
- Harvesting fruits, vegetables, or herbs in the garden



Always wash your hands after:

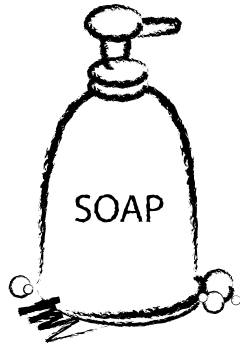
- Preparing food, especially raw seafood, meat, chicken, turkey, or eggs
- Using the toilet
- Touching an animal or animal toys, animal feed, leashes, or waste
- Blowing your nose, coughing, or sneezing into your hands
- Touching a sick or injured person
- Handling garbage or anything that could be dirty, such as a cleaning cloth or soiled shoes



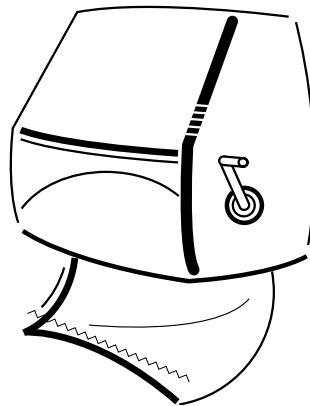
How to Wash your Hands

Wash your hands with soap and water. Follow these simple steps:

- Wet your hands with warm running water.
- Apply liquid, bar, or powder soap.
- Lather well.
- Rub your hands vigorously for at least 20 seconds or about how long it takes to sing a verse of “Old MacDonald Had a Farm.” Remember to scrub all surfaces, including the backs of your hands, wrists, between your fingers, and under your fingernails.



- Rinse well under running water.
- Dry your hands with a clean or disposable towel or air dryer.
- If possible, use your towel to turn off the faucet and to pull/push open any doors.



The Garden Detectives' Tasting Code



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Student Handout 1.3

The Five Senses



Name: _____ Date: _____

Our body gives us important clues about the world around us:

- Our eyes tell us what things look like.
- Our nose tells us what things smell like.
- Our ears tell us what things sound like.
- Our skin tells us what things feel like.
- Our mouth tells us what things taste like.

Fill in the table below with adjectives that describe the experience of tasting fruits and vegetables.



Vegetable/Fruit	Taste	Sight	Feel	Sound	Smell
Leaf Lettuce _____					
Leaf Lettuce _____					
Leaf Lettuce _____					
Carrots					
Strawberries					
Spinach					
Swiss chard					
Beets					
Raspberries					
Blackberries					



Now write a sentence about each fruit and vegetable, using one or more of the adjectives that you wrote down.
For example: "I like apples because they are red, crisp, and sweet."

Leaf Lettuces:

Carrots:

Strawberries:

Spinach:

Swiss chard:

Beets:

Raspberries:

Blackberries:

**Be a great garden detective! Discover what fruits
and vegetables are sweetest, crunchiest, and juiciest.
Share what you learned with your family.**



Garden Detective News



Grow Healthy Habits With Your Children

In both the class garden and at your table, your child can learn about fruits and vegetables. This month, give them chances to try Swiss chard, carrots, and spinach.

1



United States
Department of
Agriculture



Dear Parents:

Our class is about to embark on a *Great Garden Detective Adventure!* Over the next couple of months, we will be exploring fruits and vegetables through gardening, classroom, and school cafeteria activities. By the end of the unit, your child will have used math, science, and English/language arts skills to learn more about where fruits and vegetables come from and why they are good for us.

This week, we tasted some fruits and vegetables that we may grow in our garden. Ask your child to tell you how these fruits and vegetables taste:

- Leaf lettuces
- Carrots
- Strawberries
- Spinach
- Swiss chard
- Beets
- Raspberries or blackberries



Here are some ways you can help make our garden adventure a success:

- Send two large T-shirts or smocks to school by _____ to cover your child's clothes while working in the garden and while cooking.
- Volunteer to help us plant and maintain the garden (return the attached form).
- Volunteer to help in the classroom with our cooking activities (return the form).
- Volunteer to help us put a class cookbook together (return the form).
- Contribute a favorite family recipe featuring fruits or vegetables to our class cookbook (more details to follow).
- Come to school on _____ when we celebrate our garden harvest with a Sleuths' Mystery Dinner (more details to follow).
- Read the *Garden Detective News* when it comes home with your child, and help him or her complete the activities.
- Try serving some of the fruits and vegetables we are learning about at home. Frequent issues of the *Garden Detective News* will share ideas.

We look forward to sharing our adventures with you in the weeks to come!

Sincerely,

WANTED

Parent Volunteer Form

Yes, I'd like to help with The Great Garden Detective Adventure. I can:

- _____ Help plant the garden on _____
- _____ Help out in the garden occasionally in the next 10 weeks (e.g., watering, pulling weeds). My best time is: _____ (day/times)
- _____ Help out in class for cooking activities
- _____ Help with the class cookbook

The best time to reach me is _____

By _____ (telephone) or _____ (email)

Signed: _____

Print name: _____

Student: _____

Thank you! Please return this form to _____

by _____.

Family Activity 1

Cook Together This Week

Try making a recipe with fruits or vegetables with your child this week.
Then help your child answer the following questions:



Name of recipe: _____

Where did this recipe come from? _____

What fruits and/or vegetables were in the recipe? _____

What part of the plant did these fruits and/or vegetables come from?

Fruit/vegetable

Part of Plant?

Write 1-2 sentences about how the recipe was prepared and what you thought about it. For example: *I chopped up green peppers and carrots and added them to the tomato sauce. We put it on the spaghetti and it was delicious.*



Lesson Extension: How Plants Grow

Standards Addressed

Science:

Standard C, Life Science: *Develop an understanding of the characteristics of organisms, life cycle of organisms, and organisms and environments.*

Learning Objectives

Students will be able to:

1. Describe the interior of a seed.
2. Identify the parts of a seed.
3. Explain where young plants get their food.

Time Required

20-30 minutes

Materials

- Lima beans (seeds)—at least one lima bean per student
- Shallow container for soaking seeds
- Hand-held magnifying glass

Preparation

- Soak the seeds overnight in about 1 inch of water.
- Drain off the water prior to the lesson.

Instructional Process

STEP 1

Explain to students that every seed contains a new plant and a food source to keep the plant alive until it is big enough to make its own food. Today they will have the opportunity to examine what is inside a seed.

Not only are seeds essential to the continued life of plants, but they also provide us with food.



Ask students:

- **What are some examples of the seeds of fruits and vegetables that we eat?**

Add to responses, which may include:

- The little seeds on the outside of strawberries
- The seeds in cucumbers, tomatoes, kiwis, pumpkins, and squash
- Corn kernels
- Beans

STEP 2 Distribute seeds to each student.

STEP 3 Have students pull off the loosened seed coat.



Ask students:

- What do you think the seed coat does for the seed?

(Protects the new plant from cold or wet or from drying out before it is ready to grow.)

STEP 4 Instruct students to carefully split the seed in two from the side AWAY from the indentation. It should split open like a book. Opening the two halves of the seed exposes the embryo, i.e., the plant in its very earliest stage of development.

STEP 5 Have students find the plant's leaves and roots by looking through the hand-held magnifying glass at the opened seed.

STEP 6 Ask students:



- Besides the leaves and roots, what do you think the rest of the material in the seed is? (Food for the new plant. The food store is larger than the small plant.)

STEP 7 Have students draw the seed parts they have observed.

Source: Adapted from *Biology of Plants*, © 2006, Missouri Botanical Garden, reprinted courtesy of Missouri Botanical Garden.