



The Book Planter



Ag in the Classroom

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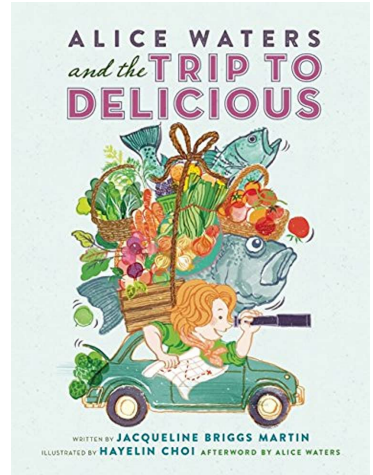
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Alice Waters and the Trip to Delicious

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Alice Waters has always loved fresh food. This is where her trip to Delicious began. Alice's trip to Delicious continued to France, where she learned more about tasty fresh food. She wanted everyone to experience the feeling of having a meal full of fresh fruits and vegetables with friends and family. But how? She opened a restaurant in California to help people gain an appreciation for great food. She learned about the local agriculture, and how important the soil and farmers' jobs were. She didn't stop there! She helped transform an empty parking lot into an Edible Schoolyard, so that local students could experience fresh foods, and she continued on to build many Edible Schoolyard. Alice wants everyone to experience a trip to Delicious!



Before Reading Questions

1. Looking at the cover of the book, what do you think this book is about?
2. Does the cover remind you of anything you have done?

After Reading Questions

1. Describe in your own words what Alice's trip to Delicious is.
2. What were Alice's favorite foods?
3. When did Alice go to France?
4. What skills did Alice learn in France?
5. What was the name of Alice's restaurant?
6. What was a challenge Alice faced?
7. Why was farming important to Alice?
8. What was the Edible Schoolyard?

Vocabulary¹

acid: a chemical compound that tastes sour

base: any substance that in water solution is slippery to the touch, tastes bitter, changes the color of indicators (e.g., turns red litmus paper blue), reacts with acids to form salts, and promotes certain chemical reactions (base catalysis)

chemical reaction: when two materials mix and react to make something new (sometimes good, sometimes bad)

pigment: the chemical compound that produces color

root: the part of the plant that grows into the soil to anchor the plant and collect water and nutrients

vegetable: any edible part of a plant that does not contain seeds

vitamins and minerals: the substances in food that our bodies need to be healthy and to use energy

Engage¹

1. To introduce this lesson, ask students, "What is a vegetable?" Allow students to offer their ideas and draw on their prior knowledge.
2. Ask students to name the parts of a plant. As students list the stem, root, leaves and flower, draw a simple sketch on the board of a plant using these primary plant parts.
3. Ask students to list the abiotic factors (nonliving) that plants need to grow. (air, sunlight, water, nutrients, soil, etc.)
4. Display the broccoli, lettuce, asparagus, green pepper, and potato (that you will use for **Activity 1**) for your students to see. Ask students if any of those vegetables resemble the basic parts of a plant.
5. Help students match the vegetables to the plant part. Help them see that asparagus is a stem, lettuce is a leaf, potatoes are roots, and broccoli and green peppers develop from a flower.

Activity 1: Vegetable Jungle¹

Materials Needed:

- **For the teacher:** 1 paring knife
 - **For each group:** 1 food scale, 1 broccoli piece, 1 celery stalk, 1 lettuce leaf, 1 green pepper, 1 potato (note which vegetables can be saved for **Activity 2**)
 - **For each student:** 1 hand lens, 1 measuring tape (or use string and ruler)
 - *Vegetable Jungle handout*
 - *Stating the Facts About Vegetables handout*
1. Have students read the *Vegetable Jungle worksheet* and complete the questions.
 2. Pass out vegetables, giving each group a broccoli piece, celery stalk, lettuce leaf, green pepper and potato. Alternatively, you may set up stations for each vegetable and have students rotate as a group from one station to the next.
 3. Review the term circumference, units of measurement, and use of scales and measuring tapes.
 4. Give students a copy of the *Stating the Facts About Vegetables handout*. Students will measure the vegetables' weights using the scale and lengths or circumferences using the measuring tape. Remind students to include units (centimeters or inch and grams or ounces) when recording measurements in the *Vegetable Facts* table.
 5. After measurements are complete, cut the vegetables in half (teacher).

6. Instruct students to use their hand lenses to study the inside and outside of each vegetable and record the color, size and shape under “appearance” in the table.
7. Discuss the classification of each vegetable. “What group does the vegetable belong in? Does this vegetable grow below or above ground? Does it contain seeds? How did you know it belonged in the root, stem, leaf, flower, or fruit group?”
8. Instruct students to complete the *Vegetable Facts* table on their *Stating the Facts About Vegetables* *handout*.
9. Optional: You can rinse, cut and serve any other extra vegetables to students. Ask students, “How do the vegetables taste—sweet, sour or bland? How do the vegetables feel in your mouth—mushy, crunchy, smooth or stringy?”

Activity 2: Vegetable Rainbow¹

Materials Needed:

- **For the teacher:** Double burner hot plate, 2 pots (A and B), liquid measuring cup, tablespoon, 2 slotted spoons, 3 strong plates (Labeled A, B and C), 8 cups of water, 3 tablespoons of vinegar, 3 tablespoons of baking soda, 3 raw broccoli pieces, 3 raw carrot pieces, 3 red cabbage leaves, 3 small chunks of white onion.
 - *Vegetable Rainbow* *handout*
 - *Color Changes in Acids and Bases* *handout*
 - *Teacher Answer Key*
1. Place two pots on a double burner. Have students measure and pour 4 cups of water into each pot. Bring the water to a boil.
 2. Have students read *Vegetable Rainbow* and complete the Doodle Bugs while the water heats.
 3. Have students carefully measure and add three tablespoons of vinegar (acid) to pot A and three tablespoons of baking soda (base) to pot B.
 4. Use the slotted spoons to stir the water in each pot.
 5. Use the slotted spoon to gently add a piece of each kind of vegetable to pot A and to pot B. Place remaining raw vegetables on plate C (C=raw). Note: the color changes will occur very soon after the vegetables are added.
 6. After the color changing reaction occurs, remove the vegetables from the water and place on corresponding plates (plate A = acid, plate B = base). Allow students to observe the color changes.
 7. Compare the raw pieces to the cooked pieces. “What colors are the raw vegetables, the vegetables cooked in an acid, the vegetables cooked in a base? Which vegetable changed colors the most, the least? Did the vegetables change colors more or less in the acidic water or basic water? Did the color changing reactions happen slowly or quickly? Would you want to eat broccoli cooked in the acidic water? Why or why not?”
 8. Instruct students to complete the *Color Facts table* on the *Color Changes in Acids and Bases* *handout* and final question.

Activity 3: Eating Vegetables¹

Materials Needed:

- **For the teacher:** Single or double burner hot plate, large pot, large stirring spoon, 1 set measuring spoons, can opener, 6 cups tomato juice, 1 teaspoon pepper, 1 teaspoon oregano, 16-ounce can diced new potatoes, 16-ounce can carrots, 16-ounce can corn, 16-ounce can green beans. Note: Instead of using canned vegetables, you could use frozen diced potatoes, frozen carrots, frozen corn and frozen green beans. Optional: Basil, garlic, parsley, onion flakes, red pepper, brown sugar. Note: open the cans before you begin the activity. If preferred, you could use a crock-pot for this activity.
 - **For each student:** 1 spoon, 1 cup or bowl (foam or other heat stable product),
 - *Eating Vegetables handout*,
 - *Scientific Soup handout*
 - *Teacher Answer Key*
1. Begin by placing your large pot on the hot plate burner. Add the tomato juice. Bring to a boil and then reduce heat so the broth simmers (little bubbles).
 2. Read *Eating Vegetables* and complete the Doodle Bugs.
 3. Next, have students carefully measure and add one teaspoon of pepper and one teaspoon of oregano.
 4. Allow students to help add the potatoes, carrots, corn and green beans.
 5. Student helpers may take turns stirring the soup.
 6. Direct your students to smell the soup and decide as a class if they want to add additional spices.
 7. With your guidance, students can decide how much of each spice to add. Allow students to measure and carefully add the extra spices.
 8. Let the soup simmer for five minutes.
 9. While the soup is simmering, discuss the variety of vegetables used (colors and types). In addition, you can explain the three components of soup: liquid (broth or juice), seasoning/spices and chunks of vegetables, meat, noodles, rice, etc.
 10. Students may then begin brainstorming their own personal soup creation.
 11. Serve soup in cups or bowl (not paper). Then let students try the soup.
 12. Instruct students to rate their soup using the smiley face scale.
 13. Next, students will create their own kind of soup and record the steps under *My Soup Creation*. Ask probing questions to help students with their soup creations. "What did you like best about our soup? What did you not like? What did we do or add first? What liquid would you use, tomato juice, chicken broth, beef broth? What did we add next? Would you make your soup

spicier by adding chili powder & red pepper? Would you add any vegetables, meat, noodles, rice, beans?"

Elaborate

- **Farmers Market Tour:** Arrange a tour of your community's farmers market in the fall or spring to observe the variety of food items farmers have produced. Assign students to talk with the farmers to learn more about what they do. If a real tour is not possible, have students do a virtual tour online or invite one or more local farmers to talk about their role and the work they do in your community.

Sources

1. <https://agclassroom.org/matrix/lesson/258/>

K-5 Subject Areas: Reading, Social Studies, Science, and Math

Reading

- **RL.K.1** With prompting and support, ask and answer questions about key details in a text.
- **RL.1.1** Ask and answer questions about key details in a text.
- **RL.1.3** Describe characters, settings, and major events in a story, using key details.
- **RL.1.4** Identify words and phrases in stories or poems that suggest feelings or appeal to the senses.
- **RL.4.2** Determine a theme of a story, drama, or poem from details in the text; summarize the text.
- **RI.K.1** With prompting and support, ask and answer questions about key details in a text.
- **RI.K.2** With prompting and support, identify the main topic and retell key details of a text.
- **RI.K.7** With prompting and support, describe how the words and illustrations work together to provide information.
- **RI.1.1** Ask and answer questions about key details in a text.
- **RI.1.2** Identify the main topic and retell key details of a text.
- **RI.1.6** Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
- **RI.1.7** Use the illustrations and details in a text to describe its key ideas.
- **RI.1.8** With guidance and support, identify the reasons an author gives to support ideas in a text.
- **RI.2.1** Answer who and what, where questions to demonstrate understanding of details in a familiar text.
- **RI.2.2** Identify the main topic of text.
- **RI.2.5** Locate key facts or information in a familiar text.
- **RI.3.5** Use text features and search tools to locate information relevant to a given topic efficiently.
- **RI.3.7** Use information gained from illustrations and the words in a text to demonstrate understanding of the text.
- **RI.4.1** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
- **RI.4.2** Determine the main idea of a text and explain how it is supported by key details; summarize the text.
- **RI.4.5** Describe the overall structure of events, ideas, concepts, or information in a text or part of a text.
- **RI.4.7** Interpret information presented visually, orally, or quantitatively and explain how the information contributes to an understanding of the text in which it appears.
- **RI.5.2** Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.

Social Studies

- **1.H.1** Understand that history tells a story of how people and events changed society over time.
- **2.H.1** Understand how various sources provide information about the past.
- **2.G.2** Understand the effects of humans interacting with their environment.
- **2.C.1** Understand how various cultures influence communities.
- **3.H.1** Understand how events, individuals, and ideas have influenced history of local and regional communities.

Science

- **K.P.2** Understand how objects are described based on their physical properties and how they are used.
- **1.E.2** Understand the physical properties of Earth materials that make them useful in different ways.
- **1.L.1** Understand characteristics of various environments and behaviors of humans that enable plants and animals to survive.
- **1.L.2** Summarize the needs of living organisms for energy and growth.

- **3.P.2** Understand the structure and properties of matter before and after they undergo a change.
- **3.L.2** Understand how plants survive in their environments.
- **4.P.2** Understand the composition and properties of matter before and after they undergo a change or interaction.
- **5.P.2** Understand the interactions of matter and energy and the changes that occur.
- **5.P.3** Explain how the properties of some materials change as a result of heating and cooling.

Math

- NC.K.MD.1 Describe measurable attributes of objects; and describe several different measurable attributes of a single object.
- NC.K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference.
- NC.K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
- NC.2.MD.1 Measure the length of an object in standard units by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- NC.3.MD.2 Solve problems involving customary measurement.

Vegetable Jungle



Did you know food scientists group vegetables based on where the vegetable grows on the plant?

Did you know that carrots are roots? Turnips and potatoes are roots too. The **roots** of all plants grow underground and store food to be used as energy.

Asparagus and celery are **stems** of plants. The stems are the long skinny parts of the plant that spurt up from the ground. Stems move the plant's food from one part to another. For example, stems move food from leaves to roots. We eat the **leaves** of plants all the time. Like stems, leaves grow above the ground. The green leaves are the food factories, using energy from the sun to make food for the plant.

Some vegetables are the **fruits** or **flowers** of the plant. Fruits grow above ground and hold the plant's seeds. Cucumbers and tomatoes are both vegetables that are fruits of plants. There are even vegetables that have tasty flowers. When you eat cauliflower and broccoli you are eating tiny flowers.

Now you can classify vegetables into five groups based on the parts of the plant. Remember the five groups include roots, leaves, stems, fruits and flowers.

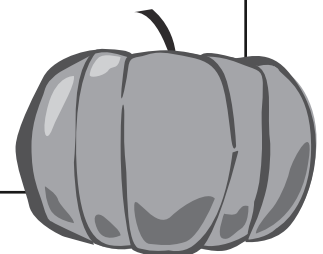
DOODLE BUGS

Circle a root vegetable listed in the reading.

Draw a box around a stem vegetable.

Can you think of a vegetable that is the leaf of a plant? Write it below.

Do you think a pumpkin is the fruit or flower of the plant? Why?



SCIENTIFIC INQUIRY: Stating the Facts About Vegetables



Your group will need:

1-4 hand lenses	1 broccoli piece	1 green pepper
1 food scale	1 celery stalk	1 potato
1-4 measuring tapes	1 lettuce leaf	

In the table below, state the facts about vegetables such as weight, size, circumference, appearance inside and out and classification/group.

Vegetable Facts

Vegetable	Measurements	Appearance	Group (root, stem, leaf, fruit or flower)
Broccoli piece	Weight: Length:		
Celery stalk	Weight: Length:		
Lettuce leaf	Weight: Length:		
Green pepper	Weight: Circumference:		
Potato	Weight: Circumference:		



Vegetable Rainbow

Did you know vegetables are red, orange, yellow, green, blue and purple in color because of compounds called pigments?

Pigments are the materials inside plants that make them colorful. Red, orange, yellow, green, blue and purple vegetables would not exist without pigments. In fact, without pigments leaves on trees would not be green in the summer and would not change colors in the fall.

Did you know you can change the color of some vegetables by cooking them with an **acid** or with a **base**? A chemical reaction between the acid or base and the pigment changes the color of the vegetable. For example, cooking broccoli in an acid turns the broccoli dull green or brownish in color. Many sour foods are acids. Lemon juice, vinegar and cream of tartar are all acids we use in the kitchen.

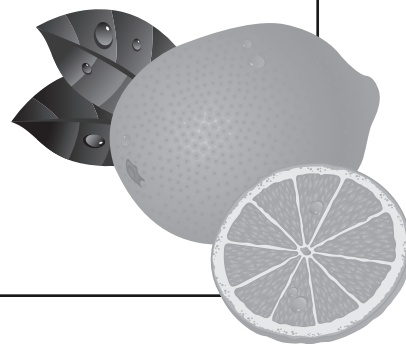
Kitchen bases like baking soda taste bitter. Cooking broccoli with baking soda makes the broccoli turn bright green. Bright green broccoli may look nice, but it feels very mushy. Vegetables cooked in basic water (water plus baking soda) not only change colors, but also become mushy. Today you will use acids, bases and vegetables to do cooking chemistry!

DOODLE BUGS

In the reading, circle three acids and draw a box around one base.

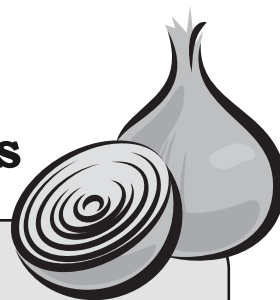
Fruit juices that are tart or sour like lemon juice are all called acids. Can you list some other tart or sour fruit juices?

How does broccoli look and feel when you cook it in a base?



SCIENTIFIC INQUIRY:

Color Changes in Acids and Bases



Your class will need:

8 cups of water

3 raw broccoli pieces

3 raw carrot pieces

3 red cabbage leaves

3 chunks white onion

3 tablespoons of vinegar

3 tablespoons of baking soda

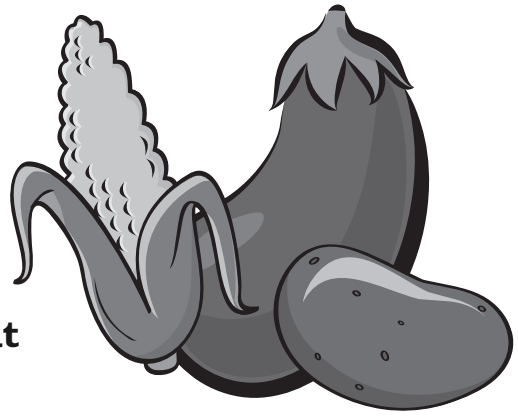
Your teacher will cook vegetables in an acid (vinegar) and in a base (baking soda). Look for any color changes. For each vegetable write down the raw color, color after cooked in an acid and color after cooked in a base.

Color Facts

Vegetable	Color Raw	Color Cooked in Acid	Color Cooked in Base
Broccoli			
Carrot			
Red cabbage			
White onion			

Which vegetable's color is changed the least by the acid and base?

Eating Vegetables



Did you know most of us need to eat more vegetables to be healthy?

Girls need to eat at least 2 cups of vegetables every day. Boys need to eat at least 2 1/2 cups of vegetables every day. You can eat whole, mashed, sliced, fresh, frozen or canned vegetables. Be sure to vary your veggies. This means try to eat vegetables of every color and from every group each week. Remember the five groups of vegetables are roots, stems, leaves, fruits and flowers.

When you eat a variety of vegetables, you get a lot of **vitamins** and **minerals**. Vitamins and minerals help keep your body healthy and strong. For example, many green vegetables like broccoli and green beans have vitamin C. Vitamin C helps heal cuts and scrapes. Orange vegetables like carrots and sweet potatoes are full of vitamin A, which helps with eyesight. Starchy vegetables like potatoes and lima beans are full of the mineral called potassium. Potassium keeps your nerves and muscles healthy. So remember to make 2-2 1/2 cups of vegetables part of your day.

DOODLE BUGS

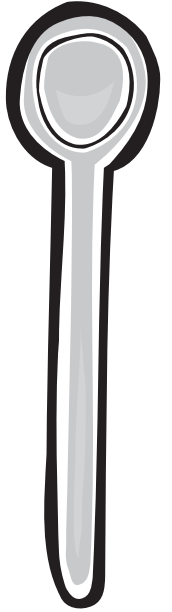
In the reading, draw a box around how many cups of vegetables you should eat a day.

Can you think of a mashed vegetable that we eat? What vegetable is it?

Underline the sentence that tells what vitamin C helps your body do.

What color are the vegetables that are full of vitamin A?

SCIENTIFIC INQUIRY: **Scientific Soup**



Your class will need:

6 cups tomato juice	16-ounce can of diced new potatoes
1 teaspoon pepper	16-ounce can of carrots
1 teaspoon oregano	16-ounce can of corn
Other spices	16-ounce can of green beans

Your teacher will lead the class in making scientific soup.

1. Place a large pot on a hot plate.
2. Add the tomato juice.
3. Bring your soup broth (tomato juice) to a boil and then turn the burner down so the broth simmers (little bubbles).
4. Add 1 teaspoon of pepper and 1 teaspoon of oregano.
5. Add the potatoes, carrots, corn and green beans to your soup. Stir it all together with a large spoon.
6. Now be creative! Smell the soup and decide as a class, if you would like to add any additional ingredients.
7. Let the soup simmer for 5-10 minutes.
8. Enjoy eating the soup!

How many different colored vegetables are in your soup? Is this a good variety?

Taste the soup. Circle how well you like or dislike the soup:

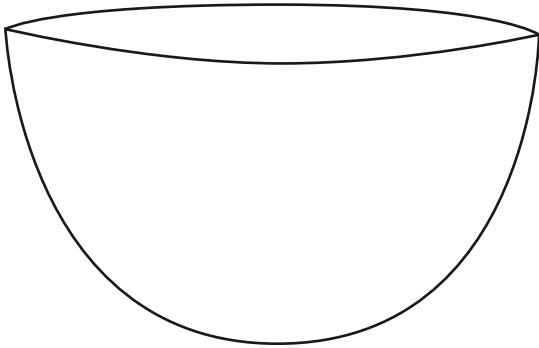


SCIENTIFIC INQUIRY:

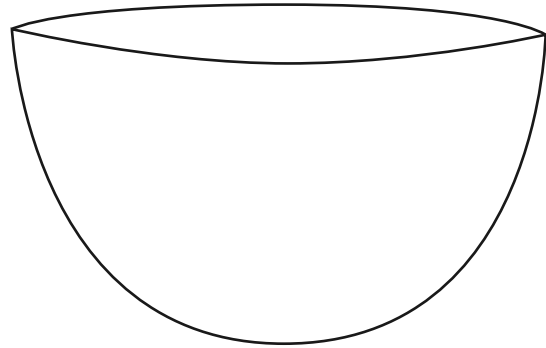
Scientific Soup (continued)

My Soup Creation

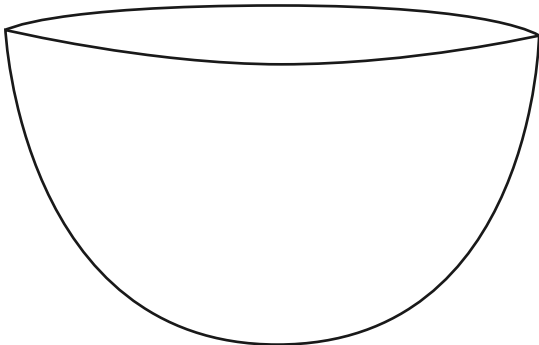
If you could create your own soup, what vegetables, spices and other ingredients would you use? Draw and write four steps for making your soup. Be sure to list all the ingredients.



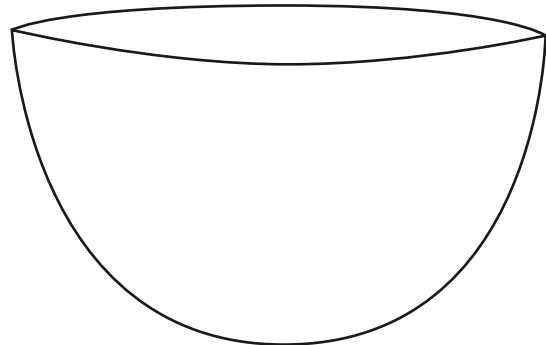
First...



Then...



Next...



Last...

Proficiency Questions

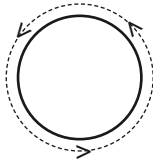
Circle the best answer:

1. Which part of the plant sends the plant's food to the other parts?

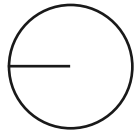
- a. fruit
- b. stem
- c. leaf
- d. flower

2. Which picture best shows the circumference of a circle?

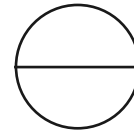
a.



b.



c.



d. None of the above

3. Which is an example of an acid?

- a. water
- b. lemon juice
- c. baking power
- d. all of the above

4. What happens when you add baking soda (a base) to broccoli?

- a. nothing
- b. the broccoli turns bright brown
- c. the broccoli turns bright green
- d. the broccoli turns bright blue

5. Which vitamin is found in orange vegetables like carrots?

- a. vitamin A
- b. vitamin B
- c. vitamin D
- d. vitamin K

6. Which meal has a variety of vegetables?

- a. hamburger and fries
- b. chicken fingers and applesauce
- c. tomato soup and a grilled cheese sandwich
- d. vegetable soup and a green salad

Answer Keys

Vegetable Jungle

Doodle Bugs

- Circle: Carrots, turnips or potatoes
Box: Asparagus or celery
Fill-in the blank: Kale, spinach, romaine lettuce, mustard greens, turnip greens, mint, collard greens, etc.
Fill-in the blank: It is the fruit of the plant because it contains the plant's seeds.

SCIENTIFIC INQUIRY:

Stating the Facts About Vegetables

- Broccoli: 25 grams (0.9 oz); 2.5 inches (6.4cm); dark green, looks like a tree; flower
Celery: 40 grams (1.4 oz); 3 inches (7.7cm); light green, gets wider and whiter at the bottom; stem
Lettuce leaf: 12 grams (0.4 oz); 4 inches (10.2 cm); light green, flat with veins running through it; leaf
Green pepper: 165 grams (5.8 oz); 10 inches (25.5 cm); bright green with white seeds inside, spherical shaped with a stem on top; fruit
Potato: 213 grams (7.5 oz); 8 inches (20.5 cm); brown outside but white inside, oblong; root

Vegetable Rainbow

Doodle Bugs

- Circle: Lemon juice, vinegar, cream of tartar
Fill-in the blank: Lime juice, grapefruit juice, cranberry juice
Fill-in the blank: It is a nice bright green, but it is very mushy.

SCIENTIFIC INQUIRY:

Color Changes in Acids and Bases

- Broccoli: Green; dull green or brownish green (acid); bright green (base)
Carrot: Orange; slightly lighter orange (acid); orange (base)
Red cabbage: Deep red; bright red (acid); blue (base)
White onion: White, clear white (acid); yellow (base)

Which vegetable's color is changed the least by the acid and base?

The carrot's color is the least changed by the acid and base. It is a slightly lighter orange when cooked in the acidic water and it does not change color when cooked in the basic water.

Answer Keys (continued)

Eating Vegetables

Doodle Bugs

Box: 2-2 1/2 cups
Fill-in the blank: Mashed potatoes, mashed sweet potatoes, mashed cauliflower, etc.
Underline: Vitamin C helps heal cuts and scrapes.
Fill-in the blank: Orange vegetables are full of vitamin A and help with eyesight.

SCIENTIFIC INQUIRY:

Scientific Soup

How many different colored vegetables are in your soup? Is this a good variety?

There are four different colored vegetables in my soup, plus red tomato juice. The four vegetables are white potatoes, orange carrots, yellow corn and green beans. I think this is a good variety.

Like/Dislike: **Answers will vary.**

My soup creation: **Answers will vary.**

Example: 1. Place the pot on the stove.
2. Add chicken broth.
3. Add garlic powder, parsley and ground pepper.
4. Add chicken chunks, noodles, carrots, celery and onions.

Proficiency Questions (Workbook)

1. **b** 2. **a** 3. **b** 4. **c** 5. **a** 6. **d**

Proficiency Questions (Virtual CD)

1. **b** 2. **a** 3. **b** 4. **c** 5. **a** 6. **b** 7. **d** 8. **a**