

# Lesson 4

Decipher the Secret Vegetable Code



## Lesson Summary



### Overview

Garden detectives learn about how the fruits and vegetables they are growing fit into a healthy diet.



### Lesson Extensions

A lesson extension engages the detectives in a role-play to develop skills in asking their families to serve more fruits and vegetables.



### Key Messages

**Make half your plate fruits and vegetables.**

**Vary your veggies.** Eat red, orange, and dark-green vegetables, such as tomatoes, carrots, and spinach, at meals and snacks.



### Garden Connection

The garden detectives learn more about the fruits and vegetables they are growing, in addition to many other fruits and vegetables. They take a photograph (or create a drawing to scale) of their assigned fruit or vegetable in the garden each week and post it on the bulletin board. As they do so, they report to the rest of the class on how their plants are growing.



### Home Connection

Send the *Garden Detective News* home to parents/caregivers. Encourage students to survey family members about their fruit and vegetable consumption and to ask their families to serve more fruits and vegetables at meals and as snacks.

Lesson Summary

## Main Lesson: Decipher the Secret Vegetable Code

### Standards Addressed

#### Science

Standard F, Science in Personal and Social Perspectives (Personal Health/Nutrition): *Develop an understanding of how various foods contribute to health.*

#### English/Language Arts

Standard 1, Speaking and Listening: *Engage effectively in a range of collaborative discussions with diverse partners.*

#### Health

Standard 1, Concepts: *Comprehend concepts related to health promotion and disease prevention to enhance health.*

Standard 3, Access Information: *Demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.*

### Learning Objectives

Students will be able to:

1. List the five food groups.
2. Identify the Vegetable Subgroups within the Vegetable Group.

### Time Required

50 minutes

### Materials

- *Student Handout 4.1, MyPlate*
- *Student Handout 4.2, Vegetable Subgroups*
- *Fruit and Vegetable Flash Cards* (Appendix D and on CD-ROM)
- *Detective Veggie Dice* (Appendix D and on CD-ROM)
- Scissors
- Tape or glue
- Index cards
- Pencils
- Timer

### Preparation

- Duplicate one copy of *Student Handouts 4.1* and *4.2* on 3-hole-punch paper for each student.
- Cut out and assemble the *Detective Veggie Dice* so that you have a set of three dice for every four students.
- Separate the *Fruit and Vegetable Flash Cards*. Laminate the *Flash Cards*, if you have not done so already. NOTE: Only the *Vegetable Flash Cards* are required in this lesson.

### Instructional Process

#### STEP 1

**Review the five food groups with students.**

Write the following five food groups on the board:

- Grains
- Dairy
- Protein Foods
- Fruits
- Vegetables



**Tell students:**

- **To help us get enough of the types of foods we need each day, foods are categorized into five food groups.** Foods in each group contribute similar nutrients to a person's diet. For instance, fruits and vegetables contain many important nutrients, including vitamins A and C, potassium (a mineral), and dietary fiber.



**Ask students to give examples of foods in each group.**

- **Grains**—Bread, rice, noodles, cereal
- **Dairy**—Milk, cheese, yogurt
- **Protein Foods**—Chicken, turkey, meats, seafood, eggs, beans and peas, nuts, seeds, processed soy products (e.g., tofu)
- **Fruits**—Banana, orange, peach, strawberries, blackberries
- **Vegetables**—Lettuce, Swiss chard, carrots, corn

Some foods in the Vegetable Group actually are considered to be the fruit part of the plant because they contain seeds. However, they belong to the Vegetable Food Group because of how they are used in meals (as vegetables in a salad, on a sandwich, etc.), the nutrients they contain, and their taste. Some examples are tomatoes, cucumber, and squash.

We eat the seeds of some plants. Seeds that we eat are in the Protein Foods Group. Examples of seeds we eat are sunflower seeds and pumpkin seeds.

Distribute *Student Handout 4.1, MyPlate*.

MyPlate is an icon developed by the United States Department of Agriculture that reminds us to choose a healthy plate at mealtimes. The icon emphasizes the Fruits, Vegetables, Grains, Protein, and Dairy Food Groups.



**Ask students:**

- **Why do you think some sections of the plate are bigger than the others?** (While we need food from all five food groups, we need different amounts from each food group. For example, the MyPlate icon shows that we need a little more vegetables than fruit.)

Instruct students to write examples of some of the foods they eat from each food group in each section of the plate.



**Ask students:**

- **What does this icon tell us about eating fruits and vegetables—like the ones growing in our garden?** (The icon encourages us to make half of our plate fruits and vegetables—with a little more coming from the Vegetable Group.)

**Review the vocabulary words on page 81 with students.**

Explain to students that fruits and vegetables contain many nutrients with important health benefits. Ask the students:

Since you have started to research the fruits and vegetables we have in the garden, can anyone tell us a health benefit of eating any of the fruits or vegetables we have planted?



### Remind students:

- Remember when we said that fruits and vegetables have important nutrients, including vitamins A and C, the mineral potassium, and dietary fiber?
- Vitamin A keeps eyes and skin healthy and helps to protect against infections.
- Vitamin C helps heal cuts and wounds and keeps teeth and gums healthy.
- Fiber keeps food moving through the digestive tract.
- Potassium plays a role in keeping blood pressure normal.

The Vegetable Group is broken into five subgroups and people are encouraged to eat vegetables from each subgroup in order to get the nutrients they need to stay healthy. Vary your veggies to get a variety of nutrients in the foods you eat. Eat red, orange, and dark-green vegetables, such as tomatoes, carrots, and spinach, at meals and snacks.

### STEP 2

**Distribute Student Handout 4.2, Vegetable Subgroups and write the names of the Vegetable Subgroups on the board.** Review the five Vegetable Subgroups with students by considering examples within each subgroup:

- **Dark-Green**
  - Examples: bok choy, broccoli, collard greens, dark-green leaf lettuce, kale, mesclun, mustard greens, romaine lettuce, spinach, Swiss chard, turnip greens, watercress, beet greens
- **Red and Orange**
  - Examples: acorn squash, butternut squash, carrots, Hubbard squash, pumpkin, red peppers, sweet potatoes, tomatoes

- **Beans and Peas**

- Examples: black beans, black-eyed peas, garbanzo beans (chickpeas), kidney beans, lentils, navy beans, pinto beans, white beans, soy beans, split peas

- **Starchy**

- Examples: corn, green peas, green lima beans, white potatoes, plantains

- **Other**

- Examples: artichokes, asparagus, bean sprouts, beets, Brussels sprouts, cabbage, cauliflower, celery, cucumbers, eggplant, green beans, green peppers, iceberg lettuce, mushrooms, okra, onions, parsnips, turnips, wax beans, zucchini

Distribute the *Vegetable Flash Cards* so that each student has one.

- Ask the students who have the vegetables to be grown in the school garden to go first.
- Ask each student to raise his or her hand and share the following information:
  - The vegetable on the card,
  - Which subgroup it belongs to, and
  - A nutrition fact from the back of the card.
- Ask the student to take his or her *Vegetable Flash Card* to the front of the room and tape it underneath the correct Vegetable Subgroup heading.
- Tell the students that it is important to eat a variety of fruits and vegetables because of the many different nutrients included in these foods.

Point out that green leaf lettuce belongs to the Dark-Green Vegetable Subgroup because of its green color and the nutrients it contains, such as vitamin A. Iceberg lettuce is lighter in color and lower in several nutrients when compared to other vegetables in the Dark-Green Vegetable Subgroup. Iceberg lettuce is part of the “Other” Vegetable Subgroup.

Most people need to eat more vegetables from the Red and Orange, Dark-Green, and Beans and peas Vegetable Subgroups. Beans and peas are special. They also belong to the Protein Foods Group because they are high in protein.



**Ask the students:**

- **Why aren't all green vegetables in the Dark-Green Vegetable Subgroup?** Some of the "Other" Subgroup vegetables, like zucchini and cucumbers, are different from dark-green vegetables because they are not green inside--they are white inside and only have a green outer skin/peel. Vegetables in the "Other" Subgroup are also lower in certain nutrients than dark-green vegetables. For instance, green beans are lower in vitamins A and C and folate than most dark-green vegetables.
- **Why aren't beet roots in the Red and Orange Subgroup?** Beet roots are different from other vegetables in the Red and Orange Subgroup. First, beet roots that are most commonly available are a purplish color. This purple color is different from the red color you see in red peppers or the orange color in carrots. Beet roots are also lower in some nutrients than red and orange vegetables, such as vitamins A and C. Because of their color and what nutrients they provide, beets are part of the "Other" Vegetable Subgroup.
- **Why aren't green (string) beans and green peas in the Beans and Peas Subgroup?** Green peas are similar in their nutrient content to other starchy vegetables and are grouped with them. Green beans are in the "Other" Vegetable Subgroup. Vegetables in the "Other" Subgroup are still healthful choices. Eating vegetables from all the subgroups helps you get the nutrients you need to play hard and be healthy.

**STEP 3**

**Play Detective Veggie Dice Game.**

Arrange the tables to seat the students in groups of four, and label each table as Detectives A, Detectives B, Detectives C, and so on. Give each table a set of three Detective Veggie Dice.

Tell students that they are going to play a game called Detective Veggie Dice. The object of the game is to identify the subgroup each vegetable is from.

**Read the following directions to the students:**

1. There will be four detectives at each table. Players seated across from each other are partners. You will work together earning points for your team's card. One member from each team keeps track of the score as his or her partner is rolling the dice by marking tallies on an index card. Each table will be given a set of three *Detective Veggie Dice*, pencils, and two index cards per team (one card is to keep track of points for each round and one card is to keep track of wins and losses).
2. Before play begins, I will decide which Vegetable Subgroup the first game will focus on: Dark-Green, Red and Orange, Starchy, Beans and Peas, or Other. To begin the game, I will call out "dark-green veggie!" and start a timer. The first detective at each table gets to roll all three dice for 1 minute and his or her partner records the scores on an index card. Each time a dark-green vegetable is rolled, that team gets a point. After 1 minute, I will call out "switch!" The next detective at each table gets to roll the dice for 1 minute. We will do this until all four detectives at each table have a chance to roll the dice for 1 minute.
3. Then we'll play another round using the next Vegetable Subgroup. I will call out "red and orange veggies!" and start the timer again.
4. The object of the game is to acquire points, which are earned each time a detective rolls a vegetable from the designated Vegetable Subgroup. When a point is earned, it is marked on the team's scorecard.

### Scoring Basics

- Each correct roll is worth 1 point.

Example: If this round is rolling for “dark-green veggies” and the dice you roll turn up a dark-green veggie, a red and orange veggie, and a starchy veggie, you would receive 1 point.

- If all three dice come up as the designated Vegetable Subgroup, this is called a Veggie Victory and it’s worth 10 points. If you get a Veggie Victory, you must call out “Veggie Victory!” and this stops play at all tables for the rest of the round and each table moves on to the next Vegetable Subgroup round. Mark a V on the scoring card to indicate that the team has a Veggie Victory.
- At the end of all Vegetable Subgroup rounds, the team with the most points wins.
- Each team keeps track of its wins and losses on the second index card.

You may wish to play the following variations of the game:

- If all three dice come up as a Vegetable Subgroup other than the designated Vegetable Subgroup (example: you roll three starchy vegetables when the designated round is red and orange vegetables), you will receive 5 points. Play continues at all the tables until time is up or someone rolls a Veggie Victory.
- After each Vegetable Subgroup round, the team with the most points at each table moves to the next table in a clockwise rotation.

### Recognition

- It is fun to give non-food prizes or stickers during the Detective Veggie Dice game. Here are some examples of achievements that could be rewarded:
  - Highest score
  - Most wins
  - Most losses
  - Most Veggie Victories

Use the Detective Veggie Dice to review the Vegetable Subgroups.

Note: The Detective Veggie Dice game may be played while smaller groups of students go out to tend the garden.

## Teacher Background Information

# Nutrients and What They Do

### Vocabulary

**Dietary Guidelines for Americans:**

Recommendations from the Federal Government that provide advice for making healthy food choices that promote good health and a healthy weight and help prevent disease for Americans ages 2 and older.

**MyPlate:** An icon developed by the United States Department of Agriculture that reminds Americans to choose a healthy plate at mealtime. The icon emphasizes the fruits, vegetables, grains, protein foods, and dairy food groups. (See <http://www.choosemyplate.gov>.)

**Nutrients:** The substances found in food that nourish your body.

**Minerals:** Nutrients such as calcium, potassium, magnesium, iron, and zinc; some regulate body processes while others become part of body tissues.

**Vitamins:** Substances found in foods that your body needs to grow and stay healthy. Many fruits and vegetables are high in vitamins A and C, folate, potassium, and fiber.

The *Dietary Guidelines for Americans, 2010* describes a **healthy diet** as one that

- Emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products;
- Includes lean meats, poultry, fish, beans, eggs, and nuts; and
- Is low in saturated fats, *trans* fats, cholesterol, salt (sodium), and added sugars.

The recommendations in the Dietary Guidelines and in MyPlate are for the general public 2 years of age and older. Making healthy food choices and being physically active can help people attain and maintain a healthy weight, reduce their risk of chronic disease, and promote overall health.

Eating more fruits and vegetables is a key part of eating healthfully. More information about fruits and vegetables can be found at <http://www.choosemyplate.gov>.

| Food Group | Key Nutrients*                                 | Action in the Body  |
|------------|--|---|
| Vegetables | Vitamin A, Vitamin C, Potassium, Folate, Fiber | <p><b>Vitamin A</b> helps maintain skin and mucous membranes and aids in vision.</p> <p><b>Vitamin C</b> helps the body heal and fight infections.</p> <p><b>Folate</b> is needed for healthy blood cells and is important for cell division, such as in pregnancy and growth.</p> <p><b>Fiber</b> aids the movement of food through the digestive tract.</p> |
| Fruits     | Vitamin A, Vitamin C, Potassium, Folate, Fiber | <p><b>Potassium</b> maintains the heartbeat, regulates body fluids, and is needed for muscle and nerve functioning.</p>   |

\*Each food group contributes many other nutrients in addition to the key nutrients listed here. There are more than 40 different nutrients with many different functions that are required for good health.



Name: \_\_\_\_\_ Date \_\_\_\_\_

Write examples of the foods that you like to eat for each food group in the correct section of the plate.

A large illustration of a plate divided into five sections. The top-left section is labeled 'Fruits', the top-right 'Grains', the bottom-left 'Vegetables', and the bottom-right 'Protein'. To the right of the main plate is a separate circle labeled 'Dairy'. To the left of the plate is a drawing of a fork. To the right of the plate is a cartoon girl with dark skin and hair, wearing a green dress and blue shoes, holding a clipboard and pencil. At the bottom of the entire illustration is the text 'Choose MyPlate.gov'.

*Make half your plate fruits and vegetables.*

## Student Handout 4.2

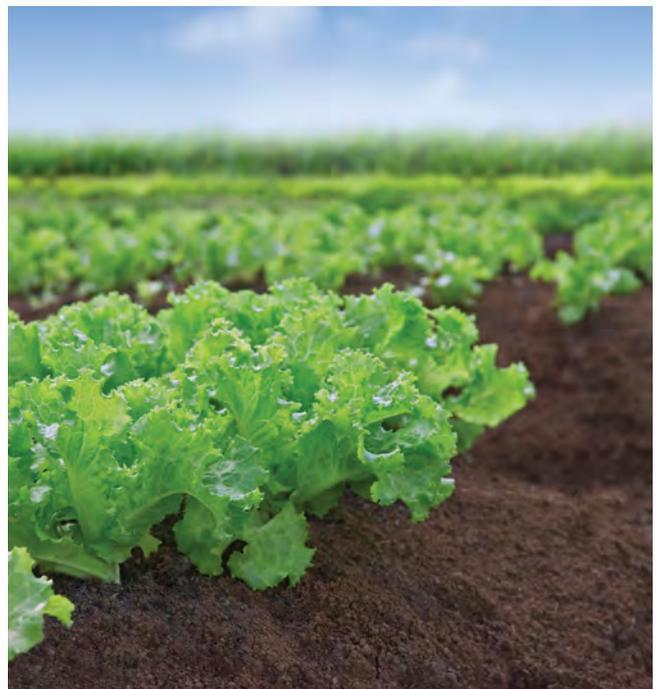
# Vegetable Subgroups



There are five Vegetable Subgroups:

- **Dark-Green**
  - Examples: bok choy, broccoli, collard greens, dark-green leaf lettuce, kale, mesclun, mustard greens, romaine lettuce, spinach, Swiss chard, turnip greens, watercress, beet greens
- **Red and Orange**
  - Examples: acorn squash, butternut squash, carrots, Hubbard squash, pumpkin, red peppers, sweet potatoes, tomatoes
- **Beans and Peas**
  - Examples: black beans, black-eyed peas, garbanzo beans (chickpeas), kidney beans, lentils, navy beans, pinto beans, white beans, soybeans, split peas
- **Starchy**
  - Examples: corn, green peas, green lima beans, white potatoes, plantains
- **Other**
  - Examples: artichokes, asparagus, bean sprouts, beets, Brussels sprouts, cabbage, cauliflower, celery, cucumbers, eggplant, green beans, green peppers, iceberg lettuce, mushrooms, okra, onions, parsnips, turnips, wax beans, zucchini

**Vary your veggies. Eat red, orange, and dark-green vegetables, such as tomatoes, carrots, and spinach, at meals and snacks.**





# Garden Detective News



## Help Healthy Habits Take Root

Ask your child to help you find ways to serve dark-green, red, and orange vegetables.



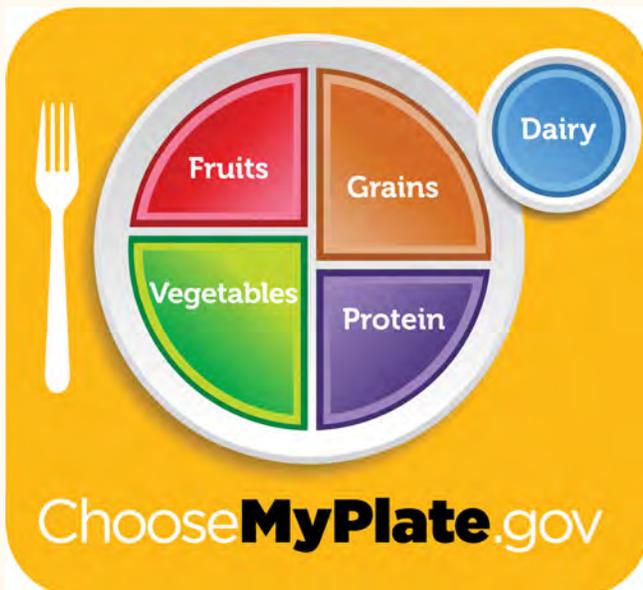
United States  
Department of  
Agriculture



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## Garden Detective News

This week, our class learned about building a healthy plate with foods from each of the food groups. One easy way is to fill half of your plate with fruits and vegetables. They also learned why it is important to vary your veggies and eat dark-green, red, and orange vegetables, and beans and peas. We are discovering lots of new ways to do that through our garden where we are growing dark-green vegetables like spinach, Swiss chard, and leaf lettuce, and orange vegetables like carrots.



### Dark-Green Vegetables

|                         |                |
|-------------------------|----------------|
| bok choy                | spinach        |
| dark-green leaf lettuce | Swiss chard    |
| romaine lettuce         | collard greens |
| watercress              | mustard greens |
| broccoli                | turnip greens  |
| kale                    | beet greens    |

### Red and Orange Vegetables

|              |                  |
|--------------|------------------|
| acorn squash | Hubbard squash   |
| carrots      | sweet potatoes   |
| red peppers  | butternut squash |
| pumpkin      | tomatoes         |

### Bean and Peas

|                 |                               |
|-----------------|-------------------------------|
| black beans     | garbanzo beans<br>(chickpeas) |
| kidney beans    | navy beans                    |
| pinto beans     | soy beans                     |
| black-eyed peas | split peas                    |
| lentils         |                               |
| white beans     |                               |

Help your garden detective complete the family survey with all members of your family. Have fun and be healthy as a family!

## Why should kids eat plenty of fruits and vegetables as part of a healthy diet?



Start them early with fruits and veggies. It's easier to get your child in the habit of eating and enjoying fruits and veggies if you start when they are young.

Studies show a positive association between healthier dietary patterns and academic performance.

Vitamin C helps heal cuts and wounds and keeps teeth and gums healthy.

Vitamin A keeps eyes and skin healthy and helps to protect against infections.

The fiber in fruits and veggies helps your child feel full longer, and that can help with a healthy body weight. It can also help prevent constipation.

**Family Activity 4**  
**Family Survey**



**It would be a crime not to include the whole family in making healthy food choices!**

Let's get everyone involved in making food choices for a healthy diet. Survey your family members to find out the kinds of food choices they are making. Use the questions below. Put a check mark in each person's column for every "yes" answer.

**Help Your Family Make Healthy Food Choices**

| <b>This week did you:</b>                              | You   | Family members |       |       |       |
|--|-------|----------------|-------|-------|-------|
| Eat a fruit or drink 100 percent fruit juice each day? | _____ | _____          | _____ | _____ | _____ |
| Eat a vegetable at lunch and dinner each day?          | _____ | _____          | _____ | _____ | _____ |
| Eat dark-green vegetables?                             | _____ | _____          | _____ | _____ | _____ |
| Eat red and orange vegetables?                         | _____ | _____          | _____ | _____ | _____ |
| Eat beans and peas?                                    | _____ | _____          | _____ | _____ | _____ |
| <b>Total check marks</b>                               | _____ | _____          | _____ | _____ | _____ |

When you are done with the survey, talk with your family about the results.

Do you and your family see any places where you could improve and eat healthier? \_\_\_\_\_

Set a goal for this week to get more yes answers to these questions. Have fun and be healthy as a family! \_\_\_\_\_



## Lesson Extension: Play a Leading Role

### Standards Addressed

#### English/Language Arts

Standard 1, Speaking and Listening: *Engage effectively in a range of collaborative discussions with diverse partners on grade 3 and 4 topics and texts, building on others' ideas and expressing their own clearly.*

#### Health

Standard 4, Interpersonal Communication: *Demonstrate how to ask for assistance to enhance personal health.*

Standard 8, Advocate for Health: *Express opinions and give accurate information about health issues.*

### Learning Objectives

Students will be able to:

1. Demonstrate effective verbal persuasion techniques in asking a parent/caregiver to have more fruits and vegetables available at home.

### Time Required

30 minutes

### Materials

*Student Handout 4.3, Playing a Leading Role*

### Preparation

- Duplicate *Student Handout 4.3* for each student on 3-hole-punch paper.

### Instructional Process

#### STEP 1

**Introduce the role-play activity.** Explain to students that you will be sending a newsletter home to their families about making healthy food choices with plenty of fruits and vegetables, especially red, orange, and dark-green vegetables such as tomatoes, carrots, and spinach, at meals and snacks.



#### Ask students:

- Do you eat fruits or vegetables several times a day? If not, why not?  
Use prompts such as:
- Do you have fruits and vegetables at home that you like?
- How easy is it to find fruits and vegetables at home?

Explain that all the reasons they have mentioned may make it more difficult to eat more fruits and vegetables.

Point out that you need a variety of fruits and vegetables available at school and home if you want to make half your plate fruits and vegetables. Having plenty of fruits and vegetables available helps you to “vary your veggies” and eat smart to play hard.

**STEP 2**

**Have students complete the role-play activity.** Distribute *Student Handout 4.3, Playing a Leading Role*. Review the directions with the students.

Talk briefly about the importance of using respectful words and tone of voice when asking for changes. Ask students to develop ground rules, such as:

- Use a pleasant tone of voice.
- Use positive body language.
- Say “please” and “thank you.”
- No put-downs allowed.

Divide the class into groups of four students and assign each group a scene from the handout.

Give students 15 minutes to discuss how they would resolve the situation in their scene.

In pairs, have one student play the parent and the other the student. Have them role-play the student asking his or her parents/caregivers for more fruits and vegetables at home. After 2-3 minutes, allow the pairs to switch roles and try again.

Have each group present its solution to the class. Compare solutions that different groups developed.

**Student Handout 4.3**

**Playing a Leading Role**



Read your group’s scene. Talk about the scene with your group. What keeps the person in the scene from eating more fruits and vegetables? As a group, decide what you would say and do. Write it down.

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Then, divide into pairs. Take turns being the parent and the student. As the student, role-play asking your parent/caregiver for more fruits and vegetables at home. After 2-3 minutes, switch roles and try again. Remember to be respectful to one another.

**Scene A**

You just got home from school and you really want a fruit or vegetable for a snack. You look in the cupboard, on the counter, and in the refrigerator. There are no fruits or vegetables. What could you say or do so there are healthy snacks for you to eat after school?

**Scene B**

You are always rushing out the door in the morning and don’t have time to sit and eat breakfast. You know you need to eat something to give you energy to learn in class. How could you talk with your parents about having fresh fruit in a bowl on the counter that you could eat on the way to school?

**Make half your plate fruits and vegetables.**



