Chapter 3
Vegetables

Vegetables are the parts of plants that people eat including roots, tubers, bulbs, stems, leaves, fruits, flowers, seeds and sprouts. Most Americans do not eat the variety or amount of vegetables that they need for healthy living. For this reason, it is important to learn about the nutrition and science of cooking vegetables.

Enjoy taking a trip to vegetable paradise!

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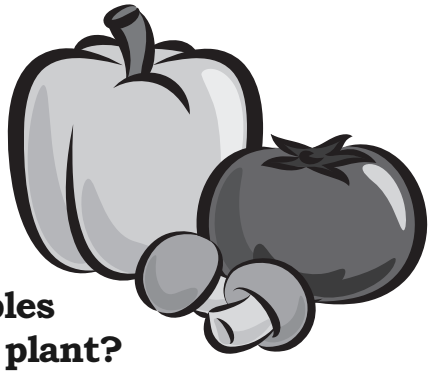
Vegetable Jungle



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.

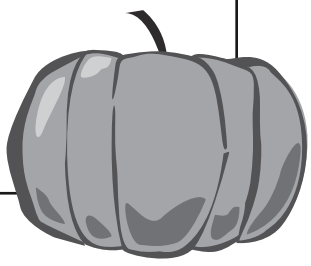
Doodle Bugs

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	

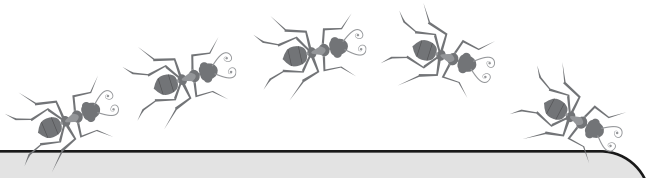
In the table below, state the facts about vegetables such as weight, size, circumference, appearance inside and out and classification/group.

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:		

TRY THIS AT HOME:

Ants on a Log



You will need:

2 celery stalks

4 tablespoons peanut butter

2 tablespoons of raisins

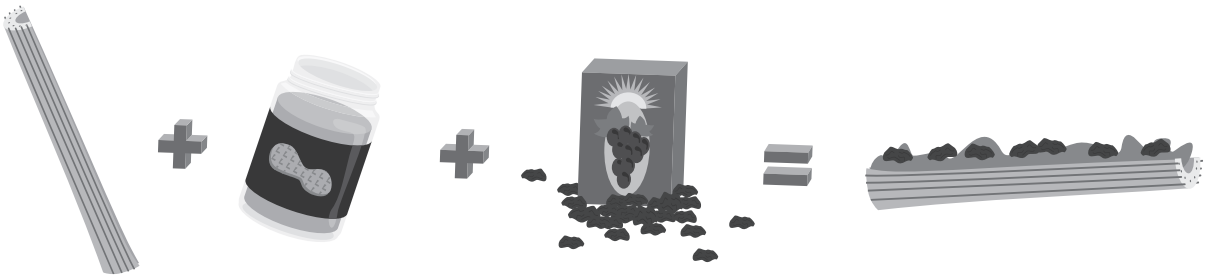
Help from an adult

PREP TIME: 5 minutes

How do you make a quick easy snack using celery?

1. Wash the celery.
2. Cut each stalk into a few sticks (about 2-3 inches long).
3. Spread peanut butter in the U-shaped part of celery, from one end to the other.
4. Press raisins gently into the peanut butter.
5. Enjoy your ants on a log!

SERVING SIZE: 1 celery stalk or 1/2 cup



Fun Fact

Celery is a good source of potassium. Potassium is important for healthy nerves and muscles. One stalk of celery will give you 1/2 cup on your way to the recommended 2-2 1/2 cups of vegetables per day.

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.

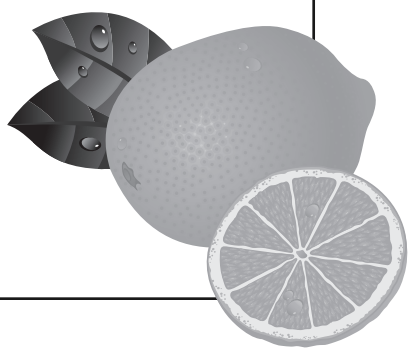
Kitchen bases like baking soda taste bitter. Cooking broccoli with baking soda makes the broccoli turn bright green. Bright green broccoli may look nice, but it feels very mushy. Vegetables cooked in basic water (water plus baking soda) not only change colors, but also become mushy. Today you will use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

DOODLE BUGS

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

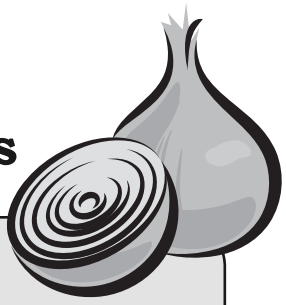
Fruit juices that are tart or sour like lemon juice are all called acids. Can you list some other tart or sour fruit juices?

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.

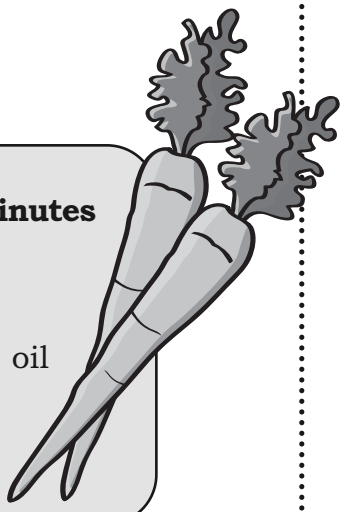
Color Facts

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?

TRY THIS AT HOME:

Copious Carrots



You will need:

Large pot
Hot plate
1 set measuring spoons
Large spoon
2 whole carrots
3/4 teaspoon salt
1 1/2 teaspoons vegetable oil
1 teaspoon pepper
Help from an adult

PREP TIME: 5-10 minutes

How do you bake a carrot?

1. Scrub carrots under running water to remove dirt from the surface. (Store carrots unwashed; only wash them when you are ready to use them.)
2. Cut the green stem off the end of the carrot.
3. Use a vegetable peeler to trim thin slices from the outside of the carrot until the entire surface (outside layer) is peeled.
4. Cut carrots into 1 1/2 inch pieces.
5. Place carrots on a baking sheet and lightly sprinkle with oil, salt and pepper.
6. Bake in the oven at 400 degrees Fahrenheit for 20 to 30 minutes or until carrots are tender and lightly browned.
7. Serve while hot and enjoy!

SERVING SIZE: 1/2 cup

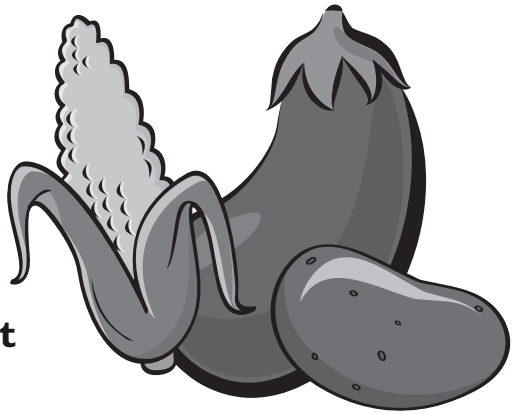
Quick Fix:

Buy canned or frozen carrots and steam in the microwave.

Fun Fact

Carrots contain beta-carotene (vitamin A), which gives carrots their orange color and helps with good eyesight. A half cup of carrots gives you 1/2 cup of vegetables on your way to the recommended 2-2 1/2 cups of vegetables per day.

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.

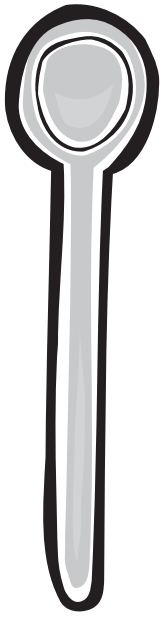
Can you think of a mashed vegetable that we eat? What vegetable is it?

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?

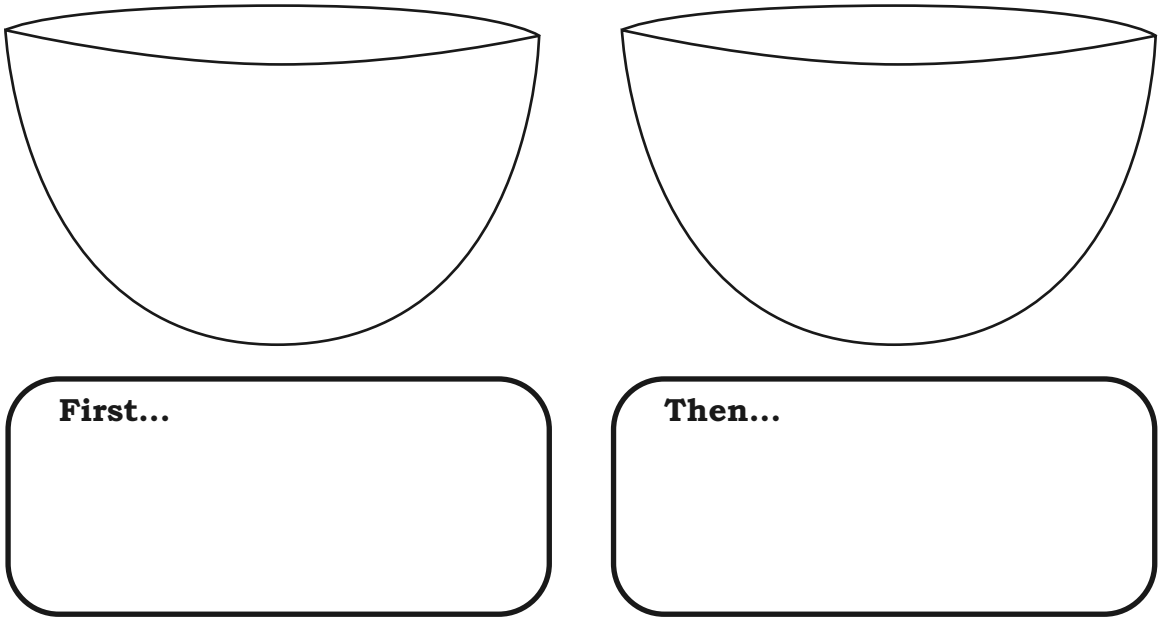
Taste the soup. Circle how well you like or dislike the soup:

SCIENTIFIC INQUIRY:

Scientific Soup (continued)

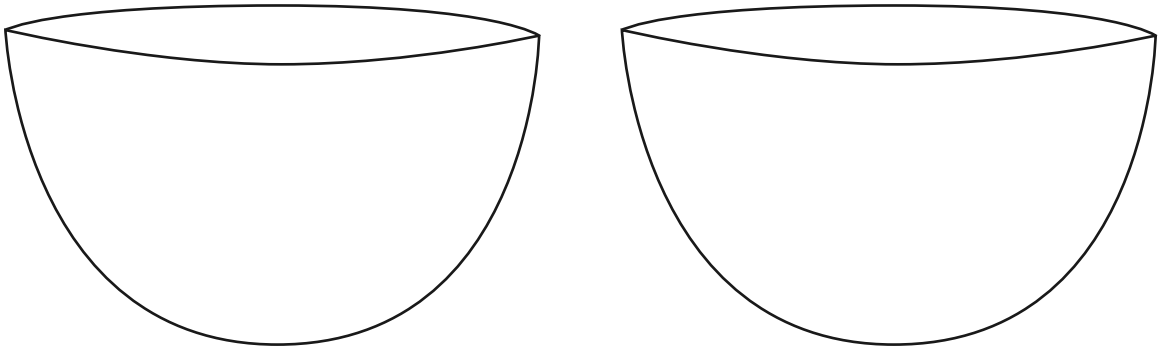
My Soup Creation

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...

TRY THIS AT HOME:

Silly Chili

You will need:

1 pound ground turkey meat
(you will need help from an adult)

2 small onions, chopped

2 tablespoons chili powder

1/2 teaspoon salt

2 1/2 cups canned tomatoes

2 1/2 cups canned kidney beans

1 cup water

Help from an adult

PREP TIME: 20 minutes

How do you make a quick and easy soup with kidney beans?

1. In a large saucepan, brown ground turkey thoroughly.

2. Drain grease completely from the ground turkey meat.

3. Add chopped onions, chili powder and salt to the browned meat.

4. Add tomatoes, beans and water.

5. Bring to a boil. Then turn the heat down to low, put the lid on the saucepan and cook for one hour.

6. Eat and enjoy!

SERVING SIZE: 1 cup

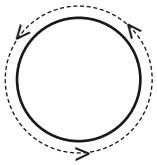
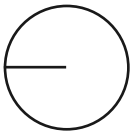
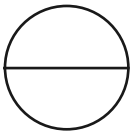
Fun Fact

Half a cup of kidney beans contains many vitamin and minerals plus 4.5 grams of fiber. Fiber keeps you digestive system healthy and helps fight off diseases. A cup of Silly Chili will provide you with a half a cup of vegetables on your way to 2-2 1/2 cups of vegetables a day.

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