Nutrition

Materials

- lab book pages 42–47, reproduced and fashioned into a booklet, one per student
- page 41, reproduced as an overhead transparency
- packaged foods, assorted (crackers, condiments, canned fruits and vegetables)
- brown paper grocery bags
- vegetable oil
- water
- paper towels
- trays
- fresh foods, assorted (fruits, vegetables)
- fruit and vegetable juices, assorted (apple, grape, orange, tomato, carrot)
- cornstarch
- gallon container
- iodine
- glass jars, small
- droppers
- dishes, small
- chicken bones
- vinegar
- large glass jar, with lid

Objectives

- give examples of healthy and unhealthy foods
- identify the ingredients in a packaged food
- conduct fat, Vitamin C, and starch tests on various foods
- recognize the importance of calcium for strong bones
- plan a healthy meal based on the MyPlate food icon

Preparation

Two weeks before starting the unit, place a number of small, cooked chicken bones (meat removed) in a large glass jar. Fill the jar with vinegar and put the lid on the jar. Let the jar sit for two weeks, then pull out the bones and set them on paper towels to dry thoroughly. Thoroughly clean another bunch of cooked chicken bones.

Note: Before you begin the unit, remind students that they are working in a science lab, and that they are not to eat anything in a science lab unless told to do so by you.

Collect a variety of different packaged foods. Make sure the packages have a nutrition facts panel, and that there are not too many total ingredients or hard-to-pronounce words. Students will read the labels and write the ingredients in their lab books.

Prepare trays of assorted food pieces for students to conduct their fat and starch tests on. Cut up small pieces of fresh fruit and vegetables, as well as pieces of processed starchy foods like crackers and cookies.

Collect an assortment of juices for students to test for Vitamin C content. Decide how you will distribute the juices to students. Each group will need one small glass jar and one dropper for each juice tested.

Make the Vitamin C indicator liquid (one gallon) by mixing a heaping teaspoon of cornstarch in a cup of cold water. Boil this mixture for two minutes. Put ten droppers full of this mixture into a gallon container of water. Add one dropper full of iodine. Cap the container; shake until mixture looks uniformly blue.

Background Information

An understanding of the nutritional value of different food is essential for lifelong health. Many students are not aware of the nutritional value of the foods they eat every day. Most students eat more fat than recommended by the USDA dietary guidelines.

Processed foods are often the worst nutritional offenders. In order to keep foods from spoiling on the shelves of supermarkets, preservatives and other chemicals are added. Oftentimes, these chemicals and other additives are not particularly good for you.

A chicken bone soaked for a period of time in vinegar will be depleted of its calcium. (The calcium will crystallize out in the vinegar solution. You'll be able to see the crystals.) A bone without calcium is much weaker than a bone with calcium. Hence the soaked bone is bendable when wet and brittle once dried.

The USDA dietary guidelines feature a MyPlate icon, which serves as a reminder to build a healthy plate at mealtime. Half your plate should be fruits and vegetables. The other half should be grains and protein. Grains include bread, oatmeal, tortillas, and rice. Protein includes meat, eggs, peanut butter, and beans. The MyPlate icon also shows a serving of dairy, which should be fat-free or low-fat milk, cheese, or yogurt. Oils and fats are not considered a food group and are not represented on the MyPlate icon. Foods such as butter, mayonnaise, and avocado contain oils and fats and should be consumed sparingly.

Assessment Ideas

Have students create a list of foods they want to start eating more of, and a list of foods they would like to eat less of. Have them explain what it is about each food that makes it a good or bad choice for their diet.

Extension Ideas

Have students research the role of carbohydrates, fats, and protein in their diets. Which types of nutrients are especially needed by athletes? by children? by teenagers? How do a person's nutritional needs change throughout his or her lifetime?

Lab Book Instructions & Answers

Page 1: Discuss student responses as a class.

Page 2: Distribute packaged foods to each student or group. Help students as needed with ingredients they have never heard of.

Page 3: Distribute a piece of brown paper, water, and vegetable oil to each student or group. Arrange class time for the papers to dry. 3) Both liquids left a wet spot. 4) Only the oil spot is still there. Explain that foods with fat leave a mark that does not dry on the paper.

Page 4: Distribute trays of assorted foods (see "Preparation"). 2) Foods high in fat include processed snack foods like crackers and cookies, as well as some vegetables, like avocados. 3) Answers will vary.

Page 5: Students wil need glass jars and Vitamin C indicator liquid. 3) Each is a slightly different color.

Page 6: 2) Answers will vary, but orange juice contains a lot of Vitamin C. 3) Answers will vary according to the juices tested.

Page 7: Distribute potato slices, dishes, and iodine to students. Warn them to be careful when using the iodine and not to get it near their eyes or mouth, or on their clothes. 3) dark brown or black; 4) yes; 5) Answers will vary.

Page 8: 2) Answers will vary according to foods tested.

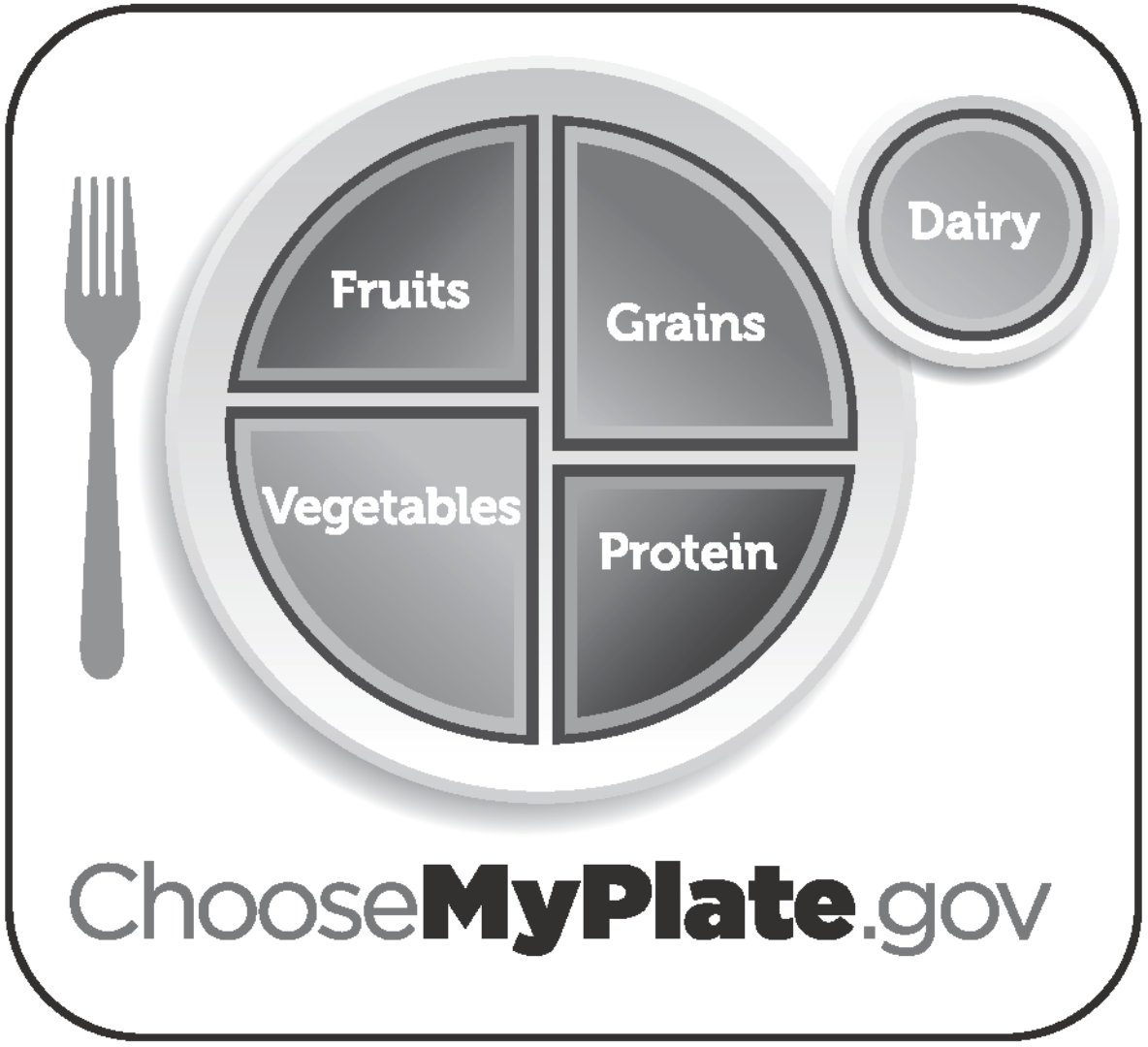
Page 9: Label the bones soaked in vinegar "A" and the unsoaked bones "B." Give each student or group one of each. 4) Calcium makes bones strong.

Page 10: Make an overhead transparency of the MyPlate food icon on page 41.

Page 11: Show the MyPlate food icon again on the overhead projector.

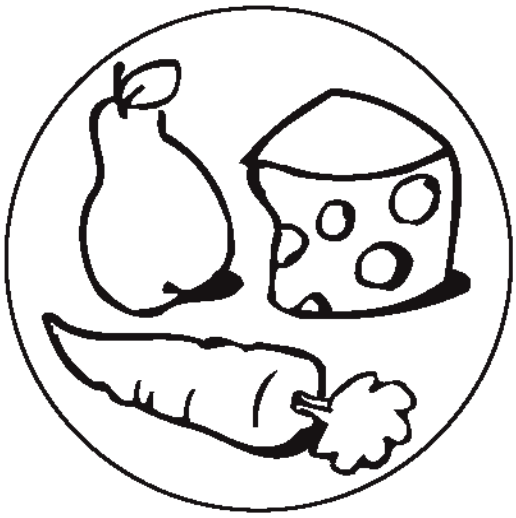
See page 40 “Page 10” for instructions on how to use the art on this page.

MyPlate



My Lab Book

Nutrition



Name _____ Date _____

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1 Favorite Foods

1. What are some of your favorite foods? Think about things you eat for breakfast, lunch, snacks, and dinner.

_____

_____

_____

_____

_____

2. Circle the foods you think are healthy. Underline the foods you think are unhealthy, or "junk food."

❷ What's Inside?

1. Look at the food package your teacher gives you. Write down all the ingredients you think are inside the food.

2. Now read the label on the side of the package. Write down all the ingredients listed. Circle the ingredients you don't know.

❸ Fat Test (1)

1. Spread a drop of water on a piece of brown paper.
2. Spread a drop of oil a few inches away from the waterdrop.
3. Hold the paper up to the light. Describe the mark left by both drops.

4. Let the paper dry for an hour. Describe what the marks look like now.

4 Fat Test (2)

1. Look at the foods your teacher gives you. Which do you think have fat in them? Record your predictions on the chart.

2. Use the brown paper to test the foods for fat. Record your results on the chart.

Food	Prediction: Has Fat?	Result: Has Fat?

3. Circle the food that seemed to have the most fat.

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5 Vitamin C Test (1)

You can use a chemical to test how much Vitamin C is in different kinds of juice. Follow these directions to do the test:

1. Pour 2 tablespoons of the blue liquid into each jar. Set the jars on a piece of white paper.

2. Add 10 drops of juice to each jar. Swirl the liquid in the jar.

3. What do you notice about the jars?

_____

_____

4. Line up the jars in order from lightest blue to darkest blue.

6 Vitamin C Test (2)

1. The jar with the lightest blue color contains the most Vitamin C. The jar with the darkest blue color contains the least Vitamin C.
2. Which jar is the lightest color? Which juice contains the most Vitamin C?

_____

3. List the juices you tested in order from Most Vitamin C to Least Vitamin C.

Most Vitamin C					Least Vitamin C

7 Starch Test (1)

1. Iodine is a chemical you can use to test for starch in foods. Our bodies use starch for energy.
2. Put a piece of potato in a dish.
3. Place a few drops of iodine on the potato. What color does the iodine turn? _____
4. If the iodine turns purple, dark brown, or black, the potato contains starch. Does the potato contain starch?_____
5. List some foods that you think contain a lot of starch.

_____

8 Starch Test (2)

1. Use iodine to give different foods the starch test.
2. Record your results on the chart.

Food Tested	Iodine Color	Does It Contain Starch?

9 Strong Bones

1. Look at the two chicken bones your teacher gives you.
2. Snap each bone in half. Which one breaks more easily?

_____

3. Bone A has been soaked in vinegar to remove the calcium inside the bone. Bone B has not been soaked in vinegar.
4. Why do you think it's important to have enough calcium in the foods you eat?

_____

_____

10 MyPlate

1. Look at the MyPlate icon on the overhead projector.
2. Plan one healthy day of eating based on the information you see on the place setting.

Breakfast: _____

_____

Lunch: _____

_____

Dinner: _____

_____

11 How Healthy?

1. Write down everything you ate yesterday on the back of this page.
2. About how many servings from each group did you have? Write the total numbers on the plate and cup.
3. Did you have a healthy day yesterday?

_____

_____

_____