

Health

Eat Colorful, Fresh Produce

Overview

Many human illnesses are related to poor nutrition and are considered preventable. Awareness of linkages between human health and nutrition is perhaps more prevalent now than ever before. However, many challenges remain for people in understanding which foods to eat and why. One way to help guide the practice of a nutritious diet is the use of colors.

The colors found in fresh produce are caused by various phytochemicals (plant chemical compounds) present in the produce. Using these colors as general indicators of the nutritional characteristics of fruits and vegetables, we can choose produce based on its ability to provide us with a balanced diet rich in nutrients. Diversified local farms and gardens that offer mixed produce through farmers' markets and community supported agriculture (CSA) programs offer ideal opportunities to access local fresh, nutritious food. The following reference resources are provided to improve your familiarity with phytochemicals and the nutritional properties of vegetables and fruits.

Resource References

The Colors of Health. 5 a Day the Color Way, Produce for Better Health Foundation
www.5aday.com/html/consumers/healthcolors.php

The Colors of Health Curricula. 5 a Day the Color Way, Produce for Better Health Foundation
www.5aday.com/html/educators/curricula.php.

Where does our food come from? Monkey Puzzle: Ecology and Education
<http://www.angelfire.com/sk/monkeypuzzle/teachplantparts.html>

Plant Parts. Missouri Botanical Garden, MBG
<http://www.mbgnet.net/bioplants/parts.html>

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Introduction

This activity is intended to introduce students to a small farm or garden that sells produce through a CSA or at a local farmers' market. They will see how a diversity of vegetables and fruits are grown and harvested for market. Students will also learn some of the nutritional values of eating fresh produce.

It is important to remember that many of the students visiting have rarely, if ever, been to a farm. Most everything the students see will be new so it is necessary to give them sufficient time to explore the farm, its rows of vegetables crops or fruit trees, and provide them with an opportunity to harvest produce that is in season.

Many of us know that we should eat 5-9 fruits and vegetables a day, but we do not know the nutritional benefits provided by, for example, tomatoes, as compared to collard greens. Through this lesson, students will see that the color of a fruit or vegetable is associated with specific phytochemicals that are essential to a balanced and nutritious diet.

To Lead This Activity You Need to Know

Facilitators of this activity need to have the following basic understandings in order to effectively lead students through the activity:

- Names of all the crops the students will see and how they are grown
 - How to harvest these crops
 - What plant parts (eg. roots, stems, fruits, flowers) are eaten
 - Some of the key nutritional benefits associated with each crop harvested.
- Valuable information on this topic is available at www.5aday.com/html/consumers/healthcolors.php. Key features of this information from that site is summarized below:

Phytochemicals typically associated with blue and purple vegetables and fruits include anthocyanins and phenolics, whose antioxidant and anti-aging effects are being researched. These foods may help with maintaining urinary tract health, memory function and more healthy aging.

Many orange and yellow fruits and vegetables contain Vitamin C and other oxidants, as well as two classes of phytochemicals called carotenoids and bioflavonoids. These foods can help promote good vision, a healthy heart and a healthy immune system.

Phytochemicals typically associated with green vegetables include lutein and indoles, which are being studied because of their potential antioxidant, health-promoting benefits. These foods may help build strong bones and teeth and maintain healthy eyesight

Lycopene and anthocyanins are among the phytochemicals that may be found in red fruits and vegetables and are being studied as health-promoting compounds. Red fruits and vegetables may help contribute to better memory function, a healthy heart and a healthy urinary tract.

Phytochemicals typically associated with white, tan, and brown fruits and vegetables may help maintain heart health as well as healthy levels of cholesterol. Allicin is a phytochemical common in the onions, garlic and their relatives.

Key Concepts

- Community Supported Agriculture (CSA)
- Local Farmers' Market
- Plant parts: stems, leaves, roots, fruits, flowers, flower buds
- Phytochemicals, including vitamins and antioxidants

Objectives

- Learn about a CSA or a farmers' market
- Learn how to harvest vegetables for a particular market, e.g., CSA basket
- Identify the main parts of a plant
- Learn what nutrients are present in different colored vegetables and fruits and what they do for human health
- Compare the taste of store bought and freshly harvested vegetables

Materials

- A farm or garden with a diversity of harvestable vegetables and/or fruits
- Boxes or baskets for harvesting – 1 for each group of 5-6 students
- A place for washing may be needed in some cases
- Digging forks, knives, or other tools for harvesting produce
- The “5 a Day The Color Way” Guide with the plants' phytochemicals – at least 1 for each group, preferably 1 for each student to take home. You can purchase these at http://www.shop5aday.com/acatalog/Color_Way_Guides.html or develop a guide using information from www.5aday.com/html/consumers/healthcolors.php
- If your campus or farm has the funds, we recommend purchasing the color guides which can be laminated for tours or given away to the youth.
- Red, green, blue/purple, and orange pens or pencils to fill in Nutrition Chart
- Copies of the Nutrition Chart work sheet for each group (attached).
- Clipboards and pencils to fill in the Nutrition Chart

Activities (30-45 minutes)

Farm Exploration and Harvesting (15-20 minutes)

1. Assemble the students and ask them how they get their vegetables and fruit. Where do their families buy them? Do any of them have a garden? Do any of their family members have a garden that provides them with any food? Briefly describe CSAs and farmers markets. Ask the students why a farmer might want to sell through a CSA or farmers market rather than selling to a wholesaler or supermarket. Discuss the benefits a farmer gets from direct marketing. Then ask students what are some of the trade-offs for consumers when buying from a CSA, farmers market, or a supermarket. Highlight the key benefits a CSA or farmers market provides to the customer. The goal is to show students some different marketing and shopping models beyond the traditional supermarket.
2. Explain that on today's visit they are going to help harvest. Walk the students through the field and show them the crops being grown. If possible, show the crops in their different growth stages, from seedling to full maturity. Show them how to harvest more than one vegetable or fruit from the farm. Possibly include root crops, greens, herbs, tomatoes, peppers, cucumbers, and fruit such as apples, plums, strawberries, and flowers.
3. Bring students to mature crop locations and show the distinctions of what make each different crop ready for harvesting. Contrast mature crops from the immature and/or over-mature crops. Since multiple crops will be harvested for this activity, it is best to use crops that have different phytonutrients (colors). It is also important to choose different crops that are close together to save time when walking between crops.
4. Break the students into groups of 4 – 6. For each crop, pass out any needed harvesting equipment to the appropriate group and demonstrate how to select, harvest and handle the crop in the field. Then instruct the students to harvest some of the crop. Supervise the work of the various groups as they harvest the crops. Ideally, this will be done in conjunction with the farm's own schedule so that the students can be acknowledged for the contribution they actually make to the task of harvesting.
5. Once back in the packing area, briefly demonstrate the steps involved in cleaning, grading, and sorting the crop. Let the students participate in these steps and supervise them.
6. After packing is finished, ask the group what they learned from seeing the crops and harvesting. Were they surprised by how a plant grew or by what part of the plant is eaten? Was it difficult? Fun? Would any of them like to grow their own garden so they could pick fresh food like they just did?

The Nutrition Worksheet (15-20 minutes)

1. Have students write the names of crops they harvested in the first column of the Nutrition Worksheet (attached). Use the "5 A Day The Color Way" guide to fill in the worksheet and identify important nutrients present in the vegetables and fruits they harvested.

2. In each separate row, have them write with the color pen corresponding with the vegetable or fruit's color – orange, red, blue/purple or green. Have each group fill in the chart and then share answers with the entire group.
3. Explain that phytochemicals are natural plant compounds that not only protect plants, but also may provide important disease protection to humans. These nutrients are not commonly found in processed foods or pills.
4. Phyto comes from the Greek word for plant, so phytochemicals are chemicals found in plants.
5. Different phytochemicals have different roles in the plant. Some contribute to color, others to flavor and aroma. This means that blueberries contain different phytochemicals than green spinach, and oranges smell differently than onions
6. Many phytochemicals are antioxidants and may help prevent disease.

Discussion and Reflection (10-15 minutes)

Ask students how many fruits and vegetables they usually eat in a day. Ask them how many would they like to eat. Ask them how many they think would be optimal. Explain that 5-9 fruit and vegetable servings a day is recommended because of all the health benefits provided by the phytochemicals, vitamins, minerals, and fiber. A colorful plate of food with green, red, blue/purple and orange vegetables or fruits helps ensure that your body obtains the nutrition it needs. Each fruit or vegetable has a variety of minerals and vitamins working in different ways to help keep a person healthy.

Have students spend a week tracking how many fruits and vegetables they consume and what phytochemicals they get from the different colored produce (student worksheet: <http://www.5aday.com/html/kids/track.php>). Ask them how they might be able increase the number of fresh fruits and vegetables they eat each day. You can combine this activity with the “Local Food, Taste the Difference!” activity in this packet to locate local fresh produce in the community.

Student Worksheet

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Name:

Date:

Location:

| CROP'S NAME | PLANT PART | PHYTONUTRIENTS | How It Helps the Body | Your Favorite Ways to Cook It |
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