

Eat a Rainbow

Overview: Students will learn about the health benefits of eating a variety of fruits and vegetables.

Grade Level/Range: Grades 3-6

Objectives:

Students will learn:

- the different parts of a plant.
- that they need to consume at least 5 fruits and vegetables a day
- the importance of “eating a rainbow” (a variety of fruits and vegetables)
- that color can indicate different nutrients available in fruits and vegetables



Time: 1 hour

Materials:

- Plant part chart (below)
- Chalkboard and chalk or dry erase board and markers
- Variety of fruits and vegetables representing different colors
- Small cups
- Toothpicks
- Napkins
- Knife and cutting board

Background Information:

In addition to providing the essential vitamins, minerals, and fiber that keep our bodies working, fruits and vegetables are also linked to health prevention benefits including decreased risk of stroke, cancer, and heart disease; improved memory; and lowered blood sugar levels. These benefits are attributed to phytonutrients (also known as phytochemicals) – substances in plants that are not recognized as vitamins or minerals, but provide a definite health boost.

Various fruits and vegetables contain different levels and kinds of lifesaving phytonutrients, so to reap the benefits we need to consume a wide variety of produce. Nutrition educators have come up with a handy and fun way to communicate the message: “Eat a Rainbow.”

Many of the phytonutrients are also pigments responsible for the color of fruits and vegetables. Plants have pigments to protect them against environmental factors (such as sunlight) and from harmful byproducts of plant processes like photosynthesis. When we consume fruits and vegetables, we receive benefits from the phytonutrients that are similar to what they provide to the plant – protection from environmental factors and cell damaging chemical byproducts.

Below is a chart from the Vegetable and Fruit Improvement Center with information about fruit and vegetable color, phytonutrient content, health benefits and produce examples. You can adapt this chart to make it age-appropriate for your students.

Color	Phytonutrient(s) Associated with Color	Health Benefit Associated with Phytonutrients	Example Fruits and Vegetables
Red	Lycopene and Anthocyanins	Strengthening collagen proteins in the body Preventing lung, prostate and stomach cancer	Strawberries Tomatoes Watermelon Cherries Red grapefruit
Orange	Beta-carotene and Liminoids	Protecting against chronic bronchitis, asthma and emphysema Reducing the risk of cataracts and lung cancer Decreasing cholesterol levels	Carrots Squash Citrus Melons
Yellow	Liminoids, Beta-carotene and Zeaxanthin	Protecting against chronic bronchitis, asthma and emphysema Reducing the risk of cataracts Decreasing cholesterol levels Protecting vision Preventing tumors and cancer in the colon, breast and prostate glands	Yellow peppers Corn Legumes
Green	Lutein, Saponins and Glucosinolates	Preserving eyesight Maintaining heart and skin health Increasing enzyme activity to detoxify carcinogens Preventing cancer and lowering lipid levels	Spinach Collard greens Broccoli Tomatillos
Blue/ Purple	Anthocyanins and Flavonoids	Strengthening collagen proteins Preventing cancer Providing anti-inflammatory and analgesic benefits	Blueberries Grapes Plums Grapes Raspberries Eggplant

Advanced Preparation:

Obtain a variety of fruits and vegetables to sample. Students can sign up to bring in an item (enough for each child in class to have a taste), arrange with your cafeteria to provide some items, or contact local grocery stores for donations. Try to provide enough variety so that each color can be represented by at least two options. Serve each food by itself, either raw or cooked (as much as possible, try to serve fresh foods however canned and frozen foods can be used). Check with your school to see if you need parent permission for tasting activities.

Laying the Groundwork:

Review plant parts, how they serve a plant, and how you identify them with your class. If possible, obtain a model or poster of the parts of a plant and worksheets for students to label the plant parts. The parts include:

Roots: found underground; absorb water and nutrients for growth; store food for plant

Stems: connect leaves to roots; carry water and nutrients from roots to leaves, and carbohydrates and other things from leaves to roots for growth; some provide food storage

Leaves: catch the sun, which gives plants energy to grow; release moisture and oxygen

Flowers: where fruits/seeds form

Fruits: contain seeds

Seeds: form inside fruit; when put in soil, grow into a new plant

Ask, which part of the plant do we eat? Do we eat all parts of all plants? Our common fruits and vegetables represent different parts of the plant, but we do not eat all parts of all plants.

Next, ask students why they think it's important for them to eat fruits and vegetables each day. *Fruits and vegetables contain different vitamins and minerals that are essential to our bodies, and they need to eat at least five servings of fruits and vegetables each day.*

Last, encourage students to begin thinking about other ways we can sort fruits and vegetables we eat. What are other characteristics that define different fruits and vegetables? What colors are represented by our fruits and vegetables? *All colors can be found, all though some are more common.*

Exploration:

1. Introduce phytonutrients and fiber, and other health benefits associated with eating produce. Explain that all fruits and vegetables contain different amounts of vitamins, minerals, fiber, and phytonutrients, and eating a lot of different types of fruits and vegetables is important to staying strong and healthy. Introduce the concept of eating a rainbow from the background information. Explain how the different colors of the fruits and vegetables indicate that they contain different vitamins, minerals, and phytonutrients, and that by eating all different colors, you are also getting all the different nutrients.
2. Lead an informal discussion about fruits and vegetables the students like, those they don't like, and those they've not tried. As they talk about various foods, encourage them to use descriptive words such as "sweet," "tangy," or "spicy" rather than "yucky," "okay," or "awesome."
3. Set up a chart on your whiteboard or chalkboard with colored markers or chalk similar to the one below. Ask students to help fill in the blanks with names of vegetables and fruits that you have obtained that match these colors. (We have listed some examples... but feel free to adapt based on availability for your class).

Student/Group Name _____

Color	Plant Part	Raw/Cooked	Flavor	Try Again?
Red 1. strawberries 2. tomatoes				
Orange 1. orange 2. carrots				
Yellow 1. pineapple 2. yellow peppers				
Green 1. Broccoli 2. Kiwi				
Blue/Purple 1. Blueberries 2. Grapes				

4. Introduce students to the idea of a tasting activity by telling them there are people in the world who have the job of sampling new vegetable and fruit varieties before the seeds are sold to gardeners and farmers, or testing foods that companies package for market. Tell them they'll be playing the role of food tasters during the tasting activity, and like real tasters, will rate flavors, using descriptive words as mentioned above. They'll also note if they'd be willing try each food again.
5. Clean fruits and vegetables thoroughly. Cut each item into bite-sized pieces as necessary. Provide toothpicks, paper cups, and napkins for students to use during the tasting.
6. Fill in the classroom chart with the comments from the students. Take a vote on whether each student will try the fruit or vegetable again.

Making Connections:

Discuss the tasting experience. Ask, which fruits and vegetables were our favorites? Did color have any impact on taste?

Brainstorm a larger list of fruits and vegetables representing different colors. Create a handout for students to take home and encourage them to try new fruits and vegetables with their families.

Branching Out:

English - Encourage students to keep a journal of their fruit and vegetable consumption for a week after the tasting. Some suggestions for what they might write about include: 1) experiences with new flavors; 2) ways that foods are prepared at their home; 3) if prepared foods or restaurant meals are consumed, what fruits and vegetables are part of those meals; 4) interviews with family members about their favorite fruits and vegetables.

Social Studies - Ask students to find a recent article related to the health benefits of fruits and vegetables in a newspaper or magazine. Instruct them to read the article and then discuss their current event either in writing or by a class presentation. During the discussion of these articles, try to focus on how encouraging healthier behaviors could effect/benefit our society.

Nutrition - Explore the nutritional content of common fruits and vegetables either as an individual or group project. http://www.dole5aday.com/ReferenceCenter/R_Home.jsp Instruct each student to create a brochure on a specific fruit or vegetable or on a specific vitamin (such as Vitamin C). The brochures can be displayed at school, or if resources are available, send copies of all brochures home.

Research/Writing - After the tasting exercise, discuss which of the plants students might like to try to grow. Have them research growing requirements for various crops and come up with a plan for including them in the garden. For assessment purposes, have students record findings in journals; present them in class; or report them via research papers.