



## The Colors of Fruits and Vegetables

### Lesson

#### Goals

Students will learn about phytochemicals and understand the importance of eating a rainbow of colors.

#### Objectives

Students will research the different color categories of fruits and vegetables and create colorful charts to display the information.

#### Standards

*Science: Life Science*

GR.5-S.2-GLE.1

GR.5-S.2-GLE.2

*Comprehensive Health: Physical & Personal Wellness*

GR.1-S.2-GLE.1

GR.2-S.2-GLE.1

GR.4-S.2-GLE.1

GR.5-S.2-GLE.1

GR.6-S.2-GLE.4

#### Did you know?

Phytochemicals are substances produced by plants to help protect themselves from insects and other pests. When we eat fruits and vegetables high in phytochemicals, these benefits get passed along to us.

**Total Time** – 60 minutes

#### Materials

- Poster board
- Seed catalogs (optional)
- Markers
- Pencils
- Meter sticks
- Copies of research information (end of lesson)

#### Background for Teachers

A phytochemical is a natural compound found in plants that works with nutrients and dietary fiber to protect against disease. Research suggests that phytochemicals, working together with nutrients found in fruits, vegetables and nuts, may help slow the aging process and reduce risk of many diseases, including cancer, heart disease, stroke, high blood pressure, cataracts, osteoporosis, and urinary tract infections.

Pronounced “fight-o-chemicals”, phytochemicals fight to protect your health. They can have complementary and overlapping mechanisms of action in the body, including antioxidant effects, modulation of detoxification enzymes, stimulation of the immune system, modulation of hormone metabolism, and antibacterial and antiviral effect.

“Phyto” is a Greek word that means plant and phytochemicals are usually related to plant pigments. So, fruits and vegetables that have bright colors – yellow, orange, red, green, blue and purple – generally contain the most phytochemicals and the most nutrients.

You can benefit from all the phytochemicals and nutrients found in plant foods by eating 5-9 servings of fruits and vegetables a day.

### **Method**

#### **Introduction** (10 minutes)

1. Write phytochemicals on the board and ask the class to try to pronounce the word. Help them by writing it phonetically (fight-o-chemicals).
2. Ask if anybody knows that this word means. If not, begin a discussion about the meaning of the word using the background information above.
3. Highlight the connection between phytochemicals and eating 5-9 servings of fruits and vegetables every day and increasing intake of fiber.

#### **Activity** (35 minutes)

1. Explain to the students that today they will be creating phytochemical charts to help the whole school understand the importance of eating a rainbow of colors.
2. Divide the class into five to seven groups (depending on how many colors you choose to do) and assign each group a color.
3. Pass out a poster board to each group and have students write their color on the top in big letters. Make a chart in the middle of the poster board with two columns—“Fruit/Vegetable” and “How to eat this”—and five or six rows. It will be helpful if the students use a meter stick and a pencil to make the straight lines. Then they can trace over the pencil lines with a marker.
4. Make sure they leave enough space around the chart to write out the benefits of eating their color. Pass out the handout with the benefits information and have each group write these in the area around the chart.
5. Under the “Fruit/Vegetable” column, have students cut out pictures (or draw pictures) of fruits and vegetables that represent their color group.
6. Under “How to eat this,” have each group come up with different ways they enjoy eating the fruit or vegetable.
7. Once all the information is on each poster, encourage the groups to make their posters as colorful and creative as possible.
8. If time permits, have each group share their charts with the class.
9. Display the charts in the hallway or the cafeteria so the whole school can learn more about phytochemicals.

### **Snack & Conclusion (15 minutes)**

1. Have a snack that highlights one or many different phytochemicals.
2. Have the class identify the different benefits they are getting from their snack.
3. To make sure students understand the connection between the garden and phytochemicals, have the students write about one thing they are growing or going to grow in the garden and its color and the benefits associated with that color.

### **Assessment Tools**

- Participation
- Group work

### **Possible Modifications and Extensions**

- For older students, have them do the research about the benefits of the different colors.
- Create a recipe book with recipes that highlight different colors and their benefits.

### **Red Beans and Rice**

You can easily cook the rice in the morning or night before and serve this dish cold.

- 1 can red beans (no sodium)
- 1 cup brown or white rice
- 3 cups water or low-sodium vegetable stock
- ¼ cup minced red onion
- ½ cup dried cranberries
- 1 Tbsp curry powder
- 2 Tbsp olive oil
- ½ lemon, juiced
- 1 cup red apple, julienned
- Salt and pepper to taste

Preparation (40 minutes): Bring water or vegetable stock to a boil. Add rice and cook. Add beans, onion and dried cranberries to cooked rice. Mix well. Whisk together lemon juice, olive oil and curry powder. Add to rice. Season with salt and pepper. Garnish with apples and serve.

### **Source**

Recipe courtesy of Corey Ferguson

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<b>Color</b>	<b>Health Benefits</b>
Red	<p>Strengthens connective tissue – which hold cells together in our bodies</p> <p>Prevents lung, prostate and stomach cancer</p>
Orange/Yellow	<p>Protects against lung diseases like: chronic bronchitis, asthma and emphysema</p> <p>Reduces the risk of eye problems like cataracts</p> <p>Reduces the risk of lung cancer</p> <p>Prevents tumors and cancer</p> <p>Decreases cholesterol levels</p>
White	<p>Lowers cholesterol and blood pressure</p> <p>Fights infections</p> <p>Helps recover from colds</p>
Green	<p>Preserves eyesight</p> <p>Maintains heart and skin health</p> <p>Prevents cancer</p>
Blue/Purple	<p>Strengthens connective tissue – which hold cells together in our bodies</p> <p>Prevents cancer in different body parts</p> <p>Reduces swelling (anti-inflammatory) and pain (analgesic)</p>