



# Lesson #6 Rainbow of Color

## MATERIALS

### **PROPS:**

- Apple corer
- Hand Sanitizer
- Cleaning wipes

### **DISPOSABLES:**

- Poly food prep gloves (latex-free) (24)
- Plastic knives (10)
- Plastic forks (1/student)
- Paper food trays (1/student)
- Two 2-gallon plastic bags

- Paper towels (10)
- Paper plates (10)
- Salad Ingredients: spinach, shredded carrots, apples, yellow raisins, sunflower seeds, dried cherries/ cranberries/ blueberries, red bell pepper, lemon, olive oil
- 2 disposable cups

## LESSON OUTLINE

1. **Warm-Up/Reflect** (3 min.)
2. **MyPlate Review Discussion** (5 min.)
3. **Vitamins & Minerals Chart Activity** (10 min.)
4. **Rainbow of Color Salad Activity** (25min.)
5. **Closure** (3 min.)

## LESSON PREP

- Write vocabulary words on board
- Write vitamin and mineral chart on board
- Review Nutrition 101 (in binder)
- Use the wipes to clean all surfaces used for salad

## VOCABULARY

micronutrients, phytochemicals, potassium, iron

## **PHS OVERARCHING ESSENTIAL QUESTIONS**

- *What does it mean to eat healthfully and be physically active, and why is it important?*
- *How do culture, experience and environment affect one's health?*
- *What goals do I have to improve my health?*

## GUIDING QUESTIONS AND CONCEPTS

1. It is important to eat a variety of fruits and vegetables for maximum health.
  - What specific health benefits do I receive from fruits and vegetables?
2. There are creative and tasty ways to include fruits and vegetables at every meal.
  - How can I include more fruits and vegetables in my daily diet?

## LESSON OBJECTIVES

Students will be able to...

1. Understand that a variety of fruits and vegetables provide health benefits.
2. Identify the roles of various vitamins and minerals within the body.
3. Assemble a salad that provides a variety of vitamins and minerals..



# Lesson #6 Rainbow of Color

## LESSON RATIONALE AND PURPOSE

In this lesson, students will learn why fruits and vegetables are important for their bodies and why it is important to include a variety of produce in their diets. Students will decode difficult vocabulary words like micronutrients and phytochemicals using Greek and Latin affixes and roots as clues. The lesson culminates with a cooking demonstration to show students how they might create their own nutrient-dense meals that feature fruits and vegetables.

### BACKGROUND INFORMATION

Most Americans do not receive the daily suggested amount of fruits and vegetables, and need assistance finding creative ways to include the proper amount in their diet. According to the recommendations from the USDA, middle school aged youth should eat 1.5 cups of fruit and 2.5 cups of vegetables each day. This means that half of MyPlate should be made up of fruits and vegetables. This lesson encourages youth to eat many different colors of fruits and vegetables in order to ensure that they receive the full range of essential vitamins and minerals. It is important to demonstrate that eating fruits and vegetables can be easy, fun, and delicious.

### RESOURCES

1. Choose MyPlate  
[www.choosemyplate.gov/](http://www.choosemyplate.gov/)
2. Fruits & Veggies– More Matters  
[www.fruitsandveggiesmorematters.org](http://www.fruitsandveggiesmorematters.org)
3. Harvest of the Month  
[www.harvestofthemonth.com](http://www.harvestofthemonth.com)
4. Nutrition 101

### LESSON EXTENSIONS

Available at the end of the lesson:

1. **Vitamin Chain** *Activity (12 min.)*
2. **Rainbow of Color** *Discussion (1 min.)*
3. **Vitamin Discussion** *Discussion (1 min.)*



# Lesson #6 Rainbow of Color

## LESSON OUTLINE

### **WARM-UP/REFLECT** (3 min.)

- Welcome! Who can tell me what we learned during our last PHS lesson?
  - Answer: The heart is a muscle that we can make stronger through aerobic exercise to keep us healthy; heart rate measures how fast our heart beats; get 60 minutes of activity per day; heart rate is a measurement of aerobic activity.
- Let's get refreshed and our hearts pumping with a brain break! *Lead the class in 90 seconds of one of the following movements or ask a student to lead* (jump up and down; jumping jacks; shoot baskets in place; run in place; swing a bat; do squats).
- Everyone have a seat and let's get started!

### **MYPLATE REVIEW** Discussion (5 min.)

- Think back to our discussion a few lessons ago about MyPlate. According to the MyPlate tool, how much of your plate should consist of fruits and vegetables?
  - Answer: Half of the food you eat in a day should be fruits and vegetables.
- Why is it important to eat fruits and vegetables?
  - Answers: good for our body, they contain micronutrients like vitamins and minerals, make us strong, etc.
- Who remembers our discussion about micronutrients?

**Micronutrients:** nutrients that are required in smaller amounts by the body. Vitamins and minerals are both classified as micronutrients.

- Consuming a variety of vitamins and minerals through the foods you eat is essential for the body to function in an optimal state. Because the body is incapable of making most of the vitamins and minerals you need, they must be obtained through your diet.
- Vitamin C is an example of a vitamin that many of you may have heard of before.
- Raise your hand if you have ever heard of phytochemicals.



# Lesson #6 Rainbow of Color

## LESSON OUTLINE

- Let's try to figure out what the word means by breaking it down. Does anyone recognize a part of the word phytochemical that might help us figure out what it means?

*Students will most likely answer "chemical"—circle the word chemical.*

- Does anyone know what the prefix "phyto" means? *Wait for student response.* Phyto is a Greek word that means plant. So if I put the two words together what do I get?
  - Answer: Plant chemicals

**Phytochemicals:** little chemical substances found in plants that help protect our bodies from disease. There are thousands of different phytochemicals and the only way to get them is by eating a variety of fruits, vegetables, whole grains, nuts, and beans.

- One piece of fruit may contain up to 900 different phytochemicals. In order to get all the thousands of phytochemicals we need, we have to choose a variety of different colored fruits and vegetables.
- The deeper the color of the fruit or vegetable, the more phytochemicals and nutrients there are. Also, keep in mind that frozen fruits and vegetables contain the same amount of nutrients that fresh ones do and are often more cost-effective.

### VITAMINS AND MINERALS CHART Activity (10 min.)

*In this section you will complete the chart with students, and help them to understand the health benefits of the different fruits and vegetables they will be trying in the next section. As shown on the next page, write out the chart prior to the lesson, but only include the words in bold. The words in [brackets] will be filled in during the lesson. For additional information on vitamins and minerals, please see Nutrition 101 in your binder or on the Portal.*



# Lesson #6 Rainbow of Color

## LESSON OUTLINE

Fruit or Vegetable	Vitamin or Mineral	Health Benefit
<i>[Red Bell Peppers]</i>	<b>Vitamin C</b>	<i>[Helps heal wounds]</i>
<i>[Dried Fruits]</i>	<b>Potassium</b>	<b>Helps muscle contractions</b>
<b>Carrots</b>	<i>[Vitamin A]</i>	<i>[Helps you see]</i>
<i>[Spinach]</i>	<b>Iron</b>	<b>Makes you strong</b>

- What fruit or vegetable provides us with Vitamin C?
  - *Students may respond with oranges.*
  - Answer: Oranges are a great example; red bell peppers are also a great source of Vitamin C. Other sources of Vitamin C include: berries, kale, broccoli, cantaloupe, tomatoes, peas, and collards.

Fill in "Red Bell Peppers" on the chart.

- What does Vitamin C do for our body?
  - Answer: Helps heal wounds.

Fill in "Helps heal wounds" on the chart.

- Who has heard of potassium?
 

**Potassium:** a mineral found in foods that helps decrease blood pressure, and helps with muscle contractions (heart included).
- What are some sources of potassium?
  - Answer: Dried fruits, other foods high in potassium include: beans, bananas, sweet potatoes, spinach, and nuts

Fill in "Dried Fruits" on the chart.

- Can anyone tell us what carrots do for your body?
  - Answer: Helps us see.

Fill in "Helps you see" on the chart.



# Lesson #6 Rainbow of Color

## LESSON OUTLINE

- What vitamin is in carrots that helps our vision?
  - Answer: Vitamin A
  - Other foods rich in Vitamin A include sweet potatoes, pumpkin, cantaloupe, peaches, apricots, dark leafy greens, broccoli, and garlic.

Fill in "Vitamin A" on the chart.

- Does anyone know a fruit or vegetable that provides our body with the mineral iron and makes us strong?
  - Answer: Spinach, other foods rich in iron include: string beans, collards, broccoli, strawberries, watermelon, prunes, figs, raisins, beans, and artichokes.

**Iron:** a mineral that helps to carry oxygen throughout the body.

Fill in "Spinach" on the chart.

- As this chart shows, we have four different fruits or vegetables, vitamins and minerals, and health benefits. The important thing to remember is that variety is key. The more variety in our fruit and vegetable choices, the more vitamins, minerals, phytochemicals, and health benefits we are getting. Each color includes its unique combination of vitamins and minerals. Red, orange, and dark green vegetables are among the most vitamin and mineral rich foods available.
- Now we are going to use these four fruits and vegetables, in addition to others, to create a rainbow of color super salad.

### **RAINBOW OF COLOR SALAD** Activity (25 min.)

*(Materials: salad ingredients, plastic gloves, cleansing wipes, plastic knives, paper towels, paper food trays, forks, apple corer, paper plates, two two-gallon bags (for mixing the salad), two small disposable cups with honey and olive oil, hand sanitizer)*

- Does anyone have any food allergies? The items in today's salad include: spinach, shredded carrots, apples, yellow raisins, sunflower seeds, dried cherries/cranberries/blueberries, red bell pepper, honey, lemon, and olive oil. *If anyone has any allergies to an ingredient, remove a serving of salad from the bag before adding the specified ingredient(s).*



# Lesson #6 Rainbow of Color

## LESSON OUTLINE

*Pass around a bottle of hand sanitizer so that all students clean their hands. Use the cleansing wipes to clean all surfaces used for salad preparation and eating.*

*Ask for student volunteers. The goal is to involve all students. Use the two two-gallon bags for easy mixing; you will have to complete bags of salad when you finish. Each item should be added to the bags separately so students can visually see all the colors of the rainbow being added into the salad.*

*Suggested ways to divide the salad preparation:*

- **Cutting the apple and red bell pepper** (4-6 students): *Have students who are handling the apple and red bell pepper wear plastic gloves. They should use paper plates as cutting boards and dice the items into small (1cm x 1 cm) pieces. The instructor should save one pair of gloves to serve salad.*
- **Adding spinach** (2 students): *Open spinach and add spinach to each of the two two-gallon bags.*
- **Adding other ingredients** (5-10 students): *Divide additional ingredients evenly and add 1/2 of each to the two bags of salad. Include the dried cherries/cranberries/blueberries, sunflower seeds, shredded carrots, and yellow raisins.*
- **Preparing the dressing** (2-6 students): *Squeeze lemon into each of the containers with oil and honey; cover and shake to mix or use a fork to stir. Pour one dressing container into each of the two bags of salad.*
- **Mixing** (2-4 students): *Seal each bag tightly and shake to mix all the ingredients together.*
- **Setting out trays and forks** (2-4 students): *Students may set out the paper trays and forks on a central table or pass out to the class.*

*Use a gloved hand to distribute salad into bowls and pass out to students with forks for taste testing. Instruct them to wait to try it until everyone has a tray.*

- Please give the rainbow super salad a try. You don't have to eat it all, but at least taste it. Please do not comment on the salad right now. I will ask you to vote on the taste at the end of the lesson.

*While students are eating the salad, ask some of the following questions:*



# Lesson #6 Rainbow of Color

## LESSON OUTLINE

- Raise your hand if you eat a fruit or vegetable at breakfast, lunch or dinner.
- What is your favorite fruit or vegetable?
- What are some creative ways to add fruits or vegetables to your meals?
  - Examples: smoothies, vegetable stir fries, kabobs
- Raise your hand if you sampled a new fruit or vegetable today.

*Clean up. Scrape all leftovers into garbage or offer remaining salad to staff. If sink is available, wash and dry apple corer.*

*Take a “thumb poll” and ask students how they liked the rainbow super salad (up for liked it, sideways for kind of liked it, down for disliked it).*

### **Closure** (3 min.)

- Consider using a whole-group discussion, small- to whole-group discussion or think-pair-share to review important lesson information.
  - What is the difference between a nutrient and a phytochemical?
    - ⇒ *Answer: a nutrient is a substance needed in small amounts for the body to function in an optimal state and a phytochemical is a chemical substance found in plants that help protect the body from disease.*
  - What are some of the specific benefits your body receives from eating fruits and vegetables?
    - ⇒ *Answer: improved immune system function, stronger muscular development, improved vision, maintain healthy blood pressure, reduces risk for developing heart disease and/or stroke, reduces risk for chronic disease like Type 2 Diabetes, etc.*
  - What is the main message you will take from today’s lesson and share with someone else?





UNIVERSITY OF MICHIGAN

## Lesson #6 Rainbow of Color *Extensions*

### **VITAMIN CHAIN** Activity (12 min.)

*(Materials: Vitamin chain pictures located on the Portal, pipe cleaners)*

*Divide students into groups of four and give them each three vitamin descriptions, a set of vitamin effect pictures, food pictures, and nine pipe cleaners.*

- We need to eat a wide variety of fruits and vegetables to get the vitamins we need. In PHS we like to say “eat the rainbow.”
- In your groups you have 3 vitamin descriptions. Read the descriptions and match your vitamin to the foods it is found in and the effect it has on our bodies. Once you have decided which images your vitamins are related to, link them together using the pipe cleaners.
  - Note: The students will use the pipe cleaners to link the different pictures together. Each image and description has a hole on each side to thread a pipe cleaner through. Every chain should contain one description, one vitamin effect, one food picture and two pipe cleaners.

*Give students about 10 minutes to complete. Ask each group to share one of their chains with the class.*

### **RAINBOW OF COLOR** Discussion (1 min.)

*Write ROYGBV on the board.*

- Who can tell me a fruit or vegetable that is one of the different colors of the rainbow?
  - Answer: Red - red pepper, red apple, Orange - orange, carrot, etc.

*Try to get students to brainstorm a variety of different fruits and vegetables in all the different colors of the rainbow.*

### **VITAMIN DISCUSSION** Discussion (1 min.)

*Facilitate a discussion using the “Vitamin and Mineral Information Sheet” located on the Portal about different vitamins and minerals and the health benefits each provides. It is important to highlight that we should eat more fruits and vegetables, but a variety of different fruits and vegetables is important because they each provide us with something different.*