



Jr. Chef Club II Cooking with Colors I Vary Your Veggies Lesson 5



Educator Information Preparing to Teach the Lesson

Minerals for Good Health

Minerals are a type of micronutrient. The human body needs minerals to help provide structure (such as calcium in bones) and to regulate many of its functions. Minerals are essential. They cannot be made in the body, so they must be consumed in foods. They often compete with one another for absorption in the small intestine therefore it is hard to know how much of any given mineral we are actually absorbing.

Minerals are found in both plant and animal foods. It is best to get one's minerals by eating a variety of fresh, whole and minimally-processed foods. There are over 20 minerals that are essential to human health. They are divided into two categories: major minerals and trace elements.

Major minerals

Major minerals are ones needed in amounts of 100 milligrams per day or more (100 milligrams weighs approximately the same as 2 drops of water).

Calcium

Magnesium

Phosphorus

Sulfur

Plus the electrolytes:

- Sodium

- Potassium

- Chloride

(Electrolytes regulate fluid balance. This means they help the right amount of fluid to be inside or outside of cells and in the body. Potassium has an extra role of normalizing blood pressure and regulating heart beat.)

The students will study calcium, magnesium and potassium in Lesson 5.

See the Lesson Plan for basic information to share with students about these minerals.

Trace Elements

These minerals are needed in amounts of less than 100 milligrams per day:

| | |
|------------|------------|
| Iron | Manganese |
| Zinc | Molybdenum |
| Copper | Vanadium |
| Selenium | Boron |
| Iodine | Nickel |
| Chromium | Silicon |
| Fluoride | Arsenic |
| Manganese | Cadmium |
| Molybdenum | Silicon |

Students will study iron and zinc in Lesson 5.

See the Lesson Plan for basic information to share with students about these minerals.

Reliable and reviewed information on minerals (and vitamins) is also available at:

http://kidshealth.org/teen/food_fitness/nutrition/vitamins_minerals.html

How Much Do We Need?

Mineral requirements vary by age and gender. In the past, we used the RDAs (Recommended Dietary Allowance) as a guideline. The percentages used on food labels to indicate how much of a mineral (or vitamin) is in a serving of food are still based on the 1968 RDAs. They indicate the amount needed for someone consuming a 2000 calorie diet. They may overestimate the amounts needed for some people, especially children, since not everyone eats 2000 calories. However, they do not underestimate the amount needed for any group of people except pregnant and lactating women. (Foods intended for age 0 to 3 have different regulations). RDAs were first established in 1943 when risk of nutrient deficiency was a threat.

As the food supply in this country changed and over-nutrition, chronic diseases and obesity became more of a threat than vitamin and mineral deficiencies, new recommendations and values were established:

- Dietary Reference Intakes (DRIs): These replace the original RDAs. They are the current standard values for nutrient intakes in both the U.S. and Canada. They state the amounts of nutrients needed by healthy people on an *average* daily basis. (Note the word “average.” Not all nutrients are needed in the amounts stated every day. Rather, the amounts should average out to the recommended values over a period of three to seven days.) DRIs are available for minerals (and vitamins) and are being researched for some prominent phytochemicals as well. Values are set according to age and gender. Several types of values are included in the DRIs:
 - o Recommended Dietary Allowances (RDAs): Amounts that will meet the needs of almost all healthy people in a specific age and gender group.

- Adequate Intakes (AIs): When there is not enough research available to determine an RDA, the experts set an AI. This is an approximate amount that researchers feel will meet needs.
- Estimated Average Requirements (EARs): Use mostly for evaluating the intake of a population, not an individual. They are the amounts believe to be needed to meet the needs of 50 percent of the people in a specific age and gender group.
- Tolerable Upper Limits (ULs): These are the maximum intake amounts for nutrients to avoid risk of adverse effects due to too much of a vitamin or mineral.

| Years of Age | Calcium | Magnesium | Potassium | Iron | Zinc |
|--------------|----------------|-----------|------------------|------|------|
| Boys 9–13 | 1300 mg | 240 mg | 4.5 grams | 8 mg | 8 mg |
| Girls 9–13 | 1300 mg | 240 mg | 4.5 grams | 8 mg | 8 mg |

Note: Amounts listed in plain type are RDAs, those in bold type are AIs.

Source: Dietary Reference Intake Tables: The Complete Set. Institute of Medicine, National Academy of Sciences. www.nap.edu

Preserving Minerals in Foods

Minerals are merely elements from the Periodic Chart of Elements. They are not molecules that are made up of several elements held together by chemical bonds, like vitamins. This means that minerals cannot be destroyed, like vitamins can be. The mineral content of food depends on the mineral content of the soil. Plants absorb minerals from the soil. When cooking foods like vegetables cook in a minimal amount of water. The cooking does not destroy the minerals, but they can leach into the cooking water. If you throw away the cooking water, you are then throwing away the minerals that have leached into the water. You might consider refrigerating your leftover cooking water if you plan to make soup soon—and use it in your soup.

A Note About Crunchy Burritos

This is one of the most popular recipes among students. They love it, ask for more, and it is the most frequently “I made it at home” recipe. Originally the Crunchy Burritos were offered pre-made to students participating in nutrition lessons.

It was disappointing then to see students reject the burritos in the Jr. Chef program. What was the problem? It was the strong, unpleasant, sulfur-laden smell of the broccoli and cauliflower as they are finely chopped. The odors are so strong that they will fill the room and hallway—pretty soon even the front office staff knew that it was Crunchy Burrito day! The unpleasant aroma caused students to be less receptive to tasting these proven treats. To prevent this and get your Jr. Chefs loving Crunchy Burritos as much as previous students have, pre-chop the broccoli and cauliflower off-premises. It is best to prepare all the vegetables ahead of time. Chop each vegetable as directed the night or morning before the lesson and put into separate containers or re-sealable baggies. Be sure to sanitize the food preparation area,

cutting boards and utensils and use gloves at all times—no bare hand contact with food that will be eaten raw.

Then shortly before the lesson begins, open the containers containing the broccoli and cauliflower in another room, perhaps the school kitchen. Bring them into the classroom right before they are needed. Let the Jr. Chefs measure the needed amounts of vegetables and prepare the burritos as instructed.

At one time we considered changing the recipe, but seeing students ravenously eat cauliflower and broccoli and ask for more kept us using this recipe; we just figured out ways to minimize the odor.

It may be helpful to let students know that the sulfur-containing compounds in the cruciferous vegetables that cause the odor are actually very beneficial. Along with other compounds, they help to prevent lung cancer and cancers of the digestive tract.

Cruciferous vegetables include broccoli, cauliflower, kale, cabbage, bok choy, Brussels sprouts, mustard greens, collard greens and more.

Phytochemicals

The concept of “Plant chemicals” is complex. So far hundreds of phytochemicals have been identified and dozens are being researched with many more to come. Many phytochemicals are the substances responsible for the color of fruits and vegetables. For instance, *lycopene* gives tomatoes their red color, and *carotenes* give carrots their orange color.

Phytochemicals help to protect cells in our bodies and may help prevent many different types of diseases. Explain it simply to students by stating that the substances that give plants their colors help us to be extra healthy. They may help prevent cancer and help keep our immune system working well. So it's best to eat a wide variety of vegetables so that we get many different kinds of these phytochemicals.

NOTE: Avoid calling these substances ‘phyto-nutrients’ as they are not technically classified as ‘nutrients’ at this time.