Lesson 3: Are Potatoes a Super Food?

Instructor Notes—

Before beginning Lesson 3, *Are Potatoes a Super Food?,* the instructor should review the goal, objectives, and instructor background information.

Goal: Analyze nutritional content of potatoes/potato products and the role these nutrients play in helping keep your body healthy.

Objectives:

1) Students will identify the three components of the Nutrition Facts Label.
2) Students will use the Nutrition Facts Label to compare the nutritional value of three potato products.
3) Students will identify potatoes' vitamins and minerals that help release energy from other foods and play a role in your healthy heart, immune, blood, and skeletal systems.

Background Information:

This class is divided into two sections: (1) teaching the students about the Nutrition Facts Label and evaluating potato products, and (2) how the nutrients in potatoes keep the body healthy.

Section 1: Nutrition Facts Label. It was developed by the United States (U.S.) Food and Drug Administration (FDA). They designed materials, specifically designed for youth, called *Nutrition Facts Label: Read the Label Youth Outreach Campaign* **(Source:** http://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm281746.htm#kids).

The *Read the Label Youth Outreach Campaign* targets youth (ages 9 to 13) to look for and use the Nutrition Facts Label posted on food and beverage packages. It also contains information for parents, health educators, and communities. It uses a three-step approach to teach youth how to read food labels:

1. Check out the serving size. One package may contain **more than one serving**. Knowing the servings per container lets you discover the total number of calories and nutrients per package.
2. Consider the calories. When checking a food's calories, keep in mind that **40 is low** and **400 is high**.
3. Choose nutrients wisely. Pick foods that are high in "nutrients to get more of," and lower in "nutrients to get less of."

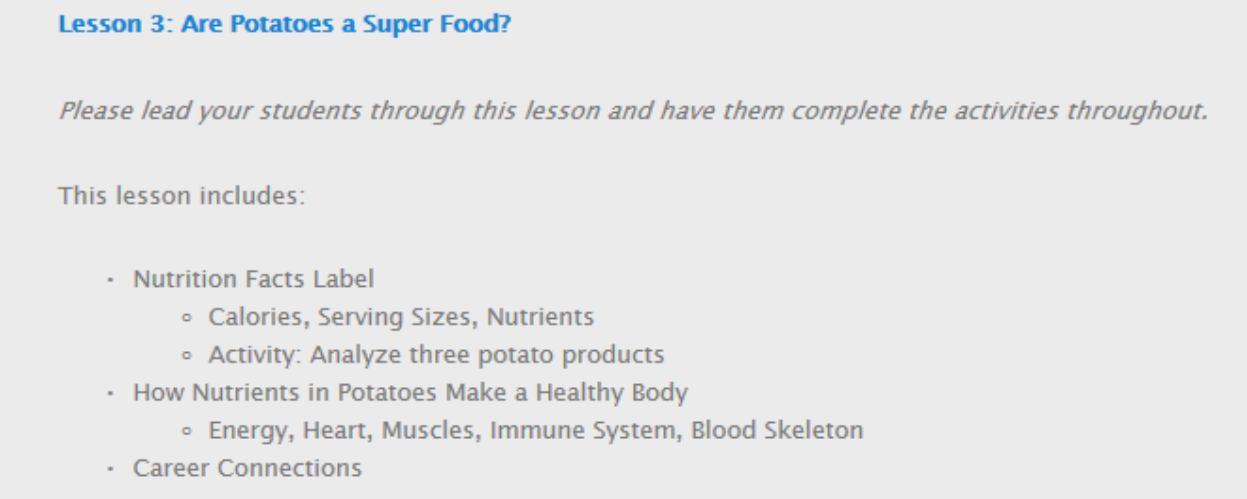
Get More: potassium, fiber, vitamins A&C, iron, and calcium.
Get Less: sodium, trans fat, saturated fat, cholesterol, and sugars.

% Daily Value (DV): The amount of nutrients recommended for Americans aged 4 and older to eat every day. When comparing nutrients in foods, remember this tip: 5% is low; 20% DV is high.

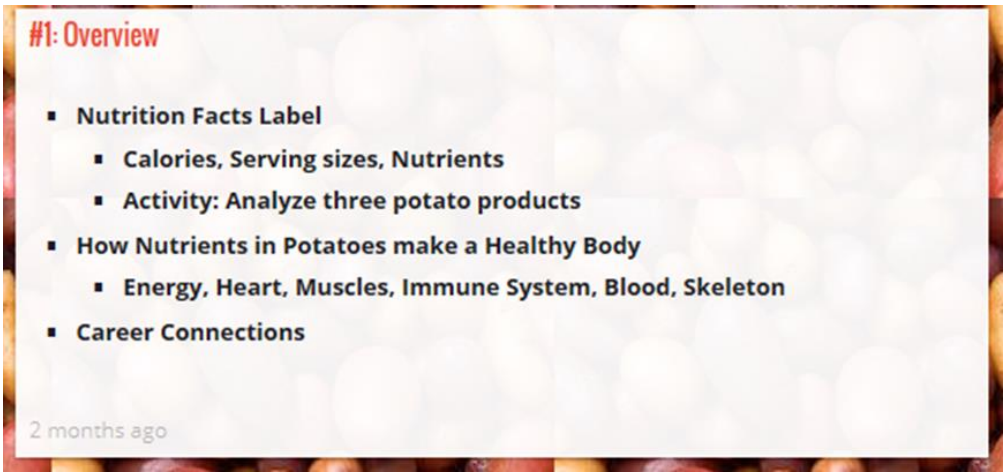
Section 2: How the Nutrients in Potatoes Keep the Body Healthy. Fresh potatoes contain six vitamins (thiamin, niacin, riboflavin, C, B6, folate) and seven minerals (calcium, iron, zinc, phosphorous, magnesium, potassium, and importantly 0 mg sodium) that keep the body healthy. These nutrients work to release energy from food, help your heart contract and relax, keep your blood pressure low, work with your immune system to heal wounds, develop healthy red blood cells, and keep your bones strong.

Lesson 3: Instructions On How to Use *The e-Potato Lesson*

1. Type in http://www.uidaho.edu/epotato and click on the link;
2. Click on Lesson 3: *Are Potatoes a Super Food?* This presentation uses three programs—Padlet, Prezi, and Slides.
3. Please note that *the Instructor Lecture notes are linked.*



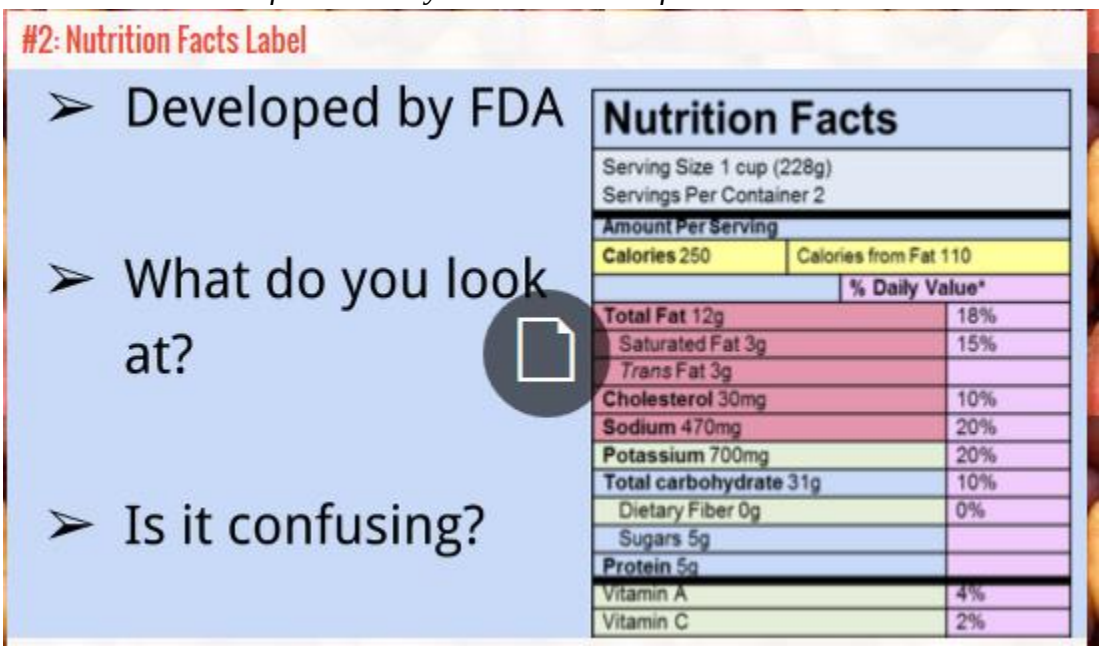
Instructions: Have all students go to the e-Potato webpage: http://www.uidaho.edu/epotato and click on *Lesson 3: Are Potatoes a Super Food?*



#1 Overview

The three topics discussed in this class will be:

1) *The **Nutrition Facts Label.** We'll start by looking at the calories, serving sizes, nutrients, % Daily Value, and use this information to analyze three potato products.*
2) ***How the Nutrients in Potatoes Keep the Body Healthy**. We'll consider the nutrients listed in the Nutrition Facts Label and show you how each is used to get energy from food, help your heart contract and keep your blood pressure down, help heal a wound, make healthy red blood cells, and keep your bones strong.*
3) ***Career Connections.** If you are interested in this information, you might consider a career in the food industry and the medical field.*



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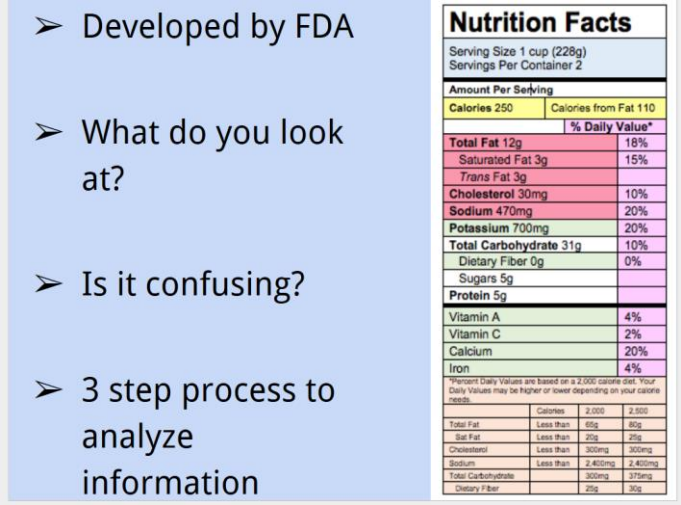
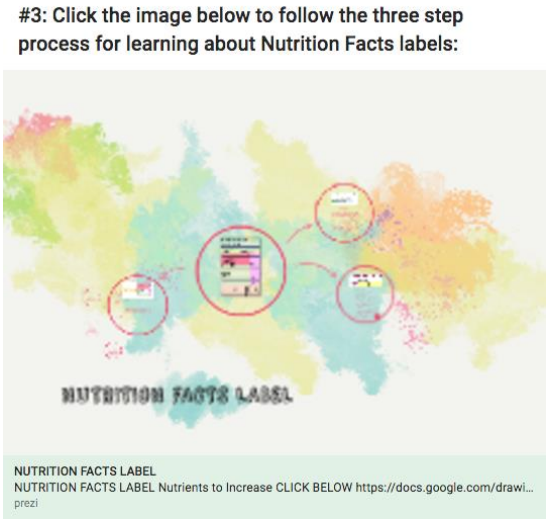


#2: Nutrition Facts Label

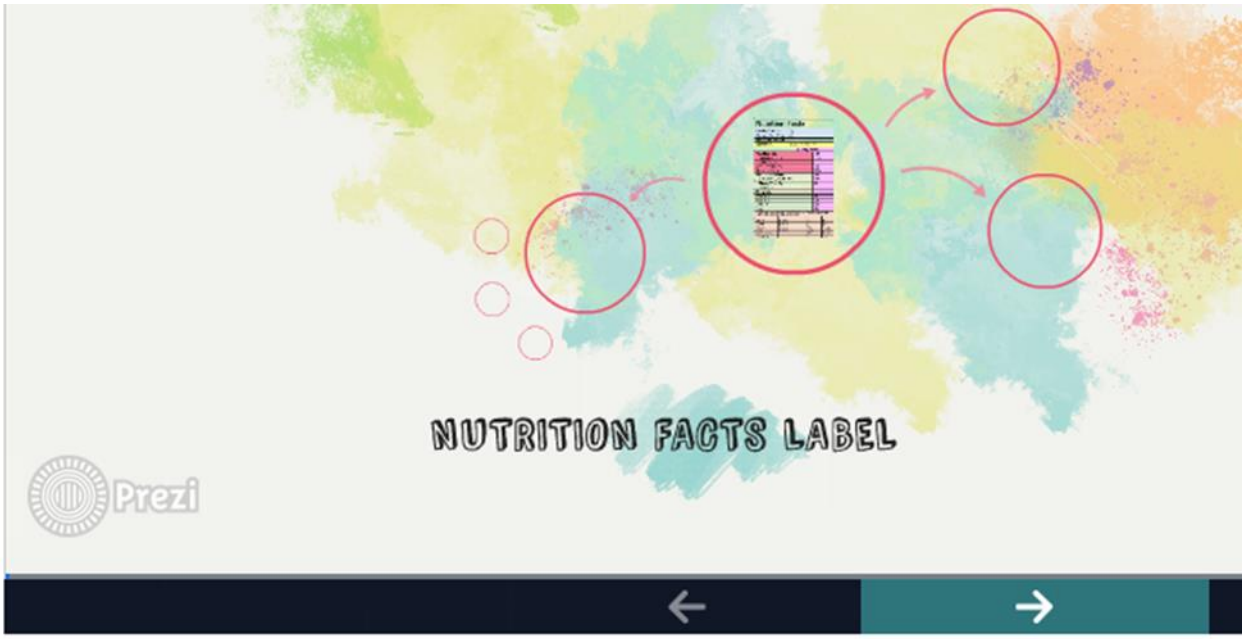
- *This is a picture of the Nutrition Facts Label. It was developed by the United States Food and Drug Administration (FDA) so people know which nutrients are contained in the food they eat. It is required to be on all foods and beverages.*
- *How many of you read the Nutrition Facts Label? What do you see first?*
- *There's a lot of information on the Nutrition Facts Label, but you will learn how to break down this information so it makes sense to you.*

Instructions: Close two pages (click on X) to get back to the **Main Page**.

#3: Click the image below to follow the three step-process for learning about Nutrition Facts Labels:



Instructions: Clicking on this image will take you to a Prezi presentation.



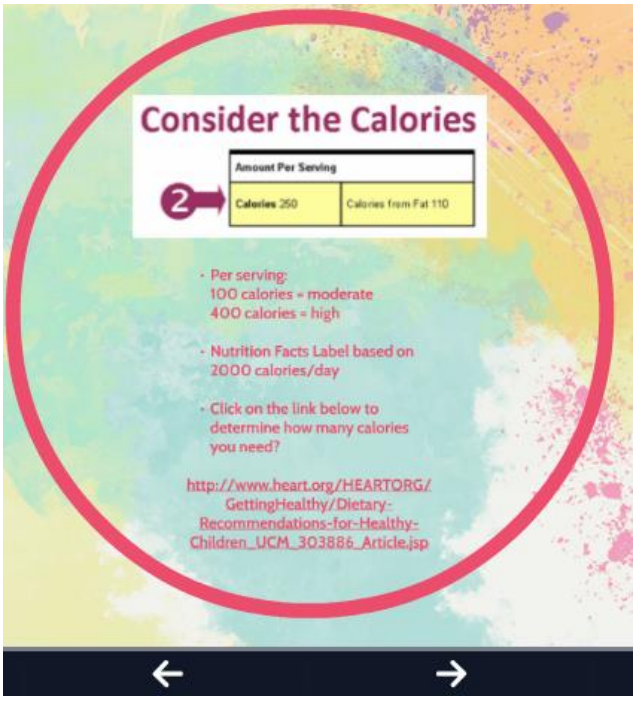
Instructions: Click on the right arrow to learn the three-step process of understanding the Nutrition Facts Label. It looks complicated so, let's go through each of the steps:

Step #1: Check Serving

- *Step 1,check serving size.*

- *Start at the Top, the top of the Nutrition Facts Label shows the serving size and the servings per container. One package may contain more than one serving!*
- *The serving size may be listed in familiar units (e.g. cups or pieces) and metric amounts (grams).*
- *All of the nutrition information is based on one serving.*
- *Eating two servings of the food results in double the calories and twice the amount of nutrients, both good and bad. Three servings means three times the calories and nutrients – and so on.*

Step #2: Consider the Calories



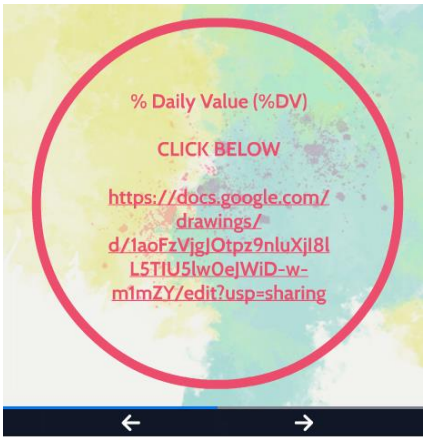
- *Step 2, Consider the Calories: When looking at a food's calories, a good rule of thumb is that 100 calories per serving is moderate and 400 calories per serving is high.*
- *Try to keep track of calories consumed throughout the day.*
- *It is important for you to learn that if you eat/drink more calories than you burn, you gain weight.*
- *Note: The food label is based on a 2,000 calorie diet — but an individual's calorie needs can differ.*
- *To determine how many calories you need, click on the link.*

Instructions: Have the male and female students report on their estimated daily calorie needs. Is it the same?

Step #3: Choose Nutrients Wisely

Instructions: There are three more circles that provide information on these three components of how to *Choose Nutrients Wisely*: (1) % Daily Value, (2) Nutrients to Increase, and (3) Nutrients to Decrease.

Circle: % Daily Value



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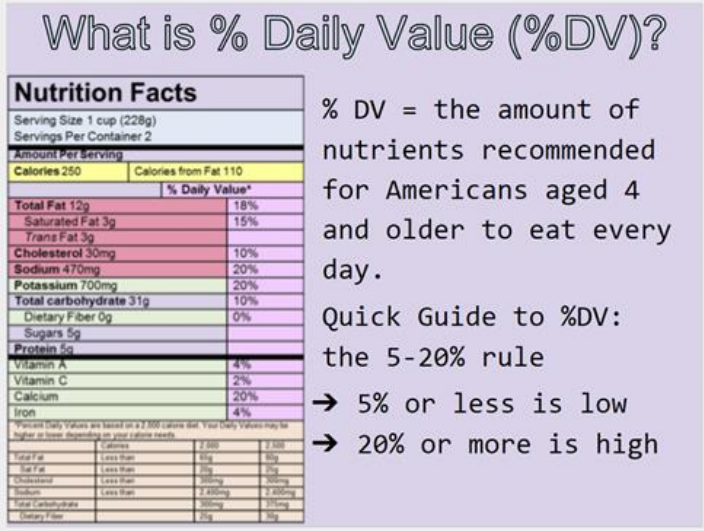
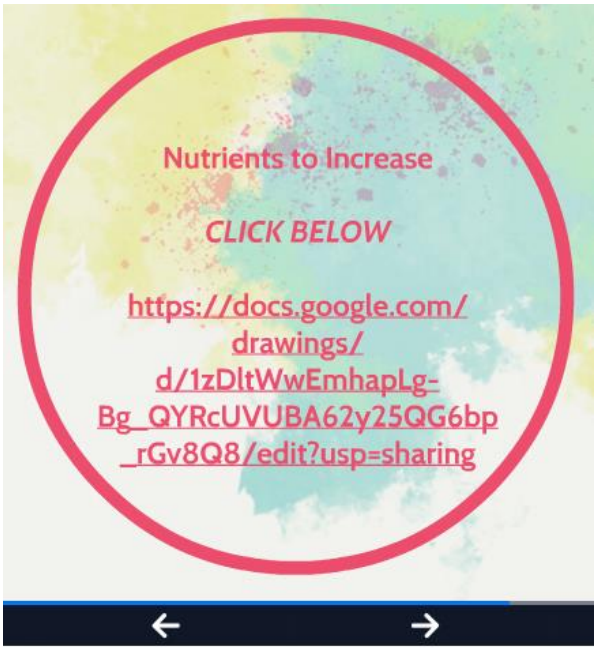


What is % Daily Value (% DV)?

- *% DV = the amount of nutrients recommended for Americans aged 4 and older to eat every day.*
- *Quick Guide to % DV: the 5-20% rule.*
- *5% or less is low: for nutrients you want to get less of, choose foods with a low % DV.*
- *20% or more is high: for nutrients you want to get more of, choose foods with a high %.*

Circle: Nutrients to Increase



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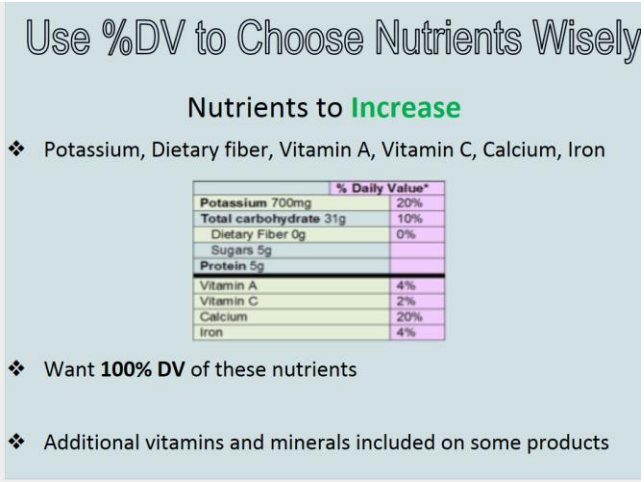
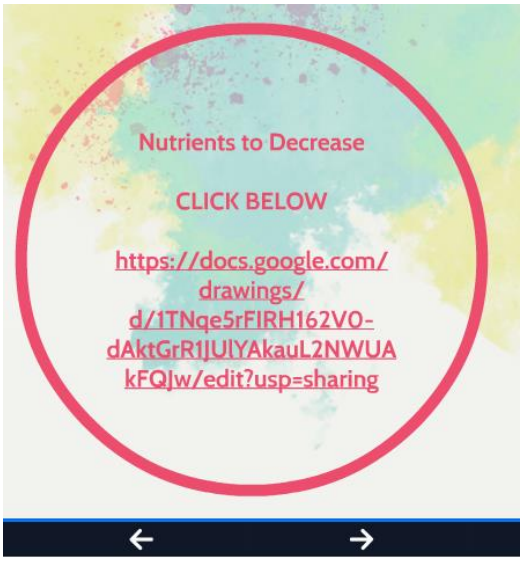


Use % DV to choose nutrients wisely.

- *Nutrients to **increase**—*
    - *Potassium, Dietary fiber, Vitamin A, Vitamin C, Calcium, Iron;*
    - *Want **100% DV** of these nutrients daily, look for higher % DV values, e.g. 20% or higher;*
    - *In addition to vitamins A and C and minerals Calcium and Iron (which are required on the Nutrition Facts Label), some products contain additional vitamins and minerals on their Nutrition Facts Label.*

Circle: Nutrients to Decrease



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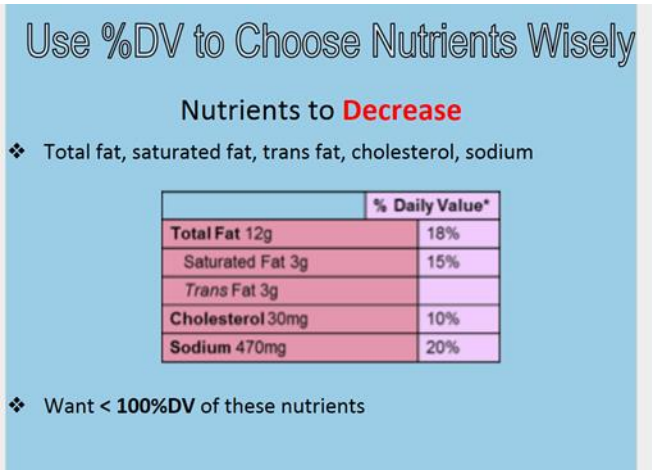
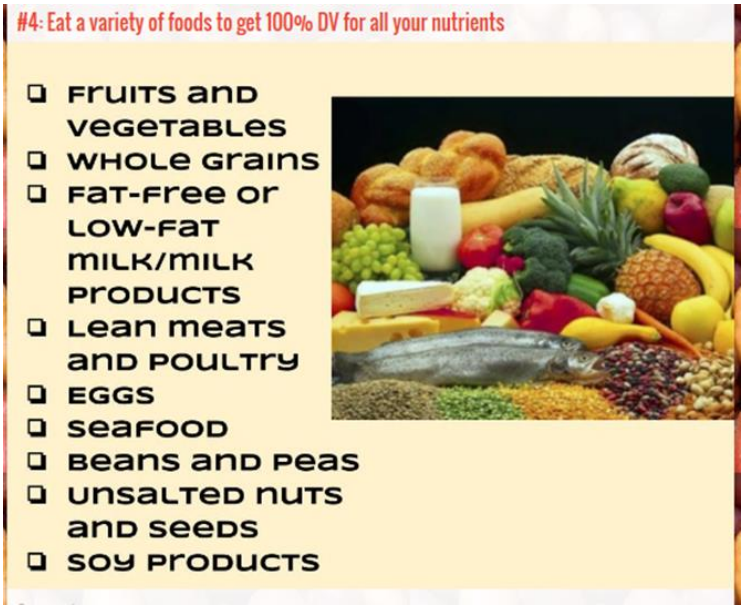


- *Nutrients to **decrease**—*
    - *Total fat, saturated fat, trans fat, cholesterol, sodium—consuming high amounts of these nutrients has been related to development of cardiovascular or heart disease.*
    - *Want < 100% DV of these nutrients daily, look for lower % DV values, i.e., 5% or less.*

Instructions**:** Close the *Nutrition Facts Label* tab to get back to the Main Page.



#4: Eat a Variety of Foods to get 100% DV of all of your Nutrients

You can't get all of your nutrients from a single food. Therefore, it's recommended that you eat the following types of foods:

- *Fruits and Vegetables*
- *Whole Grains*
- *Fat-free or Low-fat Milk/Milk Products*
- *Lean Meats and Poultry*
- *Eggs*
- *Seafoods Comment: should this be seafood and not seafoods?*
- *Beans and Peas*
- *Unsalted Nuts and Seeds*
- *Soy Products*

Step #5: Nutrition Facts Label Activity

The three potato products we will look at are: fresh/baked potato, hash brown patty, and baked potato chips.

You will be using these three Nutrition Facts Labels to answer ***five questions*** *that cover: Serving Size, Calories, and Choose Nutrients Wisely information.*

Notice all the additional vitamins and minerals listed on the baked potato and baked potato chips Nutrition Facts Labels. Also, the reason Vitamin C and Calcium are not listed is because they contain 0% DV of these nutrients.

Instructions: Click on the image to answer Questions 1-5.

Nutrition Facts Label Activity

Question 1: Compare Serving Sizes

The **three potato products**, baked potatoes, hash brown patty, and baked potato chips, differ in their serving size. Which answer ranks the serving size from highest to lowest?

a. Baked potato, hash brown patty, potato chips

b. Baked potato, potato chips, hash brown patty

c. Hash brown patty, potato chips, baked potato

d. Potato chips, baked potato, hash brown patty

Hint: To answer this question, have students look at the serving size, in grams, of each product.

Answer: The answer is a: Baked potato (148 g), hash brown patty (56 grams), and baked potato chips (28 grams).

Question 2: Calculate Calories

Consuming 400 calories or more per serving of a food is considered high. Which of the following statements is true for these three products? Check all that apply.

a. Eating 2 servings of baked potatoes is < 400 calories

b. Eating 3 hash brown patties is > 400 calories

c. Eating 60 baked potato chips = 400 calories

d. All of the above

Calculations:

a. 2 servings of baked potato = 110 calories x 2 = 220 is < 400 calories, true
b. 3 hash brown patties = 150 x 3 = 450 calories is > 400 calories, true
c. 60 baked potato chips = 4 servings = 120 calories x 4 = 480 is not equal to 400 calories, false.

A and B are true

C and D are false

Question 3: Nutrients to Avoid

To keep your heart healthy, it is recommended you keep total fat, cholesterol, and sodium intake at < 100% DV. If you consumed two hash brown patties, what % DV of each would you be consuming?

a. 14% DV Total fat, 0% DV chol, 13% DV sodium

b. 14% DV total fat, 0% DV chol, 26% DV sodium

c. 28% DV total fat, 0% DV chol, 13% DV sodium

d. 28% DV total fat, 0% DV chol, 26% DV sodium

Answer: The correct answer is d.

Question 4: Nutrients to Avoid

Refer to the picture to answer the following question. Which two nutrients resulted in Idaho potatoes being certified by the American Heart Association, as heart healthy?

a. Low in saturated fat & cholesterol,

b. High in carbohydrate & potassium,

c. Low in protein & sugar,

d. Low in trans-fat & fiber.

The correct answer is a: low in saturated fat and cholesterol.

On this graphic the two nutrients that played a role in potatoes being certified as heart healthy include their lack of two elements—0 grams of saturated fat and 0 mg of cholesterol. This is lower than the American Heart Association recommendations of 1 gram or less of saturated fat and 20 mg or less of cholesterol.

Question 5: Potato Product Nutrient Analysis

Which of the following statements about the nutrients contained in the three products is **true**?

a. Baked potato chips contain 20% or more of the DV for potassium and vitamin C.

b. A fresh potato contains more protein, iron, fiber, and calcium than hash browns or baked potato chips.

c. Baked potato chips contain more sodium than hash browns.

d. All of the above.

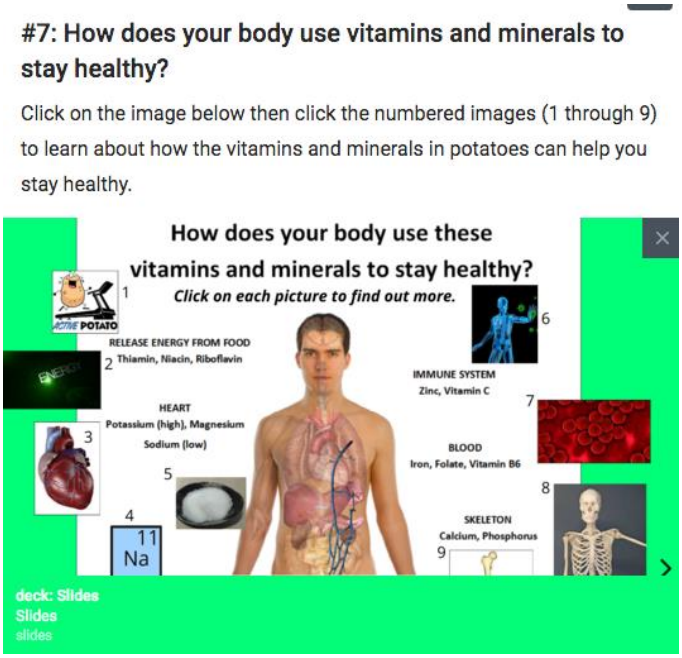
The correct answer is b.

Instructions: Close the *Nutrition Facts Label Activity* page to get back to the Main Page.

Step #6: Nutrients to Consume: Fresh Potato Vitamin & Mineral Content

Potatoes are a nutrition superfood. They contain:

- *6 vitamins: Ask the students to identify them,*
  (answer: thiamin, niacin, riboflavin, C, B6, folate.)
- *6 Minerals: Ask the students to identify them,*
  (answer: calcium, iron, zinc, phosphorous, magnesium, potassium) also 0 mg sodium.
- *The amounts vary from 2% DV to 45% DV, but they all work to keep your body healthy.*



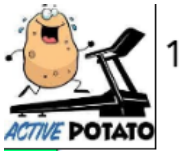
Step #7: How Does Your Body Use These Vitamins and Minerals to Stay Healthy?

Here are some examples of how your body uses these vitamins and minerals:

- *Release energy from food: thiamin, niacin, riboflavin,*
- *Heart Contraction and Relaxation: Potassium, Magnesium and blood pressure (sodium),*
- *Blood: red blood cell synthesis and function (iron, B6, folate),*
- *Immune System: vitamin C and Zinc play a role in wound healing,*
- *Skeletal System: calcium and phosphorous keep your bones strong.*

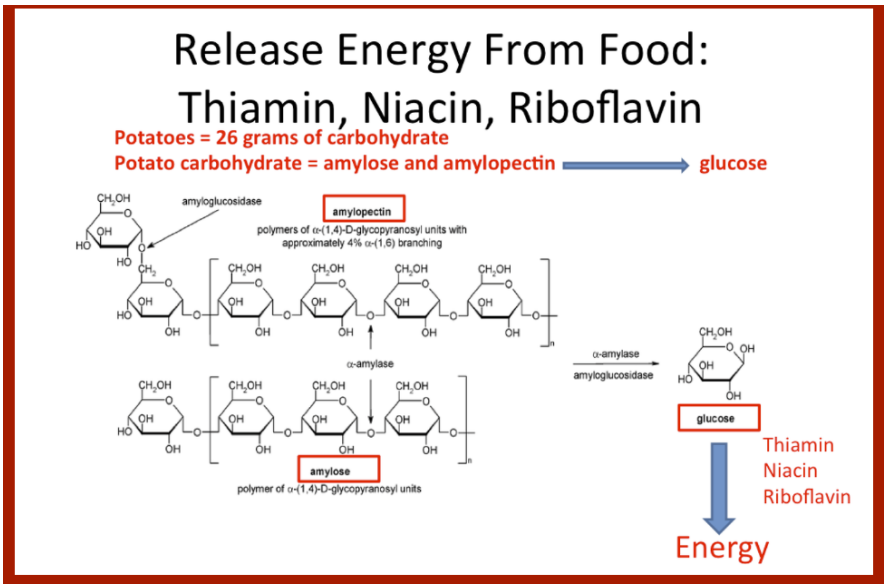
Instructions: Now click on the image to get more information

Instructions for Slides #1 - #9*: Click on the numbered slides to get more information. Each slide opens in a new window. Close the window to return to the main slide and access the next image.*

Click on image 1 

1 **to see Slide #1:**

Release Energy from Food: Thiamin, Niacin, Riboflavin

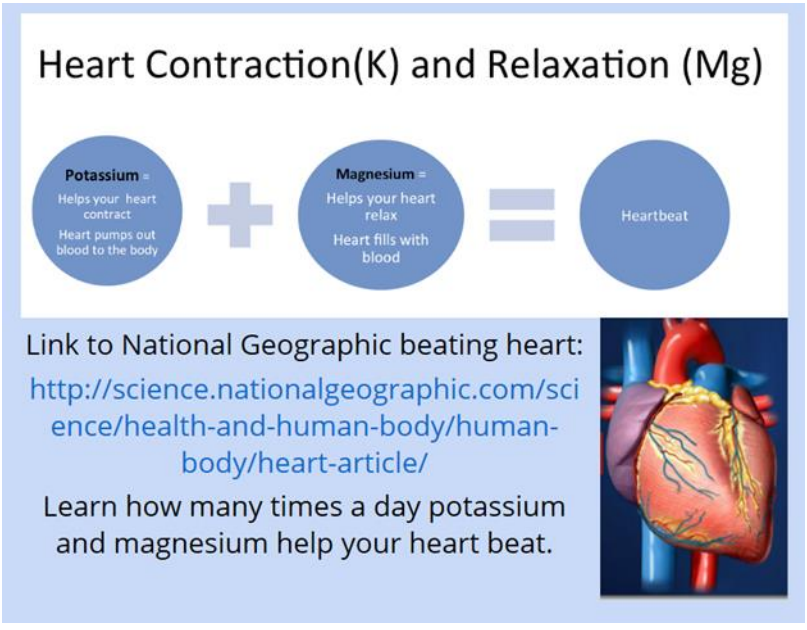


The amount of carbohydrate in one serving of baked potato is 26 grams. There are two types of carbohydrate in potato, called amylose *and* amylopectin*. There are thousands of these amylose and amylopectin molecules in the potato. When they are digested and broken down into single molecules called glucose, the three vitamins found in potatoes—thiamin, niacin, and riboflavin—help convert glucose into energy the body can use.*

This energy helps you:

2

Click on image 2 to see Slide #2: This energy lets you be active, so you can play soccer.



Click on image 3 to see Slide #3: Heart Contraction (K) and Relaxation (Mg)

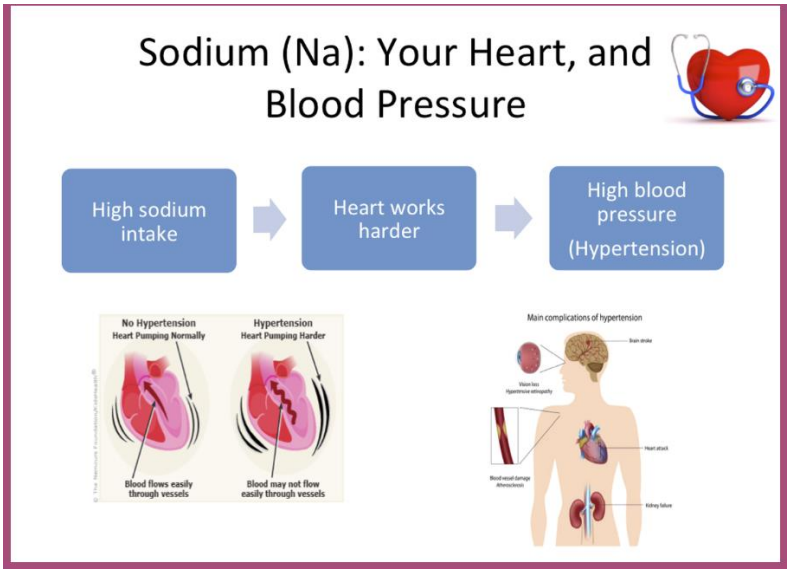
Two minerals: Potassium (K) and Magnesium (Mg) play very important roles in regulating your heart beat which comprises your hearts contracting and relaxing.

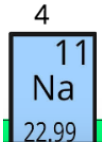
> *1) Potassium rushes out of the cell causing the heart to contract. (Systole) and pump blood out of the heart, through the arteries to the rest of the body.*
>
> *2) Almost immediately, magnesium ions trigger potassium to rush back into the cells, causing the heart to relax and fill with blood (Diastole).*

• *One complete sequence of filling and pumping blood is called a cardiac cycle, or heartbeat.*

Instructions: Click on the National Geographic heart link to learn how many times a day your heart beats and uses potassium and magnesium.

> **Answer** = 100,000 times a day.



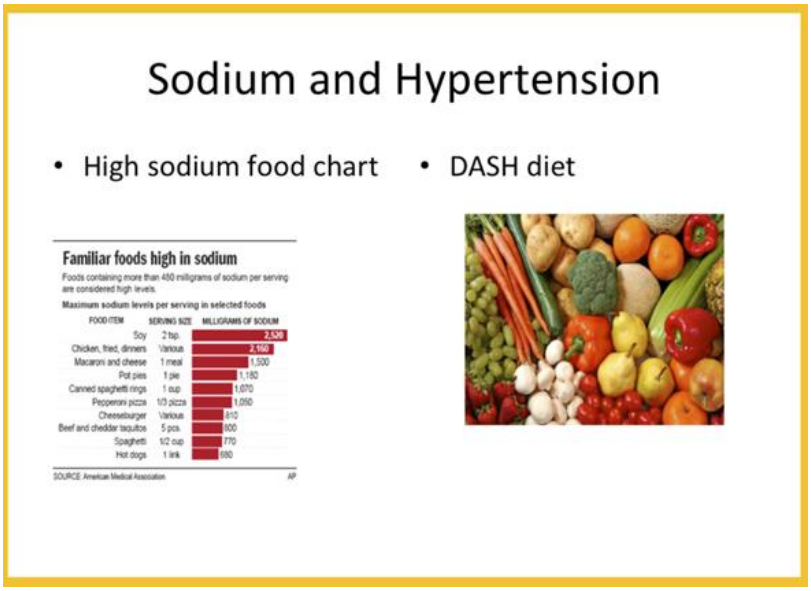


Click on image 4 to see Slide #4: Sodium (Na): Your Heart and Blood Pressure

Fresh potatoes contain 0 mg of sodium which is good for your heart.

High Sodium Diet: A diet that is high in sodium makes your heart work harder. Sodium holds on to water and this extra fluid makes your heart work harder to circulate the blood throughout your body.

High Blood Pressure (also called hypertension): can injure your brain, eyes, heart, blood vessels, and kidneys.



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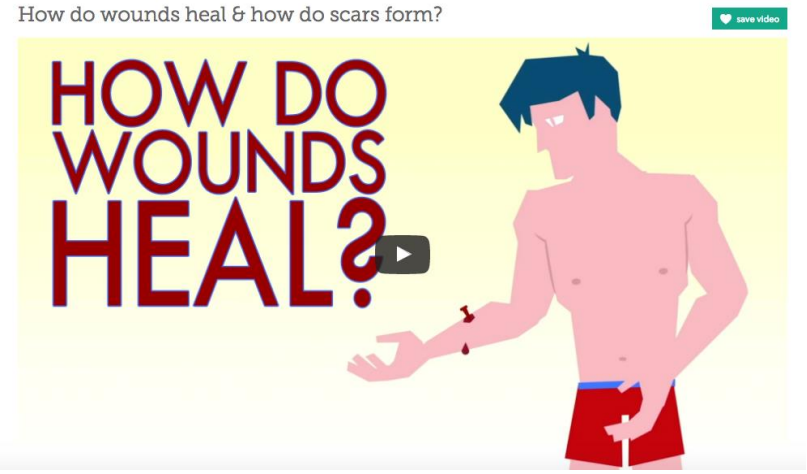
Click on image 5 to see Slide #5 (a video): Sodium and Hypertension

High Sodium Food Chart: Ask students which of the high sodium foods listed in this chart they eat.

DASH Diet: This stands for Dietary Approach to Stop Hypertension; this is what people with high blood pressure or hypertension should eat to decrease their blood pressure. This diet includes lean, high-protein foods, fruits and veggies, low-fat dairy products, fish, poultry, and whole grains.



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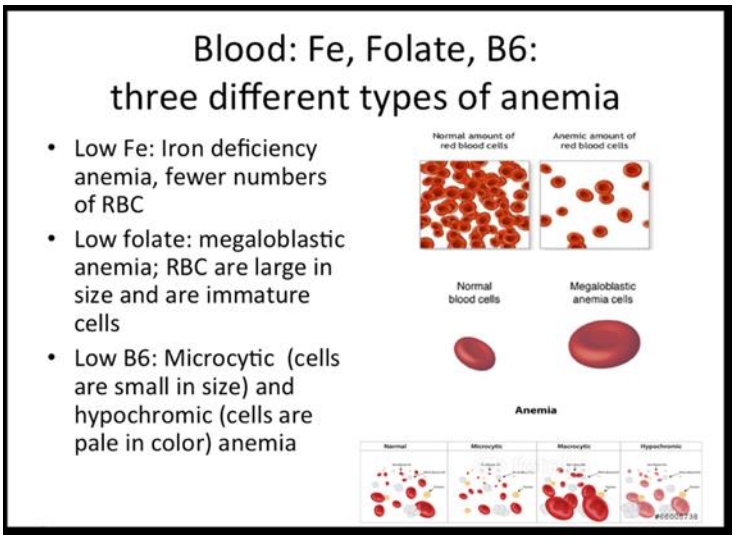
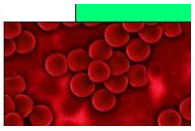
Click on image 6 to see Slide #6: Immune System—Vitamin C and Zinc Heal Wounds

Watch the TED Ed video to learn about the four stages of wound healing:

*There are **four stages to wound healing**: Hemostasis, Inflammatory Phase, Proliferation Phase, and Remodeling Phase.*

> ***In Phase 1:** Hemostasis, the skin responds to two immediate threats, blood loss and the epidermis being compromised, and forms a clot*
>
> ***In Phase 2:** Inflammation, vitamin C helps with reactions that form an initial covering over the wound.*
>
> ***In Phase 3:** Proliferative, vitamin C helps make collagen, a protein that is essential to wound healing; zinc stimulates wound healing.*
>
> ***In Phase 4:** Remodeling, vitamin C helps make a stronger collagen that covers the wound and zinc helps form and maintain the new skin.*



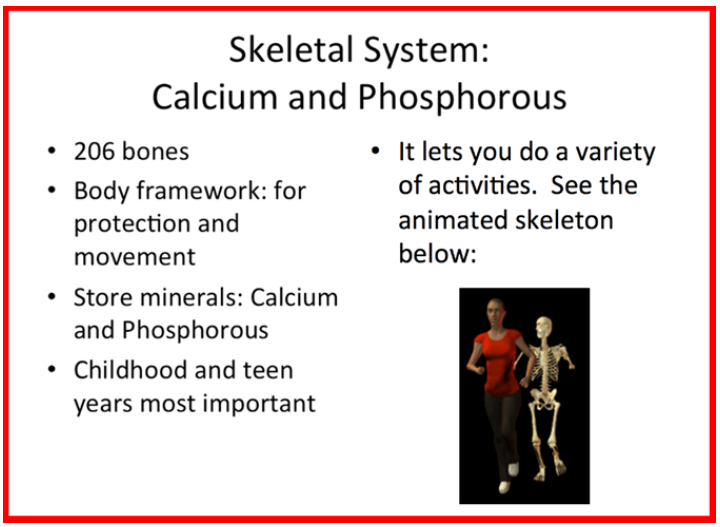
7  **Click on image 7 to see Slide #7: Blood—Fe, Folate, B6: Three Different Types of Anemia**

Anemia*: A* ***decrease in the amount of red blood cells (RBCs) or hemoglobin*** *in the blood. There are three different types of anemia that can occur if you don't get enough iron, vitamin B6, or folate in the diet.*

Iron Deficiency Anemia: *Red blood cells carry hemoglobin, an iron-rich protein that attaches to oxygen in the lungs and carries it to tissues throughout the body. Anemia occurs when you do not have enough red blood cells or when your red blood cells do not function properly. If you have iron deficiency anemia, your cells are not getting enough oxygen, and you feel tired.*

Folic acid is required for cell growth and division. If folate acid intake is low, then the cells can't grow normally nor mature properly. Instead these RBC grow into large bizarre shapes and don't live as long as healthy RBC. This is called megaloblastic anemia and the cells are large, but fewer in number.

Vitamin B6 plays a role in RBC synthesis. If you are vitamin B6 deficient, two things happen: (1) you won't make enough red blood cells and (2) they won't make enough hemoglobin which means less oxygen is binding to the hemoglobin. The result is RBC that are small in size (microcytic) and pale in color (hypochromic) (The iron gives blood its bright red color.)



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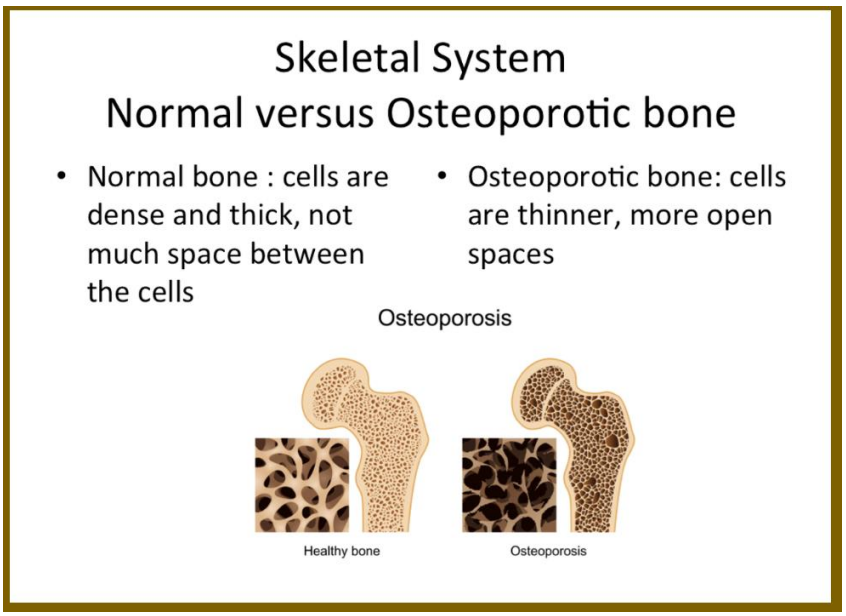
Click on image 8 to see Slide #8: Skeletal System—Calcium and Phosphorous

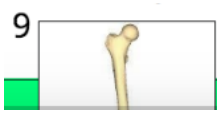
The skeletal system gives the body its basic framework, providing structure, protection, and movement. The 206 bones in the body also produce blood cells, store important minerals, and release hormones necessary to life.

The two minerals that help make your bones strong are calcium and phosphorous. Approximately 99% of the calcium and 85% of the phosphorous in your body are found in bones.

The time to build strong bones is during childhood and the teen years, so it's very important to get enough calcium now to fight against bone loss later in life. Weak bones are susceptible to a condition called osteoporosis, which causes bones to break easily.

The skeletal system lets you do a variety of activities: watch the animated skeleton.



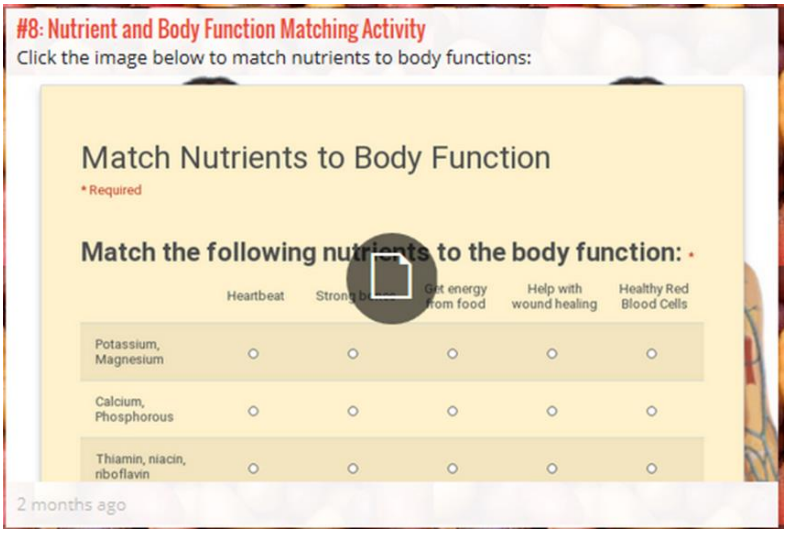


Click on image 9 to see Slide #9: Skeletal System—Normal versus Osteoporotic Bones

Calcium and phosphorous help keep your bones strong and thick. In the normal bone, cells are very close together (dense) and thick; there isn't much space between the cells.

If you don't get enough calcium and phosphorous in your diet, the cells are thinner and there are more open spaces between them. This type of bone is called ***osteoporotic or porous bones****. Individuals who have osteoporosis are more likely to suffer a fracture and break their bones.*

Instructions**:** Close the slide page (click on X) to get back to the Main page.



Step #8: Nutrient and Body Function Matching Activity

Instructions: Click the image and match nutrients to body functions.

Answers:

Potassium, magnesium are for heartbeat.

Calcium, phosphorous are for strong bones.

Thiamin, niacin, riboflavin are for turning food into energy.

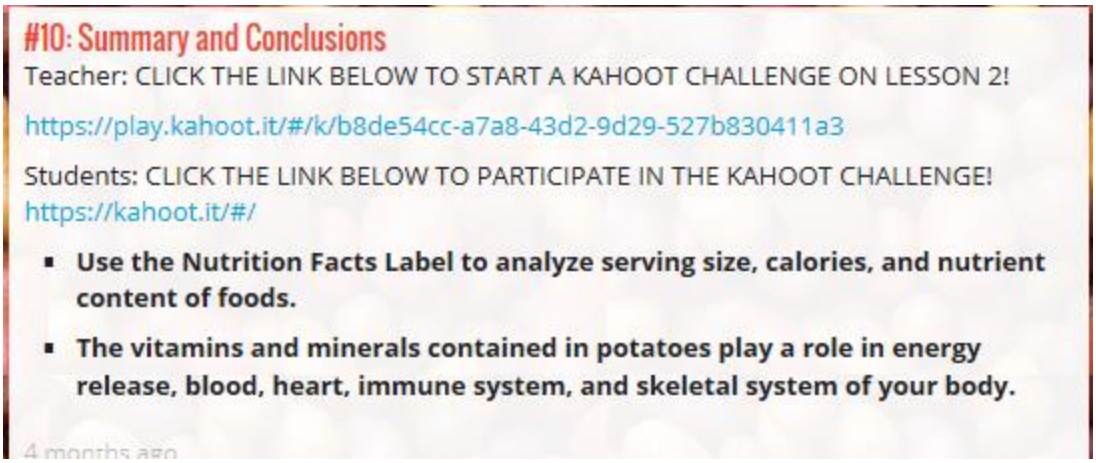
Zinc, Vitamin C are for wound healing.

Iron, Vitamin B6 and folate are for healthy red blood cells.

Slide #9: Career Connections

- *Nutrition Facts Label*
  - *Food scientist: Analyze products companies/businesses*
  - *Food regulators: Test products for nutrient specifications*

- *Health Careers*
  - *Dietitian*
  - *Doctor*
  - *Nurse*



Slide #10: Summary and Conclusions

Instructions—Teacher and students: Click on your link to participate in the Kahoot Challenge for Lesson 3!

Summary and Conclusions

- *Use the Nutrition Facts Label to analyze serving size, calories, and nutrient content of foods.*
- *The vitamins and minerals contained in potatoes play a role in energy release, blood, heart, immune system, and the skeletal system of your body.*