

# Warm Up

- *What vitamins and minerals can you name?*
- *How do people get the vitamins and minerals they need?*
- *What are health benefits that you know about vitamins and minerals?*
- *Why do some people take supplements?*

# Essential Standard

- 8.NPA.1 Apply tools (Body Mass Index, Dietary Guidelines) to plan healthy nutrition and fitness.

# Clarifying Objective

- 8.NPA.1.2 Summarize the benefits of consuming adequate amounts of vitamins A, E, and C, magnesium, calcium, iron, fiber, folic acid, and water in a variety of foods.

# Statement of Objectives:

- *Today we are going to focus on the health benefits of consuming adequate amounts of vitamins, minerals and water. We will see that these come from a variety of foods and all are necessary for good health.*

# Vitamins and Minerals



# The Nature of Vitamins

- a. Vitamins are organic (carbon) compounds needed for normal function, growth and maintenance.
- b. Vitamins are cofactors, they don't do anything by themselves.
- c. They are not a source of calories.

# Vitamin Requirements

- Daily Values (DV): standard nutrient intake values developed by FDA
  - Disease prevention
  - Best met through a consumption of a wide variety of foods

**GLACÉAU®**  
**vitaminwater™**

**power-c**  
(c+b's)

**nutrition information**

	per 100 ml	per 500 ml serving
energy	96 kJ	478 kJ
protein	0 g	0 g
carbohydrates	5.4 g	27 g
sugar	0 g	0 g
dietary fibre	0 g	0 g
sodium	0 mg	0 mg
vitamin C	24 mg	120 mg (200%*)
niacin (B3)	0.9 mg	4.5 mg (20%*)
vitamin B6	0.1 mg	0.5 mg (20%*)
vitamin B12	0.05 µg	0.25 µg (20%*)
panthothenic acid (B5)	0.3 mg	1.5 mg (20%*)
zinc	0.75 mg	3.75 mg (20%*)

\*recommended daily allowance for adults and children older than 10 years

made for  
the centre for responsible hydration (aka glaceau)  
coca-cola south africa, 9 junction avenue  
parktown 2193, south africa  
call us on: 0960 112653  
go to: [www.glaceau.co.za](http://www.glaceau.co.za)

use all of your power to respect the environment. please recycle.



**GLACÉAU®**  
**vitaminwater™**  
dragonfruit flavoured  
nutrient enhanced drink

**power-c**  
(c+b's)

legally, we are prohibited from making exaggerated claims about the potency of the nutrients in this bottle. therefore, legally we wouldn't tell you that after drinking this, thelma from braakon threw a cement mixer across a rugby field, or that this drink gave william from nelspruit enough strength to stop a speeding train. heck, we can't even tell you this drink gives you the strength of a hundred raging buffaloes, or the stamina to run up mount everest in nothing but silky running shorts.

legally, we can't say stuff like that. because that'd be wrong, you know?

500 ml

**GLACÉAU®**  
**vitaminwater™**

**power-c**  
(c+b's)

ingredients: reverse osmosis water, fructose, sucrose, flavourant, colourant, vegetable extracts, citric acid, vitamin C, niacin, panthothenic acid, B6 and B12, electrolytes (magnesium lactate, calcium lactate and potassium phosphate) and zinc gluconate.

for best results,  
stick it in the fridge.



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# Dietary Supplements

## \$6 Billion Market

- a. They are not foods, and not drugs.
- b. Supplements are “Product intended to supplement the diet”
- c. NOT consumed as a food replacement
- d. Loosely regulated, “not evaluated by FDA”

*By definition* a “drug” is used to  
“prevent, treat or cure” disease.  
These terms cannot be used with supplements.

Use of some supplements is backed by  
scientific data.



“Five bucks a bottle. Three for \$20.”



# Fat Soluble Vitamins

- a. Fat soluble vitamins require fat to be present in order to be properly absorbed and utilized by the human body.
- b. Fat soluble vitamins can be stored in the body's fatty tissues and liver

# Vitamin A

- a. Vitamin A helps to maintain good vision and immune functions
- b. Antioxidant
- c. Stored in liver
- d. Deficiency causes ~500,000 cases of “night blindness” worldwide
- e. Too much causes: Carotenosis: more vitamin A than needed, orange cast to skin



# Good Sources of Vitamin A:

- Sweet potatoes
- Carrots
- Pumpkin
- Winter squash
- Cantaloupe
- Pink Grapefruit
- Mangoes
- Apricots
- Oranges
- Spinach
- Kale
- Beet greens
- Broccoli
- Dark green leafy vegetables
- Fish oil
- and liverwurst
- Canned beef stew
- Eggs
- Fish
- Shellfish
- Cheese
- Whole milk
- Fortified skim milk
- Fortified low fat dairy products
- Fortified dried powdered milk
- [Fortified breakfast cereal](#)

# Vitamin D

- a. Vitamin D helps promote bone and cardiovascular health
- b. Main role is to maintain calcium and potassium levels
- c. It is the only fat soluble vitamin that we can make- in the presence of sunlight
- d. Toxicity is very dangerous
  - 1. Can lead to calcium deposits in kidneys, heart and blood vessels
  - 2. Occurs only from excess supplementation
- e. Elderly and shut ins are at risk- not enough sunlight

# Good Sources of Vitamin D

- Mushrooms
- milk (100 IU per cup)
- margarine (60 IU per tbs)
- some orange juices (small amount)
- some breakfast cereals. (small amount)
- Salmon
- Mackerel
- Sardines
- Tuna
- Egg yolk
- Milk

# Vitamin D



← Rickets can be caused by lack of sunlight, but also from insufficient calcium. Vitamin D linked to calcium absorption.

(Rickets reported in NYC.)

# Vitamin E

- a. E protects against cancer, heart disease, stroke, dementia and liver disease
- b. repairing tissue
- c. Deficiencies are not well understood
- d. Americans spend \$300 million per year on vitamin E supplements
  
- Good Sources
  - a. fortified foods, nuts and leafy green vegetables

# Water Soluble Vitamins

- a. help the body obtain energy from food
- b. important for normal appetite, good vision, healthy skin, healthy nervous system and red blood cell formation





# Water Soluble Vitamins

- B<sub>1</sub>, thiamine
- B<sub>2</sub>, riboflavin
- B<sub>6</sub>, pyridoxamine
- B<sub>12</sub>
- Biotin
- Pantothenic acid
- Niacin
- Folacin
- Vitamin C

# Vitamin C - Ascorbic acid

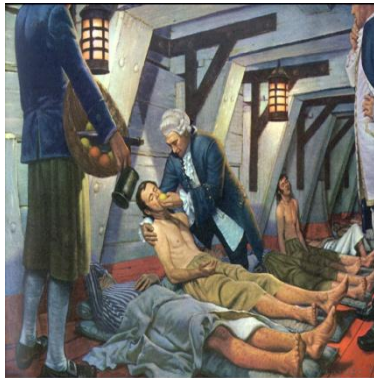
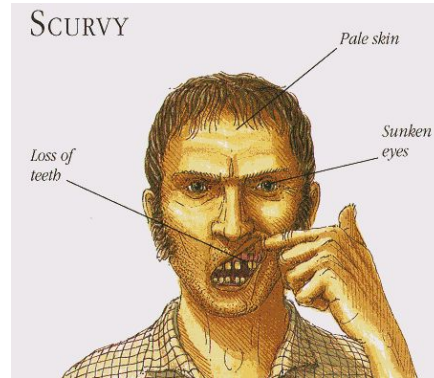
1. necessary for tissue repair
2. vital for healthy immune and nervous systems because it strengthens blood vessels
3. Deficiency leads to bleeding gums, hemorrhages

# Good Sources:

Fruits  
Grapefruit  
Guava  
Lemons  
Mangos  
Orange juice  
Tomatoes  
Strawberries  
Vegetables  
Black currants  
Watercress

Broccoli Oranges  
Brussels sprouts  
Cabbage Peppers,  
sweet and hot  
Collards Potatoes  
Green peppers  
Kale  
Papayas  
Rose hips  
Spinach  
Tangerines

# Vitamin C - Scurvy



# Folic Acid

- aids in protein metabolism
- promoting red blood cell formation
- lowering the risk for neural tube birth defects
- Folate may reduce the risk for coronary heart disease.

# Sources of Folic Acid

- liver
- kidney
- dark green leafy vegetables
- meats & fish
- whole grains
- fortified grains and cereals
- legumes
- citrus fruits

# Minerals

- a. Part of the chemical fuel in food that helps keep our bodies healthy
- b. help the body's organs, systems, bones and cells in different ways, depending on what particular food mineral they are

# Minerals

- Percent of Body weight
  - Calcium 2%
  - Phosphorus 1%
  - Potassium 0.3%
  - Sulfur 0.2%
  - Sodium 0.1%
  - Chloride 0.1%
  - Magnesium 0.05%
  - Iron 0.04%





# Calcium

- a. The body stores more than 99 percent of its calcium in the bones and teeth to help make and keep them strong
- b. help muscles and blood vessels contract and expand
- c. send messages through the nervous system.
- d. Found in Dairy Products
- e. Vitamin D aids absorption
- f. Built in youth, lost in maturity



Very hard for vegans to get enough calcium

# Calcium Deficiencies

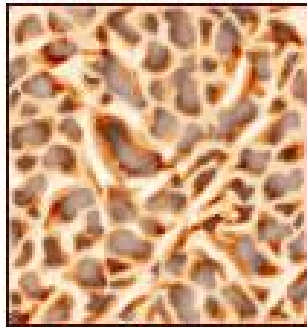
## a. Osteoporosis –

National Osteoporosis  
Foundation [www.nof.org](http://www.nof.org)

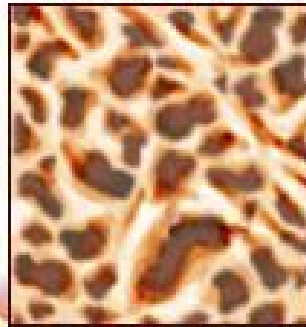


# Calcium

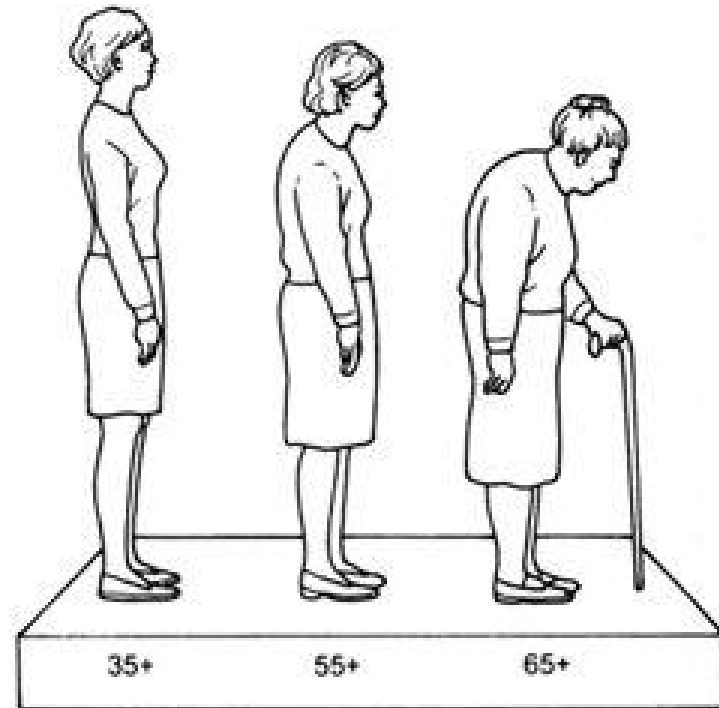
Normal Bone



Bone with Osteoporosis



Spine



- Clip on 3 essential vitamins and minerals for teens

# Iron

- a. The body needs iron to make the proteins hemoglobin and myoglobin.
  - a. Hemoglobin is found in red blood cells and myoglobin is found in muscles
  - b. help carry and store oxygen in the body
  - c. Deficiency: anemia
  - d. Good Sources:
    - a. found only in meat, fish and poultry and is absorbed much more easily
    - b. found primarily in fruits, vegetables, dried beans, nuts and grain products
  - e. Most common and easily preventable deficiency
  - f. Toxicity
    - a. 6 – 12 vitamins with 100% iron content will kill a small child

# Magnesium

- Important in...
  - regulating muscle and nerve function
  - blood sugar levels
  - blood pressure and making protein, bone, and DNA

# Sources of Magnesium

- Legumes, nuts, seeds, whole grains, and green leafy vegetables (such as spinach)
- Fortified breakfast cereals and other fortified foods
- Milk, yogurt, and some other milk products

# Fiber

- refers to carbohydrates that cannot be digested
- help lower blood cholesterol
- prevent diabetes and heart disease
- When carbohydrates are combined with fiber, it slows the absorption of sugar and regulates insulin response.
- food with fiber make us feel full, which discourages overeating.
- has no calories
- help move food through the digestive system, promoting healthy bowel function and protecting against constipation.



# Great sources of fiber include:

- whole-grain breads and cereals
- fruits like apples, oranges, bananas, berries, prunes, and pears
- vegetables like green peas, broccoli, spinach, and artichokes
- legumes (split peas, soy, lentils, etc.)
- almonds

# Fortification vs Enrichment

- Fortification - restores lost nutrients due to processing
- Enrichment – adds nutritional value to meet a specific standard



## Old London

Restaurant Style Croutons. Seasoned Sourdough.

**Enriched Bread,  
[Enriched Flour  
(Flour,  
Niacin,  
Ferrous Sulfate,  
Thiamin Mononitrate,  
Riboflavin,  
Folic Acid),**

Water,  
Yeast,  
Sugar,  
Salt,  
Partially Hydrogenated Soybean Oil ,  
Vinegar,  
Ascorbic Acid]  
Bean Oil with BHT added as a Dextrin



# Independent Practice

- Have students complete the Final Answer sheet using what they have learned today.
- Students may work individually or in pairs to complete the assignment. The last question will require them to create an advertisement and while it is not required, students may want access to markers or colored pencils (based on time allowed).
- Rubric included.

# Closure

- *You have examined the variety of vitamins and minerals our body needs to maintain good health, and you know the difference between enriched and fortified foods. You also know the importance of consuming adequate amounts of water and fiber for a healthy diet. You also know how to be a wise consumer when purchasing and consuming fortified foods. I hope you will take this information and apply it to your food choices and your efforts to maintain healthy eating habits.*