Nutrition

• The study of how your body uses the food you eat.

Metabolism

The speed at which your body uses energy to maintain its processes; vary by individual
Nutrition

- **Food** - an edible, organic substance that contains nutrients

- **Calorie** – the unit used to measure the energy of foods
  - 3500 calories is equal to a pound
  - To lose weight, a person must take in fewer calories than are burned.
  - To gain weight, a person must take in more calories than the body uses
So what do we eat?

• Food is made up of **Nutrients**... a chemical found in foods, critical to human growth and function.

**Nutrients**...

• Supply energy
• Help build and repair cells and tissues
• Regulate body processes
Nutrition plays a large role in determining:

- Height
- Weight
- Strength
- Skeletal and muscle development
- Physical agility
- Resistance to disease
- Appetite
- Posture
- Complexion
- Mental ability
- Emotional and psychological health
• Immediate effects of good nutrition include:
  • Healthy appearance
  • Good attitude - Enthusiasm
  • Proper sleep and bowel habits
  • High energy level
  • Freedom from anxiety

• Good nutrition may delay or prevent the following:
  – Hypertension
  – Atherosclerosis
  – Osteoporosis
  – Malnutrition
  – **Obesity** - a condition characterized by excessive deposits of body fat - when a person exceeds a healthy weight by 20% or more.
Malnutrition

• Poor nutrition over an extended period of time.

• Body does not get what it needs from food

• Body does not have the nutrients it needs for energy, growth, repair and the regulation of various body processes.
Malnutrition

• Causes overweight and underweight health situations

• Delays or inhibits growth and development as well as resistance to diseases in children

• Severely affects unborn child in pregnant women

• Affects your health and life span
Essential Nutrients

• Composed of chemical elements found in food
• Used by the body to perform body functions
• Nutrients in foods replace those used by the body
• Essential nutrients divided into six groups
The 6 Essential Nutrients

- Carbohydrates
- Fat
- Protein
- Water
- Vitamins
- Minerals
Carbohydrates
45-60% of your daily food intake

• 1 gram of carbohydrates = 4 calories
• Give all cells the energy they need
• Main source of energy for the body
• If we take in more than we need for immediate use, the unused amount:
  • Is stored in the liver
  • Converted to fat
Carbohydrates

Carbohydrates are the body’s main source of energy and provide the body’s need for dietary fiber.

• **Food Sources:**
  – Pasta, breads, cereals, grains, rice, fruits, milk, yogurt and sweets.

• **Three types of Carbohydrates:**
  – Starches or Complex Carbohydrates
  – Simple Carbohydrates
  – Fiber
Simple Carbohydrates

• **Food Sources:**
  – Fruits, juices, milk, and yogurt.
  – Candy, soda, jelly, cakes, pop tarts, and table sugar
    – These simple carbohydrates have a bad reputation because they are **high in calories and low in nutritional value.**

• **Function in the Body:**
  • Breakdown quickly for the body to use immediately
Starches or Complex Carbohydrates

- **Food Sources:**
  - Whole grain breads and cereals, oatmeal, pasta, raw vegetables & fruit, rice, tortilla, potatoes, and legumes (dried peas & beans)

- **Function in the Body:**
  - An excellent source of fuel (energy) for the body.
  - Help reduce ‘bad’ cholesterol
  - Rich in vitamins, minerals and fiber.
  - Feel full longer
  - Breakdown slower to be used by the body over a longer period of time
Fiber

• **Fiber** is the plant material (cellulose) that doesn’t break down when you digest food. Many, but not all, complex carbohydrates contain fiber.

• **Food Sources:**
  – Oatmeal, fruits, raw vegetables, whole grains and legumes.

• **Function in the Body:**
  – Aids in digestion.; helps promote regularity
  – May reduce the risk of developing some diseases like heart disease, diabetes and obesity, and certain types of cancer.
  – We need 20-35g of fiber daily to help our digestive tract work properly
Fat

- fat should be less than 30% of your daily intake
- The most concentrated form of food energy (calories).

• 1 gram of fat = 9 calories

• **Food Sources:**
  – Butter, vegetable oils, salad dressings, nuts and seeds, dairy products made with whole milk or cream, and meats.

• **Function in the Body:**
  – Provide substances needed for growth and healthy skin.
  – Insulate our body & Cushions organs
  – Build Brain cells and nervous tissue
  – Required to carry “fat-soluble” vitamins throughout the body... A,D,E,K
  – Provide energy.
Types of fat

• Saturated Fat
  – Animal foods: meat, cheese, milk, butter
  – Increases cholesterol, high blood pressure, heart disease and obesity
  – Solid at room temp.

• Unsaturated Fat
  – Plants, fish, olive, sunflower, and grapeseed oil
  – Liquid at room temp.
Problems with fat

• Trans Fats
  – Vegetable infused with hydrogen
    • Margarine, “partially hydrogenated…”
    • Doesn’t exist in nature so body can’t process well
    • Hard to digest so they increase the bad cholesterol in your blood and lowers the good.
    • Contribute to about 30,000 premature deaths/yr
  – Worse for you than saturated fat
Cholesterol

- A fat-like substance that is part of every cell of the body.

• Function in the Body:
  – Helps the body make necessary cells including skin, and hormones.
  – Aids in digestion.
  – The human body manufactures all the cholesterol it needs. You also get cholesterol from animal food products you eat.

• When cholesterol levels are high there is a greater risk for heart disease.
  – Do you know what the healthy cholesterol range is for teens your age?
2 Forms of Cholesterol

- **LDL**
  - Bad form that deposits cholesterol on walls of blood vessels

- **HDL**
  - Good form that removes cholesterol from cells and returns it to the liver and intestines to be recycled or excreted
Proteins

15-20% of your daily food intake

• **Food Sources:**
  – Meat, fish, eggs, poultry, dairy products, legumes, nuts and seeds. (Breads, cereals and vegetables also contain small amounts of protein.)

• **Function in the Body:**
  – Provides energy when needed
  – Help to build, maintain, and repair body tissues.
  – Helps make antibodies, hormones and enzymes.
  – 1 gram of protein = 4 calories

• Proteins are made up of chemical compounds called amino acids. There are 20 amino acids.
Amino Acids

Of the 20 amino acids, the human body is capable of producing 11 of them. The other 9 called, “Essential Amino Acids” must be supplied by food sources.

• Two types of Protein:
  • Complete Proteins:
    – Contain all 9 essential amino acids.
    – They are found in animal sources – poultry, fish, beef, eggs, milk
  • Incomplete Proteins:
    – Lack one or more of the essential amino acids.
    – They are found in plant sources - peas, beans, grains

• Complementary Proteins- 2 incomplete proteins that together would achieve the complete 9 essential amino acids required by the body
  » Ex- peanut butter on whole wheat bread
How much protein do we need?

To calculate your protein needs:

* Convert your weight to kilograms
  (1 kilogram = 2.2 lbs)
  Example: 135 lb divided by 2.2 = 61 kilograms

* Your body needs .8 gram per kilogram
  Example: .8 x 61 = 49 grams of protein a day
Water

• Did you know?
  – Water is the most critical nutrient for sustaining life!
  – It may take us weeks to starve, but only a few days to dehydrate
  – 1/2 to 3/4 of the human body consists of water!
  – Makes up more than 60% of our body mass!

It is recommended that teens drink 6-8 glasses (8 fl.oz each) of water each day. This is in addition to around 4 cups of water you get from food each day.

• What foods can you get water from??
Water

- **Functions in the Body:**
  - Water carries nutrients to your cells and carries waste from your body.
  - Regulates body temperature.
  - Dissolves vitamins, minerals, amino acids and other nutrients.
  - Lubricates joints.
  - Aids in digestion and cell growth
  - Flushes the system, kidneys pull out toxins
  - Water has a role in senses; fluid in the eyes for vision, fluid in the ears for hearing, fluids for taste, and smell to function
• 75% of Americans are chronically dehydrated; dehydration occurs when you lose more fluid than you take in, and your body doesn't have enough water and other fluids to carry out its normal functions.

• In 37% of Americans the thirst mechanism is so weak that it is often mistaken for hunger

• Even mild dehydration slows metabolism as much as 3%- it stresses the heart and blood vessels and increases the heart rate and body temperature.

• Beverages containing caffeine are dehydrating
Fruits and Vegetables: How much should we eat?

• Dietary Guidelines recommend a minimum of 3-5 servings per day.
  – Visit www.choosemyplate.gov for YOUR specific amount

• Most Americans are not meeting this recommendation.
Why is it so important?

• Fruit & vegetables are FULL of vitamins and minerals, which serve an array of important functions in the body.

• For example...
Vitamins

• **Food Sources:**
  – Fruits, vegetables, milk, whole-grain breads, cereals and legumes.

• **Unlike carbohydrates, fats, and proteins, vitamins DO NOT provide energy (calories).**

• **Function in the Body:**
  – Help regulate the many chemical processes in the body.
  – There are 13 different vitamins known to be required each day for good health.

  – **Vitamins are separated into two types:**
    • Fat Soluble & Water Soluble
Fat/Water Soluble Vitamins

• **Fat Soluble Vitamins**
  – Vitamins A, D, E, K *(ants don’t eat kangaroos!)*
  – Required for the stomach to allow them to be carried into the blood stream for use (absorption).
  – Can be stored in the body for later use.

• **Water Soluble Vitamins**
  – Vitamins C and B-complex
  – Require water for absorption.
  – Easily absorbed and passed through the body as waste.
Vitamin A

• **Food Sources:**
  - Dark green, leafy vegetables, deep yellow and orange fruits and vegetables, liver, milk, cheese, and eggs.

• **Function in the Body:**
  - Helps keep skin and hair healthy
  - Maintains eye health
  - Aids in night vision
  -Boosts the body’s immunity to infectious diseases
Vitamin D

• **Food Sources:**
  – Vitamin D fortified milk, egg yolk, salmon, sardines, and liver
  – Nonfood Source: the sun

• **Function in the Body:**
  – Helps the body use calcium and phosphorus
  – Plays a role in building strong bones and teeth
Vitamin E

• **Food Sources:**
  – Whole-grain breads and cereals; dark green, leafy vegetables; dry beans and peas; nuts and seeds; vegetable oils; margarine; avocados; liver

• **Function in the Body:**
  – Helps form red blood cells, muscles, and other tissues.
  – Antioxidant that helps protect cells from damage
Vitamin K

- **Food Sources:**
  - Dark green and leafy vegetables (such as spinach, lettuce, kale, collard greens), cabbage, liver, egg yolks, and cheese

- **Function in the Body:**
  - Helps blood to clot.
Vitamin B-complex

• **Food Sources:**
  – Whole grain and enriched breads and cereals; dry bean and peas; peanut butter; nuts; meat; poultry; fish; eggs; cheese; milk.

• **Function in the Body:**
  – Helps the body use the energy from the foods we eat.
  – Helps with brain & nerve function
FOLATE (B-Vitamin)

- Reduces a woman’s risk of having a child with a brain or spinal cord defect
- Helps prevent heart disease

**Fruit/Veggie Sources:** black eyed peas, cooked spinach, great northern beans, asparagus
Vitamin C
- ascorbic acid

• **Food Sources:**
  – Citrus fruits, strawberries, kiwi, broccoli, red peppers, green peppers, tomatoes, and sweet potatoes.

• **Function in the Body:**
  – Helps heal cuts and wounds
  – Helps maintain healthy bones, teeth, and blood vessels
  – Helps fight infection
  – Keep teeth and gums healthy.
Minerals

• A simple inorganic compound that living things need in small amount to stay healthy

• **Functions in the Body:**
  – The body depends on minerals for practically every process necessary for life.
  – The body requires 16 minerals daily.
Minerals

- Calcium
- Phosphorus
- Magnesium
- Sodium
- Potassium
- Iron
- Others include:
  - Iodine, Zinc, Copper, Sulfur, Chloride, etc.
Calcium

• **Food sources**
  – Salmon, sardines, milk, cheese, yogurt, broccoli and tofu

• **Function in the body**
  – Helps form bones and teeth, helps with blood clotting and helps with nerve & muscle function
Phosphorus

• **Food Sources**
  – Peas, meat, fish, eggs, and milk

• **Function in the body**
  – Works with calcium to give strength to bones and teeth
  – Aids the body in storing and releasing energy
Magnesium

• **Food Sources**
  – Meats, seafood, milk, cheese, yogurt, bran cereal, other whole grains, green leafy vegetables, and nuts

• **Function in the body**
  – Helps with nerve and muscle function
  – Sustains a regular heartbeat
  – Helps the body regulate body temperature
Sodium

- **Food Sources**
  - Salt, processed foods,

- **Functions in the body**
  - help the cells absorb nutrients
  - Regulate fluids in body
Potassium

• **Food Sources**
  – Bananas, potatoes, grapefruit, oranges, cantaloupe, prune juice, prunes, and tomatoes

• **Body Functions**
  – An electrolyte that’s essential for your body’s growth and maintenance. Helps keep a normal water balance between cells and body fluids
  – Helps maintain a healthy blood pressure
  – Promotes proper nerve and muscle functioning
Iron

• **Food Sources**
  – Meat, fish, poultry, lentils, beans, fortified cereals and breads

• **Functions in the body**
  – Helps boost the oxygen–carrying capability of your red blood cells
Let's talk about COLOR!

• In addition to our daily 3-5 servings of fruits and veggies... it is also highly recommended that we eat a variety of COLORS too.

• Why?
  – Brightly colored fruits and vegetables have the highest doses of phytochemicals – which help to prevent chronic illnesses and cancer!
  – Each color boasts of its own benefits, and that’s why it’s important to select a variety of colors when choosing the produce to eat.
**Blue/Purple**

These fruits/veggies reduce the risk of heart disease, help prevent formation of blood clots, and are good for memory function and healthy aging.

**Fruits:** blackberries, blueberries, black currants, dried plums, purple figs, purple grapes, plums and raisins

**Vegetables:** purple asparagus, purple cabbage, eggplant, purple peppers, purple-fleshed potatoes
Green fruits/veggies help to promote strong bones and teeth, vision health and may lower the risk of some types of cancer.

**Fruits:** avocados, green apples, green grapes, honeydew, kiwifruit, limes, green pears

**Vegetables:** artichokes, arugula, asparagus, broccoli, brussels sprouts, cabbage, green beans, celery, cucumbers, leeks, lettuce, green onions, peas, green peppers, spinach, watercress, zucchini
White fruits/veggies (also tan and brown) help promote heart health and help lower cholesterol levels that are already healthy.

**Fruits:** bananas, brown pears, dates, white nectarines, white peaches

**Vegetables:** cauliflower, garlic, ginger, jicama, mushrooms, onions, parsnips, white-fleshed potatoes, turnips, white corn
Yellow/Orange

These fruits/veggies are beneficial for heart and vision health, a healthy immune system and a lower risk of some cancers.

**Fruits:** yellow apples, apricots, cantaloupe, grapefruit, lemons, mangoes, nectarines, oranges, papayas, peaches, yellow pears, pineapples, tangerines

**Vegetables:** butternut squash, carrots, yellow peppers, pumpkin, rutabagas, sweet corn, sweet potatoes, yellow tomatoes, yellow winter squash
Red fruits/veggies promote heart and urinary tract health, memory function and a lower risk of some cancers.

**Fruits**: red apples, cherries, cranberries, red grapes, pink/red grapefruit, red pears, pomegranates, raspberries, strawberries, watermelon

**Vegetables**: beets, red peppers, radishes, radicchio, red onions, red potatoes, rhubarb, tomatoes
THE CHALLENGE

Can YOU eat something from each color... each day??

Use your tracking paper to record all the fruits and veggies that you eat today until Friday.

Then we will create a bar graph to see which color vegetable YOUR diet is lacking.
Nutrient Deficiencies

• A Nutrient Deficiency is a shortage of a nutrient
  • If you do not get enough of a nutrient a deficiency will result and poor health or lack of energy may be the result
    • The effects of some deficiencies take a long time to show
      -- Example: Not enough calcium in the teen years may not show until the elderly years (less dense bones)
VITAMIN C: Scurvy

- Scurvy can cause bleeding gums, “cork screw” hairs or bleeding follicles, and bleeding fingernails
- Scurvy was first discovered in sailors...Do you know why?
PROTEIN: Kwashiorkor

- Kwashiorkor is characterized by a protruding abdomen due to lack of proteins

- This deficiency is usually seen in third world countries
IODINE: Goiter

- Lack of iodine can cause your thyroid to enlarge and then produce a goiter

- These can be painful and uncomfortable
IRON: Anemia

- Low red blood cell count
- Leads to poor transport of oxygen through the blood
VITAMIN A: Night Blindness

- Unable to see properly at night
- Things are viewed darker than they really are
- The middle of this picture would be what someone with night blindness would see
VITAMIN D: Rickets

- Rickets is characterized by bowed legs and bones
- This is usually found in third world countries
CALCIUM: Osteoporosis

- Lack of calcium will cause bones to become brittle and less dense than normal bones.
Sodium: Edema/Hypertension

- Too much sodium can cause edema which is when the body cannot get rid of the sodium and the fluids build up causing swelling.
- Hypertension is high blood pressure.
Getting Too Many Nutrients

• Poor nutrition can also result from getting too many nutrients
  • Example: too much fat can lead to heart disease and other problems

• Excess amounts of vitamins and minerals can cause serious harm to your body
  • Example: too much vitamin A can damage your liver
  • Taking too many vitamin and mineral supplements can cause this
Nutrient Basics Quiz

1. I serve many functions in the body. I help carry nutrients to the body’s cells and I also help regulate body temperature. I am_________.

2. I can be converted into energy. I am also used to build, maintain and repair body tissues. I am_________.

3. I have a bad reputation in many people’s minds but I do serve many functions in the body. For example, I am the most concentrated source of energy and I also am needed for growth and healthy skin. I am______________.

4. I am the body’s main source of energy and I come in two forms, simple and complex. I am______________.

5. I do not provide energy (calories) but I do help regulate many of the chemical processes in the body. You need 13 different forms of me everyday. I am______________.

6. I am depended on for nearly every process necessary for life. The body requires 16 types of me everyday from calcium to iron. I am__________.