Chapter 11

Getting Energy Into and Around the Body

11-1 Digestion

**digestion**- the process of breaking down food into molecules the cells can absorb

**enzyme**- a body chemical; in digestion, it helps break down food

**esophagus**- a long tube leading from the throat to the stomach

\* Your body depends on the food you eat. It changes the food into energy that you .

1.) walking

2.) talking

3.) breathing

4.) thinking

5.) sleeping

\* You do not get the energy from food until **digestion** occurs.

1.) The first step in the process of digestion is taking a bite of food and then chewing it. This breaks food into smaller pieces. **Enzymes** in your mouth break the food down even further.

2.) After you chew the food, you swallow it. It goes into your **esophagus**. Involuntary muscles also break down (and push down) the food.

3.) From your stomach, food moves into the small intestine. The food is broken down so much that it is not ready to enter your small intestine and blood.

4.) All leftover food that can’t be used leaves your body as solid waste called *feces*. Feces is another word for poop. The feces pass out of the body through an opening below the large intestine called the *anus*. Anus is another word for butt.

\* You should drink 6-8 glasses of water each day to keep the excretory system functioning properly.

\* The liquid waste, or *urine*, passes out of the body through

\* The pancreas and liver help the small intestine during digestion. The pancreas releases digestive enzymes. The liver produces bile, which breaks up fat.

If your body stopped producing enzymes, how would that affect you?

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*11-2 Respiration*

**respiration**- the process that gets oxygen to the body’s cells and removes waste gases

**larynx**- a box-shaped structure below the throat

**trachea**- a long tube leading from the larynx to smaller branching tubes that go to the lungs; also called the windpipe

**bronchi**- two small tubes that branch off from the trachea and enter the lungs

circulation

\* Your body needs oxygen in order to survive. Without **respiration**, waste gases would not be removed.

\* Oxygen is produced by plants. Without plants, animals could not carry out respiration. Plants also use oxygen in the air to carry out respiration.

\* When you take a breath, you bring air into your body. You can breath through your nose and your mouth.

\* From there, oxygen goes down your throat past the **larynx**.

\* The box-shaped structure below the throat is called the voice box because it contains organs known as vocal cords. This is what allows you to talk and make sounds.

\* The air then goes down a long tube called the **trachea**.

\* Finally, the air enters two small tubes called **bronchi**, which enter the lungs.

\* Lungs are like sponges. They have many small pockets called *air sacs* in them. When you breathe in, the sacs fill with air. The oxygen goes from the air sacs into your blood.

\* Blood then takes oxygen to all of your cells.

\* Oxygen then combines with the food molecules to create energy.

\* When energy is released, carbon dioxide and water vapor are byproducts that are released into the air.

\* The diaphragm is a dome-shaped sheet of muscle below the rib cage. When you inhale, the diaphragm contracts and moves downward. When you exhale, it returns to its dome shape.

\* An adult human breathes out about 12 times per minute.

11-3 Circulation

**blood vessel**- a tube that carries blood around the body

**artery**- a blood vessel that carries blood away from the heart

**vein**- a blood vessel that returns blood to the heart

**capillary**- a tiny blood vessel that connects an artery to a vein

**plasma**- the liquid part of blood

**red blood cell**- a blood cell that carries oxygen and carbon dioxide throughout the circulatory system

**white blood cell**- a blood cell that fights off bacteria and sickness in the body

**platelet**- a part of blood that helps stop injuries from bleeding

\* **Circulation** keeps blood moving around the body. Blood brings food and oxygen to all of the body’s cells.

**\*** Blood carries wastes away from the cells.

\* The heart is the most important organ of the circulatory system. It is a muscle about the size of your fist.

\* The heart has four section or *chambers*. The upper chambers are called *atria* and the lower chambers are called *ventricles*.

\* The chambers act as pumps, squeezing to push blood throughout your body.

\* Tubes connected to the heart take blood to or away from the heart.

\* The heart pumps 2,000-5,000 gallons of blood every day.

\* The circulatory system has many **blood vessels**. **Arteries, veins, and capillaries** are three kinds of blood vessels.

\* Black and blue marks (bruises) are caused by broken blood vessels. This is actually spilled blood trapped under your skin.

\* Blood with lots of carbon dioxide in it is blue. Blood with lots of oxygen is red.

\* If laid end-to-end, the blood vessels in your body would measure 60,000 miles- more than twice the distance around the equator.

\* Blood has three solid parts and one liquid part.

\* **Plasma** is the liquid part of blood and is made up of mostly water.

\* **Red blood cells, white blood cells,** and **platelets** are the three solid parts.

\* Red blood cells live about 120 days.

\* Blood pressure is a measure of how hard the heart must work to pump blood. Narrow vessels cause higher blood pressure.

\* High blood pressure can damage the heart and lead to heart disease. Hundreds of thousands of people die from heart disease each year.

\* A heart attack occurs when blood vessels to the heart become clogged. The heart then can’t get the oxygen it needs to keep pumping.

So….

1. Don’t smoke
2. Eat fewer fatty foods. Fat can clog blood vessels.
3. Exercise. This helps your heart pump more blood through the circulatory system. This makes the circulatory system stronger.

Make a poster about the heart. Include at least two charts/figures and give tips to keep the heart and body healthy.