

## **Respiratory System**

### **Why the body needs Oxygen**

The energy-releasing chemical reaction that take place inside your **cells** require **oxygen**.

Cellular **respiration** is the process in which oxygen and **glucose** undergo a complex series of chemical reactions inside cells.

Besides releasing energy, respiration produces **carbon dioxide** and some **water** through your lungs.

**Breathing** refers to movement of air into and out of the lungs.

Besides the lungs respiration requires **digestive** and **circulatory** system.

### **The Path of Air**

As air travel from the outside environment to the lungs, it passes through the following organs: **nose/mouth, pharynx, trachea** and **bronchi**.

#### **Nose**

Air enters the body through the nostrils and then moves in to the **nasal cavities**.

Cells of the cavities produce **mucus**, this keeps the tissue from **drying** out and traps **particles** such as dust and bacteria.

**Cilia**, tiny hairlike extensions move the mucus, along with the bacteria and particles to the stomach where the stomach acid destroys the bacteria.

You **sneeze** because the particles and bacteria irritate the lining of your nose.

#### **Pharynx**

The pharynx is shared by the respiratory and the **digestive** system.

#### **Trachea**

The trachea is also called the **windpipe**. The trachea's **cilia** and **mucus** continue the cleaning and moistening of the air.

The **Epiglottis** seals the trachea off while you swallow.

#### **The Bronchi and Lungs.**

Air moves from the trachea to the right and left **bronchus**.

The **bronchi** branches into smaller bronchioles. At the end of bronchioles are **Alveoli** which are tiny sacs of lung tissue specialized for movement of **oxygen** between air and blood.

## **Gas Exchange**

After air enters an alveoli oxygen passes through the wall of the alveolus and then through the **capillary** wall into the blood. **Carbon dioxide** and water pass from the blood in the **capillary**.

Your lungs can absorb a large amount of oxygen because of the large **surface area** of the alveoli.

## **How to Breathe.**

Breathing, like other body movements, is controlled by **muscles**.

The muscles of the ribs along with the **diaphragm**, a large dome-shaped muscle work together to help control inhalation and **exhalation**.

## **How to Speak.**

The **larynx** is also called the **voice box**.

Two **vocal cords** which are folds of connective tissue which produce your **voice**, stretch across the opening of the larynx.

When you speak, **muscles** make the vocal cords contract , narrowing the opening.

The movement of the vocal cords makes the air vibrates. The vibrations creates a sound, Your **voice**.

The **length** of vocal cords affect whether you produce **high** or **low** tones. The length of vocal cords change as you get older. Small children have small larynxes and short vocal cords this produces **high pitch** voices.

As you grow older the vocal cords of boys grow longer than girls. This is why men have **lower** voices than women.

## **Excretory System**

The excretory system is the system in the body that collects **waste** produced by cells in the body and removes the **waste** from the body.

The removal process is called **excretion**.

Your two **kidneys** are the major organs of the excretory system.

The kidneys eliminate, urea, excess **water**, and other waste material in a watery fluid called **urine**.

The kidneys act something like a **filter** .

Each kidney contains about a million tiny filtering factories called **nephrons**.

The urine flows from the kidneys down the ureters to the **urinary bladder**

Then out the body through a small tube called the **urethra**.

Urine formation takes place in 2 stages. First, both wasted and needed materials such as glucose are **filtered** from the blood. Second, much of the needed material is **returned** to the blood.

### **Urine can be used to help analyze some diseases.**

Glucose in urine can be an indicator of **diabetes**.

**Protein** in urine can be a sign of a kidney problem.

The kidneys also keep maintain homeostasis by regulating the amount of **water** in your body. The exact amount of water that is **reabsorbed** depends on the conditions both outside and within the body.

Everyday, you need at least     **1 liter**     of water per day. This can be obtained from drinking or **eating foods** such as apples.

### **Other Organs of Excretion**

Besides the kidneys, other organs of excretion include **lungs skin** and **liver**..

When you breathe out **carbon dioxide** and some other water are removed from the body.

Sweat glands also function in excretion, because water and some chemical waste are excreted in **perspiration**.

Some waste needs to be broken down before being excreted, the **liver** performs this function. The liver also converts parts of hemoglobin into **bile**, which is then used for fat digestion. Therefore you can think of the liver as a **\_recycling** factory.

### **Draw and Label the parts of the Air Pathway and Kidney**