

# Chapter 4 Respiration & Excretion

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## Section 1 The Respiratory System

# Respiratory System Functions

The respiratory system moves oxygen from the outside environment into the body.

It also removes carbon dioxide and water from the body.

# Respiratory System Functions

## Taking in Oxygen

Oxygen is taken in so respiration, can occur and make energy. Production of ATP that your body needs to survive.

As a result of respiration, your cells release the energy that fuels growth and other cell processes.

# Respiratory System Functions

## Removing Carbon Dioxide and Water

By producing energy (atp), waste materials are also produced.

Carbon Dioxide and Water are the wastes produced. Which are also removed by the respiratory system.

# Respiratory System Functions

## Systems Working Together

**Respiratory System:** Brings in Oxygen for Production of energy (atp)

**Digestion System:** Brings in sugar, for the production of energy (atp)

**Circulatory System:** Brings “stuff” all to the cells.

# The Path of Air

Nose

Pharynx

Trachea

Bronchi

Bronchus

Alveoli

# The Path of Air

**Nose:**

**Two Important Jobs:**

Produce mucus

Warms air

**Cilia:** tiny hairlike extensions

**Sneezing:** powerful burst of air used to clean out passageways in nose.

# The Path of Air

## Pharynx:

Fancy name for throat, shared with digestive system. Both nose and mouth connect to pharynx.

# The Path of Air

Trachea:

Fancy word for windpipe.

Tube with ridges, lined with cilia and mucus.

When it is irritated you cough.

Epiglottis is located here.

# The Path of Air

## Bronchi & Lungs:

Passageway that directs air into the lungs, attaches to the alveoli.

Alveoli: “grapes” tiny sacs of lung tissue specialized for the movement to gases between Air and blood. Use of capillaries to exchange gas.

# Gas Exchange

After air enters an alveolus, oxygen passes through the wall of the alveolus and then through the capillary wall in to the blood. Carbon dioxide and water pass from the blood into the alveoli. This whole process is known as gas exchange.

# Gas Exchange

## How Gas Exchange Occurs

Oxygen attaches to the hemoglobin in your red blood cells, and carbon dioxide gets dropped off.

# Gas Exchange

## Surface Area for Gas Exchange

An adult lung contains about 300 million alveoli, or gas exchanging sacs.

Surface area of about 70 square meters.

# How You Breathe

## Muscles for Breathing

**Diaphragm:** Large, dome-shaped muscle at the base of the lungs.

# How You Breath

## The Process of Breathing:

When you breath, the actions of your rib muscles and diaphragm expand or contract your chest. As a result, air flows in or out.

# How You Breathe

## Relating Breathing and Speaking

**Larynx:** the “voice box” located in the top part of the trachea, underneath the epiglottis.

**Vocal Cords:** Folds of connective tissue that produce your voice, stretch across the opening of the larynx.

# Chapter 4 Respiration & Excretion

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## Section 3 The Excretory System

# The Excretory System

The structures of the excretory system that eliminate urea, water, and other wastes include the kidney, ureters, urinary bladder, and urethra.

# The Excretory System

Urea: Chemical that comes from the breakdown of proteins.

Kidneys: major organs of the excretory system, they remove urea and other wastes from the blood.

# The Excretory System

Urine: Watery fluid that contains urea and other wastes.

Ureters: tubes that run from kidneys to urinary bladder.

Urinary Bladder: saclike muscular organ that stores urine.

# The Excretory System

Urethra: Small tube which urine leaves the body.

# Filtration of Wastes

The nephrons filter wastes in stages.

First: both wastes and needed materials, are filtered out of the blood.

Second: Needed materials are returned to the blood, and the wastes are eliminated from the body.

# Filtration of Wastes

## Filtering Out Wastes

First Step in removing waste

Blood enters kidney

Capillaries remove urea, glucose, and some water.

# Filtration of Wastes

## Formation of Urine

Water, glucose, and small amounts of other substances return to blood. Leaving behind urine.

# Filtration of Wastes

## Analyzing Urine for Signs of Disease

Glucose & Protein: If found in Urine can be a sign of diabetes.

# Excretion and Homeostasis

Excretion maintains homeostasis by keeping the body's internal environment stable and free of harmful levels of chemical. IN addition to the kidneys, organs of excretion that maintain homeostasis include the lungs, skin, and liver.

# Excretion and Homeostasis

## Kindney

Filter blood, regulating water, forming urine.

# Excretion and Homeostasis

## Lungs and Skin

Breathing, along with sweating are the other ways to also remove liquid.

# Excretion and Homeostasis

## Liver Functions:

Breaking down large waste products

Converting hemoglobin from old red blood cells into bile.