Interactive Classroom

Graw Glencoe

 $\mathbb{D}(0)(0)2$

Click the advance arrow or press the space bar to continue

Glencoe Science

Copyright © by The McGraw-Hill Companies, Inc

Section 1: Circulatory System

Section 2: <u>Respiratory System</u>

Section 3: Excretory System

EXIT

34.1 Circulatory System

Functions of the Circulatory System

- Transports oxygen and nutrients
- Carries disease-fighting materials produced by the immune system
- Contains cell fragments and proteins for blood clotting
- Distributes heat throughout the body to help regulate body temperature



- 34.1 Circulatory System
 - **Blood Vessels**
 - Arteries
 - Capillaries
 - Veins







34.1 Circulatory System

Arteries

- Oxygen-rich blood is carried away from the heart.
- Arteries are composed of three layers:
 - Outer layer of connective tissue
 - Middle layer of smooth muscle
 - Inner layer of endothelial tissue



34.1 Circulatory System

Capillaries

- Microscopic blood vessels where the exchange of important substances and wastes occur
- The walls are only one cell thick.



34.1 Circulatory System



- Carry oxygen-poor blood back to the heart
- Contraction of skeletal muscles helps keep the blood moving.



34.1 Circulatory System

The Heart 🕥

- A hollow, muscular organ that pumps blood throughout the body
- Pumps oxygenated blood to the body
- Pumps deoxygenated blood to the lungs



- 34.1 Circulatory System
 - Structure of the Heart
 - Divided into four compartments called chambers
 - The right atrium and the left atrium receive blood returning to the heart.
 - The right and left ventricles pump blood away from the heart.



34.1 Circulatory System

A strong muscular wall separates the left side of the heart from the right side of the heart.

 Valves separate the atria from the ventricles and keep blood flowing in one direction.



34.1 Circulatory System



- 34.1 Circulatory System
 - How the Heart Beats
 - The atria fill with blood.
 - The atria contract, filling the ventricles with blood.
 - The sinoatrial (SA) node sends out signals that cause both atria to contract.
 - The signal travels to another area in the heart called the atrioventricular node, causing both ventricles to contract.



34.1 Circulatory System

Pulse

 The alternating expansion and relaxation of the artery wall caused by contraction of the left ventricle

Blood Pressure

A measure of how much pressure is exerted against the vessel walls by the blood



34.1 Circulatory System

- Deoxygenated blood flows from the right atrium into the right ventricle and is pumped into the pulmonary arteries that lead to the lungs.
- Oxygenated blood flows from the lungs to the left atrium of the heart.

Home

Resources







Circulatory System



34.1 Circulatory System

The blood moves from the left atrium into the left ventricle, which pumps the blood into the largest artery in the body, the aorta.

Oxygen is released from the blood into the body cells by diffusion, and carbon dioxide moves from the cells to the blood by diffusion.



34.1 Circulatory System

Plasma 🕚

 Carries glucose, fats, vitamins, minerals, hormones, and waste products from the cells



34.1 Circulatory System

Red Blood Cells 🕥

- Carry oxygen to all of the body's cells
- Consist of an iron-containing protein called hemoglobin
- Hemoglobin chemically binds with oxygen molecules and carries oxygen to the body's cells.



34.1 Circulatory System

Platelets

- Collect and stick to the vessel at the site of the wound
- Release chemicals that produce a protein called fibrin
- Fibrin is a protein that weaves a network of fibers across the cut that traps blood platelets and red blood cells.



- 34.1 Circulatory System
 - White Blood Cells
 - Recognize disease-causing organisms
 - Produce chemicals to fight the invaders
 - Surround and kill the invaders



34.1 Circulatory System

Blood Types

There are four types of blood—A, B, AB, and O.
Rh Factor

Another marker found on the surface of red blood cells

	Blood Groups			
Blood type	А	В	AB	0
Marker molecule and antibody	Marker molecule: A Antibody: anti-B	Marker molecules: B Antibody: anti-A	Marker molecules: AB Antibody: none	Marker molecules: none Antibodies: anti-A, anti-B
Example	A A A A A A A A A A A A A A A A A A A	B B B B	B A B A B A B A B A B A B A B A B A B A	
Can donate blood to:	A or AB	B or AB	AB	A, B, AB, or O
Can receive blood from:	A or O	B or O	A, B, AB, or O	ο



COncepts In MOtion



Breathing and Respiration

- The respiratory system sustains cellular respiration by supplying oxygen to body cells and removing carbon dioxide waste from cells.
- Breathing is the mechanical movement of air into and out of your lungs.
- External respiration is the exchange of gases between the atmosphere and the blood.
- Internal respiration is the exchange of gases between the blood and the body's cells.

Home

Resources

34.2 Respiratory System



The Path of Air

 The respiratory system is made up of the nasal passages, pharynx, larynx, epiglottis, trachea, lungs, bronchi, bronchioles, alveoli (al VEE uh li), and the diaphragm.



- Air enters your mouth or nose.
- Hairlike structures called cilia trap foreign particles from the air and sweep them toward the throat.
- Filtered air then passes through the upper throat called the pharynx.



- The epiglottis allows air to pass from the larynx to a long tube in the chest cavity called the trachea.
- The trachea branches into two large tubes, called bronchi, which lead to the lungs.



- Each bronchus branches into smaller tubes called bronchioles.
- Each of these small tubes continues to branch into even smaller passageways, which end in individual air sacs called alveoli.



Home Resources 🗲 🔶

34.2 Respiratory System

Breathing

- Inhalation is the act of taking air into the lungs.
- The diaphragm contracts, causing the chest cavity to expand as the diaphragm moves down.



34.2 Respiratory System

- During exhalation, the diaphragm relaxes and returns to its normal resting position.
- This reduces the size of the chest cavity as the diaphragm moves up.





Common Respiratory Disorders			
Lung Disorder	Brief Description		
Asthma	Respiratory pathways become irritated and bronchioles constrict.		
Bronchitis	Respiratory pathways become infected, resulting in coughing and production of mucus.		
Emphysema	Alveoli break down, resulting in reduced surface area needed for gas exchange with alveoli's blood capillaries.		
Pneumonia	Infection of the lungs that causes alveoli to collect mucus material		
Pulmonary tuberculosis	A specific bacterium infects the lungs, resulting in less elasticity of the blood capillaries surrounding alveoli, thus decreasing effective gas exchange between the air and blood.		
Lung cancer	Uncontrolled cell growth in lung tissue can lead to a persistent cough, shortness of breath, bronchitis, or pneumonia, and can lead to death.		



COncepts In MOtion

Table 34.2	Common Respiratory Disorders		
Lung Disorder	Brief Description		
	Respiratory pathways become irritated and bronchioles constrict.		
	Respiratory pathways become infected, resulting in coughing and production of mucus.		
	Alveoli break down, resulting in reduced surface area needed for gas exchange with alveoli's blood capillaries.		
	Infection of the lungs that causes alveoli to collect mucus material		
	A specific bacterium infects the lungs, resulting in less elasticity of the blood capillaries surrounding alveoli, thus decreasing effective gas exchange between the air and blood.		
	Uncontrolled cell growth in lung tissue can lead to a persistent cough, shortness of breath, bronchitis, or pneumonia, and can lead to death.		
Lung cancer	Bronchitis		
Pneumonia	Pulmonary tuberculosis		
Emphysema	Asthma		
Drag each option to its corresponding	description 🥏 Reset Submit Show me		
	Home Becourees		

34.3 Excretory System

- Functions of the Excretory System
- The excretory system removes toxins and wastes from the body.
- Regulates the amount of fluid and salts in the body
- Maintains the pH of the blood



34.3 Excretory System

- Parts of the Excretory System
- The components that make up the excretory system include the lungs, skin, and kidneys.





34.3 Excretory System

The Kidneys 🕥

- Bean shaped organs that filter out wastes, water, and salts from the blood
- Renal cortex
- Renal medulla
- Renal pelvis





34.3 Excretory System

Nephron Filtration

- Each kidney contains approximately one million filtering units called nephrons.
- The renal artery transports nutrients and wastes to the kidney.






34.3 Excretory System

Reabsorption and the Formation of Urine

- The filtrate flows through the loop of Henle and the collecting tubule.
- Glucose and minerals are reabsorbed back into the capillaries surrounding the renal tubule.
- Urine, which is excess fluids and wastes, leaves the kidneys through ducts called the ureters.
- Urine is stored in the urinary bladder and exits the body through the urethra.



34.3 Excretory System

Kidney Disorders

Common Excretory Disorders	
Excretory Disorder	Brief Description
Nephritis	Inflammation of the glomeruli can lead to inflammation of the entire kidneys. This disorder can lead to kidney failure if left untreated.
Kidney stones	Hard deposits form in the kidney that might pass out of the body in urine. Larger kidney stones can block urine flow or irritate the lining of the urinary tract, leading to possible infection.
Urinary tract blockage	Malformations present at birth can lead to blockage of the normal flow of urine. If untreated, this blockage can lead to permanent damage of the kidneys.
Polycystic (pah lee SIHS tihk) kidney disease	This is a genetic disorder distinguished by the growth of many fluid-filled cysts in the kidneys. This disorder can reduce kidney function and lead to kidney failure.
Kidney cancer	Uncontrolled cell growth often begins in the cells that line the tubules within the kidneys. This can lead to blood in the urine, a mass in the kidneys, or affect other organs due to the cancer spreading, which can lead to death.



COncepts In MOtion



Drag each Excretory Disorder label to its corresponding description 🥏

Home Resources 🗲 🛁

Chapter Resource Menu



Chapter Diagnostic Questions



Formative Test Questions

CheckPoint

Chapter Assessment Questions

CheckPoint

Biology nline bio

Standardized Test Practice

biologygmh.com

Glencoe Biology Transparencies





Vocabulary

Image Bank



Animation

Click on a hyperlink to view the corresponding lesson.



Chapter Diagnostic Questions



Identify the structures that carry blood away from the heart.

A. valves
B. veins
C. arteries
D. capillaries



Chapter Diagnostic Questions





Only veins have valves to prevent backward flow of blood.



Chapter Diagnostic Questions



Name the blood component that is helpful in clotting.

A. platelets
 B. plasma
 C. red blood cells

D. white blood cells





34.1 Formative Questions



Which blood vessels have valves that prevent blood from flowing backward?

A. arteries
B. arterioles
C. veins
D. venules



34.1 Formative Questions



Which node is the pacemaker for the heart?





34.1 Formative Questions



Which blood component carries most of the carbon dioxide produced in the body's cells?

A. hemoglobin
B. plasma
C. platelets
D. red blood cells



34.2 Formative Questions



Which is *not* one of the defenses against foreign materials entering the lungs?

A. cilia B. mucous C. nose hairs D. trachea



34.2 Formative Questions



How is oxygen and carbon dioxide transported into and out of cells?

A. by diffusion
B. by osmosis
C. by active transport
D. by membrane pumps



34.2 Formative Questions



What causes inhalation of air to the lungs?



A. Rib and diaphragm muscles contract. B. Rib and diaphragm muscles relax.



34.2 Formative Questions



What internal stimulus causes breathing rate to increase?

A. a high concentration of O₂ in the blood
B. a high concentration of CO₂ in the blood
C. a low concentration of O₂ in the blood
D. a low concentration of CO₂ in the blood



34.2 Formative Questions



Which is an example of internal respiration?

- A. Air in the lung moves into and out of alveoli.
- B. Carbon dioxide is carried from body tissues to the lungs.

C. Oxygen in alveoli diffuses into red blood cells.
 D. Oxygen in red blood cells diffuses into tissue cells.



34.3 Formative Questions



What is the role of the skin in the excretory system?

A. It controls levels of CO₂ and other gases.
B. It excretes water and salts.
C. It regulates the pH of the blood.
D. It removes minerals and urea.



34.3 Formative Questions



How do the kidneys help maintain pH homeostasis in the body?

- A. by adjusting the balance of electrolytes in urine
- B. by excreting hydrogen ions and reabsorbing buffers
- C. by increasing or decreasing the reabsorption of water
- D. by regulating the level of carbon dioxide in the blood



34.3 Formative Questions



What condition results from crystallization of mineral compounds in the kidney?

A. Bowman's disorder
B. kidney stones
C. nephritis
D. polycystic disease



34.3 Formative Questions



What is the immediate result of kidney failure?

A. Fluid-filled cysts grow in the kidney.
B. The body rejects the kidney.
C. The urinary tract becomes blocked.
D. Waste products build up in the blood.



Chapter Assessment Questions



Sequence the flow of blood through the heart beginning with the right atrium.

Answer: Deoxygenated blood flows from the right atrium to the right ventricle, and then to the lungs and back to the left atrium and into the left ventricle which pumps oxygen-rich blood to the body and returns to the right atrium.



Chapter Assessment Questions



Which is not true of red blood cells?

A. live for about 120 days
B. fight disease
C. develop in the marrow
D. have no nuclei



Chapter Assessment Questions



What structure contracts during inhalation?

A. bronchi B. diaphragm C. ribs D. pharynx





Standardized Test Practice



Which heart chamber is responsible for the pulse you can feel in your wrist?

A. left atrium
B. left ventricle
C. right atrium
D. right ventricle





Standardized Test Practice

Which two blood vessels are veins? (Two answers)







Standardized Test Practice

Which two blood vessels carry oxygenated blood? (Two answers)





Standardized Test Practice



Why should a girl with type A blood *not* receive a transfusion of type AB blood?

A. She has A markers on her blood cells.

- B. She has A and B markers on her blood cells.
- C. She has Anti-A antibodies in her blood plasma.
- D. She has Anti-B antibodies in her blood plasma.



Circulatory, Respiratory, and Excretory Systems Chapter 34



Where is urea filtered out of the blood?

Practice



Standardized Test Practice



What is the function of the convoluted tubule and the Loop of Henle?

A. accumulate urea and toxins
B. filter out sugars and proteins
C. reabsorb water and glucoset
D. store salts and minerals



Glencoe Biology Transparencies







Vocabulary

Section 1

- artery
- capillary
- 🕑 vein
-) valve
-) heart
-) pacemaker
-) plasma

- red blood cell
- e) platelet
- white blood cell
- atherosclerosis

Home Resources

Vocabulary

Section 2

- Streathing
 - external respiration
 - internal respiration
- 🕑 trachea
- bronchus
- 🖲 lung
- alveolus



Vocabulary

Section 3







Animation



- Arteries, Capillaries, and Veins
- Circulatory System
- Visualizing Gas Exchange
- Kidney Filtration

