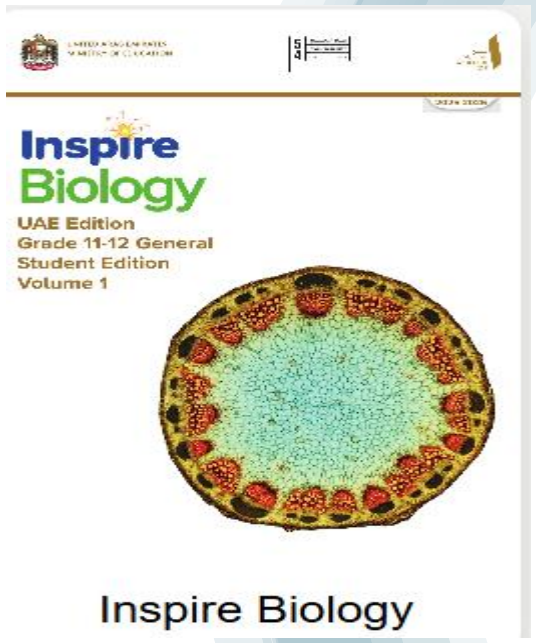
حل مراجعة نهائية وفق الهيكل الوزاري منهج انسباير

التواصل الاجتماعي بحسب الصف الحادي عشر العام					
صفحة المناهج الإماراتية على فيسبوك					
المواد على تلغرام	التربية الاسلامية	اللغة العربية	اللغة الانجليزية	الرياضيات	

المزيد من الملفات بحسب الصف الحادي عشر العام والمادة علوم في الفصل الأول	
حل مراجعة شاملة الجهاز الدوري والتنفسي	1
أوراق عمل الجهاز الدوري بدون الحل	2
حل أوراق عمل الجهاز التنفسي اختيار من متعدد	3
حل مراجعة نهائية استعداداً للاختبار النهائي منهج بريدج	4
نموذج اختبار تجريبي وفق الهيكل الوزاري الجديد منهج بريدج	5



Revision from the EoT coverage

11General. Inspire Biology

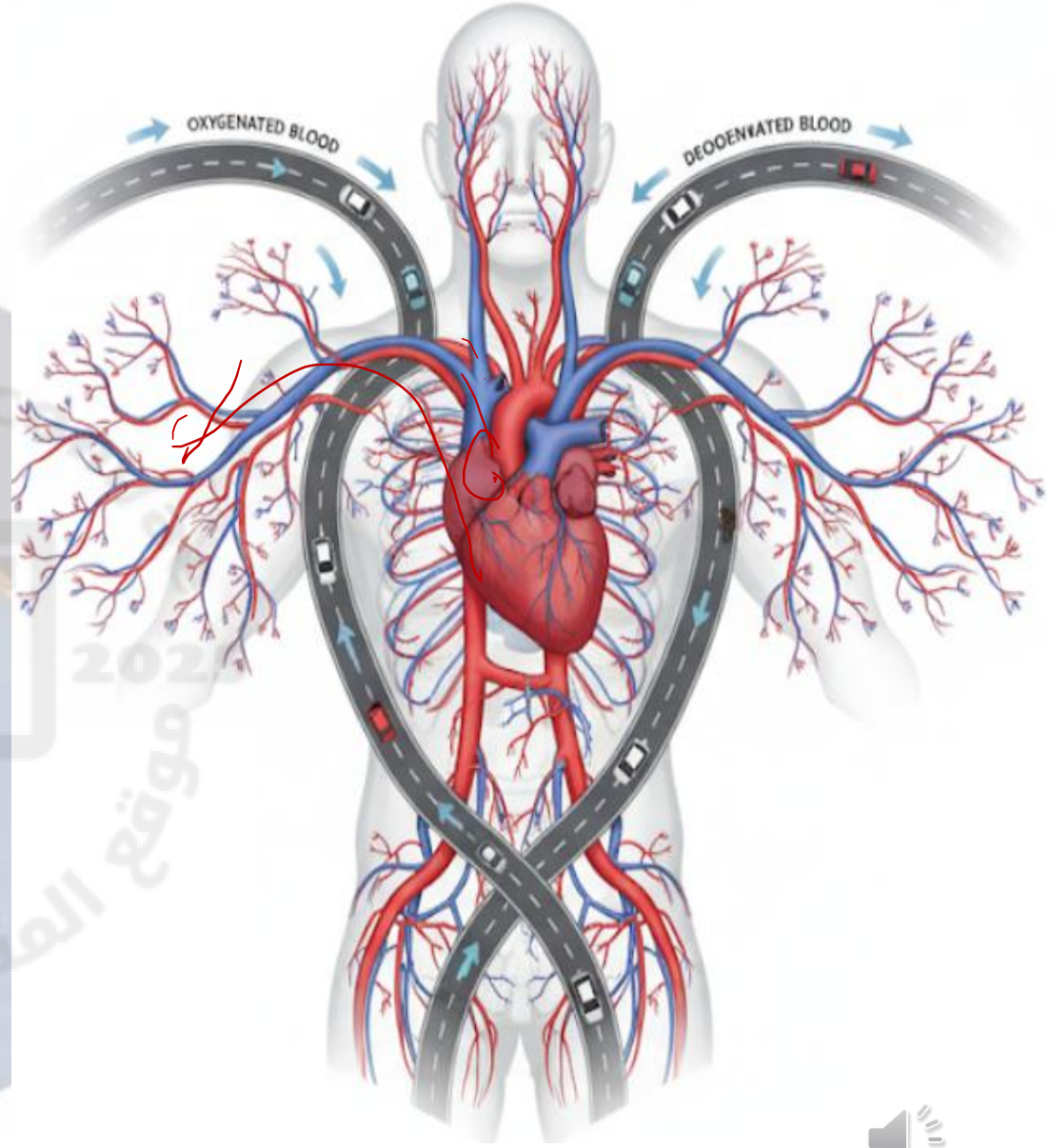
Stay strong for the moment you dream about every day.

2025-2026

Term1

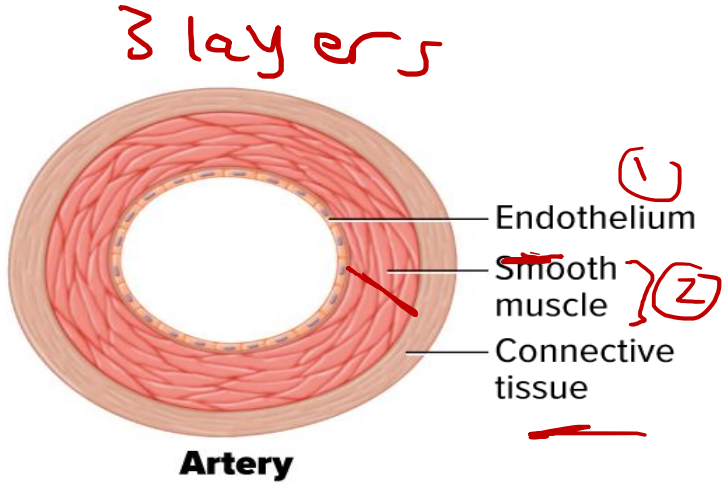
Blood Vessels

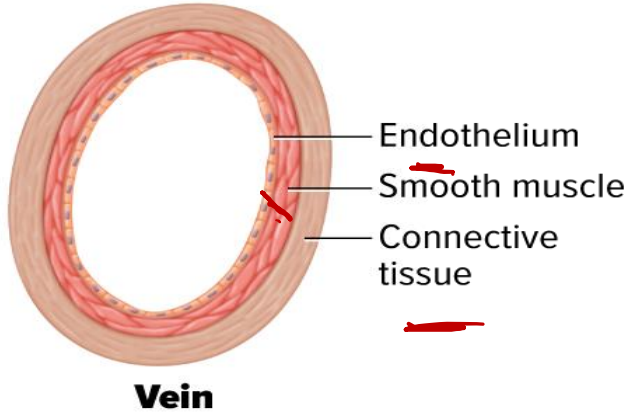
Highways have lanes that separate traffic. They also have access ramps that take vehicles to and from roads. Similarly, the body has a network of channels—the blood vessels. Blood vessels circulate blood throughout the body and help keep the blood flowing to and from the heart



Blood Vessels

- Blood vessels circulate blood throughout the body and help keep the blood flowing.
- **The 3 major blood vessels are**:
  - Arteries
  - Capillaries
  - Veins





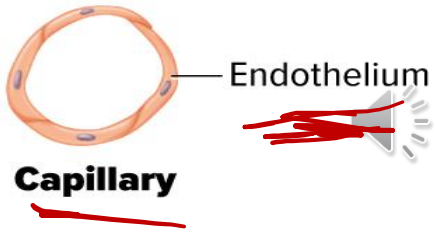


Figure 1 The three major blood vessels in the body are arteries, veins, and capillaries.

Predict *By what process do you think materials cross the walls of capillaries?*

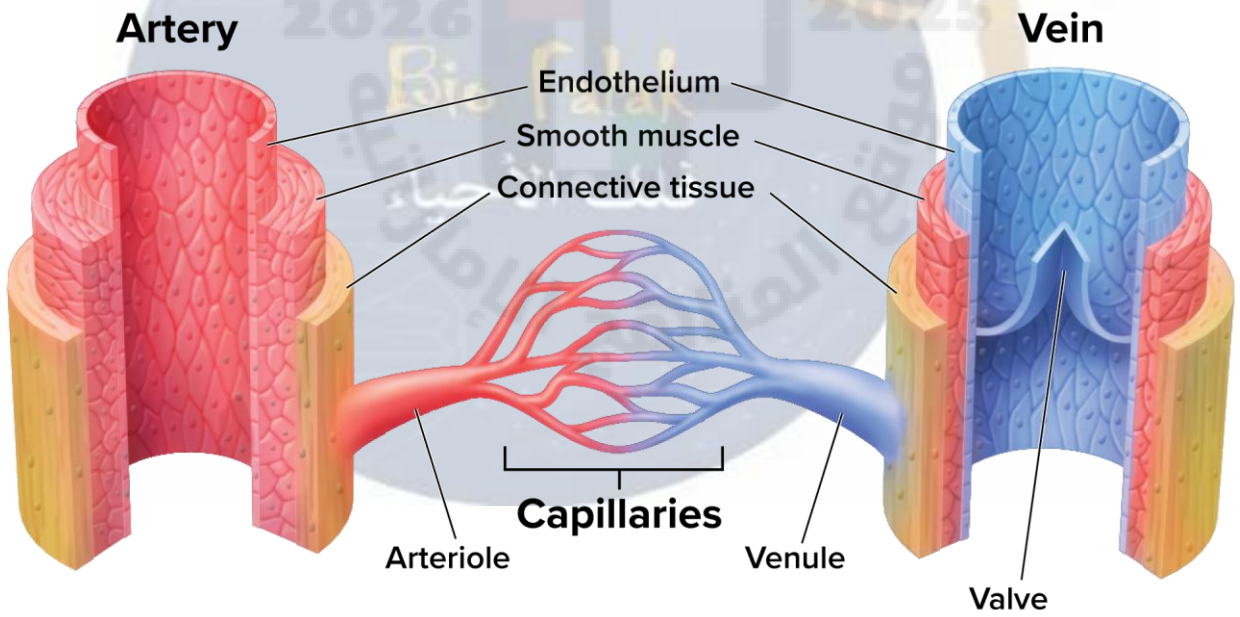
Blood Vessels

Artery → away

Veins → back (into)

Veins

- The largest vessels are **veins**.
- They carry oxygen-poor blood back to the heart.
- Skeletal muscle contraction keeps blood moving.
- **Valves** are tissue flaps that prevent backward flow.



Blood Vessels

Arteries

- Oxygen-rich blood is carried away from the heart in large blood vessels called **arteries**. They have three layers:
  - Outer layer of connective tissue
  - Middle layer of smooth muscle
  - Inner layer of endothelial tissue

Capillaries

- **Capillaries** are microscopic vessels in which exchange of substances and wastes occurs.
- The walls are only one cell thick.

Feature	Arteries	Veins	Capillaries
Function	Carry oxygen-rich blood away from the heart.	Carry oxygen-poor blood back to the heart.	Facilitate the exchange of substances between blood and body cells.
Structure	Strong, thick-walled, and elastic vessels. Composed of three layers, with a thick inner endothelial layer.	Have thinner walls than arteries. Often contain valves to prevent blood from flowing backward.	Microscopic, with walls only one cell thick.
Blood Pressure	Withstand high pressure from the heart's pumping.	Blood pressure is lower than in arteries.	Very low pressure, allowing for diffusion.
Blood Flow	Blood is pumped from the heart at high pressure.	Blood flow is helped by muscle contractions and breathing movements.	Blood cells move through them in a single file.

1- Large blood vessels that carry oxygenated blood away from the heart are: **a-Veins** **b- Artery**

2- Blood vessels that carry deoxygenated blood to the heart are: **a-Veins** **b- Artery**

3- One-cell-thick blood vessels where Exchange of substances and wastes occur its: **a-Veins** **b- Capillary**

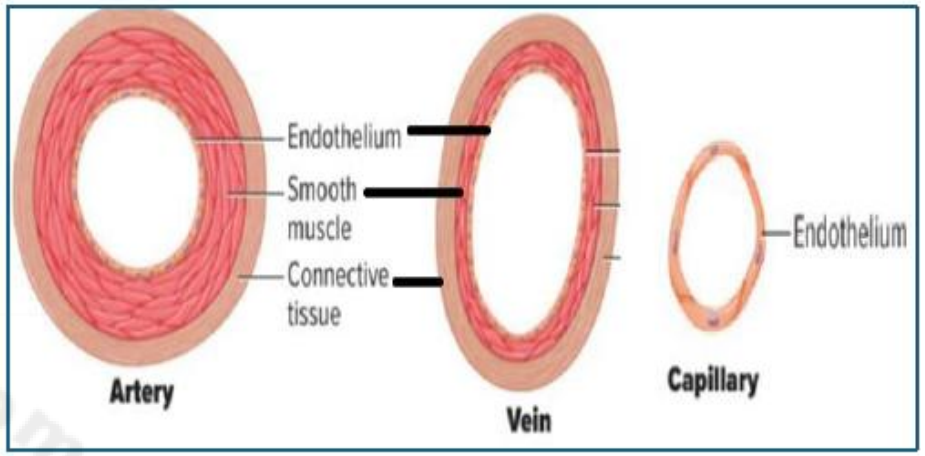


Figure 1 The three major blood vessels in the body are arteries, veins, and capillaries.

Predict *By what process do you think materials cross the walls of capillaries?*

Diffusion

Compare and contrast the structure of arteries and the structure of veins.

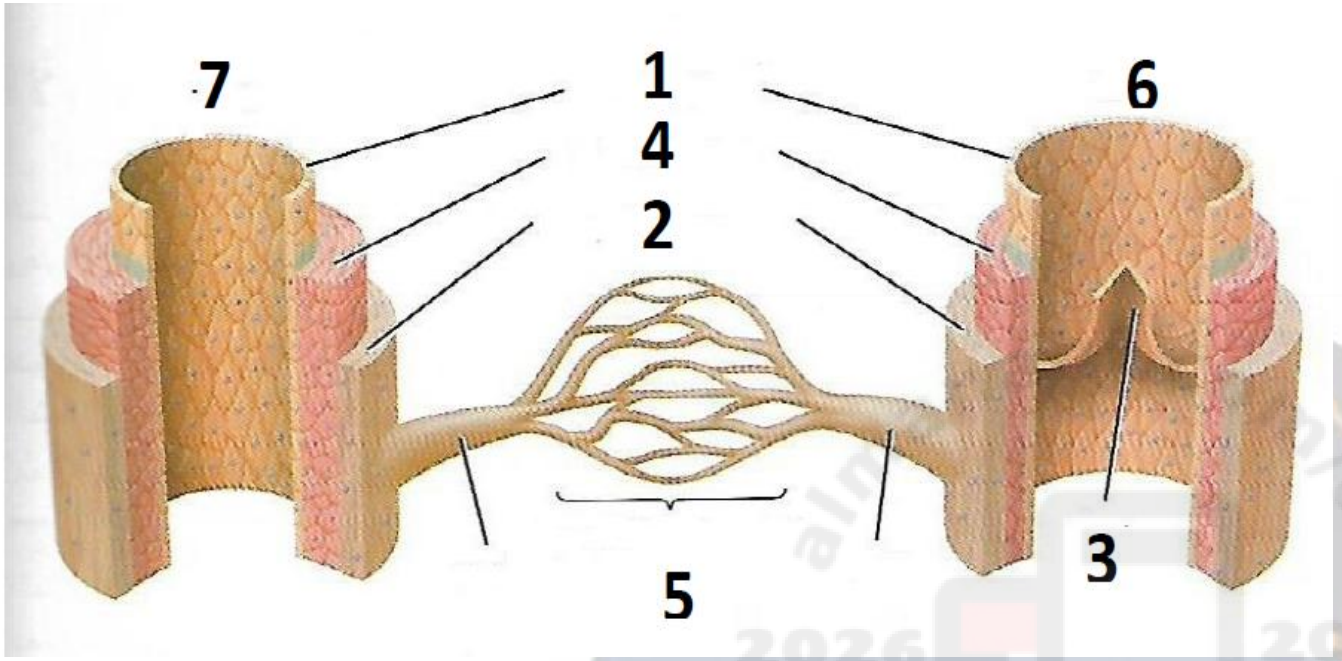
Arteries have a thicker endothelial wall than veins have. Veins have valves and arteries do not.

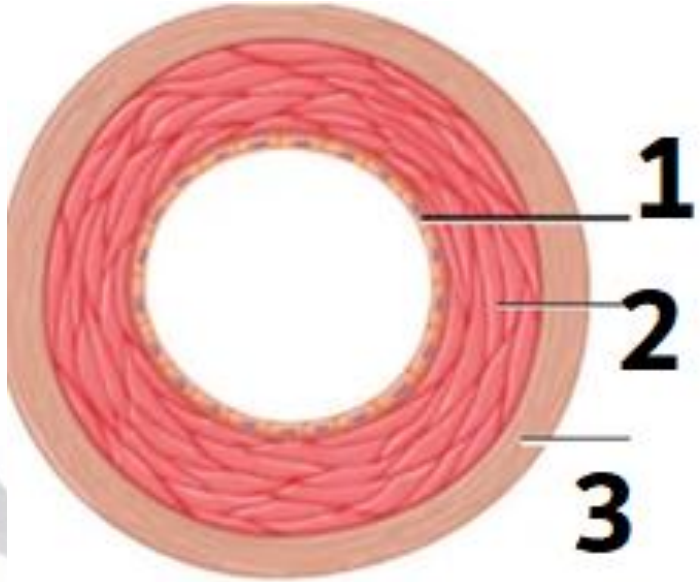
What causes oxygen to diffuse from the lungs into the capillaries?

oxygen concentration is lower in capillaries

Get It? **Describe** the differences in structure among arteries, capillaries, and veins.

Veins are the largest blood vessels, but have thinner endothelia than arteries. The largest veins contain valves to prevent blood from flowing backward. Arteries are large blood vessels with thick endothelia to withstand high blood pressure. Capillaries are microscopic blood vessels with walls that are only one cell thick.





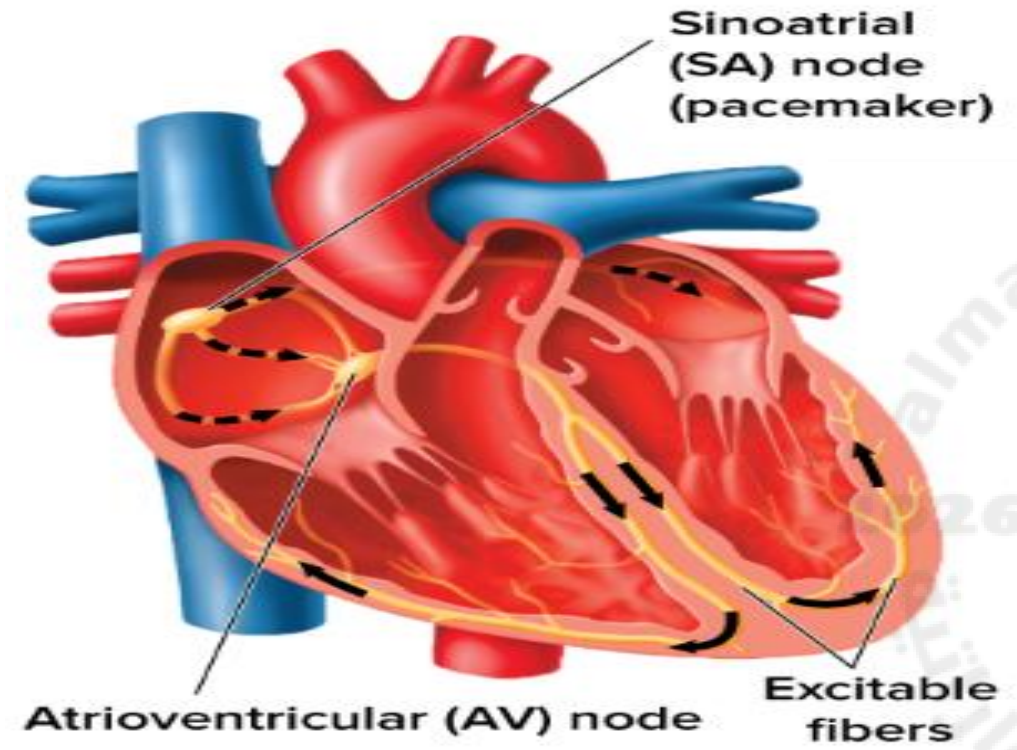
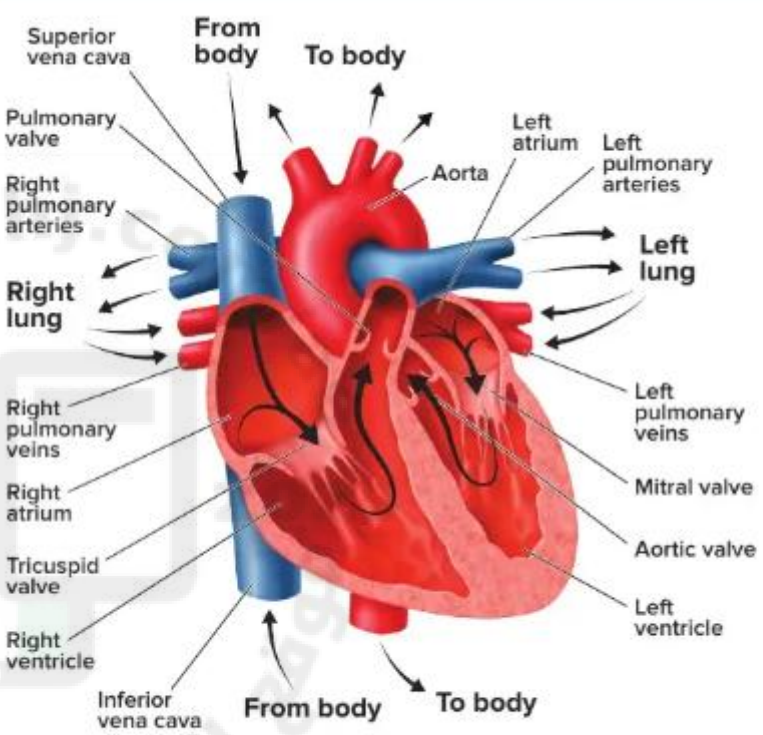


Figure 5 The SA node initiates the contraction of the heart, which spreads through both atria to the AV node. The AV node transmits the signal through excitable fibers that stimulate both ventricles.



Aortic valve in an opened position

Figure 4 The arrows map the path of blood as it circulates through the heart.

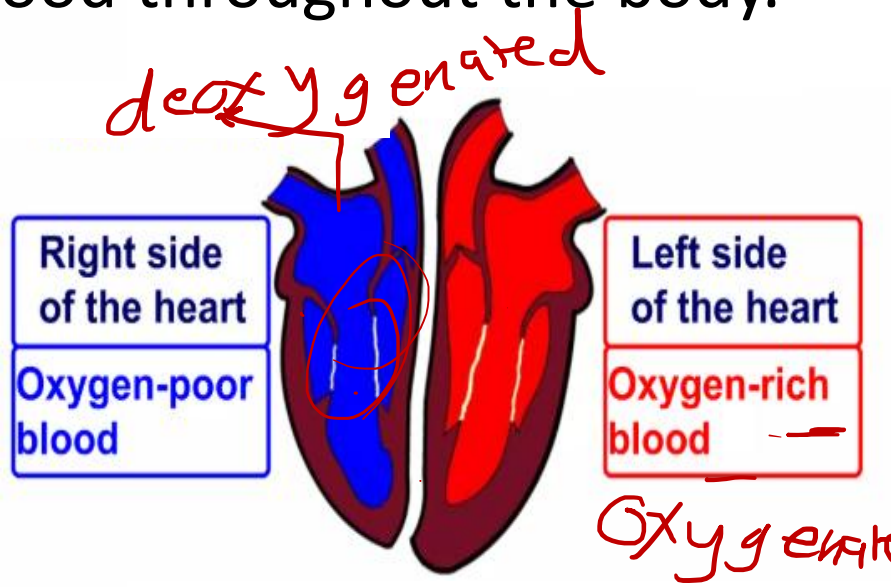
Diagram *the path of blood through the heart.*

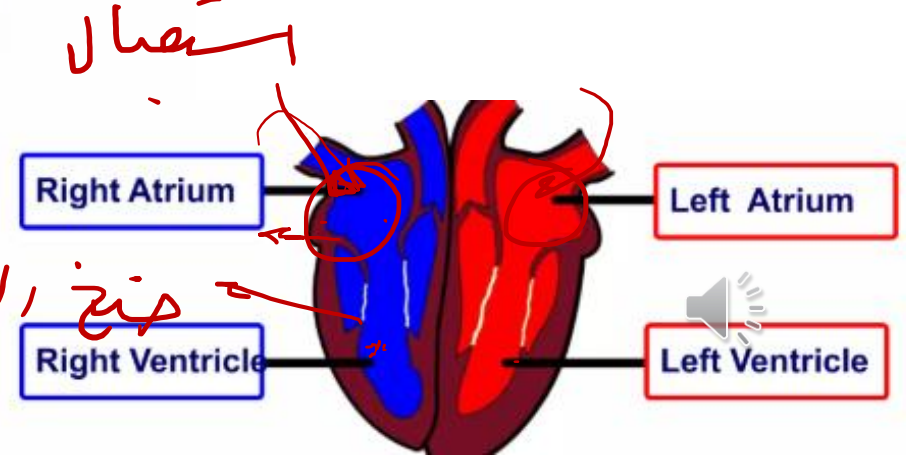
The Heart

- The **heart** is a hollow, muscular organ that pumps blood throughout the body.
  - It pumps oxygenated blood to the body.
  - It pumps deoxygenated blood to the lungs.

Structure of the Heart

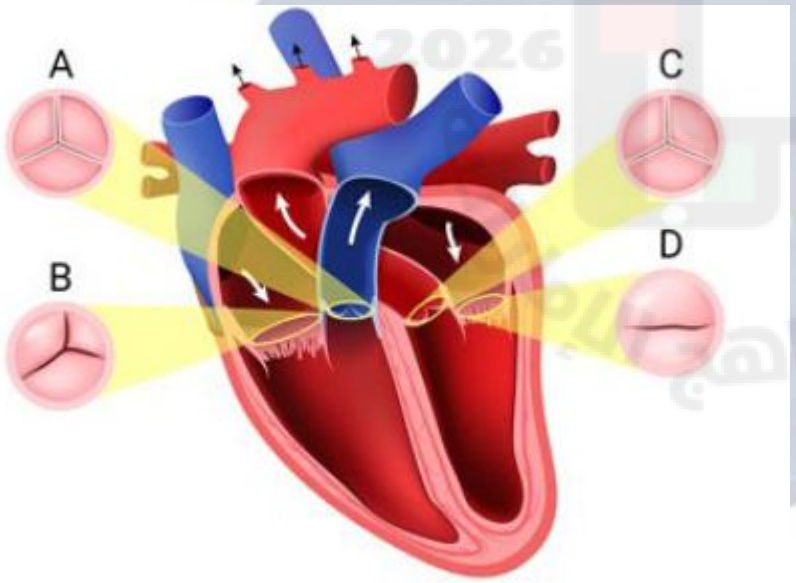
- It is divided into **four sections** called chambers.
- The **right and left atrium receive blood** returning to the heart.
- The **right and left ventricles pump blood away** from the heart.

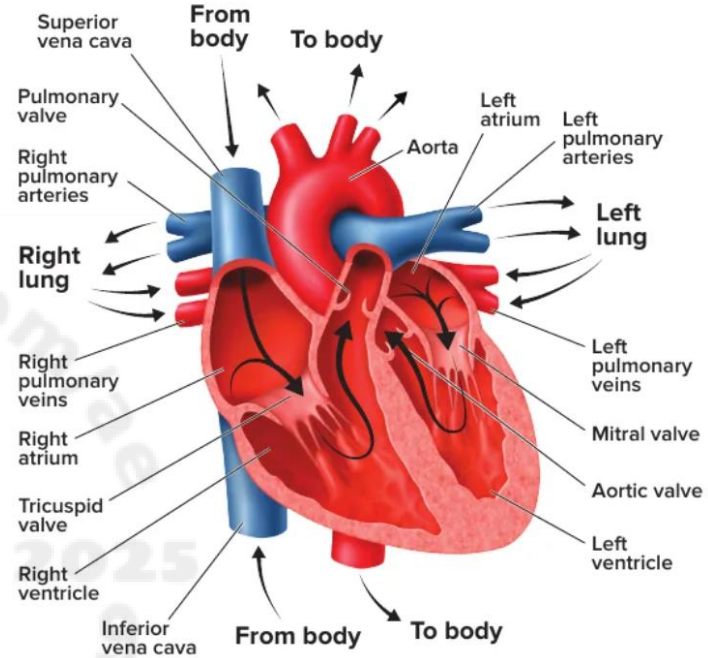




Structure of the Heart

- 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.





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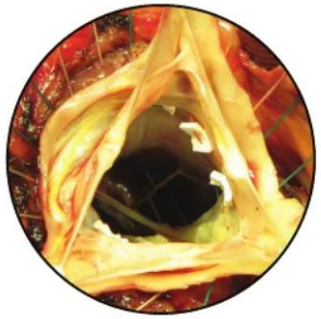
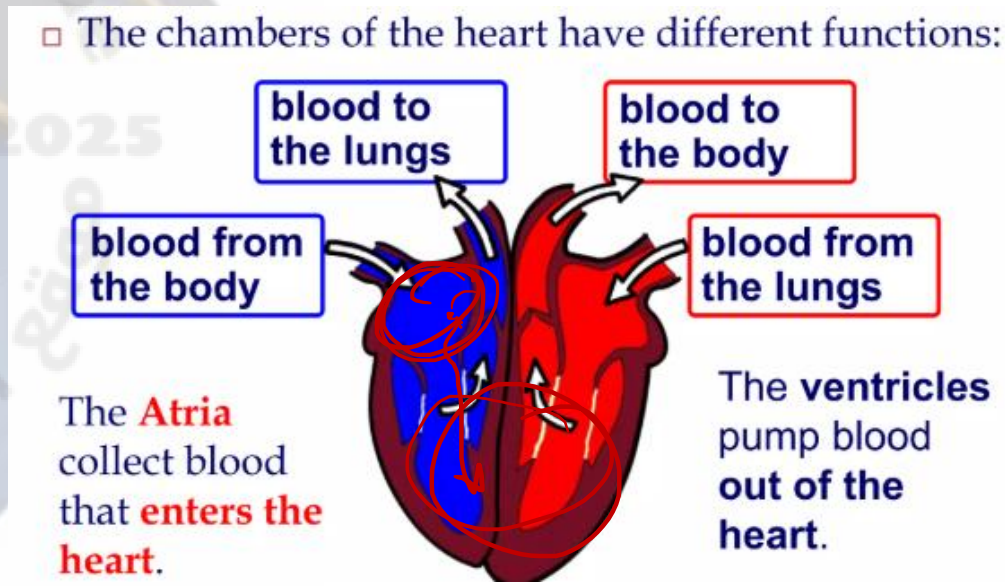


Aortic valve in an opened position

The Heart

How the Heart Beats

- In the first phase, the atria fill with blood. Then the atria contract, filling the ventricles with blood.
- In the second phase, the ventricles contract to pump blood out of the heart.



The Heart

How the Heart Beats

- A group of cells in the right atrium, called the **pacemaker, or 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.

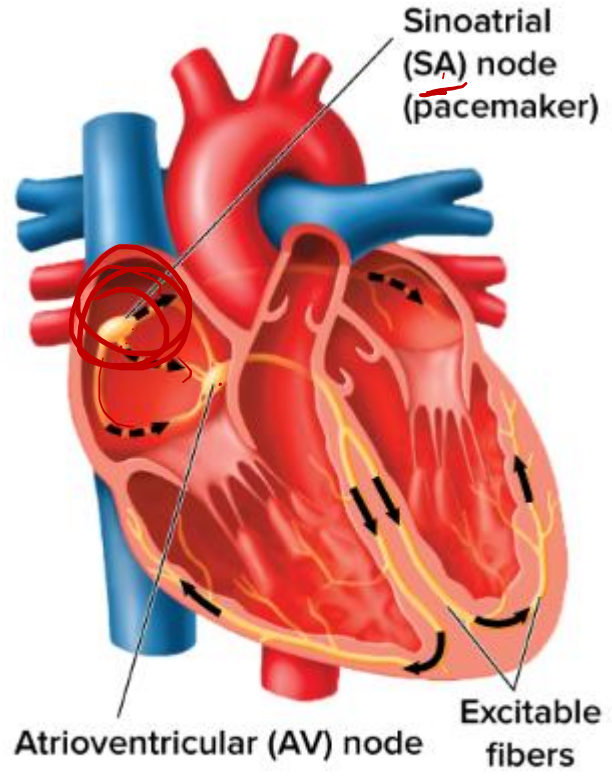


Figure 5 The SA node initiates the contraction of the heart, which spreads through both atria to the AV node. The AV node transmits the signal through excitable fibers that stimulate both ventricles.

When blood is returning from the body to the heart, which chamber of the heart does the blood enter first?

a) Right atrium
b) Right ventricle
c) Left atrium
d) Left ventricle

Cause and Effect If a pacemaker received faulty signals from the brain, what would happen?

The heart might beat irregularly.

When blood leaves the heart, where does it exit?

a) The aorta
b) The capillaries
c) Pulmonary vein
d) Pulmonary artery

Apply Suppose you are running hard as you play soccer. How do you think the SA node will respond to this situation?

increases the heart rate

Which chamber pumps blood into the aorta?

a) Right atrium
b) Right ventricle
c) Left atrium
d) Left ventricle

Identify the heart chambers that push the blood through the body. (Circle your answer.)

a. atria

b. ventricles

Calculate Suppose Cory's blood pressure is 125 at its highest point. To return his blood pressure to normal, Cory must reduce it by what percentage? (Show your work.)

125 –120 = 5; 5/125 = .04 × 100 = 4%

A group of cells called the ___ causes the heart to contract.

pacemaker

Pulse

- The pulse is the alternating expansion and relaxation of the artery wall caused by contraction of the left ventricle.
- The heart pulses about 70 times each minute.

Blood Pressure

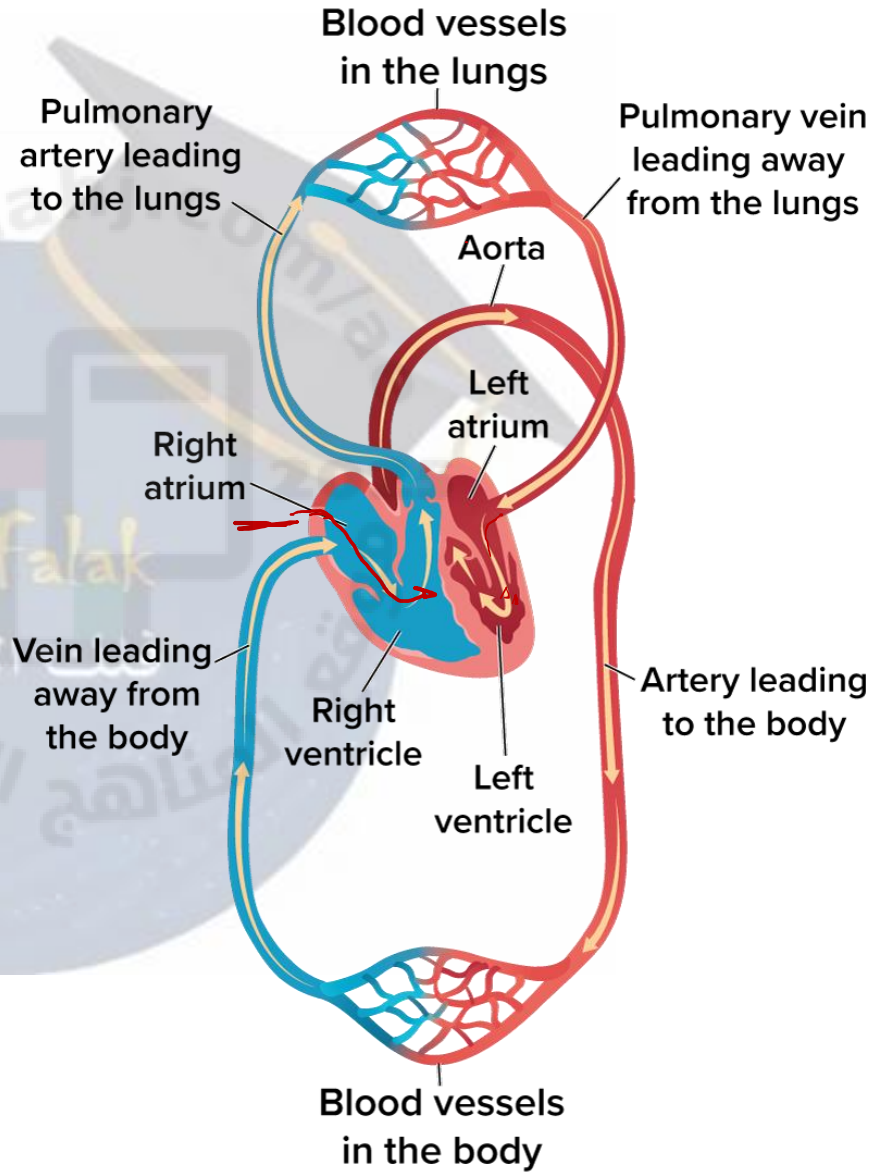
- Blood pressure is a measure of how much pressure is exerted against the vessel walls by the blood.

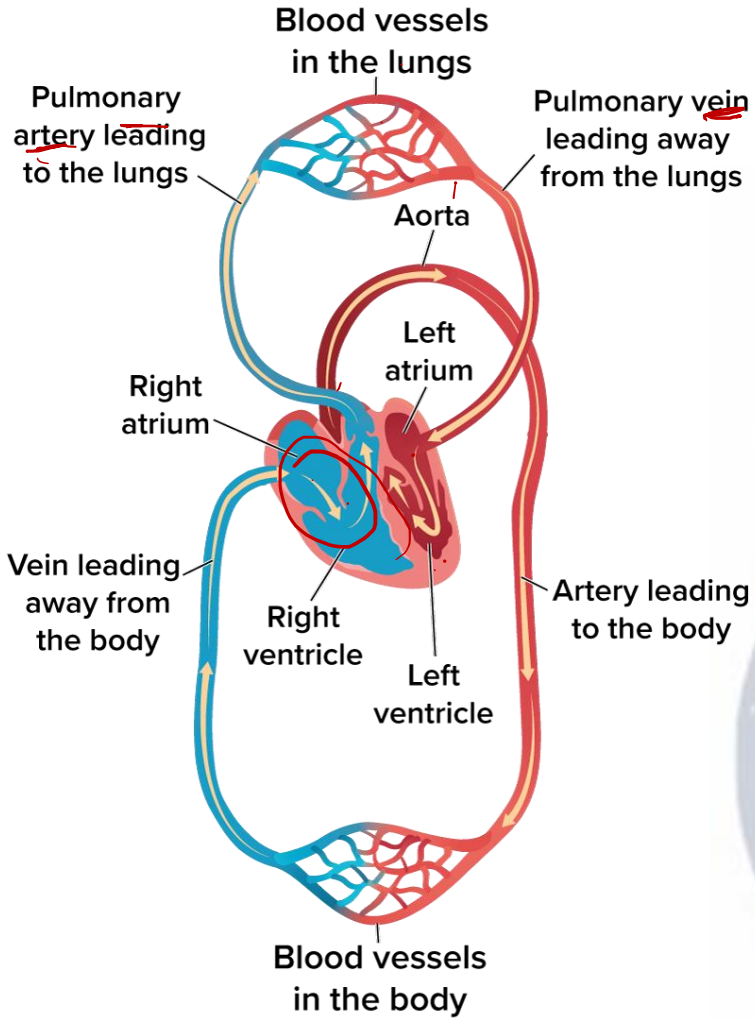
Figure 6 A sphygmomanometer measures the blood pressure in an artery.

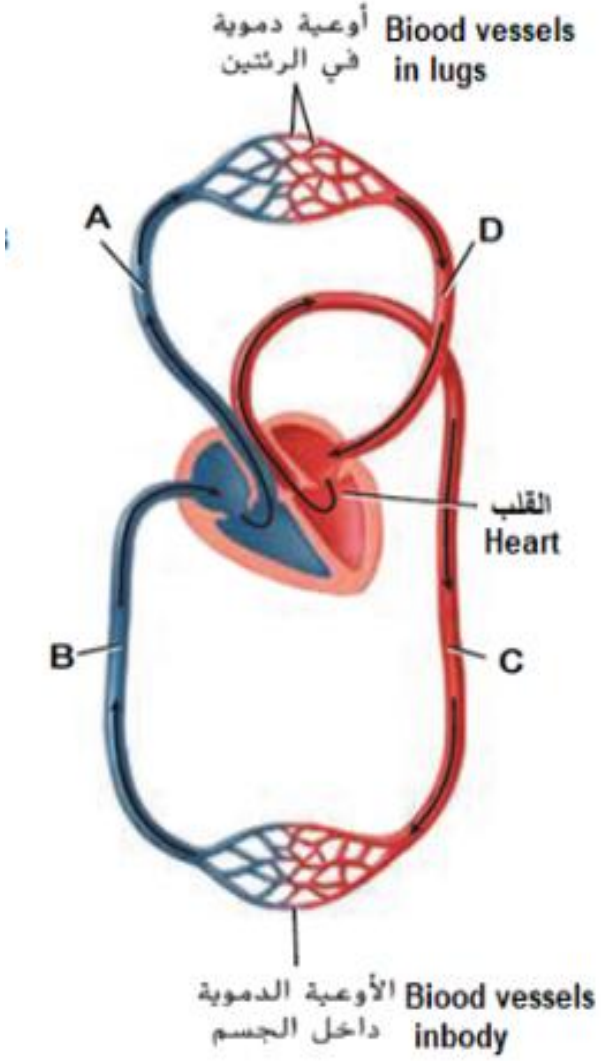
Determine *What is this person's blood pressure? Is it normal? Explain.*

The Heart

Blood flow through the body consists of two different circulatory loops.







Functions of the Circulatory System

- The circulatory system is the body's transport system.
- Blood carries important substances, such as oxygen and nutrients, to all parts of the body.
- It carries waste products, such as carbon dioxide, away from body cells.
- It also carries disease-fighting materials produced by immune system.
- Blood contains cell fragments and proteins for clotting.
- It also distributes heat throughout the body.

Blood Components

Figure 8 Plasma is the clear, yellowish portion of the blood, made up mostly water.

Plasma

- **Plasma** is the clear, yellowish portion of the blood.
- It carries glucose, fats, vitamins, minerals, hormones, and waste products from the cells.

Red Blood Cells

- **Red blood cells** carry oxygen to all body cells.
- They consist of an iron-containing protein called hemoglobin.
- Hemoglobin binds with oxygen molecules and carries oxygen to the body's cells.

Blood Components

White Blood Cells

- The body's disease fighters are **white blood cells**, which are produced in bone marrow.
- Some white blood cells recognize disease-causing organisms.
- Others produce chemicals to fight invaders or to surround and kill the invaders.
- Many white blood cells move from bone marrow to other sites in the body to mature.
- White blood cells have nuclei, and most live for months or years.

SEM Magnification: unavailable

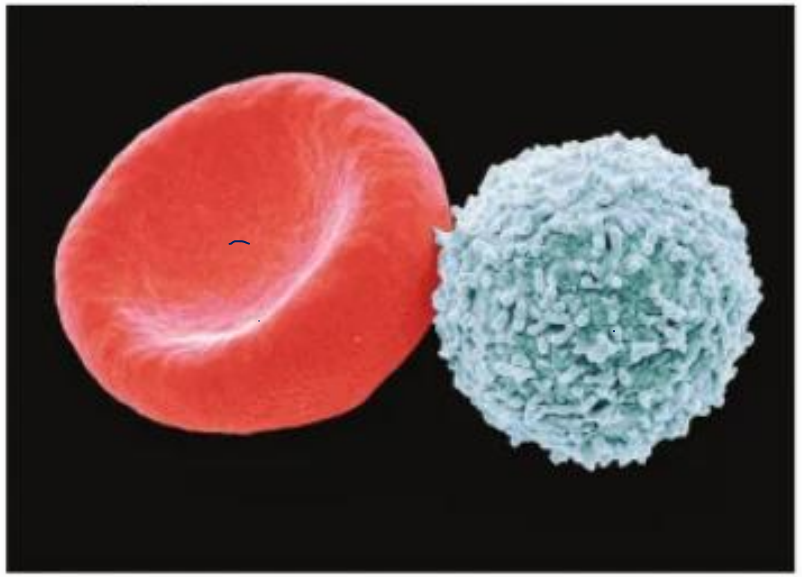


Figure 9 Blood is composed of liquid plasma, red blood cells (dimpled disc on the left), white blood cells (irregularly shaped cell on the right), and platelets (flat fragments, not shown).

Infer *What might be occurring if there are too many white blood cells?*

Blood Components

Platelets

- **Platelets** are cell fragments that are important in forming blood clots.
- They collect and stick to the vessel at the site of a wound.
- Platelets 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.

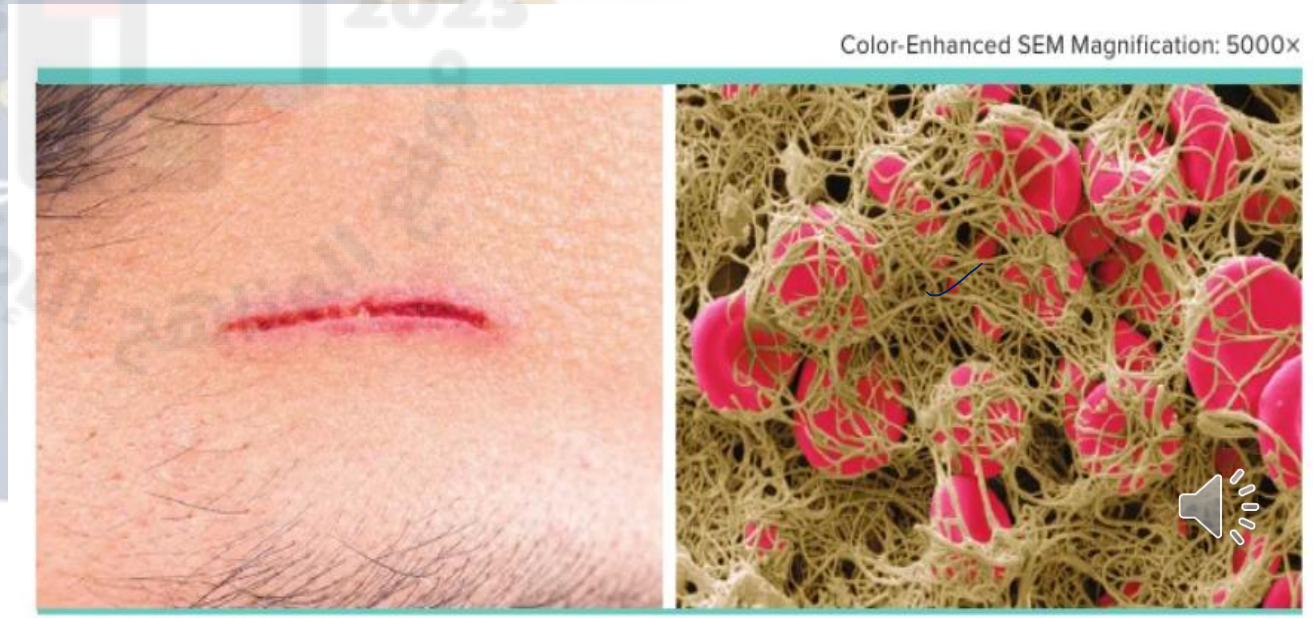


Figure 10 A scab forms as fibrin threads trap blood cells and platelets.

Which blood cells have an iron-containing protein called hemoglobin?

a) Red blood cells
b) Thrombocytes
c) White blood cells
d) Platelets

Which component of the blood fights disease in the body?

a) Red blood cells
b) Thrombocytes
c) White blood cells
d) Platelets

Draw Conclusions Which best describes the role of carbon dioxide in the body? (Circle your answer.)

a. nutrient

b. waste product

Identify the protein produced by the platelets that weaves a network of fibers across the cut that forms a blood clot.

a) Hemoglobin
b) Pectin
c) Fibrin
d) Chlorophyll

Get It? **Explain** the functions of plasma.

Plasma transports vitamins and carries waste products away from cells.

Explain the importance of hemoglobin.

enables transportation of oxygen and some carbon dioxide

Explain the essential functions of life performed by the specialized cells that make up blood.

Red blood cells carry oxygen to cells and carry carbon dioxide away from cells. White blood cells defend the body from disease. Platelets are cell fragments that help form blood clots.

Blood Groups

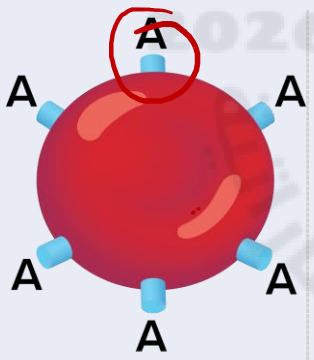
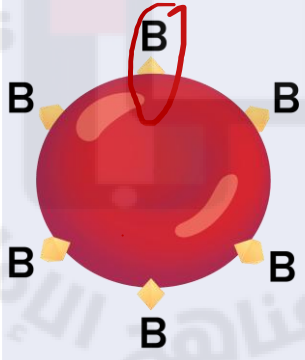
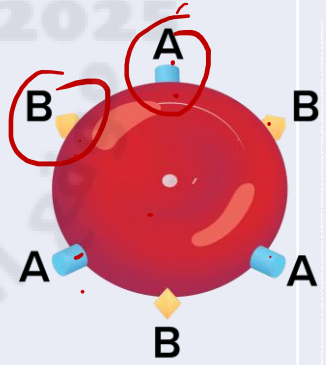
ABO Blood Group

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

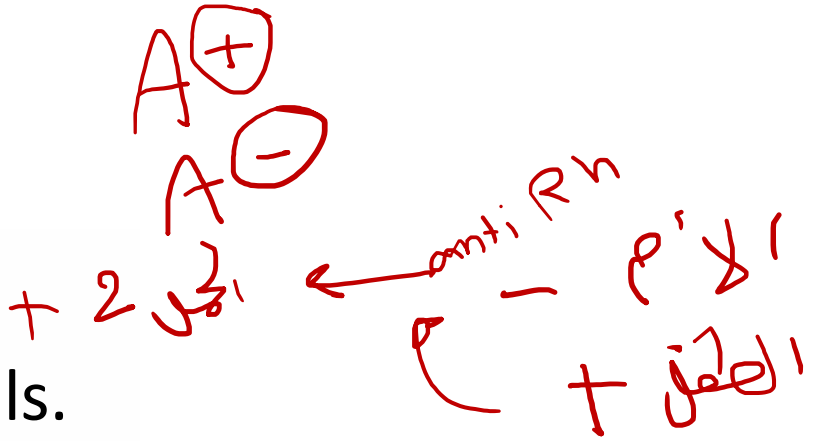
Importance of Blood Type

- If you ever need a blood transfusion, you will be able to receive only certain blood types.
- Plasma contains proteins called antibodies that recognize red blood cells with foreign markers and cause those cells to clump together. The table on the next page illustrates this.

Blood Groups

Blood Type	A	B	AB	O
Marker molecule and antibody	Marker molecule: A Antibody: B	Marker molecules: B Antibody: anti-A	Marker molecules: AB Antibody: none	Marker molecules: none Antibodies: anti-A, anti-B
Example				
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	O

Blood Groups



Rh Blood Group

- The Rh factor is another marker on red blood cells.
- It can cause complications during pregnancy.
- If a fetus's Rh-positive blood mixes with the mother's Rh-negative blood, the mother will make anti-Rh antibodies.
- During another pregnancy, these antibodies can cross the placenta and destroy red blood cells if the fetus has Rh-positive blood.

Circulatory System Disorders

- Blood clots and other matter can reduce the flow of blood travelling through the arteries.
- **Atherosclerosis** is the condition of blocked arteries.
- When blood flow is reduced or blocked, the heart must work even harder to pump blood, and vessels may burst.
- Atherosclerosis can lead to a heart attack or stroke.

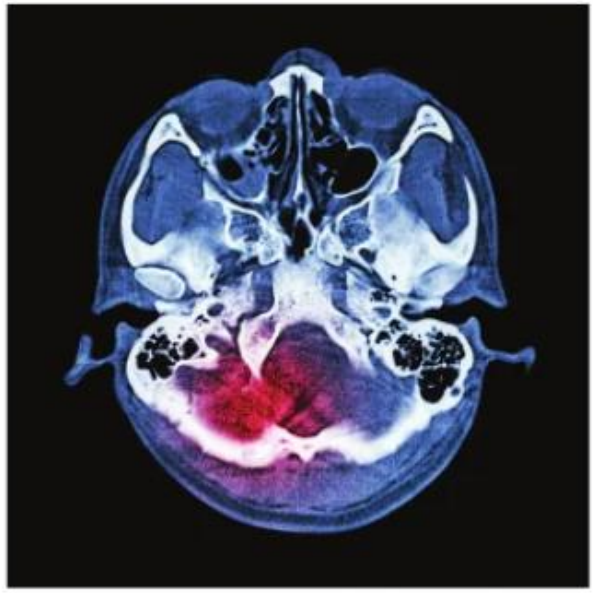


Figure 11 A stroke is associated with ruptured blood vessels in the brain, as shown in red.

When blood leaves the heart, where does it exit?

A the aorta artery CORRECT

~~C~~ the capillaries

~~C~~ the lungs

~~C~~ the pulmonary vein

Where is the pacemaker located in the heart?

- right ventricle
- C right atrium ✓ CORRECT
- left ventricle
- left atrium

Which chamber pumps blood into the aorta?

to lungs

Pulmonary arteries

right ventricle

B left ventricle

aorta to body

CORRECT

right atrium

left atrium

Which component of the blood fights disease in the body?

platelets

red blood cells

plasma

D white blood cells

CORRECT

If your blood type is B, which blood types can you donate to?

A B or AB

CORRECT

A and B

B or O

B only

The Importance of Respiration

Your body's cells require oxygen. Recall that oxygen and glucose are used by cells to produce energy-rich ATP molecules needed to maintain cellular metabolism. This process is called cellular respiration. In addition to releasing energy, cellular respiration releases carbon dioxide and water.

Breathing and respiration

The respiratory system sustains cellular respiration by supplying oxygen to body cells and by removing carbon dioxide waste from cells.

The functions of the respiratory system can be divided into two processes: breathing and respiration. First, air must enter the body through breathing. **Breathing** is the mechanical movement of air into and out of your lungs. **Figure 12** illustrates air being released from the lungs into the air. Second, gases are exchanged in the body. **External respiration** is the exchange of gases between the atmosphere and the blood, which occurs in the lungs. **Internal respiration** is the exchange of gases between the blood and the body's cells.

Figure 12 Exhaled air from a person's lungs can be seen on a chilly day.

Infer *how the air that you inhale is different from the air that you exhale.*

Get It?

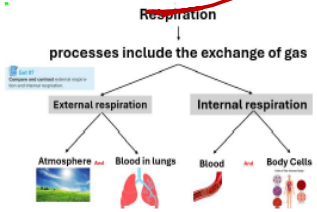
Compare and contrast external respiration and internal respiration.

$C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O + ATP$

glucose

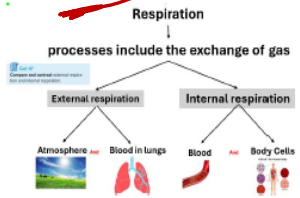
4) The exchange of gas between the atmosphere and the blood is called _____

a) External respiration
b) Internal respiration
c) Breathing
d) Respiration system



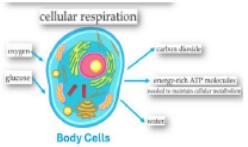
5) The exchange of gas between the blood and the body cells is called _____

a) External respiration
b) Internal respiration
c) Breathing
d) Respiration system



6) The cells use oxygen and glucose to produce energy-rich ATP molecules important for cellular metabolism and release carbon dioxide and water in a process called _____

a) Cellular respiration
b) breathing
c) metabolism
d) inhalation

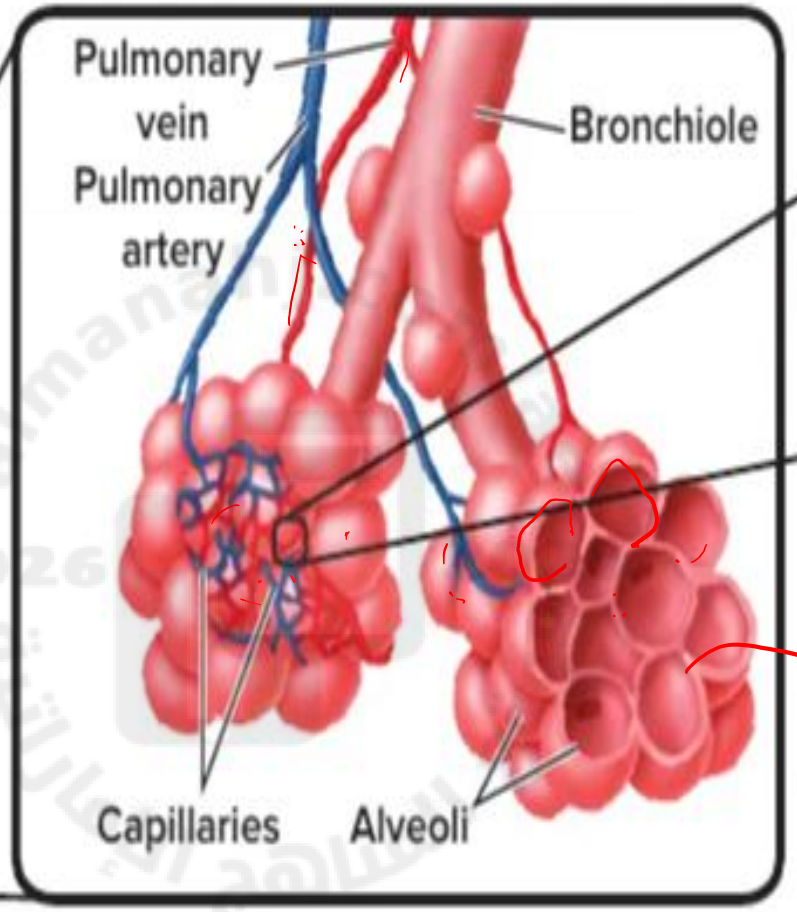


O2 enter to body inhale

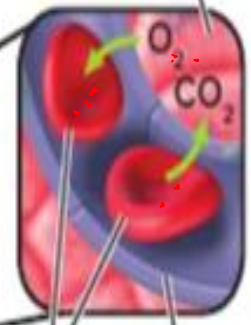
exhale to leave CO2 out of body

Pathway of O2

1. Nasal cavity
2. Pharynx
3. Epiglottis
3. Larynx
4. Trachea
5. Bronchus
6. Bronchiole
Lungs
Diaphragm



7 Alveolus



functional gas exchange unit

Figure 13 Air travels into the alveoli of the lungs, where gases are exchanged across thin capillary walls.

Diagram *Trace the path of oxygen from the atmosphere to the alveoli in the lungs.*

The Path of Air مسار الهواء من الخارج الى الحويصلات الرئوية

The respiratory system is made up of the nasal passages, pharynx (FER ingks), larynx (LER ingks) or voice box, epiglottis, trachea, lungs, bronchi, bronchioles, alveoli (al VEE uh li), and diaphragm. Air travels from the outside environment to the lungs, where it passes through the alveoli, as shown in **Figure 13**.

Cilia

Microscopic hairlike structures that line your nasal passages and respiratory tubes. They trap foreign particles and sweep them toward your throat. so they don't enter lungs.

Color-Enhanced SEM Magnification: 2000×

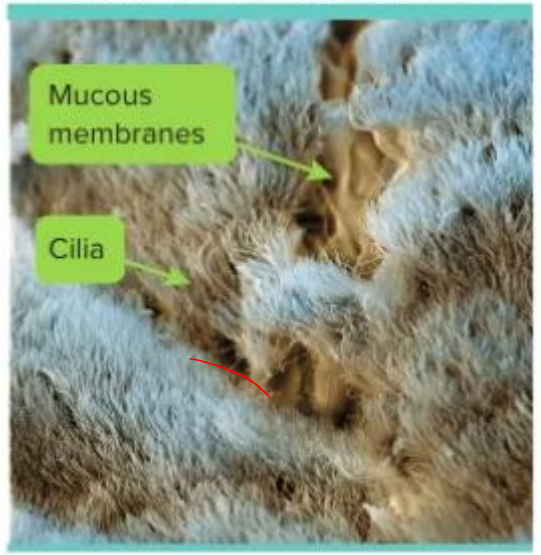


Figure 14 Hairlike cilia line the mucous membranes of the nasal cavity.

Mucous Membranes

Beneath the cilia , These moist tissues warm and humidify incoming air while trapping foreign materials .

They work with cilia to keep your lungs clean.

then

filtered air pass through the pharynx the epiglottis.

8- The main function of the .. **hair** .. in the nose filters out dust in the air.

9- The { A } in this image line nasal passages its .. **Cilia** .....

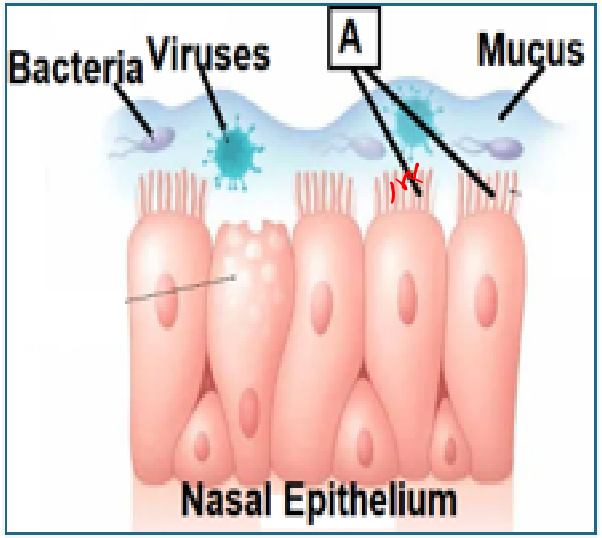
10- What is the function of hairlike cilia lining the nose?

a- To exchange gases in the alveoli

b- To expand and contract the lung

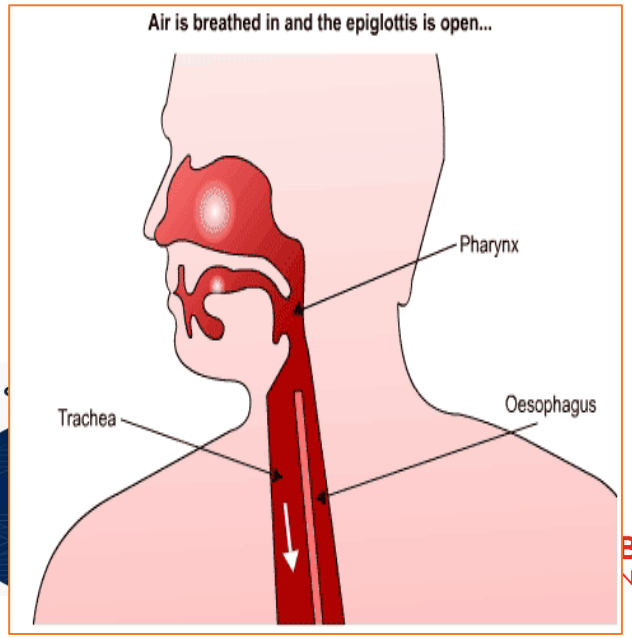
c- To move mucus and trapped particles out of the airways.

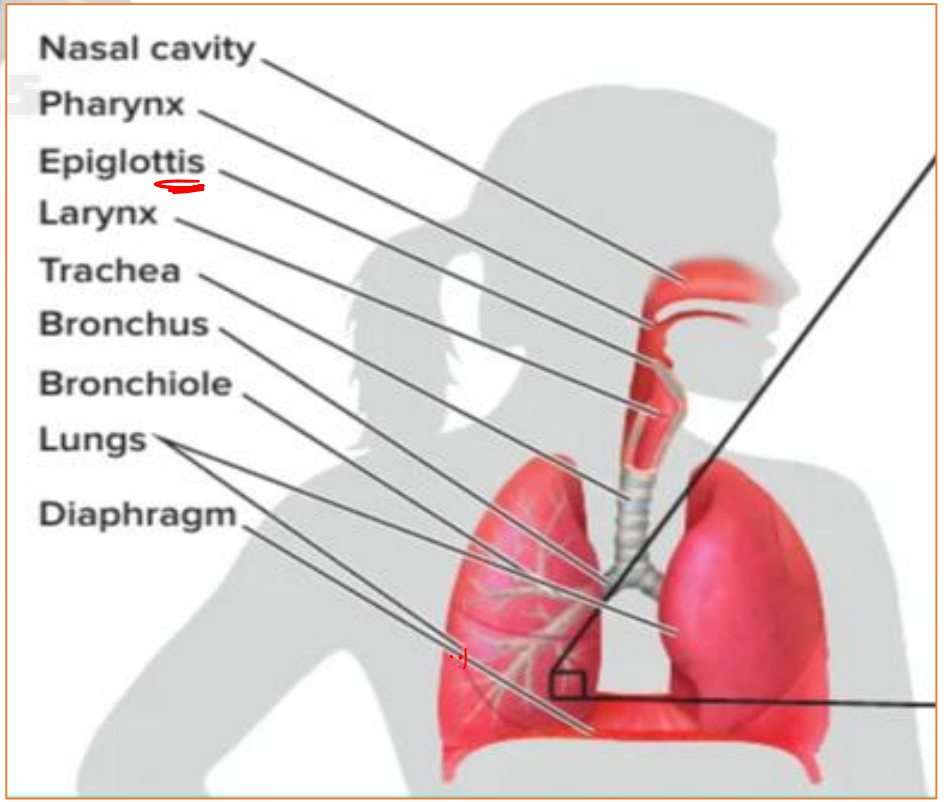
11-The .. **mucus** .. membranes beneath the cilia warm and moisten the air while trapping foreign particles.



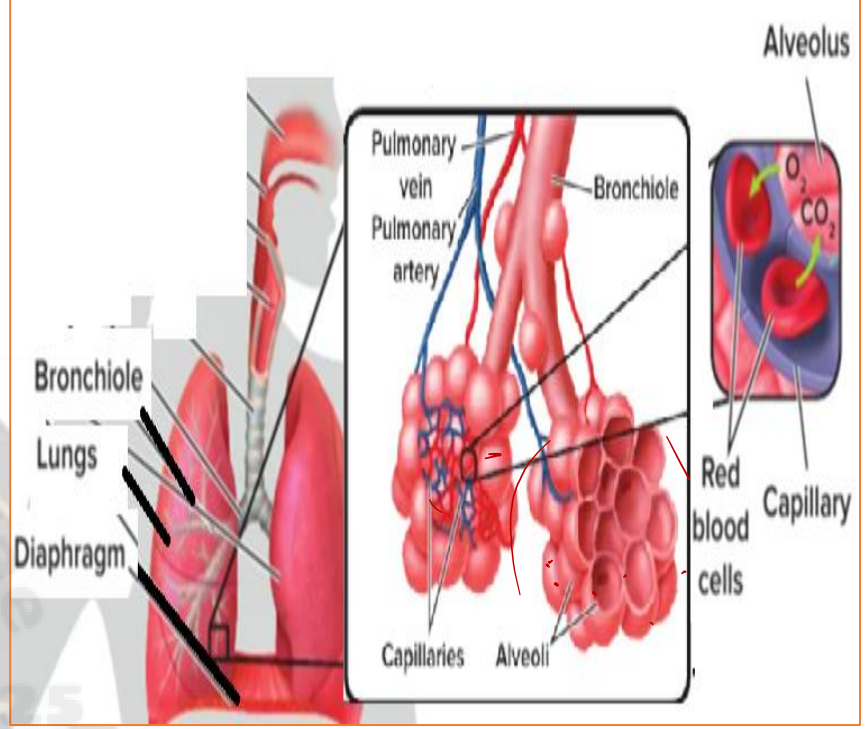
Air pathway: 1-Nasal cavity

Filtered air then passes through the upper throat, called th 2phar-ynx. A flap of tissue called the epiglottis, which covers the opening to th 3larynx, prevents food particles from entering the respiratory tubes. The epiglottis allows air to pass from the larynx to a long tube in the chest cavity called 4 **trachea,** or windpipe. The trachea branches into two large tubes, call 5 **bronchi** (BRAHN ki) (singular, bronchus), which lead to the lungs.





The **lungs** are the largest organs in the respiratory system, and gas exchange takes place in the lungs. Each bronchus branches into smaller tubes call 6 bronchioles (BRAHN kee ohlz), which continue to branch into even smaller passageways. Each of these ends in an individual air sac called an 7 **alveolus** (plural, alveoli). Each alveolus has a thin wall—only one cell thick—and is surrounded by very thin capillaries.



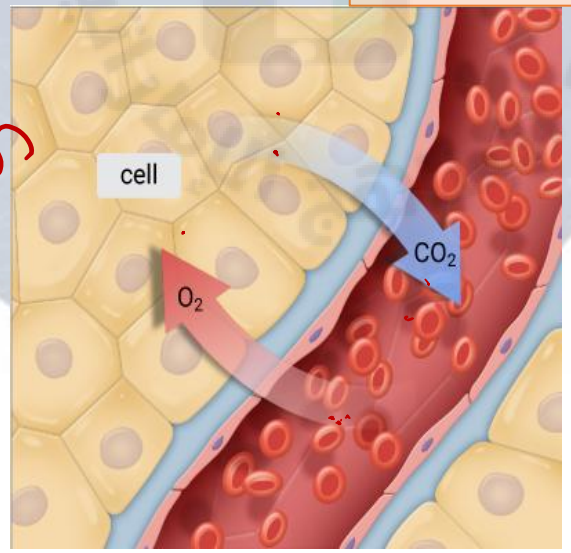
Gas exchange in the lungs

Air travels to individual alveoli, where oxygen diffuses across the moist, thin walls into capillaries and then into red blood cells. The oxygen is then transported to be released to tissue cells in the body during internal respiration. Meanwhile, carbon dioxide in the blood crosses capillary walls and diffuses into the alveoli to be returned to the atmosphere during external respiration. Carbon dioxide in the blood is found as carbonic acid in the red blood cells, dissolved in plasma, and bound to hemoglobin in red blood cells.

1 2 3

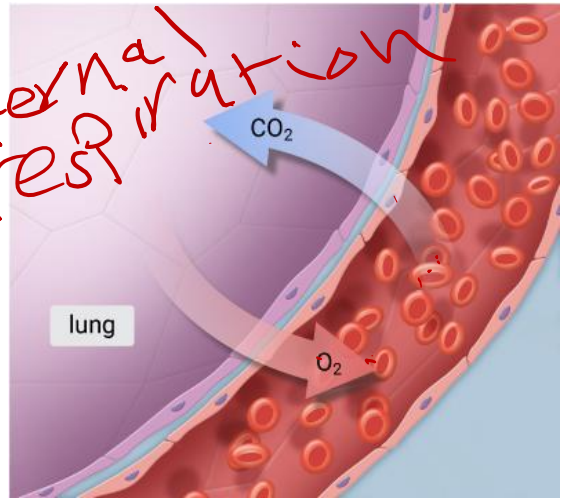
Near Cells

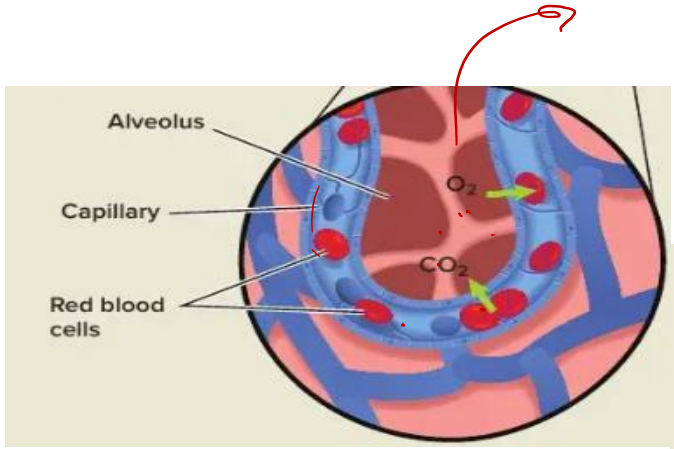
internal respiration



Around Alveoli

external respiration





In the lungs, oxygen (O_2) that is inhaled moves into capillaries and is transported to body cells. Carbon dioxide (CO_2) leaves the capillaries and is exhaled from the lungs.

In body tissues, such as muscle tissues, oxygen (O_2) moves from capillaries into tissue cells. Carbon dioxide (CO_2) produced by cellular respiration leaves tissue cells and moves into capillaries, and then it is transported to the lungs.

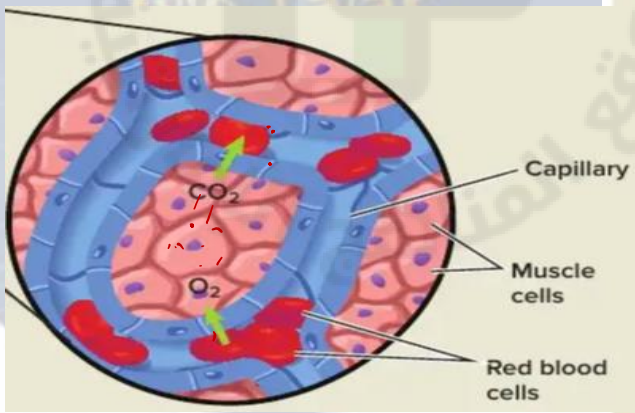
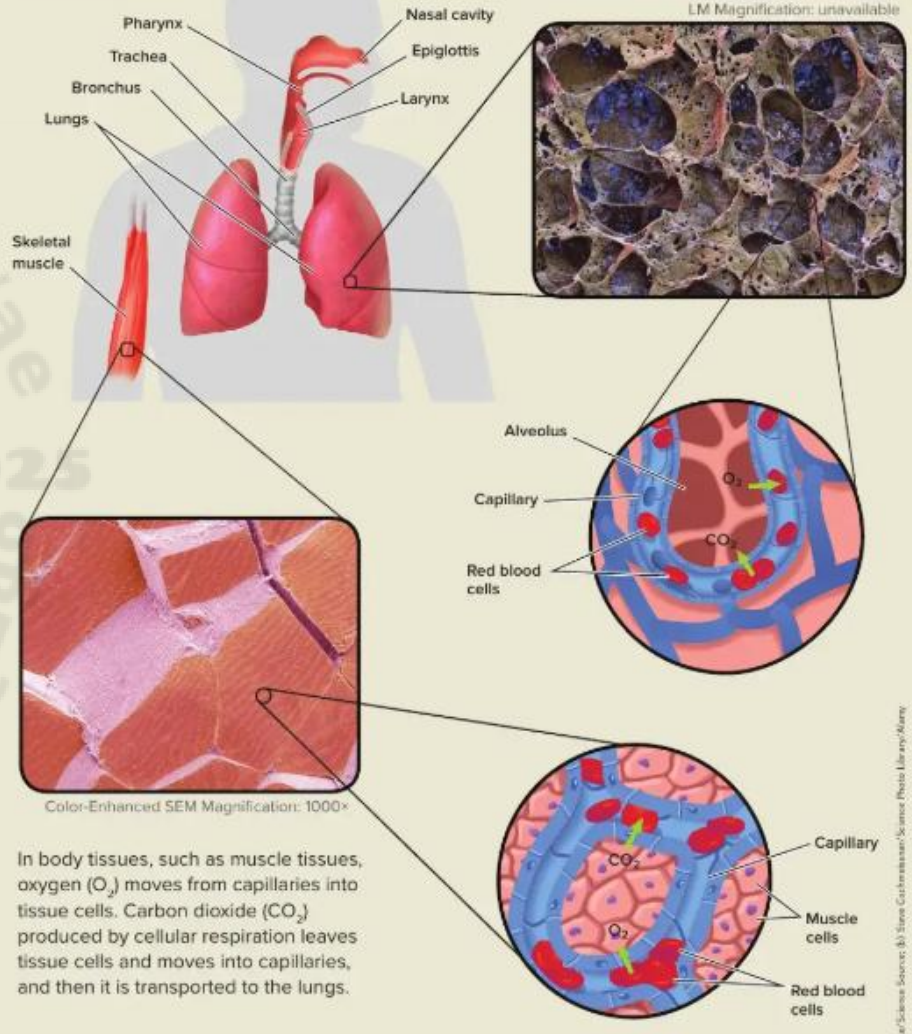


Figure 16 Visualizing Gas Exchange

Gases are exchanged in the lungs and in the tissue cells of the body.

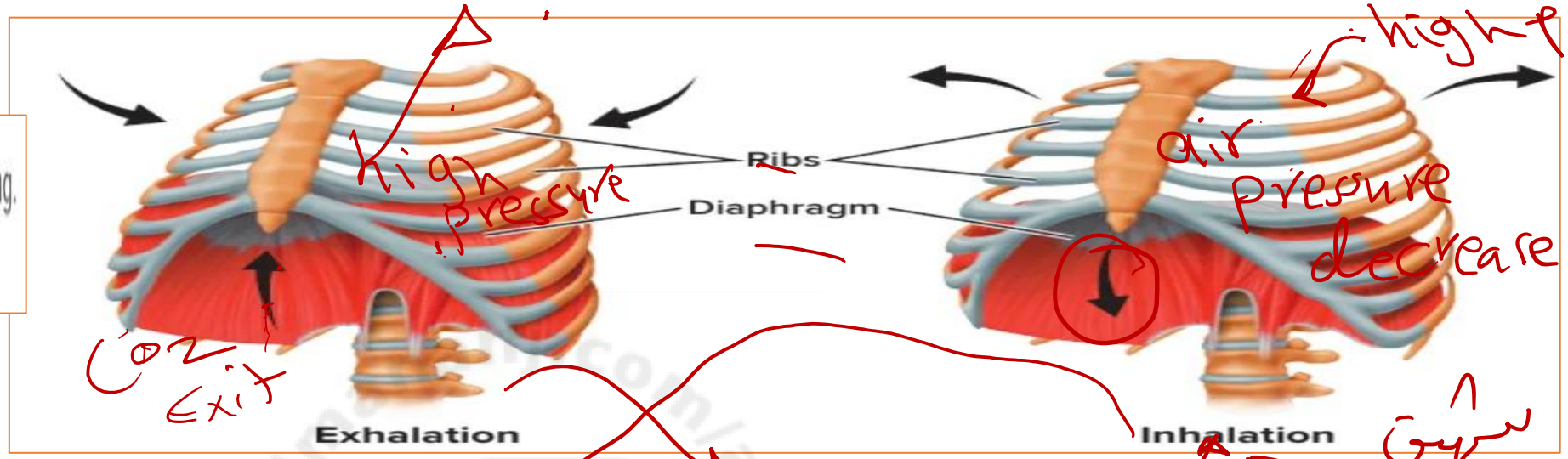
In the lungs, oxygen (O_2) that is inhaled moves into capillaries and is transported to body cells. Carbon dioxide (CO_2) leaves the capillaries and is exhaled from the lungs.



In body tissues, such as muscle tissues, oxygen (O_2) moves from capillaries into tissue cells. Carbon dioxide (CO_2) produced by cellular respiration leaves tissue cells and moves into capillaries, and then it is transported to the lungs.

Figure 15 Rib and diaphragm muscles contract and relax during breathing.

Analyze *how air pressure is involved in breathing.*



Inhalation

- Diaphragm contracts and moves down
- Chest cavity expands
- Air pressure decreases in lungs
- Air rushes in to fill the space

Exhalation

- Diaphragm relaxes and moves up
- Chest cavity contracts so its size reduced
- Air pressure increases in lungs
- Air naturally flows out

Question 1

During inhalation, the diaphragm _____ and moves _____ causing the chest cavity to expand.

Question 2

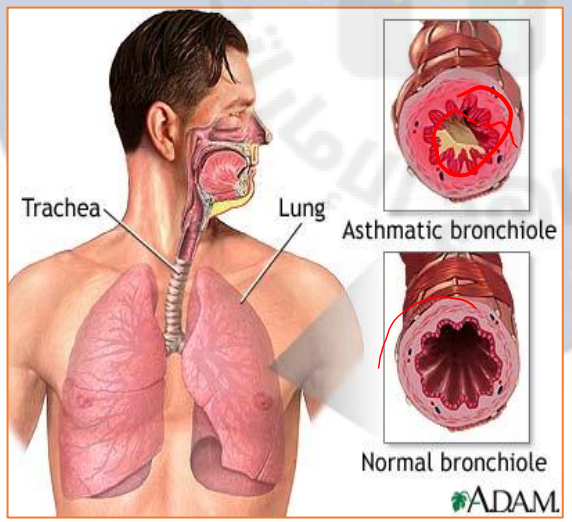
When the chest cavity contracts during exhalation, the air pressure in the lungs _____ causing air to flow out.

Question 3

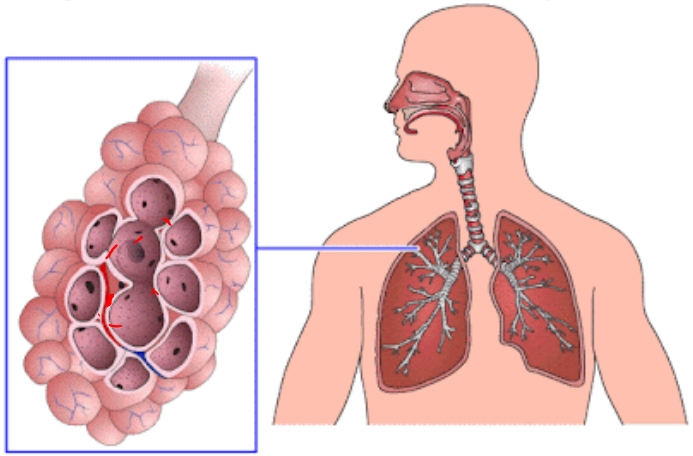
Air rushes into the lungs during inhalation because the air pressure inside _____.

Table 2 Common Respiratory Disorders

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 the alveoli's blood capillaries.
Pneumonia	Infection of the lungs causes the alveoli to collect mucous material.
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.



Emphysema involves damage to the air sacs in the lungs. This makes it hard to catch your breath.



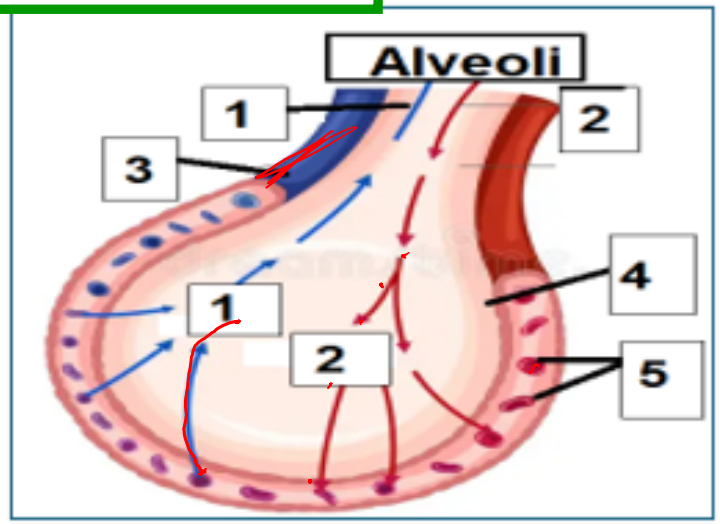
23- Which of the following is the correct order of the air pathway from the nose to the alveoli?

a- Nasal cavity → Trachea → Bronchi → Alveoli

b- Nasal cavity → Pharynx → Larynx → Trachea → Bronchi → Alveoli.

c- Nasal cavity → Larynx → Bronchi → Trachea → Alveoli.

d- Nasal cavity → Larynx → Alveoli → Bronchi → Trachea.



24-Label all numbers in this figure below correctly:

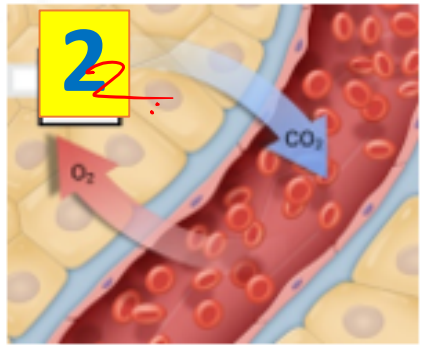
a-(4) Alveoli wall b- -(3) Capillaries

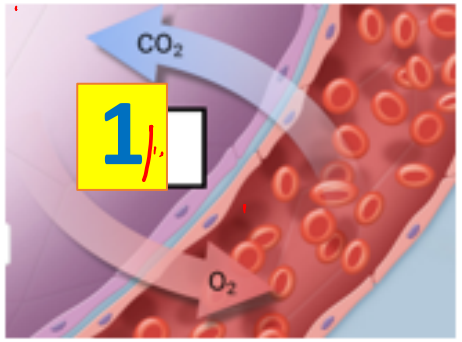
c -(1) CO2 d-(5) Red BC e -(2) O2

25- Label each image with correct number:

1- Alveoli (Lungs)

2- Near Cells





⇒ **26- Choose the correct answer on the table below:**

	Inhalation	Exhalation
Air Direction	a-Out of the lungs. b- Into the lungs	a-Out of the lungs. b- Into the lungs
Diaphragm	a- Relaxes, moves up b- Contracts, moves down	a- Relaxes, moves up b- Contracts, moves down
Chest Cavity	a- Expand b-Reduce	a- Expand b-Reduce
Ribcage فقص صدري	a-Moves up and out b- Moves down and in	a-Moves up and out b- Moves down and in
Rid & Diaphragm Muscle	a- Relaxes b- Contracts	a- Relaxes b- Contracts
Air Pressure	a- Decreases inside the lungs b- Increases inside the lungs	a- Decreases inside the lungs b- Increases inside the lungs

⇒ **Key idea:** Increasing lung volume → decreases air pressure → air flows in.

8. The total surface area of the alveoli tissue in your lungs is approximately 70 m^2. This is more than 40 times the surface area of the skin. What is the surface area of your skin?

The surface area of the skin is approximately 1.75 m^2.

$\frac{70}{40} = \frac{40 \times S.A.S}{40}$

1.75

Get It? **Identify** the role of cilia in the respiratory system.

Cilia trap foreign particles from the air and sweep them toward the throat so that they do not enter the lungs.

Summarize each of the following common respiratory disorders.

Respiratory Disorder	Description
Pneumonia	lung infection causing mucus buildup in alveoli
Emphysema	breakdown of alveoli
Lung cancer	uncontrolled cell growth in lung tissue
Asthma	constriction of bronchioles

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