

KEY

Name: _____ Class: _____ Date: _____

SECTION
30.4

BLOOD VESSELS AND TRANSPORT
Reinforcement

KEY CONCEPT The circulatory system transports materials throughout the body.

The circulatory system includes three types of blood vessels—arteries, veins, and capillaries—that act as a transportation network for the blood.

- Arteries are strong and flexible. They must carry blood away from the heart under great pressure. Their thick muscle layer and elastic fibers allow the artery to expand and contract to help move the blood. Smaller arteries, called arterioles, connect arteries to capillaries.
- Veins carry blood under much less pressure back to the heart. They have a larger diameter and thinner walls than do arteries and contain valves that prevent blood from flowing backwards. Veins need the pressure of skeletal muscles pushing against their walls to keep blood moving. Smaller veins, called venules, connect larger veins to capillaries.
- Capillaries have thin walls, only one cell thick, that allow materials to diffuse into and out of the blood. In some organs such as the liver or kidneys, capillary beds move a large volume of blood into and out of the organs.

Blood pressure is a measure of the force with which blood pushes against an artery wall. **Systolic pressure** measures pressure in an artery after the left ventricle has contracted. **Diastolic pressure** measures pressure after the ventricle has relaxed. When arteries become blocked or less elastic, the heart has to pump harder to circulate blood, resulting in high blood pressure.

Unhealthy lifestyle choices can increase the risk of developing circulatory diseases. The artery walls may become thick and inflexible or may be blocked by sticky plaque, leading to a possible heart attack or stroke. Treatments include balloon angioplasty or bypass surgery. Healthy lifestyle choices and some medications can greatly reduce the risk of heart disease.

1. How do the structures of arteries, veins, and capillaries relate to their functions?

Arteries = thick, strong to move blood away from heart
Veins = thin with valves, near muscles to move blood back to heart
Capillaries = thin walls for O₂ + CO₂ to diffuse into/out of blood.

2. What do systolic and diastolic pressures measure?

Systolic = pressure of contracted ; Diastolic = pressure of relaxed.

3. How can lifestyle choices affect the health of the arteries?

-increase risk of circulatory diseases EX: artery walls thick with plaque → leads to heart attack or stroke

KEY

Name: _____ Class: _____ Date: _____

SECTION
30.5 | BLOOD
Reinforcement

KEY CONCEPT Blood is a complex tissue that transports materials.

Whole blood is mostly plasma, red blood cells, white blood cells, and platelets.

- **Plasma** is mostly water and makes up about 55 percent of the blood. The concentration of molecules dissolved in plasma determines which substances diffuse into and out of the blood. The movement of these materials plays a critical role in maintaining homeostasis. Plasma also contains many proteins that help stabilize blood volume and control bleeding.
- **Red blood cells** transport oxygen to all the cells. Oxygen binds to hemoglobin, which gives blood its red color. Red blood cells have surface protein markers that define a person's blood type and Rh factor. Blood type and **Rh factor** are important when giving or receiving a transfusion. The most common blood types are the **ABO blood group**, four blood types that can be Rh negative or Rh positive. If the wrong blood type is given, a person's immune system will attack the foreign proteins. This causes the blood to clump, which can be a life-threatening condition.
- **White blood cells** defend the body against infection and remove foreign materials and dead cells. They contain no hemoglobin. Unlike red blood cells, they are not limited to the circulatory system but can move into the lymphatic system and function as part of the immune system.
- **Platelets** are cell fragments that help control bleeding. When a blood vessel is torn or injured, platelets form a complex net around the injury and release clotting factors that begin the process of repair. Eventually a clot forms to seal the wound.

1. What are the main components in blood?

Plasma; (RBCs) Red blood cells; White blood cells (WBCs); Platelets

2. How does plasma help to maintain homeostasis?

movement of materials / substances diffuse into and out of the blood.

3. What are the main functions of red blood cells, white blood cells, and platelets?

RBC = transport oxygen

WBC = defend body against infection & remove foreign materials.

Platelets = help control bleeding

4. Why is it so important to know blood type for a transfusion?

if wrong blood type given, person's immune system will attack and cause the blood to clump which can be life threatening.