

THE BLOOD

1. Components of the Blood

Blood is a liquid tissue that consists of a fluid portion—the plasma—and solid components—red blood cells, white blood cells, and platelets. The blood serves as a medium of transport, helps protect against disease, and is involved in the regulation of body temperature.

RED BLOOD CELLS

Red blood cells, or *erythrocytes*, are disk-shaped structures that are thinner in the middle than they are around the edges. A mature human red blood cell has no nucleus. Erythrocytes are formed in the red marrow of the long bones. The main function of the red blood cells is the transport of oxygen from the lungs to the cells of the body. To a lesser extent, they also carry carbon dioxide from the body cells to the lungs. Red blood cells contain the respiratory pigment *hemoglobin*, which greatly increases their oxygen-carrying capacity.

1. What are the functions of the red blood cells?

The major function of the red blood cells is the transport of (a) _____ To a much lesser extent, they are also involved in the transport of (b) _____ from the body tissues to the lungs.

(a) = _____ (b) = _____

2. What is hemoglobin, and what function does it serve?

Hemoglobin is an iron-containing pigment found in (a) _____. It combines reversibly with oxygen, and greatly increases the oxygen-carrying capacity of the blood.

(a) = _____

3. Where are erythrocytes formed?

Erythrocytes are formed in the (a) _____ of the ribs, skull, vertebrae, and other bones.

(a) = _____

WHITE BLOOD CELLS

White blood cells, or leukocytes, are amebalike cells that contain a nucleus but no pigments. White blood cells are involved in fighting infections in the body. Several different types of white blood cells are produced in the marrow of long bones. *Lymphocytes* are white blood cells that are produced in the lymph nodes. Various types of white blood cells can pass through the walls of the capillaries by ameboid movement and migrate to almost any tissue in the body. They fight infection by engulfing bacteria and other microorganisms by phagocytosis. Lymphocytes also fight infection by producing antibodies.

1. Where are white blood cells produced?

White blood cells are produced in the (a) _____ of bones and in the (b) _____ nodes.

2. What are the functions of the white blood cells? (a) = _____ (b) = _____

White blood cells fight (a) _____ in the body. Some are phagocytes, and some are involved in the production of (b) _____. / (a) = _____ (b) = _____

3. How do white blood cells engulf microorganisms?

White blood cells engulf microorganisms by (a) _____, like amebas. (a) = _____

PLATELETS

Platelets are cell fragments that initiate blood clotting. These structures, which generally have no nucleus, are formed in the marrow of long bones.

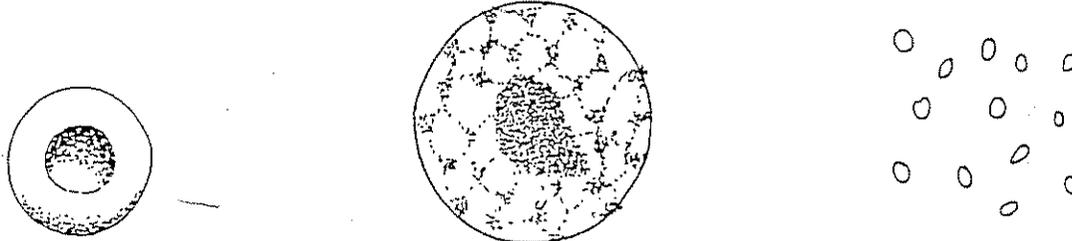
1. What is the function of blood platelets?

Platelets initiate

2. Where in the body are platelets formed?

Platelets are formed in

3. Identify the three blood components in the following diagram.



Immunity

1. Fill in the blanks in the following table, specifying which antigens and which antibodies are present with each blood type.

Blood Type	Antigens	Antibodies
A		
B		
AB		
O		

2. Fill in the blanks in the following table on transfusions.

Blood Type	Can Receive	Can be given to
A		
B		
AB		
O		

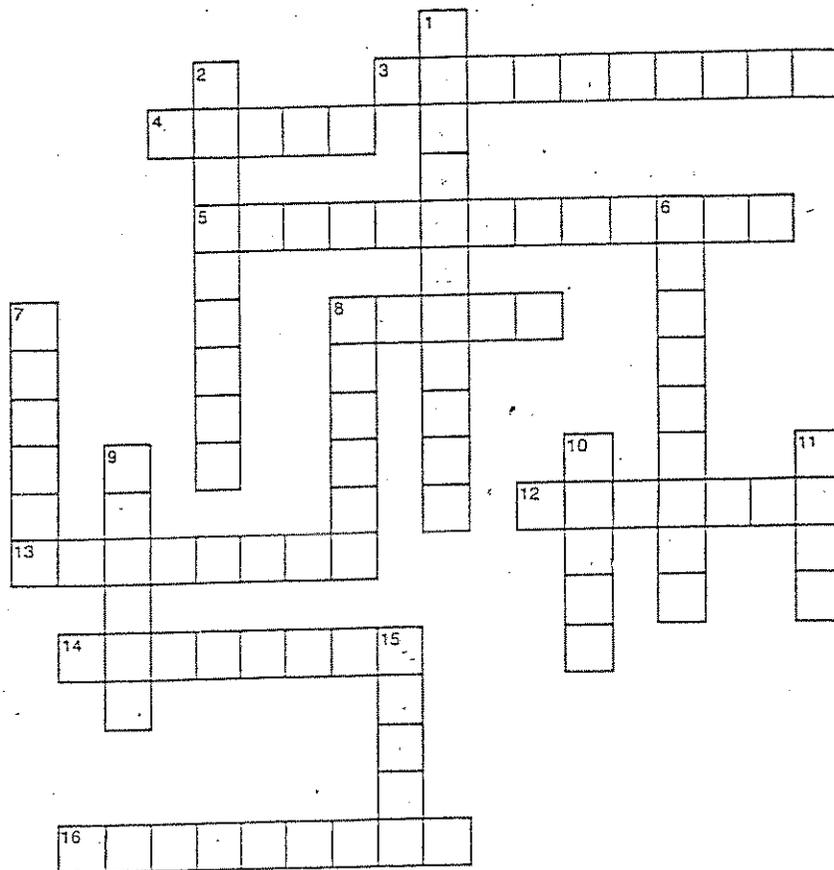
3. Which blood type is the universal donor? Which type is the universal recipient?

Type O is the universal donor. Type AB is the universal recipient.

4. What happens if a person with type A blood is given a transfusion of type B blood?

People with type A blood have B antibodies in their plasma. These antibodies will react with type B antigens, causing clotting to occur.

Chapter 9. Vocabulary Puzzle



Across

3. The iron-containing respiratory pigment that increases the oxygen-carrying capacity of the blood.
4. A flaplike structure that permits body fluids to flow in only one direction.
5. The colorless, watery solution that bathes all the body cells is called _____ fluid.
8. The major artery carrying oxygenated blood away from the heart.
12. The period of contraction during the heartbeat cycle.
13. The subdivision of the systemic circulation that supplies blood to the muscle of the heart is the _____ circulation.
14. A large vein that collects blood from the upper half of the body and returns it to the right atrium of the heart is the _____ vena cava.
16. One of the lower, thick-walled chambers of the heart.

Down

1. The tough, protective membrane surrounding the outside of the heart.
2. A microscopic blood vessel that connects the smallest arteries to the smallest veins.
6. The system of vessels that returns excess fluid and proteins from the intercellular spaces to the blood is the _____ system.
7. The heartlike blood vessels in earthworms are called _____ arches.
8. A thick-walled blood vessel that carries blood away from the heart.
9. One of the upper, thin-walled chambers of the heart.
10. The interstitial fluid found in conducting vessels.
11. A blood vessel that carries blood to the heart.
15. A subdivision of the systemic circulation that carries blood to and from the kidneys is the _____ circulation.