# Blood Basics Review Answer Key

Blood Basics Assignment Name _____

1. What makes up the blood in our bodies?
   a. _____ _____ _____(erythrocytes) – The most abundant cells in our blood; they are produced in the bone marrow and contain a protein called hemoglobin that carries oxygen to our cells.
   b. _____ _____ _____ (leukocytes) – They are part of the immune system and destroy pathogens.
   c. _____ – The yellowish liquid portion of blood that contains electrolytes, nutrients and vitamins, hormones, clotting factors, and proteins such as antibodies to fight infection.
   d. _____ (thrombocytes) – The clotting factors that are carried in the plasma; they clot together in a process called coagulation to seal a wound and prevent a loss of blood.
2. The average adult has about _____ liters of blood inside of their body, which makes up 7-8% of their body weight.
3. This red liquid has living _____ that carry oxygen and _____ that carries nutrients to all parts of the body. These carry carbon dioxide and other waste products back to the lungs, kidneys and liver for disposal. It also fights against _____ and helps heal _____.
4. There are about _____ red blood cells in two to three drops of blood. For every _____ red blood cells, there are about _____ platelets and _____ white blood cells.
5. Identify each part of blood based on the descriptions. Use P for plasma, R for red blood cell, W for white blood cell, and PLT for platelet.
   a. _____ A mixture of water, sugar, fat, protein, and potassium and calcium salts
   b. _____ Contains a special protein called hemoglobin, which carries oxygen & causes these cells to be red.
   c. _____ More than 92% of this substance is water
   d. _____ Produce proteins called antibodies that help our bodies fight infection
   e. _____ Contains chemicals that helps blood form clots
   f. _____ Fragments of cells that gather at a cut or other wound and stick to the edges
   g. _____ Makes up 55% of the blood
   h. _____ Makes up 45% of the blood
   i. _____ Makes up 0.1% of the blood
   j. _____ Makes up 0.17% of the blood
6. Your blood type is established before you are _____, by specific _____ inherited from your parents.
7. These two genes - one gene from your _____ and one from your _____ - determine your blood type by causing proteins called _____ to exist on the surface of all of your red blood cells.
8. There are three alleles or genes for blood type: _____, _____, and _____.
9. Give all of the possible genotypes for each of the four blood types: Type A = _____ _____ Type B = _____ _____ Type AB = _____ Type O = _____
10. How common are the four blood types? A = _____ % B = _____ % AB = _____ % O= _____ %
11. In order for a transfusion to work, the agglutinogens on the surface of the _____ blood cells must match the agglutinogens on the surface of the _____ blood cells. This means that the blood type of the _____ and the blood type of the person receiving the transfusion must be _____.

**Blood basics review answer key** is essential for understanding the fundamental components, functions, and significance of blood in the human body. This article aims to provide a comprehensive overview of blood, its composition, and its critical role in maintaining homeostasis. Additionally, we will explore common questions and their answers, which can serve as a valuable study guide for students and those interested in human biology.

## 1. Introduction to Blood

Blood is a vital fluid in the human body, responsible for transporting nutrients, oxygen, hormones, and waste products to and from cells. It plays a crucial role in the immune system, regulating body temperature, and maintaining pH levels. Understanding the basics of blood is essential for anyone studying human biology, medicine, or health sciences.

## 2. Composition of Blood

Blood is composed of several key components, each serving unique functions. The primary components of blood include:

## 2.1. Plasma

Plasma is the liquid portion of blood, constituting about 55% of its total volume. It is primarily composed of water (about 90%), but also contains:

- Proteins: Such as albumin, globulins, and fibrinogen, which play roles in maintaining osmotic pressure, immune responses, and blood clotting.
- Electrolytes: Sodium, potassium, calcium, bicarbonate, and chloride, which are essential for various physiological functions.
- Nutrients: Glucose, amino acids, and fatty acids, which provide energy and building blocks for cells.
- Hormones: Chemical messengers that regulate various bodily functions.

## 2.2. Formed Elements

The formed elements of blood include:

- Red Blood Cells (Erythrocytes): These cells are responsible for transporting oxygen from the lungs to the tissues and carbon dioxide from the tissues back to the lungs. They contain hemoglobin, a protein that binds to oxygen.
- White Blood Cells (Leukocytes): Part of the immune system, leukocytes help the body fight infections and diseases. They are divided into several types, including:
- Neutrophils
- Lymphocytes
- Monocytes
- Eosinophils
- Basophils
- Platelets (Thrombocytes): These are cell fragments that play a crucial role in blood clotting and wound healing.

# 3. Functions of Blood

Blood serves multiple critical functions in the body, including:

## 3.1. Transportation

Blood transports essential substances throughout the body, including:

- Oxygen: Carried from the lungs to tissues.
- Carbon Dioxide: Transported from tissues back to the lungs for exhalation.
- Nutrients: Delivered from the digestive tract to cells.
- Waste Products: Removed from cells and transported to excretory organs.

## 3.2. Regulation

Blood helps regulate:

- Body Temperature: By distributing heat generated by metabolic processes.
- pH Levels: Through buffer systems that maintain the acidity or alkalinity of blood.
- Fluid Balance: By regulating the osmotic pressure between blood and surrounding tissues.

## 3.3. Protection

Blood plays a protective role in several ways:

- Immune Response: White blood cells identify and neutralize pathogens.
- Clotting Mechanism: Platelets and proteins form clots to prevent excessive bleeding following injury.

# 4. Blood Types and Transfusion Compatibility

Understanding blood types is crucial, especially in medical situations requiring blood transfusions. Blood types are categorized based on the presence or absence of specific antigens on the surface of red blood cells. The main blood group systems are:

## 4.1. ABO System

The ABO blood group system includes four main types:

- Type A: Has A antigens on the surface of red blood cells.
- Type B: Has B antigens.
- Type AB: Has both A and B antigens (universal recipient).
- Type O: Has no A or B antigens (universal donor).

## 4.2. Rh Factor

The Rh factor is another important antigen that can be either present (Rh+) or absent (Rh-). This factor is crucial when considering blood transfusions, as incompatible blood types can lead to severe reactions.

# 5. Common Blood Disorders

Several blood disorders can affect the body's ability to function properly. Some of the most common include:

## 5.1. Anemia

Anemia is a condition characterized by a deficiency of red blood cells or hemoglobin, leading to reduced oxygen transport. It can result from:

- Nutritional deficiencies (iron, vitamin B12, folate).
- Chronic diseases (kidney disease, cancer).
- Genetic conditions (sickle cell disease, thalassemia).

## 5.2. Leukemia

Leukemia is a type of cancer that affects the blood and bone marrow, characterized by the overproduction of abnormal white blood cells. It can lead to a weakened immune system and other complications.

## 5.3. Hemophilia

Hemophilia is a genetic disorder that impairs the body's ability to make blood clots, leading to excessive bleeding. It is typically inherited and more common in males.

# 6. Frequently Asked Questions (FAQs)

Here are some common questions related to blood basics, along with their answers:

1. **What is the average volume of blood in an adult human?**

   The average adult has about 5 to 6 liters of blood.

2. **How often does the body replace red blood cells?**

   The body continuously produces new red blood cells, with the lifespan of a red blood cell being approximately 120 days.

3. **What is the function of platelets?**

   Platelets are critical for blood clotting and wound healing.

4. **Why is blood type compatibility important during transfusions?**

   Incompatible blood types can cause severe immune reactions, leading to complications or even death.

5. **What are the symptoms of anemia?**

   Common symptoms of anemia include fatigue, weakness, pale skin, and shortness of breath.

# 7. Conclusion

In summary, the **blood basics review answer key** provides a foundational understanding of blood's composition, functions, and importance in the human body. By familiarizing yourself with these concepts, you can better appreciate the critical roles that blood plays in health and disease. Whether you are a student, healthcare professional, or simply interested in human biology, understanding the basics of blood is essential for grasping more complex biological and medical topics.

# Frequently Asked Questions

## What are the primary components of blood?

The primary components of blood are red blood cells, white blood cells, platelets, and plasma.

## What is the main function of red blood cells?

The main function of red blood cells is to transport oxygen from the lungs to the body's tissues and carry carbon dioxide back to the lungs.

## How does the immune system utilize white blood cells?

White blood cells play a crucial role in the immune system by identifying and fighting off pathogens, such as bacteria and viruses.

## What role do platelets play in the body?

Platelets are essential for blood clotting, helping to prevent excessive bleeding when injuries occur.

## What is plasma, and why is it important?

Plasma is the liquid portion of blood, making up about 55% of its volume, and it carries nutrients, hormones, proteins, and waste products throughout the body.

## What are the different blood types, and how are they classified?

Blood types are classified based on the presence or absence of antigens on the surface of red blood cells, primarily the ABO and Rh systems.

## What is the significance of hemoglobin in blood?

Hemoglobin is a protein in red blood cells that binds to oxygen, allowing for its transport throughout the body and contributing to the red color of blood.

## How can understanding blood basics help in medical emergencies?

Understanding blood basics can help in medical emergencies by informing appropriate treatment for conditions like anemia, bleeding disorders, and transfusions.



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