

Blood

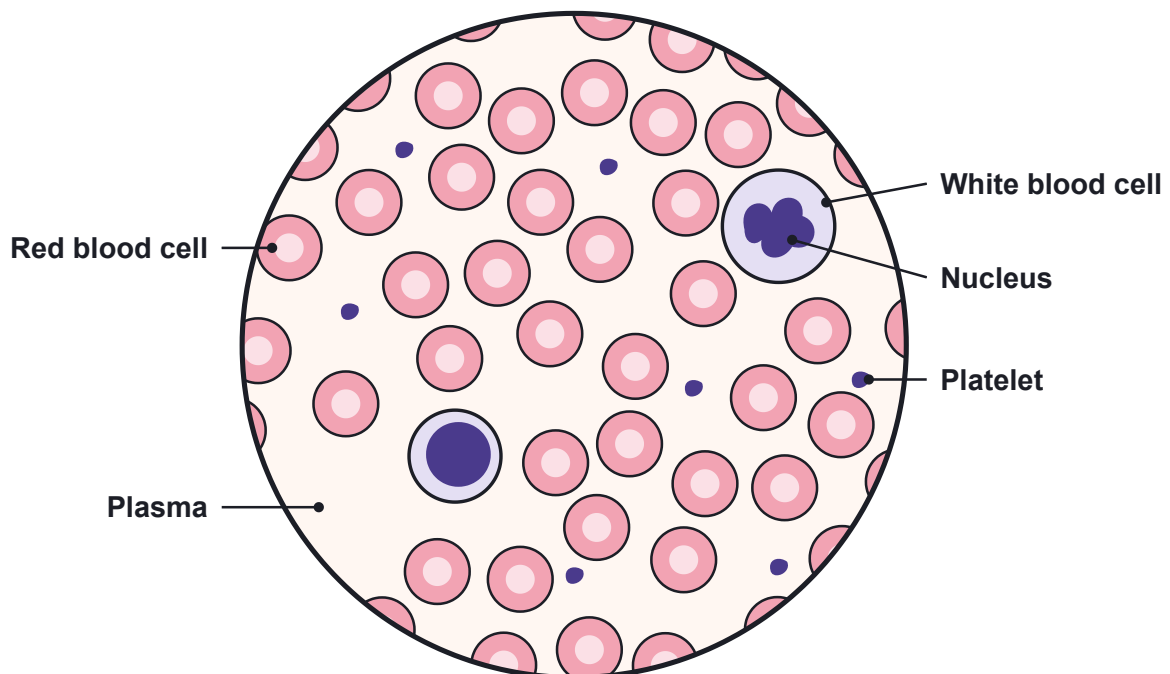
Revision notes · The components of blood and their functions, white blood cell types, and how blood clots.

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Blood Spec 9.4

Components of blood Spec 9.4.1, 9.4.2, 9.4.3

Blood is made of red blood cells, white blood cells, platelets and plasma. Plasma is the liquid part.



Red blood cells are the most numerous. White blood cells have a **nucleus**. Platelets are tiny fragments.

- Red blood cells are small, round and pale in the middle, with **no nucleus**.
- White blood cells are larger and have a **nucleus**, usually stained dark.
- Platelets are tiny fragments of cells.

Functions of the components of blood

Component	Function
Red blood cells	Transport oxygen. They contain the red pigment haemoglobin , which combines with oxygen
White blood cells	Defend against pathogens by phagocytosis and antibody production
Platelets	Help blood to clot
Plasma	Transports blood cells, ions, nutrients, urea, hormones and carbon dioxide

Exam tip: Name the pigment. 'Red blood cells carry oxygen' is not enough: say the oxygen is carried by haemoglobin. Clotting details are not required for platelets.

White blood cells and blood clotting Spec 9.4.4, 9.4.5, 9.4.6, 9.4.7

Roles of blood clotting

When the skin is cut, blood clots to **prevent blood loss** and to **prevent the entry of pathogens** into the body. The clot dries to form a scab.

Supplement

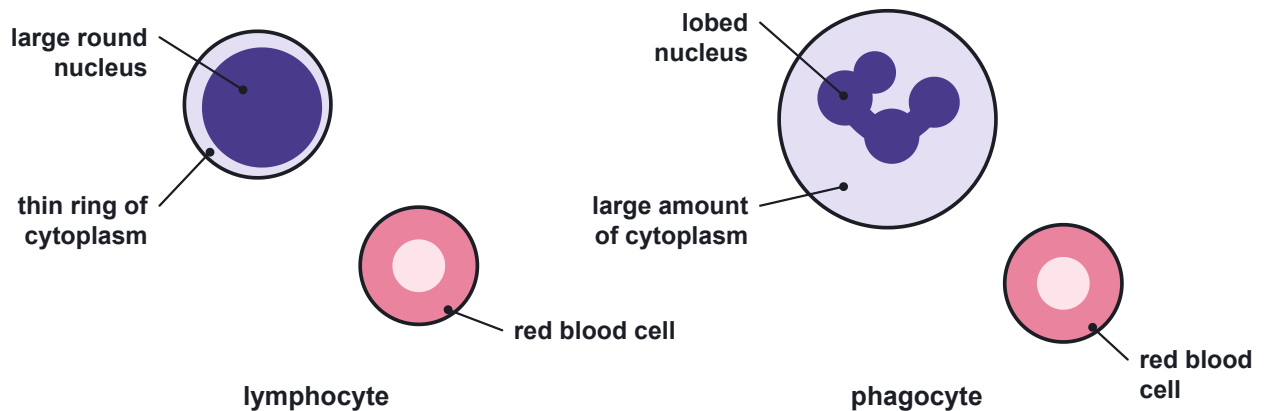
Two types of white blood cell

Supplement

Lymphocytes and phagocytes

Type	How to identify	Function
Lymphocyte	Large round nucleus filling most of the cell, with little cytoplasm	Antibody production
Phagocyte	Lobed or bean-shaped nucleus and a larger amount of cytoplasm	Engulfing pathogens by phagocytosis

Supplement



A **lymphocyte** has a large round nucleus. A **phagocyte** has a lobed nucleus and more cytoplasm.

Supplement

The clotting process

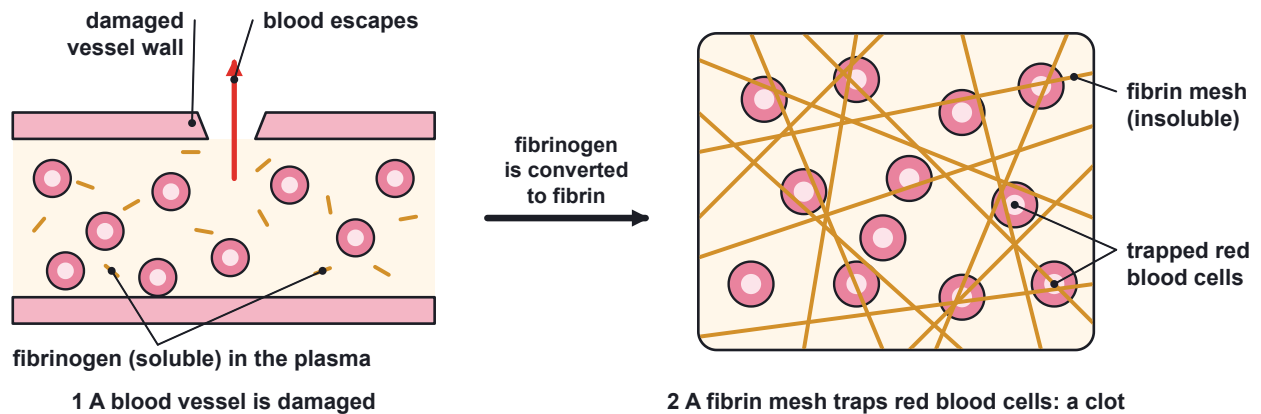
Supplement

Clotting is the conversion of soluble **fibrinogen** to insoluble **fibrin** to form a mesh.

Supplement

1. A blood vessel is damaged and blood escapes.
2. Fibrinogen (a soluble protein in the plasma) is converted to fibrin (insoluble).
3. Fibrin forms a mesh of fibres across the wound.
4. The mesh traps red blood cells and forms a clot, which dries into a scab.

Supplement



Soluble **fibrinogen** is converted to insoluble **fibrin**, which forms a mesh that traps red blood cells.

Supplement

Common mistake: Fibrin is the insoluble mesh. Fibrinogen is the soluble form in the plasma. Do not swap them.

Quick check

1. List the four components of blood.
2. What is the function of haemoglobin?
3. State two roles of blood clotting.
4. **Supplement** What does a phagocyte do?
5. **Supplement** Name the protein converted to fibrin during clotting.

Quick check answers

Blood

1. Red blood cells, white blood cells, platelets and plasma.
2. To transport oxygen in the red blood cells.
3. Prevents blood loss and prevents entry of pathogens.
4. Engulfs pathogens by phagocytosis.
5. Fibrinogen.