*This is the **Higher Separate** version — includes all Higher Tier content (marked ★) and all Separate Science content.*

Blood is a tissue made up of four main components, each with a specific function.

- Red blood cells (erythrocytes): no nucleus, biconcave disc shape, packed with haemoglobin — carry O■ as oxyhaemoglobin.
- White blood cells: phagocytes (engulf and digest pathogens — phagocytosis); lymphocytes (produce antibodies specific to antigens).
- Plasma: yellow liquid that carries: digested food (glucose, amino acids, fatty acids), CO■ (from tissues to lungs), urea (from liver to kidneys), hormones, heat.
- Platelets: cell fragments that help form blood clots at wounds — prevent infection and blood loss.
- Haemoglobin: protein in red blood cells that binds O■ in the lungs (forms oxyhaemoglobin) and releases it in tissues.

■ **Sep** Red blood cells are made in bone marrow and live for ~120 days before being broken down in the liver.

★ **HT + Sep** Haemoglobin dissociation curves show how O■ is loaded and unloaded at different O■ partial pressures.

Key Terms

Haemoglobin	Red protein in red blood cells that binds oxygen — forms oxyhaemoglobin in the lungs
Phagocytosis	Process by which phagocytes engulf and digest pathogens or debris
Antibody	Specific protein produced by lymphocytes that binds to antigens on pathogens
Plasma	Liquid component of blood — carries dissolved substances throughout the body
Platelets	Cell fragments involved in blood clotting at wound sites

■ **Exam Tip:** Adapt answers to the question asked. If asked about red blood cells, mention: no nucleus (more space for haemoglobin), biconcave (increased SA:V ratio for O■ diffusion), haemoglobin present. Include ALL THREE adaptations for full marks.