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

Multicellular organisms need transport systems because diffusion alone is too slow over large distances.

- Double circulatory system: pulmonary (heart→lungs) + systemic (heart→body)
- Right side: deoxygenated blood → lungs. Left side: oxygenated blood → body
- Left ventricle has thicker walls — pumps to whole body at higher pressure
- Arteries: away from heart, thick walls, high pressure. Veins: to heart, valves, low pressure. Capillaries: one cell thick — exchange.
- Blood components: red blood cells (O■), white blood cells (immunity), plasma (transport), platelets (clotting)
- Coronary heart disease: plaque narrows coronary arteries → reduced O■ to heart muscle

Key Terms

Double circulation	Two circuits: pulmonary and systemic — keeps oxygenated/deoxygenated blood separate
Coronary arteries	Supply heart muscle with O■ and glucose

■ **Exam Tip:** Left side = thicker (body). Right side = thinner (lungs). Arteries AWAY, Veins TOWARDS — remember A=Away.