

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

The heart is a muscular pump that drives blood around the body in a double circulatory system.

- Double circulatory system: pulmonary circulation (heart → lungs → heart) and systemic circulation (heart → body → heart).
- Right side: receives deoxygenated blood from body → pumps to lungs.
- Left side: receives oxygenated blood from lungs → pumps to body.
- Four chambers: right atrium, right ventricle, left atrium, left ventricle.
- Left ventricle has THICKER walls — must pump blood all the way around the body at higher pressure.
- Valves (atrioventricular and semilunar) prevent backflow of blood.
- ★ HT Heart rate is controlled by a pacemaker (sino-atrial node, SAN) in the right atrium.
- ★ HT The cardiac cycle: diastole (relaxation, heart fills with blood) → systole (contraction, blood pumped out) → repeat.
- Coronary arteries supply the heart muscle with O<sub>2</sub> and glucose.
- Coronary heart disease: fatty plaques narrow coronary arteries → reduced O<sub>2</sub> to heart → risk of heart attack.
- Treatments for CHD: statins (lower cholesterol), stents (widen artery), bypass surgery, artificial valves, heart transplant.

### Key Terms

<b>Sino-atrial node (SAN)</b>	The heart's natural pacemaker — generates electrical impulses that control heart rate
<b>Cardiac cycle</b>	The sequence of contraction and relaxation that makes up one heartbeat — systole and diastole
<b>Coronary arteries</b>	Blood vessels on the surface of the heart supplying it with oxygen and glucose
<b>Atherosclerosis</b>	Narrowing of arteries by fatty plaques — leads to coronary heart disease
<b>Stent</b>	Small mesh tube inserted into a narrowed artery to hold it open

■ **Exam Tip:** The LEFT side has THICKER walls — it pumps to the BODY (longer distance). The RIGHT side pumps to the LUNGS (nearby). This question comes up regularly in exams.