Heart structure and one-way flow

Student activity • observation and reasoning

YEAR 10 / LESSON 63 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

How does the heart keep pulmonary and systemic blood flowing in the right direction?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, pencil and ruler
- Heart diagram sets showing chambers, valves, septum, coronary supply and the major vessels

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Shared Biology / Double Award: 2.65. Heart structure and function.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

YEAR 10 / LESSON 63 / BIOLOGY + SCIENCE (DOUBLE AWARD)

1. Label atria, ventricles, septum, valves, vena cava, pulmonary artery, pulmonary veins and aorta on a diagram.

2. Trace a red cell from body to right heart, lungs, left heart and back to body.

3. Explain valve opening and closure using pressure differences; valves do not pump blood actively.

4. Compare ventricular wall thickness and relate the left ventricle to systemic pressure and distance.

5. Identify coronary arteries as the heart muscle's own blood supply.

6. Correct the claim that every artery carries oxygenated blood or that the left side of a front-view diagram is necessarily the person's left.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

YEAR 10 / LESSON 63 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Reference and task data

The right ventricle pumps to the lungs; the left ventricle pumps to the body. The septum separates the two sides. Arteries carry blood away from the heart and veins return it, regardless of oxygen content. This lesson uses diagrams/models, not animal dissection.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

YEAR 10 / LESSON 63 / BIOLOGY + SCIENCE (DOUBLE AWARD)

1. Which chamber pumps to lungs?

2. Which pumps to the body?

3. Which vessel returns blood from lungs?

4. Why is the left ventricular wall thicker?

5. What prevents backflow?

6. What supplies oxygen to heart muscle?