

Communication · supported focus

Supported focus · HL

## Supported scope

- Supported HL focus. First assessment 2026; current SL/HL brief acquired. Remaining guide, assessment and practical requirements retain their recorded holds.
- State model conditions and distinguish fictional data from measurements.

# Sport Phys · 1.1

## Reasoning

Heart rate increases during a short exercise bout, then recovers. This time course connects energy demand, oxygen transport and cardiovascular regulation. Start with a prediction. State the quantities or features you would compare, then decide what evidence could distinguish two explanations.

## Sport Phys · 2.1

### Reasoning

Cardiac output is heart rate multiplied by stroke volume .  
Ventilation supports gas exchange, while blood transport delivers oxygen to working tissues. ATP demand changes as muscle activity changes. cardiac output: Blood volume pumped per minute; stroke volume: Blood volume pumped per beat.

## Sport Phys · 3.1

### Reasoning

An acute response occurs during or soon after exercise. A training adaptation develops over repeated sessions. A lower post-exercise heart rate cannot alone establish greater fitness without comparable workload and participant conditions. Use voluntary informed participation, school supervision and an approved low-intensity protocol. Record baseline, a standardized workload and timed recovery measurements. Stop for discomfort and do not use maximal exertion or health diagnosis as a classroom task.

## Sport Phys · 4.1

### Reasoning

State the known values and their units. Choose the relation because its assumptions fit this case, then rearrange before substitution. Known: heart rate is 120 beats per minute and stroke volume 80 millilitres per beat. Cardiac output = heart rate  $\times$  stroke volume =  $120 \times 80 = 9,600$  millilitres per minute = 9.6 litres per minute.

## Sport Phys · 4.2

### Reasoning

Heart rate is 100 beats/min and stroke volume is 70 mL/beat. Find cardiac output in L/min. Use the same sequence: known quantities  $\rightarrow$  model  $\rightarrow$  relation  $\rightarrow$  substitution  $\rightarrow$  unit and interpretation.

# Sport Phys · 5.1

## Reasoning

A heart-rate monitor measures one response, not every dimension of performance. Hydration, stress, medication and recent activity can confound comparisons. Return to the original observation. Explain what the result supports, which conditions it assumes, and one way to test a competing explanation.

## Sport Phys · 5.2

### Reasoning

A single heart-rate reading proves a person fitness level. This claim is false: A heart-rate monitor measures one response, not every dimension of performance. Hydration, stress, medication and recent activity can confound comparisons.

## Sport Phys · 5.3

### Reasoning

Exercise physiology: responses and recovery: An acute response occurs during or soon after exercise. A training adaptation develops over repeated sessions. A lower post-exercise heart rate cannot alone establish greater fitness without comparable workload and participant conditions.

## Sport Phys · diagram



- Original teaching diagram: Exercise physiology: responses and recovery
- Use the labels and the stated model together.

## Sport Phys · original transfer

### Your turn

Fictional records have  $100 \text{ beats/min} \times 70 \text{ mL/beat}$  and  $140 \times 50$ . Compare outputs and explain why heart rate alone cannot determine output or fitness.

## Sport Phys · transfer reasoning

### Method and interpretation

Both give 7 L/min. Output is a product; stroke volume matters. These invented arithmetic examples do not diagnose fitness or health.

## Check yourself

- Explain cardiac output using the stated model.
- Explain stroke volume using the stated model.
- Change one value in the original transfer; explain which assumption still matters.