

Summary

Topic 2.2 Structure and function of the cardiovascular system Current



Subject	Year	Start date	Duration
Sports, exercise and health science	IB1	Week 3, May	6 weeks 12 hours

Course Part

Unit 2: Exercise Physiology

Description

The cardiovascular and ventilatory systems are examples of such systems that work together to regulate variables such as the oxygen content of arterial blood, acid-base status and core body temperature, to name a few. The transport of oxygen is an excellent illustration of the body's systems in action during exercise and this will present a common theme while studying the cardiovascular and ventilatory responses to exercise in this topic. Indeed, the rate at which oxygen is taken into the body and used (known as oxygen uptake, $\dot{V}O_2$) is an excellent indicator of how well these systems are working together. Students will develop knowledge and understanding of how the cardiovascular system adapts to ensure homeostasis is maintained within the body.

Inquiry & Purpose

? Inquiry / Higher Order Questions

Type	Inquiry Questions
Content-based	How does the cardiovascular system work to ensure Homeostasis is maintained at rest and during exercise?

Curriculum

⊕ Aims

Appreciate scientific study and creativity within a global context through stimulating and challenging opportunities

Acquire a body of knowledge, methods and techniques that characterize science and technology

Develop an ability to analyse, evaluate and synthesize scientific information

◇ Objectives

Demonstrate knowledge and understanding of

facts, concepts and terminology

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(IB1)

methodologies and techniques

communicating scientific information

Apply

facts, concepts and terminology

methodologies and techniques

methods of communicating scientific information

Syllabus Content

Core

Topic 2: Exercise physiology

2.2 Structure and function of the cardiovascular system

2.2.1 State the composition of blood.

2.2.2 Distinguish between the functions of erythrocytes, leucocytes and platelets.

2.2.3 Describe the anatomy of the heart with reference to the heart chambers, valves and major blood vessels.

2.2.4 Describe the intrinsic and extrinsic regulation of heart rate and the sequence of excitation of the heart muscle.

2.2.5 Outline the relationship between the pulmonary and systemic circulation.

2.2.6 Describe the relationship between heart rate, cardiac output and stroke volume at rest and during exercise.

2.2.7 Analyse cardiac output, stroke volume and heart rate data for different populations at rest and during exercise.

2.2.8 Explain cardiovascular drift.

2.2.9 Define the terms systolic and diastolic blood pressure.

2.2.10 Analyse systolic and diastolic blood pressure data at rest and during exercise.

2.2.11 Discuss how systolic and diastolic blood pressure respond to dynamic and static exercise.

2.2.12 Compare the distribution of blood at rest and the redistribution of blood during exercise.

2.2.13 Describe the cardiovascular adaptations resulting from endurance exercise training.

2.2.14 Explain maximal oxygen consumption.

2.2.15 Discuss the variability of maximal oxygen consumption in selected groups.

2.2.16 Discuss the variability of maximal oxygen consumption with different modes of exercise.

ATL Skills

Approaches to Learning



Thinking

- In this unit, we will
 - ask students to formulate a reasoned argument to support their opinion or conclusion
 - give students time to think through their answers before asking them for a response
 - reward a new personal understanding, solution or approach to an issue
 - ask open questions
 - set students a task which required higher-order thinking skills (such as analysis or evaluation)
 - build on a specific prior task



Self-management

- In this unit, we will
 - set deadlines for students to meet
 - require students to revise and improve on work previously submitted
 - ask students to break down a larger task into specific steps
 - ask students to look for personal relevance in the subject matter
 - give students feedback on their approach to a task
 - model positive skills and behaviours such as being well organized and punctual
 - help students to learn from failures or mistakes
 - create an atmosphere where students do not think they have to get everything right first time



Research

- In this unit, we will
 - provide opportunities for students to reflect on how they determine the quality of a source, or analyse contradictory sources



Developing IB Learners

Learner Profile



Inquirers



Knowledgeable

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(IB1)



Thinkers



Communicators



Balanced