

Key Elements: Human Biology (Respiratory System)**Estimated Time: 6–8 hours**

By the end of this course, students will have an understanding of the structures and function of the respiratory system.

Vocabulary

alveoli, aortic bodies, bicarbonate ions, bronchi, bronchioles, carbaminohemoglobin, carbon dioxide, carbonic anhydrase, carotid bodies, cilia, diaphragm, exhalation, external respiration, hydrogen ions, inhalation, intercostal (rib) muscles, internal respiration, larynx, lungs, mucus, nasal cavity, oxygen, oxyhemoglobin, pH, pharynx, pleural membrane, reduced hemoglobin, respiratory centre in the medulla oblongata, respiratory tract, ribs, stretch receptors, thoracic cavity, trachea

Knowledge

- structures of the respiratory system and their inter-relationships
- processes of breathing
- internal and external respiration
- role of various substances in stimulating breathing

Skills and Attitudes

- interpret graphs, tables, and diagrams
- demonstrate safe and correct dissection technique
- demonstrate correct use of a compound microscope (e.g., slides showing cilia)
- demonstrate correct use of a dissection microscope (e.g., lung tissue)
- demonstrate proper technique for handling and disposing of laboratory materials
- create models (e.g., inhalation and exhalation, respiratory tract)
- conduct experiments (e.g., to measure vital capacity)
- communicate results (e.g., using tables, graphs, diagrams, lab reports)
- demonstrate ethical, responsible, co-operative behaviour
- show respect for living things

HUMAN BIOLOGY (RESPIRATORY SYSTEM)

Prescribed Learning Outcomes	Suggested Achievement Indicators
<i>It is expected that students will:</i>	<p><i>The following set of indicators may be used to assess student achievement for each corresponding prescribed learning outcome.</i></p> <p><i>Students who have fully met the prescribed learning outcome are able to:</i></p>
C8 analyse the functional inter-relationships of the structures of the respiratory system	<ul style="list-style-type: none"> <input type="checkbox"/> identify and give functions for each of the following: <ul style="list-style-type: none"> – nasal cavity – pharynx – larynx – trachea – bronchi – bronchioles – alveoli – diaphragm and ribs – pleural membranes – thoracic cavity <input type="checkbox"/> explain the roles of cilia and mucus in the respiratory tract <input type="checkbox"/> explain the relationship between the structure and function of alveoli
C9 analyse the processes of breathing	<ul style="list-style-type: none"> <input type="checkbox"/> describe the interactions of the following structures in the breathing process: <ul style="list-style-type: none"> – respiratory centre in the medulla oblongata – lungs – pleural membranes – diaphragm – intercostal (rib) muscles – stretch receptors <input type="checkbox"/> compare the processes of inhalation and exhalation <input type="checkbox"/> explain the roles of carbon dioxide and hydrogen ions in stimulating the respiratory centre in the medulla oblongata <input type="checkbox"/> explain the roles of oxygen, carbon dioxide, and hydrogen ions in stimulating carotid and aortic bodies
C10 analyse internal and external respiration	<ul style="list-style-type: none"> <input type="checkbox"/> describe the exchange of carbon dioxide and oxygen during internal and external respiration, including <ul style="list-style-type: none"> – location of exchange – conditions that favour exchange (e.g., pH, temperature) <input type="checkbox"/> explain the roles of oxyhemoglobin, carbaminohemoglobin, reduced hemoglobin, bicarbonate ions, and carbonic anhydrase in the transport of carbon dioxide and oxygen in the blood <input type="checkbox"/> write the chemical equations for internal and external respiration