



Learning Journey – 8B Cellular Respiration

What have I done previously in my learning journey?			
Previously....	You have learnt previously about cells, body systems and the processes needed to keep organisms alive. This has involved: - Identifying cells as the fundamental units of living organisms and describing the functions of key cell structures. - Explaining that multicellular organisms are organised into cells, tissues, organs and organ systems. - Describing the structure and function of the human digestive system and how it provides nutrients needed by the body. - Describing the structure and function of the respiratory system, including how gases are exchanged in the lungs. - Explaining how substances move into and out of cells by diffusion. - Understanding that living organisms require food and oxygen to survive, grow and carry out life processes.		
In this topic...	You will learn about cellular respiration, the process that releases energy needed for life. This will involve learning about: - how food and oxygen are used by cells to release energy through aerobic respiration - the role of respiration in supporting life processes such as movement, growth, repair and keeping warm - the relationship between the respiratory system, digestive system and cells - how the products of respiration can be identified and used as evidence that respiration has occurred - how exercise affects the body, including breathing rate and heart rate - what happens when there is not enough oxygen available for aerobic respiration - how anaerobic respiration releases energy and why it can lead to muscle fatigue - how different activities and sports place varying demands on the body's energy supply - how scientists use observations, measurements and evidence to investigate respiration and its effects on the body.		
We will develop our learning by studying the following each lesson:		British Values	Skills in Science checklist
8B.01 Aerobic Respiration - Recall and interpret the word equation for aerobic respiration. - Describe how glucose and oxygen are transported to cells for respiration. - Explain why respiration is essential for life processes using the respiration equation.		☐ Democracy ☐ Rule of law ☐ Tolerance ☐ Individual liberty ☐ Mutual respect	☐ Development of scientific thinking ☐ Experimental skills and strategies ☐ Analysis and evaluation ☐ Scientific literacy ☐ Maths skills
8A.02 Anaerobic Respiration - Recall the word equations for aerobic and anaerobic respiration in humans. - Describe why anaerobic respiration occurs when insufficient oxygen is available. - Explain the advantages and limitations of aerobic and anaerobic respiration during different types of exercise.		☐ Democracy ☐ Rule of law ☐ Tolerance ☐ Individual liberty ☐ Mutual respect	☐ Development of scientific thinking ☐ Experimental skills and strategies ☐ Analysis and evaluation ☐ Scientific literacy ☐ Maths skills
8B.03 Fermentation - Recall the word equation for anaerobic respiration in yeast. - Investigate how temperature affects the rate of anaerobic respiration in yeast. - Explain how the process of fermentation is used in food and drink production.		☐ Democracy ☐ Rule of law ☐ Tolerance ☐ Individual liberty ☐ Mutual respect	☐ Development of scientific thinking ☐ Experimental skills and strategies ☐ Analysis and evaluation ☐ Scientific literacy ☐ Maths skills

Key Words									
Aerobic respiration	Carbon dioxide	Glucose	Mitochondria	Oxygen	Anaerobic respiration	Fatigue	Lactic acid	Recovery	Sprinting
Ethanol	Fermentation	Microorganism	Temperature	Yeast					

Future Learning	At GCSE you will build on your knowledge of aerobic and anaerobic respiration by learning how cells use respiration to provide the energy needed for all life processes. You will explore the relationship between
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	respiration and exercise, including how the body responds to increased demand for energy. You will learn how aerobic respiration transfers energy efficiently when oxygen is available and how anaerobic respiration occurs when oxygen supply is limited. You will also investigate the role of the circulatory and respiratory systems in supplying glucose and oxygen to cells and removing the products of respiration. Building on your understanding of fermentation, you will study how microorganisms use anaerobic respiration and how these processes are applied in biotechnology and food production. You will use scientific evidence to explain the effects of exercise on the body and evaluate the factors that influence the rate of respiration.
In careers	Understanding respiration is important in many careers linked to health, sport and food production. Sports scientists use knowledge of aerobic and anaerobic respiration to improve athletic performance and training programmes (average salary £25,000–£50,000+). Physiotherapists apply their understanding of respiration, muscles and exercise to help people recover from injury and improve physical fitness (average salary £28,000–£50,000+). The study of fermentation is important in careers such as food scientists and brewers, who use microorganisms to produce foods and drinks safely and efficiently (average salary £25,000–£45,000+). Knowledge of respiration is also used by doctors (£40,000–£126,000+) and biomedical scientists (£28,000–£50,000+) to understand how the body releases energy and responds to disease, exercise and changing environmental conditions.