

IB Biology Y2 - MHS Subject Group Overview

Unit Name	Unit 1 Internal Assessment (IA)	Unit 2 Cell Energetics	Unit 3 Cell Development	Unit 4 Genetics and Molecular Biology	Unit 5 Interactions & Interdependence	Unit 6 Responding to the Environment	Exams/ Review
Time	Ongoing Due March 2023	5 weeks	5 weeks	5 weeks	5 weeks	5 weeks	5 weeks May 2023 IB Exam
IB Topics	Objectives 1, 2, 3, 4,	2.1, 2.5, 2.8, 2.9, 6.1	1.1, 1.2, 2.6, 2.7 3.1-3.3, 5.1- 5.2	2.4, 2.7, 3.1, 3.4, 3.5, 5.3-5.4	4.1-4.4	6.2, 6.3, 6.5, 6.6	1.1-6.6
	<p>Scientific investigation The internal assessment, worth 20% of the final assessment, consists of one scientific investigation. This individual investigation will cover a topic that is commensurate with the level of the course of study.</p> <p>Student work is internally assessed by the teacher and externally moderated by the IB.</p> <p>Internal Assessment Components Set by IB Biology Guide</p>	<p>Statement of Inquiry: Research is continuously being conducted to find novel applications for enzymes that will promote human health and wellness.</p> <p>Phenomenon: Industrial production of lactose-free milk – Enzymes have become more important to the production of items that are needed by populations around the world.</p> <p>Crosscutting Concepts: Structure and Function</p>	<p>Statement of Inquiry: Stem cell research offers great promise for understanding basic mechanisms of human development & differentiation, as well as the hope for new treatments for diseases.</p> <p>Phenomenon: The causes and effects of sickle cell anemia – A base substitution mutation drives significant phenotypic change in humans.</p> <p>Crosscutting Concepts: Structure & Function</p>	<p>Statement of Inquiry: Advancements in biotechnology supports complex research into the inheritance patterns and genetics of all living things.</p> <p>Phenomenon: Somatic Cell Cloning –Dolly the sheep was a highly-publicized and successful mammalian clone from an adult cell.</p> <p>Crosscutting Concepts: <ul style="list-style-type: none"> ■ Systems and System models ■ Patterns Stability and Change </p>	<p>Statement of Inquiry: In recent years, the underlying biochemical unity of all plants, animals and microbes has become increasingly apparent.</p> <p>Phenomenon: The Great Barrier Reef as a microcosm of the diversity of life– Organisms adapt to changing conditions and are sensitive to stress imposed by humans.</p> <p>Crosscutting Concepts: Interactions and Equilibrium</p>	<p>Statement of Inquiry: The physiology of the Immune, endocrine, and nervous systems allow humans to maintain homeostasis in a changing environment.</p> <p>Phenomenon: Zika virus and Microcephaly—An arbovirus as an emerging threat to developmental neurobiology and reproductive endocrinology.</p> <p>Crosscutting Concepts: Cause and Effect Structure and Function Systems and System models</p>	<p>Review all Topics</p> <p>Unit summative assessments & IB Exam</p>

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	<p>Duration: 10 hours</p> <p>Weighting: 20%</p> <ul style="list-style-type: none"> ■ Individual Investigations <p>IA Criteria:</p> <ul style="list-style-type: none"> ■ Personal Engagement 8% ■ Exploration 25% ■ Analysis 25% ■ Evaluation 25% ■ Communication 17% 	<p>Interactions and Equilibrium Stability and Change</p> <p>Core Ideas: Enzymes, Digestive Systems, DNA Replication, Protein Synthesis (enzymatic focus)</p> <p>Cellular Energy: Photosynthesis, Respiration, Fermentation</p> <p>SEP: Asking Questions and Defining Problems Developing & Using Models Constructing Explanations</p>	<p>Core Ideas: Cell Cycle, DNA replication, Meiosis, Asexual Reproduction</p> <p>SEP: Asking Questions and Defining Problems</p> <ul style="list-style-type: none"> ■ Carry out Investigations <p>Engage in Argument from Evidence Analyze & Interpret Data</p>	<p>Core Ideas: Mendel and Inheritance, Chromosomal Inheritance Patterns and Abnormalities, Regulation of Gene expression, Protein Synthesis, Biotechnology Applications</p> <p>SEP: Asking Questions & Defining Problems Constructing Explanations Carry out Investigations</p>	<p>Patterns</p> <p>Core Ideas: Ecosystem Structure and function, Nutrient Cycling and Energy Flow, Community Ecology, Climate change and Human Impact</p> <p>SEP: Asking Questions and Defining Problems Developing & Using Models Constructing Explanations Carry out Investigations</p>	<p>Core Ideas: Cell Signaling and Regulation, Hormones, Nervous System and impulses, Immune System, Clotting</p> <p>SEP:</p> <ul style="list-style-type: none"> ■ Asking Questions and Defining Problems ■ Constructing Explanations ■ Carry Out Investigations 	
<p>Assessments / Major Projects</p>	<p>Internal Assessment Final Report</p>	<p>Group 4 Project The Group 4 project is a collaborative interdisciplinary activity</p>	<p>Data analysis: Human Genome project: base sequencing analysis Debate: ethical considerations</p>	<p>Design Lab: Survival of the black fin icefish and antifreeze proteins</p>	<p>Design Lab: Quadrat study and chi-square analysis to determine biodiversity ■ Practicum: Designing a mesocosm experiment</p>	<p>Virtual labs and in class labs - respiration and activity</p>	<p>Unit Summative Assessments IA & IB Exam</p>

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Level Specific Differentiation ALL UNITS	Marietta City Schools teachers provide specific differentiation of learning experiences for all students. Details for differentiation for learning experiences are included on the district unit planners.
Resources	Damon, A.; McGonegal, R.; Tosto, P.; Ward, W. <i>Standard level biology</i> ; Pearson Education Limited: Harlow, Essex, 2014, Greenwood, T.; Pryor, K.; Bainbridge-Smith, L.; Allan, R. Environmental science: student workbook; Biozone International: Hamilton, New Zealand, 2013 Van de Lagemaat, R. www.inthinking.net : Andorra la Vella, Andorra, 2019 IB Biology Schoology Course Hodder Study and Revision Guide for IB Biology Hodder IA Textbook Internal Assessment for Biology (Purchased 2020-2021) Campbell Biology Savvas Online Textbook (Purchased 2021-2022) Discovery Education District Purchased Resources – Life Science and Chemistry Resources