

## MCS IB Physics Y2 Subject Group Overview

Unit Name	Measurement and Uncertainty	Electricity and magnetism	Internal assessment	Thermal Physics	Energy Production	Atomic and Nuclear Physics	Exams and Review
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Time Frame	2 weeks	8 weeks	3 weeks	4 weeks	5 weeks	7 weeks	3 weeks
Standards/ IB Topics	1.1, 1.2, 1.3	5.1, 5.2, 5.3, 5.4	IA	3.1, 3.2	8.1, 8.2	7.1, 7.2, 7.3	All topics
<p style="font-size: small; margin: 0;">Content Specific Information (texts, documents, methods)</p>	<p><b>Statement of Inquiry</b> Measurement is a process of detecting an unknown physical quantity by using a standard quantity.</p> <p><b>Phenomenon:</b> A plane can “fly blind” and arrive safely at the correct location simply by using vector coordinates.</p> <p><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>● Scale, Proportion, and Quantity</li> <li>● Systems and System Models</li> </ul> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>● Units and the metric system</li> <li>● Precise measurements</li> <li>● Errors and</li> </ul>	<p><b>Statement of Inquiry</b> The various manifestations of electricity are the result of the accumulation or motion of numbers of electrons.</p> <p><b>Phenomenon:</b> Energy can be efficiently transferred through the use of moving electrons.</p> <p><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>● Cause and Effect</li> <li>● Systems and System models</li> </ul> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>● Charges and electric fields</li> <li>● Coulomb’s Law</li> <li>● Current and Potential Difference</li> <li>● Circuits</li> <li>● Ohm’s and Kirchoff’s Laws</li> <li>● Resistivity</li> <li>● Internal resistance of a cell</li> <li>● Magnetic fields and forces</li> </ul>	<p><b>Scientific Investigation</b></p> <p>The IA, 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>Assessed by the teacher, and externally moderated by the IB.</p> <p><b>IA Component</b> Duration: 10 hours Weighting: 20% Individual investigation.</p>	<p><b>Statement of Inquiry</b> Energy may exist in potential, kinetic, thermal, electrical, chemical, nuclear, or other various forms.</p> <p><b>Phenomenon:</b> Power plants harness temperature differences to generate electrical power.</p> <p><b>Crosscutting Concepts</b></p> <ul style="list-style-type: none"> <li>● Systems and System Models</li> <li>● Energy and Matter</li> </ul> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>● Temperature</li> <li>● Internal energy</li> <li>● Specific heat capacity and specific latent heat</li> <li>● Pressure</li> <li>● Ideal gas equation</li> <li>● Kinetic model of ideal gas</li> <li>● The mole</li> </ul>	<p><b>Statement of Inquiry</b> Some energy will be lost to surroundings and will not be used to perform useful work.</p> <p><b>Phenomenon:</b> The Earth will run out of non-renewable energy much sooner than we think.</p> <p><b>CORE IDEAS</b></p> <ul style="list-style-type: none"> <li>● Sankey Diagrams</li> <li>● Black body radiation</li> <li>● Albedo and emissivity</li> <li>● The solar constant and greenhouse effect</li> <li>● Forms of renewable energy and resources</li> </ul>	<p><b>Statement of Inquiry</b> The energy of a photon is dependent on its frequency.</p> <p><b>Phenomenon:</b> Matter is made up of many fundamental particles.</p> <p><b>Core Ideas</b></p> <ul style="list-style-type: none"> <li>● Energy levels</li> <li>● Radioactive decay</li> <li>● Isotopes</li> <li>● Mass defect and binding energy</li> <li>● Nuclear fission and fusion</li> <li>● Quarks, lepton, and their antiparticles</li> <li>● Conservation laws</li> <li>● Exchange particles</li> <li>● Feynman diagrams</li> </ul>	<p><b>Review all previous topics</b></p> <p><b>Topics summative assessments</b></p> <p><b>Practice IB exams</b></p>

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	Uncertainties <ul style="list-style-type: none"> <li>● Vectors vs scalars</li> <li>● Combining vectors</li> </ul>						
Common Assessments/ Major Projects	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Planning and Carrying out investigations  Analyzing & interpreting data  Constructing Explanations  Use mathematics and computational thinking  Obtaining, evaluating and	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Carry out Investigations  Analyzing & interpreting data  Use mathematics and computational thinking Engage in Argument from Evidence  Obtaining, evaluating and communicating information	<b>IA Criteria</b> Personal engagement:8% Exploration: 25% Analysis: 25% Evaluation: 25% Communication: 17%  Internal Assessment final report	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Carry out Investigations  Analyzing & interpreting data  Use mathematics and computational thinking  Engage in Argument from Evidence  Obtaining, evaluating and communicating information	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Carry out Investigations  Analyzing & interpreting data  Use mathematics and computational thinking  Engage in Argument from Evidence  Obtaining, evaluating and communicating information	Internal Assessment Preparation  Practice IB Exams  <b>SEP</b> Asking Questions and Defining Problems  Developing & Using Models  Carry out Investigations  Analyzing & interpreting data  Use mathematics and computational thinking  Engage in Argument from Evidence  Obtaining, evaluating and	IA and IB Exam

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	communicating information					communicating information	
<b>Level Specific Differentiation</b>	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.						
<b>Resources</b>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Pearson IB Physics textbook (problems and labs)</li> </ul>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Pearson IB Physics textbook (problems and labs)</li> </ul>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Pearson IB Physics textbook (problems and labs)</li> </ul>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Pearson IB Physics textbook (problems and labs)</li> </ul>	<ul style="list-style-type: none"> <li>Schoology Course Page</li> <li>Pearson IB Physics textbook (problems and labs)</li> </ul>	Schoology Course Page	Schoology Course Page