



Suzhou Singapore International School
MYP Scope and Sequence

Science

2009 – 2010 v1.0 – December 2009

Last Updated:

16th December 2009



SSIS Scope and Sequence

Grade 6 MYP Science



Overview

→ Averaging 19 weeks per semester (38 weeks per year)

→ End of semester varies dependent upon Chinese New Year – Units may need to be moved accordingly

month week	Aug	September				October				November				December			January		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
SEMESTER 1	How do Scientists work? 7 Weeks							Acids & Alkalis 5 Weeks					Cells & Reproduction 6 Weeks						

month week	February			March				April				May				June			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
SEMESTER 2	Forces 5 Weeks			Simple Chemical Reactions 6 Weeks						Solar System 5 Weeks				Reproduction 4 Weeks					

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Unit of Work	SSIS OILs	IB Framework	Unit Skills, Content or Knowledge	Common Assessments
How Scientists Work Booklet: How Scientists Work	1,2,3,4,5	MYP Area of Interaction Human Ingenuity SLE Identify the processes involved in innovation, creation, development, and change, recognizing the contexts in which these processes are used.	Unit Question(s): How Do Scientists Work? 1. Recognize potentially dangerous situations. 2. Make measurements using a range of appropriate instruments 3. Explain the reason for each laboratory rule 4. Recognize and name common pieces of equipment 5. Understanding 'Fair Tests' and state the steps in the scientific investigations 6. Draw line graphs and bar graphs by hand	1. Pendulum Lab report 2. Unit Test 3. Lab Safety Poster 4. How can scientific technology improve our lives research project.
Acids and Bases Chapter 7E	2,3,4,5	Environment (Acid Rain) SLE Examine, illustrate and explain the effects of human actions, attitudes, and constructs on the environment	What is the Impact of Acids and Bases on humans and their environment? 1. General properties of acids and bases 2. Acids and bases in daily life 3. Indicators- what they are and using them 4. pH scale (acidic and alkali) 5. How acids react with metals 6. Testing for gases and neutralization reactions	1. Concentration of acid Lab report 2. Unit Test 3. Presentation – acid rain
Cells and Variation Chapter 7A	1,2,3,4	Approaches to Learning	How Does Technology Impact Our Understanding of Cells? 1. Be able to use a microscope	1. specialized cell poster 2. essay – organ donation 3. unit test

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			<ol style="list-style-type: none"> 2. Know the similarities and differences between plant and animal cells 3. Understand why cells need to become specialized 4. Describe the reproduction of cells (meiosis and mitosis) 5. Understand the organization of cells into tissues and organs 6. Introduction of ethical issues in science 	
Forces and their Effects Chapter 7K	2,3,4,5	Human Ingenuity	<p style="text-align: center;">How Do Forces Impact Human Engineering?</p> <ol style="list-style-type: none"> 1. Define what forces are and how to differentiate between them: friction, upthrust, weight, applied force. 2. Be able to calculate the speed of an object by examining the relationship between time and distance 3. That the Earth and objects are pulled towards each other; this is called gravity and this gravitational pull causes objects to have weight 4. When an object is submerged in water the water provides an upthrust, and when it floats its weight acting downwards balances the upthrust. 	<ol style="list-style-type: none"> 1. Friction poster 2. Spaghetti bridge lab report 3. Unit test
Simple Chemical Reactions Chapter 7F	2,3,4,5	Environment	<p style="text-align: center;">How Do Chemical Reactions Impact Our Lives?</p> <ol style="list-style-type: none"> 1. Know that there are physical and chemical changes 2. Know that physical changes are easy to reverse and do not involve the formation of new substances 3. Know that chemical changes are difficult to reverse and will involve the formation of new substances 4. Be able to represent reactions using word equations 5. Know the causes of fire (heat/fuel/oxygen) and how 	<ol style="list-style-type: none"> 1. Sodium Thiosulfate Lab 2. Fire project 3. Unit test

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			<p>they are extinguished</p> <p>6. Observing the concentrations of reactions and their affect on the speed of the reaction</p>	
<p>Solar System and Beyond</p> <p>Chapter 7L</p>	2,3	Human Ingenuity	<p>What's Our Place in the Universe?</p> <ol style="list-style-type: none"> 1. Be able to identify the components of the solar system. 2. Be able to describe the effect of the Earth's axis on seasons and daylight. 3. Be able to describe orbits of the planets, moon and other celestial bodies and discuss it's affect on Earth 4. Describe the phases of the Moon and its affect on the Earth. 5. Understand the concept of distance and scale in relation to planetary spacing from the Sun 	<ol style="list-style-type: none"> 1. planet project 2. evolution of astronomical equipment 3. unit test
<p>Reproduction</p> <p>Chapter 7B</p>	1,2,3,4,5	Health and Social Education	<p>How Do We Develop as Individuals Through Puberty?</p> <ol style="list-style-type: none"> 1. Describe the difference between external and internal fertilization and the functions of the human reproductive organs. 2. Explain how sperm and egg cells are specialized and how they provide the baby with the characteristics of their parents. 3. Describe the menstrual cycle and explain the role of the placenta 4. Describe the stages that occur from the egg leaving the ovary until the baby is born. 5. Know about the stages of human growth and development. 6. Understand about the changes that occur during 	<ol style="list-style-type: none"> 1. Presentation 2. birthing technology investigation 3. unit test

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			puberty.	
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SSIS Scope and Sequence

Grade 7 MYP Science



Overview

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
SEMESTER 1	Unit 1: Respiration 6 weeks					Unit 2: Atoms, Elements, Compounds, Mixtures 7 weeks							Unit 3: Light & Sound 6 weeks						

month week	February			March				April				May				June		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SEMESTER 2	Unit 4: Heating & Cooling 5 weeks			Unit 5: Microbes 6 weeks						Unit 6: Environment 2 weeks		Unit 7: Electricity 3 weeks			Unit 8: Magnetism 3 weeks			

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Unit of Work	SSIS OILs	IB Framework	Unit Skills, Content or Knowledge	Common Assessments
Respiration Chapter 8B P17-28	1,2,3,4,5	Health and Social Education SLE Actively practice healthy habits that reflect personal lifestyle choices.	Unit Question: How Can I Keep My Heart and Lungs Healthy? 1. Understand how we can keep a healthy heart and lungs. 2. Understand the importance of the Respiratory and Circulatory systems on our health. 3. Understand the importance of exercise on the cardiovascular system. 4. Dissection of a mammalian heart and lung. 5. Investigate inhaled and exhaled air. 6. Know how plant and animal cells release energy.	1. End of Unit Test 2. Lab Report: Effects of Exercise 3. One World Essay: Atherosclerosis
Atoms, Elements, Compounds, & Mixtures Chapter 8E & 8F P49-74	2,3,4,5	Human Ingenuity SLE Demonstrate some understanding of the term 'ingenious', and give a few examples of how it relates to human creativity	Unit Question: Why are there so many substances when there are only 100 elements? 1. Understand that there is a huge range of materials that are made from only 100 elements. 2. A basic understanding of the particle model (structure). 3. The idea of ionic (give /take) and covalent (sharing) bonding (structure/pattern). 4. Explain some of the uses of elements. 5. Determine the melting point of a substance using a cooling curve. 6. Classify metals and non-metals based on properties. 7. Design a lab. 8. Working safely and effectively as a group.	1. End of Unit Test 2. Lab Report: Salt and Water's Boiling Point 3. Element Advertisement 4. Element Poster

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<p style="text-align: center;">Light & Sound</p> <p style="text-align: center;">Chapter 8K & 8L</p> <p style="text-align: center;">P125-148</p>	<p style="text-align: center;">1,2,3,4,5</p>	<p style="text-align: center;">Human Ingenuity</p>	<p>Unit Question: What are the Uses of Light and Sound in Modern Technology?</p> <ol style="list-style-type: none"> 1. Understand that both light and sound travel in waves. 2. Understand opaque, transparent and translucent (patterns). 3. Draw and label waves including crest, trough, amplitude and frequency. 4. Use of sound meters and the oscilloscope. 5. Explain reflection using plane mirrors, and concave and convex mirrors. 6. Explain how sound waves travel through a solid, liquid, gases and vacuum. 7. Discuss sight and sound hearing deficits and how they can be improved and prevented. 	<ol style="list-style-type: none"> 1. One World Essay: Ban of the Incandescent Light Bulb 2. Light and Sound Unit Test 3. Lab Report: To be determined
<p style="text-align: center;">Heating and Cooling</p> <p style="text-align: center;">Chapter 8I</p> <p style="text-align: center;">P97-112</p>	<p style="text-align: center;">2,3,4,5</p>	<p style="text-align: center;">Community and Service</p>	<p>Unit Question: How Can We Use Thermal Energy in Our Daily Lives?</p> <ol style="list-style-type: none"> 1. How materials lose and gain heat. 2. Thermal energy travels by conduction, convection, evaporation and radiation (energy/patterns) 3. Which types of materials are good and poor insulators. 4. Draw and interpret line graphs and interpret data. 5. Understanding the change of state in water: ice, liquid water, steam/vapour 6. Uses of insulators and infrared radiation 7. Investigate the effectiveness of different types of insulation, controlling relevant variables 	<ol style="list-style-type: none"> 1. Poster: reduction of Energy Waste 2. End of Unit test 3. Lab Report: How does the concentration of solutes affect boiling point of water

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<p>Microbes Chapter 8C P29-38</p>	<p>1,2,3,4,5</p>	<p>Health & Social education</p>	<p>How can I keep myself healthy during flu season?</p> <ol style="list-style-type: none"> 1. What are microorganisms? How do they grow? 2. What are some ways in which microorganisms are harmful or helpful? 3. How do our bodies protect us from disease? 4. What can we do to keep ourselves healthy? 5. What is immunity? How do we develop an immune system? 6. What are vaccines and how do they work? 	<ol style="list-style-type: none"> 1. Disease poster 2. End of unit test 3. Yeast laboratory exercise 4. One world essay: To vaccinate or not to vaccinate?
<p>Environment In house unit</p>	<p>1,2,3</p>	<p>Environments</p>	<p>How can I help make the world greener?</p> <ol style="list-style-type: none"> 1. How can garbage be used for useful purposes? 2. How is garbage broken down? 3. How much garbage is created making the things I need? 4. What are some ways in which I can help reduce my effect on the planet? 	<ol style="list-style-type: none"> 1. End of unit test 2. One world essay: to be determined
<p>Electricity Chapter 7J P111-124</p>	<p>2,3,4,5</p>	<p>Approaches to Learning</p>	<p>How do we use electricity to make our lives better?</p> <ol style="list-style-type: none"> 1. What are circuits? How do they work 2. What is electricity? 3. What are some different types of circuits? 4. How do batteries work in a circuit? 5. What are limitations of models? 6. What are some useful circuits in everyday life? 	<ol style="list-style-type: none"> 1. end of unit test 2. lab report: what is the relationship between current and resistance? 3. Poster: a useful circuit



SSIS Scope and Sequence

Grade 8 MYP Science



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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
SEMESTER 1	Unit 1 Plants for Food 6 weeks					Unit 2: Speeding Up 4 weeks				Unit 3: Reactions of Metals 6 weeks						Unit 4: Food & Digestion 5 weeks			

month week	February			March				April				May				June		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SEMESTER 2	Unit 4: Food & Digestion 5 weeks	Unit 5: Pressure & Moments 6 weeks						Unit 6: Using Chemistry 5 weeks				Unit 7: Inheritance & Selection 3 weeks			Unit 8: Drugs & Behavior 3 weeks			

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Unit of Work	SSIS OILs	IB Framework	Unit Skills, Content or Knowledge	Common Assessments
Plants for Food Chapter 9D P43-54	1,2,3,4,5	Environments SLE Examine and discuss the effects of human actions on the environments Evaluate problems and issues in a specific environment and begin to develop habits that help address issues concerning environments	Unit Question: How can we feed the world? 1. What are food chains and food webs? How does each animal affect the other animals in a food web? 2. What are the implications of food management on other organisms in the environment. 3. What are some considerations between development and sustainability?	1. End of unit test 2. Design an experiment to test one factor that affects photosynthesis 3. Processing data collected from an online photosynthesis activity 4. One World Poster: World food crisis
Speeding Up Chapter 9K P129-138	3,4,5	Approaches to Learning SLE Analyze and discuss various considerations behind a creation or innovation	Unit Question: How can the motion of an object be described and explained? 1. How do forces affect speed? How can you calculate how fast an object is moving? 2. How can we increase speed? 3. How do force diagrams and graphs explain the movement of objects? 4. Unbalanced forces give rise to changes in shape, size or motion	1. Lab report: How does mass affect acceleration? 2. End of unit test 3. Streamlined poster

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<p>Reactivity of Metals</p> <p>Chapters 9E & 9F</p> <p>P55-78</p>	<p>2,3,4,5</p>	<p>Approaches to Learning</p>	<p>Unit Question: How can we identify the differences in properties and reactivity of different metals?</p> <ol style="list-style-type: none"> 1. Chemical Reactions take place at different speeds. 2. Metals can be listed in order of reactivity called a reactivity series. 3. Identify differences between metals and non-metals 4. Represent chemical reactions by word and/or symbol equations 5. Why are metals useful? 6. Why do metals tarnish? 7. What happens when metals react with water? Acid? 	<ol style="list-style-type: none"> 1. Metal Fact Sheet – students research a metal and present in in a poster form 2. End of unit test 3. Lab Report: carry out a lab to quantitatively compare the reactivity of metals.
<p>Food and Digestion</p> <p>Chapter 8A</p> <p>P7-16</p>	<p>2,3,4,5</p>	<p>Health and Social Education</p>	<p>Unit Question: How can we improve our health through our choice of diet?</p> <ol style="list-style-type: none"> 1. What is a balanced diet? 2. What are the food groups? Why do we need to eat from all food groups? 3. How does your lifestyle impact on your dietary requirements 4. How can you test food for carbohydrates (glucose / starch), fats, and protein? 5. What are the organs of the digestive system? What is their specific job? 6. What are enzymes? What affects the operation of enzymes? 	<ol style="list-style-type: none"> 1. End of unit test 2. Lab report: rate of enzyme activity 3. Healthy meal planning activity

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<p>Pressure & Moments</p> <p>Chapter 9L P139-150</p>	<p>1,2,3,4,5</p>	<p>Human Ingenuity</p>	<p>Unit Question: How do we use our knowledge of forces to help us?</p> <ol style="list-style-type: none"> 1. What is pressure? How is it related to force? 2. How does atmospheric pressure affect our weight? 3. How do levers work? What are some examples of levers in the world? 4. How is moment (turning effect) calculated? What factors affect moment? 5. Determine the force, moment, or pressure in simple problems. 	<ol style="list-style-type: none"> 1. End of unit test 2. Essay: Are hydraulic exoskeletons a good idea? 3. Lever poster 4. Lab Report: what is the relationship between mass, distance from a fulcrum, and moment?
<p>Using Chemistry</p> <p>Chapter 9H P93-104</p>	<p>1,2,3,4,5</p>	<p>Human Ingenuity</p>	<p>Unit Question: What happens when we use chemistry to create new products?</p> <ol style="list-style-type: none"> 1. What changes occur in chemical reactions? 2. How are chemical reactions used as a source of energy? 3. What are some advantages and disadvantages of fuels 4. A range of new materials are created using chemical reactions 5. Mass is conserved in chemical reactions 	<ol style="list-style-type: none"> 1. One world presentation: consequences of using coal for power. 2. End of unit test 3. Lab Report: conservation of mass – burning magnesium

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<p>Inheritance & Selection</p> <p>Chapter 9A P7-16</p>	<p>1,2,3,5</p>		<p>Unit Question: How are our traits inherited and what are the causes of variation in animal and plant populations?</p> <ol style="list-style-type: none"> 1. Where are my traits/characteristics from? 2. How is genetic information passed on from one generation to the next? 3. How and why have humans artificially selected animals with particular traits for use in the modern world? 4. How do plants reproduce? What is asexual reproduction? 5. There are dominant and recessive traits. 6. What are some genetic disorders and how are they caused? 	<ol style="list-style-type: none"> 1. End of unit test 2. Lab report: Pea Pod Lab 3. Essay: amniocentesis 4. Genetic Disease presentation
<p>Behavior & Drugs</p> <p>Chapter 9B P17-32</p>	<p>1,2,3</p>	<p>Health & Social Education</p>	<p>Unit Question: How do drugs affect my body?</p> <ol style="list-style-type: none"> 1. How is information carried through my body? How do drugs affect this? 2. What are the parts of the nervous system? 3. What are reflexes? 4. What is tolerance? 5. What is addiction? Why is it difficult to quit using durgs? 	<ol style="list-style-type: none"> 1. Presentation on a drug 2. End of unit test 3. Essay: What are the benefits and risks of morphine? 4. Lab Report: testing your reflexes



SSIS Scope and Sequence

Grade 9 Science



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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SEMESTER 1	Biology Cellular activity (6 weeks) Note: Camp will occur within this unit block					Chemistry Atomic Structure (3 weeks) Separation of matter (3 weeks)					Physics Measurement (1 week) Forces and Motion (5 weeks)							

month week	February			March				April				May			June			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SEMESTER 2	Biology Humans are responsible for our environment (5 weeks)			Chemistry Heat & Energy (5 weeks)				Physics Energy (1.7 weeks) Thermal Physics (3.3 weeks)				MYP Exams	Projects					

Note: All classes will study the assigned biology, chemistry and physics units each semester. The sequence of the three units for each class varies, ensuring that enough resources are available for each class.

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Unit of Work	SSIS OILs	IB Framework	Unit Skills, Content or Knowledge	Common Assessments
Cellular activity	1, 2, 3, 4, 5	Human Ingenuity	<p>Unit Question How has technology impacted our understanding of cellular activity?</p> <p>Content Cellular structure Movement of materials into and out of cells Enzymes (More detail on skills and content are present on the unit planner)</p>	<p>C- End of unit test</p> <p>D + E + F – Transport in tissues or Enzyme lab</p>
Humans are responsible for our environment	1, 2, 3, 4, 5	Environments	<p>Unit Question What is the human responsibility to the environment?</p> <p>Content Ecosystem relationships Energy transfer and Feeding relationships Nutrient cycles within ecosystems Human influences in the environment Use of biological resources</p>	<p>A + B – One world essay on human impact of our environment(s)</p> <p>C- End of unit test</p>

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			(More detail on skills and content are present on the unit planner)	
Atomic Structure (Sem. 1)	2, 3, 4, 5	Human Ingenuity	<p>UNIT QUESTION How can the atom be used to predict the properties of chemical substances?</p> <p>CONTENT</p> <ol style="list-style-type: none"> 1. Learn the names, symbols and uses of 35 common elements 2. Understand what a molecule is and how elements combine to make them 3. Understand how the model of the atom has changed over time 4. Predict the reactivity of an element based upon its structure 5. Describe how the Periodic Table was created 	<ol style="list-style-type: none"> 1. Design an experiment to classify an element as a metal, non-metal or metalloid 2. Present a particular element, its properties and uses in real life 3. Recall knowledge and understanding 4. Perform laboratory skills proficiently and safely
Separation of Matter (Sem. 1)	1, 2, 3, 4, 5	Environments	<p>UNIT QUESTION How does the knowledge of classifying matter assist in cleaning up a polluted environment</p> <p>CONTENT</p> <ol style="list-style-type: none"> 1. Differences between physical and chemical properties 2. Telling whether or not a chemical reaction occurred. 3. Classification of mixtures of matter 4. Separation methods of matter 	<ol style="list-style-type: none"> 1. Designing a procedure to separate an unknown mixture 2. Presenting a separation method and how it might be used to clean up environmental pollution 3. Recall knowledge and understanding 4. Perform laboratory skills proficiently and safely

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<p>Heat and Energy (Sem. 2)</p>	<p style="text-align: center;">2, 3, 4, 5</p>	<p style="text-align: center;">Human Ingenuity</p>	<p style="text-align: center;">UNIT QUESTION How does the study of energy help us understand the machines we use every day?</p> <p style="text-align: center;">CONTENT</p> <ol style="list-style-type: none"> 1. endothermic versus exothermic reactions 2. measuring the heat of reaction 3. making and breaking bonds, energy of activation 4. oxidation and reduction reactions 5. the voltaic cell 	<ol style="list-style-type: none"> 1. Present a source of energy and how it is used in everyday life 2. Create the best possible battery out of normal everyday materials 3. Recall knowledge and understanding 4. Perform laboratory skills proficiently and safely
<p>Measurement</p>	<p style="text-align: center;">3,4,5</p>	<p style="text-align: center;">Human Ingenuity</p>	<p>Can we know how good our data is when we measure and perform calculations on our results?</p> <ul style="list-style-type: none"> • Make and record measurements including values, uncertainties and units • Deal appropriately with uncertainties • Understand the nature errors • Understand the nature of random errors • Understand how to minimize errors • Process numerical data to the correct precision • Draw and graphs (including error analysis) 	<ol style="list-style-type: none"> 1. Questions in the end of unit test 2. Assessed during the investigation

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<p>Forces and Motion</p>	<p>1,2,3,4,5</p>	<p>Human Ingenuity</p>	<p>How do things move? Why do things move?</p> <ul style="list-style-type: none"> • describe the ways in which a force may change the motion or shape of a body • describe the turning effect of a force • Add vectors to determine a resultant • show familiarity with the idea of the mass of a body • plot and interpret a speed/time graph • recognise linear motion for which the acceleration is constant and calculate the acceleration • Use the equations of motion to solve problems relating to bodies moving with constant acceleration • describe qualitatively the effect of air resistance and friction • Use the concepts behind Newton’s laws to explain and predict the behaviour of objects and systems. 	<ol style="list-style-type: none"> 1. End of unit test 2. Investigation of the motion of an object on a slope
<p>Energy</p>	<p>1,2,3</p>	<p>Environments</p>	<p>What is energy? What does it do? Where do we get it? What problems arise from our use of energy?</p> <ul style="list-style-type: none"> • give examples of energy in different forms, its conversion and conservation and apply the principle of energy conservation to simple examples • Calculate the energy of moving objects or objects moved against a force • describe processes by which electricity can be generated including conventional and alternative sources • Understand the concept of energy efficiency and apply it to specific examples. • relate, with calculation, power to work done and time taken, using appropriate examples 	<ol style="list-style-type: none"> 1. One World Essay 2. End of unit test

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<p>Thermal Physics</p>	<p>3,4,5</p>	<p>Human Ingenuity</p>	<p>How does an understanding of the particle theory help our study of physics</p> <ul style="list-style-type: none"> • relate the properties of solids, liquids and gases to the forces and distances between molecules and to the motion of the molecules • describe evaporation in terms of the escape of more-energetic molecules from the surface of a liquid • relate the change in volume of a gas to change in pressure applied to the gas at constant temperature • describe qualitatively the thermal expansion of solids, liquids and gases • appreciate how a physical property which varies with temperature may be used for the measurement of temperature and state examples of such properties • describe an experiment to measure the specific heat capacity of a substance • describe experiments to demonstrate the properties of good and bad conductors of heat • give a simple molecular account of heat transfer and relate the theory to practical situations 	<ol style="list-style-type: none"> 1. End of unit test 2. Investigation involving heat transfer
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SSIS Scope and Sequence

G10 MYP Science



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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
SEMESTER 1	G10 Science Rotation 1				CAMPS	(Genetics Revolution, Radioactivity / Waves, Acids & Bases)				G10 Science Rotation 2 (Genetics Revolution, Radioactivity / Waves, Acids & Bases)				G10 Science Rotation 3					

month week	February			March			April			May			June					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
SEMESTER 2	(Genetics Revolution, Radioactivity / Waves, Acids & Bases)			Advanced Biology												HS Exams		
Advanced Physics																		
Advanced Chemistry																		
G10 Science Rotation 4																		

Grade 10 MYP Science

Unit of Work	SSIS OILs	IB Framework	Unit Skills, Content or Knowledge	Common Assessments
Unit Title Radioactivity	1,2,3,5	Human Ingenuity <i>deliberate and make judgements on the use and consequences of systems, solutions and products created by humans</i>	Unit Question: How can I make judgements on the balance between the risks and benefits of science and technology? 1. The content focus of the unit <ul style="list-style-type: none"> • The Physics of Radioactivity • Radioactivity and Power Generation • The Uses and Dangers of Radioactivity 	A,B: One World Essay "Is Nuclear Power a viable solution to the problem of generating sufficient electricity" C: Unit Test on Radioactivity

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Waves	3,4,5	<p>Human Ingenuity <i>analyse and make judgements on the impact of innovation and creation on individuals, communities, societies and the world from both positive and negative perspectives.</i></p>	<p>Unit Question: How can we use science and the applications of science to extend human perceptions?</p> <ul style="list-style-type: none"> • describe what is meant by wave motion as illustrated by vibration in ropes, springs and by experiments using water waves • explain the meaning of terms associated with waves • describe the use of water waves to show (i) reflection at a plane surface (ii) refraction due to a change of speed (iii) diffraction produced by wide and narrow gaps • perform calculations relating to waves • describe the formation, and give the characteristics, of an optical image by a plane mirror * perform simple constructions, measurements and calculations • describe an experimental demonstration of the refraction of light • describe internal and total internal reflection • describe the action of optical fibres • describe the action of a thin converging lens on a beam of light • draw ray diagrams to illustrate the formation of an image by a single lens • give a qualitative account of the dispersion of light as illustrated by the action on light of a glass prism • describe the main features of the electromagnetic spectrum and state that all e.m. waves travel with the same high speed in vacuo • describe the production of sound by vibrating sources • show an understanding that a medium is required in order to transmit sound waves • describe an experiment to determine the speed of sound in air • relate the loudness and pitch of sound waves to amplitude and frequency 	<ol style="list-style-type: none"> 1. C: End of Topic Test 2. D/E: Investigation – The properties of a lens
Rates of Reaction (Sem 1)	1, 2, 3, 4, 5	<p>MYP – AoI Human Ingenuity</p>	<p style="text-align: center;">UNIT QUESTION</p> <p style="text-align: center;">What conditions are optimal for obtaining the optimal chemical reaction rate</p> <p style="text-align: center;">CONTENT</p> <ol style="list-style-type: none"> 1. collision and kinetic molecular theories 2. Describe how changing a factor (temperature, pressure, concentration, surface area, presence of a catalyst) affects the rate of a reaction 3. in order to measure one of the affecting factors 	<ol style="list-style-type: none"> 1. Investigate how one of the factors changes the rate of reaction 2. Investigating a chemical industrial process and its benefits/usefulness/drawbacks to global society

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			<p>(mentioned under assessments), all other factors must be held constant</p> <p>4. understand the concepts of energy of activation and energetic pathway</p>	<p>3. Recall knowledge and understanding</p> <p>4. Perform laboratory skills proficiently and safely</p>
<p>Acids and Bases</p> <p>(Sem 1)</p>	<p>1,2,3,4,5</p>	<p>MYP – AoI</p> <p>The Environment</p>	<p>UNIT QUESTION</p> <p>What are the effects of human activity (i.e. acidic and basic pollution) on our environment</p> <p>CONTENT</p> <ol style="list-style-type: none"> How acids and bases are created in nature Properties of acids and bases Naming of acids and bases Neutralization and indicators Measuring the strength of acids and bases 	<ol style="list-style-type: none"> Present an industrial process that creates acidic or basic pollution and detail its effects upon the environment Design an experiment that compares the relative strengths of acids and bases Recall knowledge and understanding Perform laboratory skills proficiently and safely
<p>Naming and Types of Reactions</p> <p>(Sem 2 – gen. sci. and adv. chem.)</p>	<p>2,3,4,5</p>	<p>MYP – AoI</p> <p>Human Ingenuity</p>	<p>UNIT QUESTION</p> <p>How can we predict the products of a chemical reaction?</p> <p>CONTENT</p> <ol style="list-style-type: none"> Ionic and covalent bonding (creating chemical names and formulas that are correct) predicting the products of a reaction based upon given reactants balancing equations and following the law of conservation of mass the difference between complete and incomplete combustion 	<ol style="list-style-type: none"> Designing an experiment and analyzing the results for a pattern in metal reactivity Recall knowledge and understanding Perform laboratory skills proficiently and safely

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<p style="text-align: center;">Gases (Sem 2 – adv. chem.)</p>	<p style="text-align: center;">2,3,4,5</p>	<p>MYP – AoI Environments</p>	<p style="text-align: center;">UNIT QUESTION How does one change in one property of a gas affect the other properties of a gas?</p> <p style="text-align: center;">CONTENT</p> <ol style="list-style-type: none"> 1. understanding collision and kinetic molecular theory 2. what “pressure” is, how it is measured, how it can be affected 3. How changing pressure, volume, temperature and amount of gas can affect the properties of a gas 4. How the properties of a gas mixture are based upon its individual components 	<ol style="list-style-type: none"> 1. Design an experiment to compare how changing one gas property affects another 2. Recall knowledge and understanding 3. Perform laboratory skills proficiently and safely
<p>Unit Title</p> <p>The genetics revolution (Semester 1)</p>	<p style="text-align: center;">1, 2, 3</p>	<p>Health and social education</p> <p><i>defend and advocate a stance on a particular issue.</i></p>	<p>Unit Question: How can our understanding of genetics improve the quality of our lives?</p> <p>Reproduction</p> <p>Differences between sexual and asexual reproduction Review male and female reproductive systems with a view of fertilization to produce a embryo, Structure of a typical dicotyledonous flower Significance of pollination → seed dispersal</p> <p>Inheritance</p> <p>Cell, nucleus, chromosome, DNA, genetic code is universal, mutations, link to natural selection, Meiosis Genetic terminology – work of Gregor Mendel, Genetic problems using the 7 steps – determination of sex, monohybrid problems Inherited diseases with related genetics problems, Interpret family pedigrees Drosophila simulation lab</p> <p>Evolution</p>	<p>A and B – One world essay on the use of genetics-based technologies to solve global problems.</p> <p>C - End of unit test</p>

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			<p>Definition – species change over time How natural selection causes evolution Examples of observed selection → evolution Evolution of bacteria</p> <p>Use of biological resources</p> <p>Selective breeding - causing change for human needs – plants and animals</p>	
<p>Unit Title</p> <p>Human Health (Semester 2)</p>	<p>2, 3, 4, 5</p>	<p>Approaches to learning</p>	<p>Unit Question(s)</p> <p>What further knowledge and skills do I need to help me be more successful in grades 11 and 12?</p> <p>1. The content focus of the unit</p> <p>Reproduction – sexually transmitted diseases, contraception, fertility drugs, IV fertilization, sexual health,</p> <p>Disease – preventing infection, destroying germs, immunity, antibodies and pregnancy testing, AIDS, drug abuse, solvents, alcohol,</p> <p>2. Essential knowledge required to successfully complete assessments – as above</p> <p>3. Key skills to be developed throughout unit</p> <p>Communication, lab design, data collection and processing, conclusion and evaluation, manipulative skills, personal skills – individual and group, ICT science skills, data based</p>	<p>Lab work (4/5)</p> <p>A written lab report (4)</p> <p>Examination (2, 3)</p>

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			question,	
Electricity	3, 4, 5	Human Ingenuity	<p>How can we make use of the effects observed when electricity flows?</p> <ul style="list-style-type: none"> • Understand the role of the components in a circuit • Understand the ways that components may be connected (series and parallel) • Know how to measure potential difference and current. • Understand the relationship between pd and current • Understand the factors affecting resistance • Perform calculations involving pd, current, resistance, heat and power and relate these to the cost of electricity • Understand the dangers of electricity and the ways that these may be avoided or minimized. • Investigate the thermal, magnetic and chemical effects of effects of an electric current • Understand the applications of electrical heating and electrolysis. • Understand some applications of electromagnetism (electromagnets, motors, relays) 	<ol style="list-style-type: none"> 1. End of unit test 2. investigation – relationship between pd and current 3. investigation – investigate an effect of an electric. current