

IB Advanced Biology 2 Curriculum Map

Month	Content/Unit	Essential Question	Materials	Skills	Standards,	Assessment
August	Review Adv Bio I topics Review the last unit covered in Adv Bio 1	What are units covered during Advanced Biology I?	Notebooks, texts, labs from Advanced Biology I			Review Exam II or just Remotes Quiz on major objectives from Adv Bio 1
	Evolution	What are the four major processes that are needed for spontaneous origin of life on earth? What experiment did Urey and Miller conduct? What is panspermia? What locations on earth that might have allowed the synthesis of organic compounds? What is a protobiont? How could primitive prokaryotes have contributed to an oxygen rich environment? What is the endosymbiotic theory?	Evol PPT Video: How Life Began		D.1.1 D1.2 D1.3 D1.4 ESLR 1.1 D1.6 D1.7 D1.8	Quiz Early Life Origins

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		<p>What evidence supports it?</p> <p>What is a modern definition of evolution?</p> <p>What are the major categories of evidence used to support evolution of species?</p> <p>What is the difference between analogous and homologous structures?</p> <p>How can biochemical evidence provided by the universality of DNA and protein structures be used to explain common ancestry?</p>		<p>Comparisons and Contrast</p>	<p>5.4.1</p> <p>5.4.2</p> <p>ESLR</p> <p>2.5</p> <p>2.4</p> <p>2.1</p> <p>D5.6</p> <p>D5.2</p>	<p>Quiz Evidence for Evol</p>
		<p>How can variations in specific molecules be used to indicate phylogeny?</p>	<p>Clustal X Activity</p>	<p>Use of Bioinformatic tools to construct a cladogram</p>	<p>D5.3</p> <p>ESLR 4.1, 4.2, 4.3, 5.1</p>	<p>Lab Fish Protein Cladograms</p>
		<p>What are molecular clocks?</p>	<p>Mt. Clock Lab</p>	<p>Calculate age of Mitochondrial Eve</p>	<p>D5.4</p>	
		<p>What significance is the</p>			<p>5.4.3</p>	

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		<p>overproduction of offspring to evolution? How does Sexual Reproduction promotes variation? What is natural selection? How does it lead to evolution? How does antibiotic resistance show evolution due to environmental change? What is another? What is an allele frequency?</p> <p>What is a gene pool? And relate it to how evolution occurs. What is a modern definition of a species? What are barriers between gene pools? What is adaptive radiation? What is the difference between divergent and</p>		<p>Use of HW Equation to calculate gene frequency</p>	<p>5.4.4 5.4.5 5.4.6 5.4.7 5.4.8 D2.1 ESLR 1.2 D2.2 D2.3 D2.4, 2.5, 2.6 D 2.7 D2.8</p>	<p>HW on Hardy Weinburg Equation</p>

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		<p>convergent evolution? What drives it?</p> <p>What are gradualism and punctuated equilibrium?</p> <p>What is a transient polymorphism?</p> <p>Why is sickle-celled anemia an example of a balanced polymorphism?</p> <p>What are the characteristics of a non-evolving population?</p> <p>What is the gene frequencies of a the carriers of a recessive disease if the frequency of the disease is 1/10,000?</p> <p>Why are organisms classified?</p> <p>What is a clade? What are cladistics?</p> <p>How can a cladogram be constructed and what can you conclude from the diagram?</p>	<p>Lab: PV 92 Alu PCR</p> <p>Lab Classification Key Construction</p> <p>Cladogram W.S.</p> <p>Lab Fish Protein Cladograms</p>	<p>Calculating genetic frequencies using the HW equation.</p> <p>Construction of Classification Key</p> <p>Constructing a Cladogram using characteristic</p>	<p>D2.9</p> <p>D2.10</p> <p>D2.11</p> <p>D4.3</p> <p>D 4.2 ESLR 1.2 3.3</p> <p>D5.1 ESLR 1.1, 2.1, 2.2, 2.3, 2.4, 2.5 D5.5</p> <p>D5.7 D5.8 D5.9 D5.10</p>	<p>Lab Report PV 92 Alu PCR</p> <p>Classification Key to major plant and animal groups</p> <p>Cladogram W.S</p> <p>Lab Report Fish Proteins</p>

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		<p>How can Carbon 14 and Potassium 40 be used to date rocks and fossils?</p> <p>What is half life?</p> <p>What are the anatomical features that make humans primates?</p> <p>What are the trends of the fossils of Ardipithecus ramidus, Australopithecus afarensis, A. africanus, Homo habilus, H. erectus, H. neanderthalensis, and H.sapiens</p> <p>Did any of the mentioned species overlap?</p> <p>What uncertainties are there in the human fossil record?</p> <p>What change was there</p>	<p>Graphs, Data, and Charts</p>	<p>matrix and bioinformatic tools.</p> <p>Graph interpretation using half lives.</p>	<p>ESLR 1.2, 2.2,</p> <p>D 3.1</p> <p>ESLR 1.1</p> <p>D3.2</p> <p>D3.3</p> <p>D3.4</p> <p>D3.5</p> <p>ESLR 3.2, 3.4,2.3</p> <p>2.1</p> <p>D3.6</p> <p>D 3.7</p> <p>D3.8</p>	<p>Graph interpretations</p> <p>Essay on hominid trends.</p>

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	Plants	in diet and brain size during hominid evolution?			D3.9	
		What is the difference between genetic and cultural evolution?			D3.10	Exam on Evolution
		What role has the previous had on modern human evolution?			9.1.1 ESLR 1.3 9.1.1	Quiz plant structure
		What are the parts of a dicot plant?	Plant I PPT			
		How are the tissues distributed in the dicot plant?				
		What are the major differences between a monocot and dicot plant?	Lab Monocot/Dicot plants	Measuring under the microscope	9.1.2	Lab report Monocot/Dicot Plants
		What is the structure of a dicot leaf? What are the functions of the tissues there?			9.1.3	Quiz Dicot leaf
		What are the parts of a dicot flower?		Use of a dissecting microscope	9.3.1	Quiz Dicot Flower
		What are the functions of root, stems, and leaves like bulbs, stem tubers, storage roots, and			9.1.4	

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		<p>tendrils? What are the differences between lateral and apical meristems? How does Auxin (IAA) effect phototropism? How can a root generate a large surface area? How are minerals moved into a root? How do plants support themselves that live on land? What is transpiration?</p>	<p>Plant II PPT</p>		<p>9.1.5 9.1.6 9.1..7 9.2.1 9.2.2 9.2.4</p>	
		<p>How does water get to the top of a very tall tree? How do guard cells open and close? What effect does light, temperature, wind, and humidity have on rate of transpiration</p>	<p>Lab Transpiration and stomata analysis</p> <p>Group Report</p>	<p>Construction of Apparatus to measure change in volume</p> <p>Collaboration</p>	<p>9.2.5 Design, DCP and CE ESLR 1.2 1.3 9.2.6 ESLR 1.3, 2.2,2.4 9.2.7 9.2.8 9.2.9 ESLR</p>	<p>Lab Report Transpiration</p> <p>Group Eval Rubric</p>

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	Endocrine System	What are four adaptations of Xerophytes?	Endocrine Poster Handout. Endocrine PPT		9.2.10	Quiz Seed Diagram
		What is the source to sink theory?		9.2.11		
		What is the difference between pollination, fertilization, and seed dispersal?		9.3.2		
		What are the parts of a dicot seed?		9.3.3		
		What are the steps in seed germination?		9.3.4		
		How is flowering controlled by day length?		9.3.5		
		What is the difference between endocrine and exocrine glands?		9.3.6	Exam Plants	
		How can homeostasis be achieved in terms of glucose?		6.5.7	Endocrine Poster Eval Rubric	
		How can negative feedback work to control a hormone?		6.5.8		
		How can homeostasis be maintained in terms of temperature?		6.5.11		
			6.5.9	Quiz Exocrine vs. Endocrine		
			6.5.10			

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	Digestion	What is the difference between type I and type II diabetes			6.5.12	
		What are the three major types of hormones?			H1.2	
		What are the mode of action of steroid hormones and protein hormones?			H1.3	Quiz Mode of Action of Hormones
		What is the relationship between the hypothalamus and the pituitary gland?			H1.4	
		How is the release of ADH regulated			H1.5	Exam Endocrine
		Why do we need digestion?	Digestion PPT		6.1.1	
		Why are enzymes needed?			6.1.2	
	How does a protease, amylase, and lipase function?	How many people have Salivary Amylase Lab		6.1.3	Lab Report Salivary Amylase	
	What are the divisions of a human digestive system?	Rat Dissection		Safe use of Dissection Equipment	Design, DCP, CE ESLR 1.2, 1.1, 2.3, 4.3 6.1.4 ESLR 3.2, 3.3,	Lab Report: Rat Dissection

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		<p>What are the functions of the stomach, small and large intestine?</p> <p>What is the difference between absorption and assimilation?</p> <p>How does the structure of a villus aid in absorption and transport of the products of digestion/</p> <p>What glands secrete digestive juices into the alimentary canal?</p> <p>What are the structure of exocrine cells?</p> <p>What is the difference in composition of saliva, gastric juice, and pancreatic juice?</p> <p>How do nerves and hormones influence the secretion of digestive juices?</p> <p>How do membrane bound enzymes on the surface of epithelial cells work in the small</p>	Drawing of Ileum and Villus	<p>Skinning, Classification.</p> <p>Drawing</p>	<p>6.1.5</p> <p>6.1.6</p> <p>6.1.7 ESLR 2.2, 2.1</p> <p>H2</p> <p>H2.2</p> <p>H2.3</p> <p>H2.4</p> <p>H2.5</p>	<p>Drawings</p> <p>Quiz Digestive Anatomy</p>

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	Liver	intestine? Why can't cellulose be digested? Why are pepsin and trypsin synthesized as an inactive precursors? How does H. pylori cause stomach ulcers? If lipid digestion has to work in a hydrophilic environment, how does bile aide in this happening? What is the structure of the ileum?	Role of Bile Activity		H2.6	Quiz Digestion 2
				H2.7		
				H2.8		
				H2.9	Lab Report Bile Salts Function	
				H3.1		
		How does the ileum absorb and transport food? What can be absorbed and which can not and are egested?	Liver PPT		H3.2 H3.3	Exam Digestion
		What route does blood take as it moves from the digestive system into and out of the liver?		H3.4		
		How does the liver help regulate levels of		H4.1	Quiz Diagram of Blood flow from Digestive system through the liver.	
				H4.2		

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	Circulation and Transport	nutrients in the blood? What role does the liver play in storing nutrients, iron, vitamen A and D?			H4.3	
		What does the liver make?			H4.4	
		What role does the liver play in detoxification			H4.5	
		How does the liver recycle the iron from hemoglobin and make bile?			H4.6	
		What does alcohol do to the liver if you drink too much/			H4.7 ESLR 5.3	Exam on Liver Functions
		What is the path of blood through the heart?	Circulatory PPT	Dissection	6.2.1	Quiz Chambers of the Heart
		How does the heart get oxygen to it's muscle?			6.2.2	
		How does the heart move blood?	Heart Dissection		6.2.3 ESLR 2.2	Heart Lab Report
		How does the heart control it's beat?			6.2.4	
		What is the similarities and differences of arteries, veins, and capillaries?			6.2.5	Quiz on Vessels

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		<p>What are the major components of blood?</p> <p>What is transported in the blood?</p> <p>What is a pathogen?</p> <p>Why can't antibiotics treat viral infections?</p> <p>How can the skin and mucous membranes protect against infection?</p> <p>How do the phagocytic leucocytes ingest pathogens?</p> <p>What are the difference between antigens and antibodies?</p> <p>How are antibodies produced?</p> <p>How does HIV work?</p> <p>What impact does it have (HIV/AIDS)</p> <p>How does blood clot?</p> <p>What is challenge and response, clonal selection, and memory</p>	<p>Blood Typing and Pressure Lab</p> <p>ELISA Lab</p>	<p>Typing of ABO Blood Typing</p> <p>Conduct an ELISA test to look for antibodies</p>	<p>6.2.6 ESLR 4.3, 2.3, 6.2.7</p> <p>6.3.1 6.3.2</p> <p>6.3.3</p> <p>6.3.4</p> <p>6.3.5</p> <p>6.3.6</p> <p>6.3.7 6.3.8 ESLR 1.2, 2.4, 3.3, 5.1 11.1.1 11.1.2</p>	<p>Lab Report Blood Typing and Pressure</p> <p>Quiz Immune Reponse</p> <p>Lab Report HIV Antibody Detection Quiz HIV and Life Cycle</p>

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	Respiration	cells? What is the difference between active and passive immunity? How are monoclonal antibodies produced?			11.1.3	
		How do vaccines protect us? What are some dangers with vaccinations?	Vaccine Posters		11.1.4 11.1.5 11.1.6 11.1.7 ESLR	Vaccine poster Eval
		What is the difference between ventilation, gas exchange, and cell respiration? Explain the need for a ventilation system Why is the structure of alveoli important to gas exchange?			6.4.1	Exam Circulatory Quiz Human Respiratory Anatomy
		What is the structure of the human ventilation system?	Lung Volume Lab		6.4.2 6.4.3	
		How do people breath?			6.4.4	Lab Report Lung Vol
	Excretory System	What is excetion?	Excretory PPT		6.4.5	Quiz Breathing
		What is the structure of a human kidney?			11.3.1 11.3.2	Quiz Excretory System Diagram

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	Reproduction	What is the structure of a glomerulus and nephron?	Reproduction and Development PPT	Diagram a Nephron	11.3.3	Quiz Glomerulus	
		What is ultrafiltration?			11.3.4	Nephron Posters	
		What is osmoregulation?			11.3.5		
		How does the proximal convoluted tubule reabsorb glucose, water and salts?			11.3.6		
		How does the loop of Henle, collecting duct and ADH work together to regulate water balance?				11.3.7	Quiz Nephron
		What are the differences in the conc. Of proteins, glucose, and urea between blood, glomerular filtrate and urine?				11.3.8	
		Why would there be a large amount of glucose in the urine in an untreated diabetic?				11.3.9	Exam Excretion
		What is the structure of male and female reproductive anatomy?				6.6.1 ESLR 2.2	Quiz Male Anatomy Quiz Female Anatomy
		What is the role of hormones in regulating				6.6.2 6.6.3	Quiz Menstral Cycle

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		egg release in females? What are three roles of testosterone in males? How does IVF work? What are some ethical issues with IVF			6.6.4 6.6.5 6.6.6	
		Where is testosterone produced? What is the structure of a seminiferous tubule? What is spermatogenesis? What is the role of LH testosterone and FSH in spermatogenesis?	Lab Gametogenesis		11.4.1 11.4.2 11.4.8 11.4.3	Male Hormone Quiz
		What is the structural anatomy of an ovary? What is oogenesis? What is the structure of a mature egg and sperm? What do the male reproductive glands provide to the semen? How does an egg insure that only one sperm fertilizes one egg? How does HCG maintain			11.4.4 11.4.5 11.4.8 11.4.6 11.4.7 11.4.9 11.4.10	Ovary Diagram Quiz

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	Nervous and Movement	early pregnancy? What are the stages of development from fertilization to implantation?	Lab Embryology		11.4.11	Lab Report Embryology
		How does the placenta work? What roll does it play in maintaining pregnancy?			11.4.12 11.4.14	
		What roll does the amniotic sac play?			11.4.13	
		How does birth take place? What hormones regulate it?	Stages of Labor Video		11.4.15	Exam Repro and Dev
		What is the difference between the CNS and PNS?	Nervous PPT		6.5.1	
		What is the structure of a neuron?			6.5.2	Quiz Neuron
		How are nerve impulses conducted?			6.5.3	
		What is a resting potential and action potential?			6.5.4 6.5.5	Quiz Action Potential
		How does synapsis work?			6.5.6	Quiz Synapse
		What is the roll of bones, ligaments, muscles,	Movement PPT		11.2.1	

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	Ecology	tendons, and nerves play in movement?	Ecology PPT		11.2.2 11.2.3 11.2.4	Quiz Human Elbow			
What is the structure of a human elbow?									
What is the difference between a hip joint and an knee joint?									
What is the structure and function of a sarcomere?		Food chain and Web Posters				11.2.5 11.2.6 11.2.7 11.2.8	Quiz Sarcomere		
How could you conclude the state of contraction by looking at an EM of a sarcomere?									
What is a species, habitat, population, community, ecosystem?								5.1.1	Exam Nervous and Movement
What is the difference between an autotroph and heterotrophy?								5.1.2	
What are consumers, detritovores, and saprotrophs?								5.1.3	
What is a food chain? Give three examples with each having 3 linkages								5.1.4	Poster Eval
What is a food web?								5.1.5	

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		What are trophic levels?			5.1.8	Quiz Food Webs
		How is energy moved in the ecosystem? How much moves from level to level?			5.1.6 5.1.7 5.1.10 5.1.11	
		What role do detritivores and prototrophs play in nutrient recycling?			5.1.14	Quiz Energy Pyramids
		What is the carbon cycle?	Posters Carbon Cycle		5.2.1	
		What has happened to the level of Carbon Dioxide over time?			5.2.2	Poster Eval
		What is the enhanced Greenhouse effect?			5.2.3	
		What is the precautionary principle?			5.2.4	
		How do the Precautionary Principle give justification for strong action posed by the Greenhouse Effect?			5.2.5	
		What is the increase in global temperature doing to the Arctic			5.2.6	Quiz Greenhouse Effect

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		<p>Ecosystems? What role does natality, immigration, mortality and emigration have on populations? What is a sigmoid growth curve?</p> <p>Why is there an exponential growth phase, plateau phase, and transitional phase between? What are three factors that limit population increase?</p>	<p>Bacteria Growth Activity and Graphing</p>	<p>Use of a spectrophotometer to measure Optical Density at 600nm</p>	<p>5.3.1</p> <p>5.3.2</p> <p>5.3.3</p> <p>5.3.4</p>	<p>Lab Report Bacterial Population Growth</p> <p>Exam Ecology</p>