Year 12 Human Biology 2021
Topic Outline

Topic: Evidence for Evolution (Term 3 weeks 2-5)

*Pre-reading: Prior to the beginning of this topic, students should read *Human Perspectives* Chapter 10 and 11

Week	Lesson	Syllabus Links	Lesson Content / Assessments	Study/Homework
2	A	Science Inquiry Skills Conduct investigations, including the use of virtual or real biotechnological techniques of polymerase chain reaction (PCR), gel electrophoresis for deoxyribonucleic acid (DNA) sequencing, and techniques for absolute and relative dating, safely, competently and methodically for valid and reliable collection of data Represent data in useful and meaningful ways; organise and analyse data to identify trends, patterns and relationships; discuss ways in which measurement error, instrument accuracy, the nature of procedure and sample size may influence uncertainty and limitations in data; and select, synthesise and use evidence to make and justify conclusions Interpret a range of scientific and media texts, and evaluate models, processes, claims and conclusions by considering the quality of available evidence; and use reasoning to construct scientific arguments Select, use and/or construct appropriate representations, including phylogenetic trees, to communicate conceptual understanding, solve problems and make predictions. Science as a Human Endeavour Developments in Biotechnology have increased access to genetic information of species, populations and individuals, existing now or in the past, the interpretation and use of which may be open to ethical considerations Developments in the fields of comparative genomics, comparative biochemistry and bioinformatics have enabled identification of further evidence for evolutionary relationships, which help refine existing models and theories Science Understanding: Evidence for Evolution Biotechnological techniques provide evidence for evolution by using PCR, bacterial enzymes and gel electrophoresis to facilitate DNA sequencing of genomes Comparative studies of DNA (genomic and mitochondrial), proteins and anatomy, provide additional evidence for evolution; genomic information enables the construction of phylogenetic trees showing evolutionary relationships between groups The fossils record is incomplete and cannot represent the entire biodiversity of a time or a location due to many factors that affect fossil formation, persistence of fossils and accessibility to fossilised remains Sequencing a fossil record requires a combination of relative and absolute dating techniques to locate fossils onto a geological time line Both relative and absolute dating techniques, including stratigraphy and index fossils, and absolute dating techniques, including radiocarbon dating and potassium-argon dating, have limitations of application Science Understanding Hominid evolutionary trends Humans as primates are classified in the same taxonomic family as the great apes. The species within the family are differentiated by DNA nucleotide sequences, which brings about differences in: Relative size of cerebral cortex Mobility of digits Locomotion – adaptations to bipedalism and quadrupedalism Prognathism and Dentition	*End of prior topic*	You should spend a minimum of 30 min per day, 5 days a week on your Human Biology study. Aim to: • Read through the textbook chapter(s) before starting the topic. • Read through your notes each day. • Complete, mark and correct the review worksheets given in class • Practice writing out processes and drawing flow diagrams. • Do the *Review* and *Apply your Knowledge* questions from the textbook as you go • Do the Past exam questions given. Do any revision given or suggested by your teacher before tasks.
	B		Intro to biotechnology and comparative genomics as evidence for evolution Comparative genomics	
	C		Mitochondrial DNA Ubiquitous Proteins	
	D		Fossil Formation Fossil discovery	
3	A		Absolute Dating – radiocarbon dating	
	B		Absolute Dating – potassium argon dating	
	C		Relative dating – Stratigraphy Relative dating – Fluorine dating Limitations of the fossil record	
	D		Comparative anatomy – embryology Comparative anatomy – homologous structures Comparative anatomy – vestigial structures	
4	A		Phylogenetic trees	
	B		Science Inquiry Simulation: Amino Acid Sequencing	
	C		***Task 11: Science Inquiry – Biotechnological Techniques***	
	D		Intro What are Primates? Classifying Primates Characteristics of Primates	
5	A		Evolutionary Trends within the primates Digits, Dentition, Vision Cerebral Cortex size Gestation and Parental Care	
	B		Revision for Upcoming Tests Do relevant WACE Study Guide questions Do Practice Test in WACE Study Guide	
	C		Revision for Upcoming Tests Do relevant WACE Study Guide questions Do Practice Test in WACE Study Guide	
	D		**Task 12: Test – Evidence for Evolution**	

Assessments: **Thursday 12th August (week 4) Task 11: Science Inquiry - Biotechnological Techniques (includes some content on Evidence for Evolution)**
Friday 20th August (week 5) Task 12: Test - Evidence for Evolution *based on *Human Perspectives* Ch 10-11 and some Ch 12