



This course is developed using the WA Curriculum as a guide. The order of the content and the time in which they are covered are only a guide. Circumstances may result in changes during the year. Kambalda West District High School reserves the right to alter the order the objectives are taught and time over which they are taught.

In the Year 10 curriculum students explore systems at different scales and connect microscopic and macroscopic properties to explain phenomena. Students explore the biological, chemical, geological and physical evidence for different theories, such as the theories of natural selection and the Big Bang. Students develop their understanding of atomic theory to understand relationships within the periodic table. They understand that motion and forces are related by applying physical laws. They learn about the relationships between aspects of the living, physical and chemical world that are applied to systems on a local and global scale and this enables them to predict how changes will affect equilibrium within these systems.

Vocabulary & Grammar

Below is a list of science words and phrases that students should know: the meaning of; and be able to spell; by the end of term:

Genotype	Elements	Universe	Displacement
Phenotype	Chemical symbols	Galaxy	Distance
Heterozygous	Protons	Fusion	Time
Homozygous	Electrons	Supernova	Scalar
Genome	Electron shells	Black hole	Vector
Evolution	Octet theory	Big Bang	Gradient
DNA	Ionic bonding	Cosmic microwave	Acceleration
Nucleus	Ions	radiation	Deceleration
Transcription	Periodic table	Red shift	Momentum
Natural selection	Conservation	Doppler affect	Conservation
Fossils	Valence	Nitrogen cycle	
Radioactive decay	Reactions	Carbon Cycle	
Half life	Displacement	Global warming	
Amino acids	Combustion	Climate change	
Mutation	Synthesis	La Nina	
Artificial selection		El Nino	
		Ocean Currents	

There is an expectation that students will make every effort to correctly use capitals, full stops, commas, semi colons, apostrophes, question marks and exclamation marks.

Topics

Science Understanding –

- Biological Science – Students explain the processes that underpin heredity and evolution.
- Chemical Science - Students analyse how the periodic table organises elements and use it to make predictions about the properties of elements. They explain how chemical reactions are used to produce particular products and how different factors influence the rate of reactions
- Earth and Space Science - Students describe and analyse interactions and cycles within and between Earth's spheres. They describe the evidence for scientific theories that explain the origin of the universe and the diversity of life on Earth.
- Physical Science – Students apply relationships between force, mass and acceleration to predict changes in the motion of objects. They explain the concept of energy conservation and represent energy transfer and transformation within systems.

Science as a Human Endeavour –

- Students analyse how the models and theories they use have developed over time.

Science Inquiry –

- Students develop questions and hypotheses and independently design and improve appropriate methods of investigation. They describe how they have considered reliability, safety, fairness and ethical actions in their methods. When analysing data, selecting evidence and developing conclusions, students identify any sources of uncertainty. They evaluate the validity and reliability of claims made in secondary sources with reference to the evidence cited. Students construct evidence-based arguments and select appropriate representations to communicate science ideas.



Semester 1

Week	Topics/Syllabus	Assessment	Resources
Term 1			
1	<u>The Universe</u> <ul style="list-style-type: none"> Common celestial objects found in the night sky The solar system and its planets Natural satellites, meteors and comets The leading observers to the universe; Galileo Galilei, Edward Hubble etc. 		
2	<u>Evidence of the Big Bang</u> <ul style="list-style-type: none"> What is the Big Bang? Evidence includes; Galaxies moving apart (Red shift), cosmic background microwave radiation (static on radios and TV). 		
3	<u>Life cycle of a star</u> <ul style="list-style-type: none"> Main sequence stars vs largest sequence stars. Hydrogen fusion Identify the stages involved for each type of star and what awaits at the end of its lifecycle. 		
4	<u>How it started and how it ends</u> <ul style="list-style-type: none"> Introduce the theory of abiogenesis. And how it was disproved. Introduce the concept of panspermia and some of the supporting evidence; amino acids found in comet's tails and extremophiles can survive outer space (tardigrade). Identify some ideas of how the universe will end; the Big Crunch, the Big Freeze (most popular) and the Big Rip. 		
5	<u>Revision for Multiple choice test</u> <u>Recycling in Nature</u> <ul style="list-style-type: none"> Carbon cycle Nitrogen cycle 	Assessment 1: Multiple choice test Big Bang Theory	
6	<u>Weather and ocean currents</u> <ul style="list-style-type: none"> Explore how the weather and atmosphere has changed since the early years of Earth. High levels of Carbon dioxide, and the formation of cyanobacteria. The formation of ocean currents, surface currents and deep ocean currents also known as Thermohaline circulation -form due to water density. Describe the La Nino and El Nina phenomena and the Weather that is associated. 		
7	<u>Climate change and global warming</u> <ul style="list-style-type: none"> Describe what Greenhouse gases are (relate back to carbon cycle) and the Greenhouse effect. Relate data of temperature and weather to industrial motion/growth. Introduce the socio-science debate that is climate change. And why it divides people. 		
8	<u>Revision for extended response</u>	Assessment 2 Global Systems extended response	
9	<u>Revision for topic test</u>	Assessment 3 Earth and Space Topic test	
10	<u>Science Inquiry</u> <ul style="list-style-type: none"> Student lead investigation 		

Term 2			
1	<u>Chemistry essentials (revision)</u> <ul style="list-style-type: none"> List the three subatomic particles – protons, electrons and neutrons. Identify the properties of each sub-atomic particles. Revisit the concept of writing chemical formulae, and isotopes 		
2	<u>The history of the periodic table</u> <ul style="list-style-type: none"> Introduce Mendeleev and the father of the modern periodic table. Describe the major groups of the periodic table; metals, non-metals, transition metals and the Lanthanides and actinides Revisit the groups 1 -18 (columns) and their significance regarding valence electrons and the periods (rows) for number of shells. 		
3	<u>Family groups and trends in the table</u> <ul style="list-style-type: none"> Explore the properties of the common family groups; Groups 1 Alkali metals, Group 2 Alkali Earth metals, Group 4 (14) Carbon group, Group 6 Oxygen group, Group 7 (17) the Halogens and Group 8 (18) noble gases. Identify the electron affinity and ionisation energy and how it changes across the periodic table. 		
4	<u>Revision for Multiple choice Test</u> <u>Chemical equations</u> <ul style="list-style-type: none"> Revisit the concept of writing word equations and balancing chemical equations 	Assessment 4 Periodic table multiple choice	
5	<u>Energy in chemical Equations</u> <ul style="list-style-type: none"> Identify Exothermic and endothermic reactions and relate to the making and breaking of chemical bonds. 		
6	<u>Classifying chemical reactions</u> <ul style="list-style-type: none"> Classify reactions as decomposition, composition reactions. Precipitation reactions, acids and bases and redox equations. <u>Rate of reaction</u> <ul style="list-style-type: none"> Identify and explain how changing various properties of substances changes the rate at which a reaction occurs; Temperature, Concentration, Surface area, and catalyst. 		
7	<u>Revise for short answer test</u>	Assessment 5 Chemical reactions short answer test	
8	<u>Revise for topic test.</u>	Assessment 6 Chemistry topic test	
9 -10	<u>Science inquiry</u> <ul style="list-style-type: none"> Student lead investigation 		
END OF SEMESTER 1			

Semester 2

Week	Topics/Syllabus	Assessment	Resources
Term 3			
1	The DNA molecule <ul style="list-style-type: none"> • Shape and structure of DNA molecule • The function of the DNA; Transcription • Building proteins from DNA 		
2	Replication <ul style="list-style-type: none"> • Mitosis and the process of cell rejuvenation • IPMAT – cell cycle • Interphase – longest part of the cell cycle • Prophase – dissolving nucleus etc. • Metaphase – chromosomes meet in the middle • Anaphase – Chromatids are separated and move to opposite poles of cell • Telophase - Nucleus reforms around separated chromosomes • Cytokinesis – dividing the cell membrane • Important for growth and repair of tissues • Creates 2 identical daughter cells 		
3	Meiosis <ul style="list-style-type: none"> • Divides the number of chromosomes from diploid number to haploid (46 to 23 in human). • Cell undergoes two cellular divisions to produce 4 unique daughter cells. • Compare the differences between Meiosis and Mitosis. • Issues can occur during Meiosis that can lead to syndromes such as Trisomy 21 (down syndrome) • Investigate Karyotypes 		
4	Inheritance <ul style="list-style-type: none"> • Animals inherit a set of chromosomes from mother and father. Therefore, animals receive two copies for each gene. • Explore Dominant genes vs recessive genes using common traits; eye colour blood types, ear lobes etc. • Use Punnett Squares to assist with probabilities of likely outcomes • Use pedigrees to track family disorders and traits. 		
5	Revise for Multiple choice test Fossils and dating <ul style="list-style-type: none"> • Identify common fossils such as imprints depressions etc. • Identify common dating methods such as carbon dating that are used to date fossils and other ancient artifacts. 	Assessment 7 Inheritance Multiple choice test	
6	The theory of Evolution and natural selection <ul style="list-style-type: none"> • explain Darwin's theory of evolution with reference to Darwin's trip to the Galapagos islands and Darwin's finches. • Explore the concept of "Survival of the fittest" 		
7	Selective breeding and genetic engineering <ul style="list-style-type: none"> • Explain the concepts of selective breeding. Identify the need for this in select industries such as livestock industries. • Identify the steps needed to selectively breed a small dog from a large wolf. Difference between species and breeds. • Genetic engineering is a scientific marvel whereby man can combine the genes of different species to create a genetically modified organism. These include golden rice, glow in the dark fish, insulin producing bacteria, drought resistant crops, featherless chickens etc. • Debate the concept of a designer human baby. • Clones 		
8	Revise for Extended response Test		Assessment 8 Extended response
9	Revise for Topic test		Assessment 9 Biology topic test
10	Science inquiry <ul style="list-style-type: none"> • Student lead investigation 		

Term 4

1	<u>Describing motion</u> <ul style="list-style-type: none"> • Vectors vs Scalar quantities; Distance vs displacement, Speed vs velocity • Using graphs to describe motion 		
2	<u>Changes in Speed</u> <ul style="list-style-type: none"> • Acceleration is equal to change in velocity over time. • Use the SUVAT equations to solve for the unknown. • $v = u + at$ • $v^2 = u^2 + 2as$ • $s = ut + \frac{1}{2} at^2$ • $s = vt - \frac{1}{2} at^2$ 		
3	<u>Revise for Multiple choice test</u>	Assessment 10 Changing Speed Multiple choice test	
4	<u>Newton's laws of motion</u> <ul style="list-style-type: none"> • Relate Newton's three laws of motion to various scenarios. • Newton's first law = an object will not change its motion unless a force acts on it • Newton's second law = Force = mass x acceleration • Newton's third = when two objects interact, they apply forces to each other of equal magnitude and opposite direction. 		
5	<u>Energy change</u> <ul style="list-style-type: none"> • Energy cannot be created nor destroyed (conservation of Energy) • Energy stores vs energy transfers • Use examples to show how energy can move between systems and be transformed. • Energy efficiency can be shown as a Sankey diagram 		
6	<u>Revise for Topic test</u>	Assessment 11 Physics topic test	
7 - 10	<u>Science inquiry</u> <ul style="list-style-type: none"> • Students partake in student lead investigations on motion i.e explore a law of motion and conduct an experiment. 		
END OF SEMESTER 2			



ASSESSMENT OUTLINE 2022

SUBJECT YEAR 10

A number of assessments will be used throughout the term to identify the students understanding in the course and be used to determine a grade. Student achievement will be reported using the following descriptors.

Semester 1

Assessment Type	Task Description	KWDHS Weighting	Due Date
Multiple Choice	Task 1: The Big Bang Multiple choice	7.5%	<i>Term 1, Week 5</i>
Extended Answer Test	Task 2: Global Systems Extended answer test	7.5%	<i>Term 1, Week 8</i>
Topic Test	Task 3: Earth and Space Topic Test	10%	<i>Term 1, Week 9</i>
Multiple Choice	Task 4: The periodic table Multiple choice	7.5%	<i>Term 2, Week 4</i>
Short Answer Test	Task 5: Chemical reactions Short answer test	7.5%	<i>Term 2, Week 7</i>
Topic Test	Task 6: Chemistry Topic Test	10%	<i>Term 2, Week 8</i>

Semester 2

Assessment Type	Task Description	KWDHS Weighting	Due Date
Multiple Choice	Task 7: Inheritance Multiple choice	7.5%	<i>Term 3, Week 5</i>
Extended Answer Test	Task 8: Natural Selection Extended Answer	7.5%	<i>Term 3, Week 8</i>
Topic Test	Task 9: Biology Topic Test	10%	<i>Term 3, Week 9</i>
Multiple Choice	Task 10: Changing Speed Multiple choice	12.5%	<i>Term 4, Week 3</i>
Topic Test	Task 11: Physics Topic Test	12.5%	<i>Term 4, Week 6</i>

It is expected that all assessments will be completed to the best of your ability and be submitted by the deadlines set. Please make yourself aware of the Assessment Policy as failure to meet deadlines has severe consequences.

Grade	Description	The student demonstrates achievement that:
A	Excellent	has greatly exceeded the expected standard. Achievement is well beyond what is expected at this year level.
B	Good	exceeds the expected standard.
C	Satisfactory	at the expected standard.
D	Limited	is below the expected standard.
E	Very Low	is below the minimum acceptable for this year level.

Student Signature: _____

Parent/Guardian Signature: _____