

SCIENCE FACULTY
SEMESTER 1 2019

Course Title	Year 10 Science
Term 1 Units	Genetics Evolution
Term 2 Unit	Physics

Curriculum Content

Science Understanding

Biological sciences

- The transmission of heritable characteristics from one generation to the next involves DNA and genes
- The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence

Physical Sciences

- Energy conservation in a system can be explained by describing energy transfers and transformations (ACSSU190)
- The motion of objects can be described and predicted using the laws of physics (ACSSU229)

Year 10 Achievement Standard

By the end of Year 10, 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.

They explain the concept of energy conservation and represent energy transfer and transformation within systems. They apply relationships between force, mass and acceleration to predict changes in the motion of objects. Students describe and analyse interactions and cycles within and between Earth's spheres. They evaluate the evidence for scientific theories that explain the origin of the universe and the diversity of life on Earth. They explain the processes that underpin heredity and evolution. Students analyse how the models and theories they use have developed over time and discuss the factors that prompted their review.

Students develop questions and hypotheses and independently design and improve appropriate methods of investigation, including field work and laboratory experimentation. They explain how they have considered reliability, safety, fairness and ethical actions in their methods and identify where digital technologies can be used to enhance the quality of data. When analysing data, selecting evidence and developing and justifying conclusions, they identify alternative explanations for findings and explain any sources of uncertainty. Students evaluate the validity and reliability of claims made in secondary sources with reference to currently held scientific views, the quality of the methodology and the evidence cited. They construct evidence-based arguments and select appropriate representations and text types to communicate science ideas for specific purposes.

Students must bring the following equipment to every lesson: topic work book (\$5 from the front office), writing equipment – pens, pencil, ruler, etc., and a scientific calculator.

CONTENT SUMMARY & ASSESSMENT TIMELINE GUIDE

Week	Content	Tasks	Assessment
1	<ul style="list-style-type: none"> Structure and basic biochemistry of the DNA and RNA molecules. 	<ul style="list-style-type: none"> DNA extraction Strawberry Experiment 	Assignment on Genetics issued. Investigation - Strawberry Experiment
2	<ul style="list-style-type: none"> Genetics and heredity Traits Meiosis 	<ul style="list-style-type: none"> View Meiosis Slides with Microscopes/micro viewer slides 	Investigation- Strawberry DNA Extraction
3	<ul style="list-style-type: none"> Patterns of Inheritance – Punnett Squares <ul style="list-style-type: none"> Co-dominance, Incomplete Dominance etc. Genetics and Natural Selection 	<ul style="list-style-type: none"> Punnett Squares- Monohybrid Crosses Natural Selection Model 	In-class research assignment. Collation of notes- review
4	<ul style="list-style-type: none"> Pedigree charts & Sex linkage Human genetic disorders. 	Create and Analyse Pedigree Charts	
5	<ul style="list-style-type: none"> Artificial Selection Gene Technology 	Pidgeon/Dog Breeding/ IVF/designer babies/ethics	Sitting of In-class research assignment
6	<ul style="list-style-type: none"> History of Evolutionary Theory- Lamarck, Wallace & Darwin. Other evidence of Evolution <ul style="list-style-type: none"> Fossils & Biogeographical Evidence Comparative Anatomy: Homologous, Analogous and vestigial structures Embryology Biochemical evidence 		
7	Speciation	Hypothetical Speciation Experiment Design Challenge	
8	Revision		Exam Genetics and Evolution
9	Introduce Physics Booklet on Motion Physics	Definitions of speed/velocity Acceleration/distance/ Displacement/scalar/vector	
10-12	<p>Gather data to analyse everyday motions produced by forces, such as measurements of distance and time, speed, force, mass and acceleration</p> <p>Recognise that a stationary object, or a moving object with constant motion, has balanced forces acting on it</p>		
13-14	Assignment on speed/acceleration and conservation of energy	In-class assignment data and allocated time for completion	Physics assignment- due week 14

15-16	Use Newton's Second Law to predict how a force affects the movement of an object Recognise and applying Newton's Third Law to describe the effect of interactions between two objects		
14-15	<ul style="list-style-type: none"> recognise that the Law of Conservation of Energy explains that total energy is maintained in energy transfer and transformation recognise that in energy transfer and transformation, a variety of processes can occur, so that the usable energy is reduced, and the system is not 100% efficient compare energy changes in interactions such as car crashes, pendulums, lifting and dropping use models to describe how energy is transferred and transformed within systems 	<u>Selected practical work:</u> Energy resources Energy conversion Heat Energy use Mechanical energy Fundamental forces Molecular forces Waves (Energy)	Week 14- Physics assignment due
16-17	<ul style="list-style-type: none"> Complete, consolidate and revise 		
17	<ul style="list-style-type: none"> Cross-line semester exams- TBA 	Complete exam and ensure all assessment is submitted	
18	<ul style="list-style-type: none"> Year 10 Alternate program 		
	<ul style="list-style-type: none"> 		

ASSESSMENT SUMMARY

TASK	DUE DATE	WEIGHTING
Genetics In-class Assignment	Week 5 (Term 1)	25%
Genetics & Evolution Test	Week 8 (Term 1)	25%
Physics motion assignment	Week 12 (Term2)	25%
Physics exam	Week 16 (Term 2)	25%

ASSESSMENT CRITERIA FOR ASSESSMENT AND REPORTING OF STUDENT ACHIEVEMENT

The following assessment criteria are a focus for assessment and reporting in this unit. Criteria are the essential qualities that teachers look for in student work. These criteria must be used by teachers to assess student's performance, however not all of them need to be used on each task. Assessment criteria are to be used holistically on a given task and in determining the unit grade.

Students will be assessed on the degree to which they demonstrate:

- Knowledge & Understanding:** - demonstrates thorough and extensive knowledge and understanding of scientific concepts.
- Critical Thinking:** - applies highly effective analytical and evaluative skills, makes perceptive connections between scientific concepts, draws accurate conclusions and proposes appropriate improvements.
- Investigative Skills:** - demonstrates logical and coherent investigations, acknowledges information using referencing conventions and operates equipment highly effectively and safely.

- **Communication:** - presents highly complex concepts accurately and coherently in a wide range of written and non written formats using appropriate terminology with flair.
- **Work practices** - organises time and resources to work in a highly productive and safe manner both independently and in a team.

SCIENCE UNIT GRADE DESCRIPTORS

Teachers will consider, when allocating grades, the degree to which students demonstrate their ability to complete and submit tasks within a specified time frame.

	A student who achieves an A grade typically	A student who achieves a B grade typically	A student who achieves a C grade typically	A student who achieves a D grade typically	A student who achieves an E grade typically
Knowledge and Understanding	demonstrates thorough and extensive knowledge and understanding of scientific concepts justifies and applies knowledge to familiar and unfamiliar contexts and across different concept areas and experiences, displays originality and lateral thinking in problem solving	demonstrates broad and in-depth knowledge and understanding of scientific concepts applies knowledge to familiar and unfamiliar contexts and across different concept areas and experiences, displaying originality and effective thinking in problem solving	demonstrates broad and general knowledge and understanding of scientific concepts is able to apply knowledge in a variety of contexts and different concept areas to solve problems	demonstrates general and basic knowledge and understanding of scientific concepts is able to use knowledge in different areas to solve problems	demonstrates a limited knowledge of scientific concepts displays emerging awareness of strategies to solve problems
Critical Thinking	evaluates, synthesises and analyses patterns and trends in data, observations and investigations and makes valid and perceptive inferences applies highly effective analytical and evaluative skills, makes perceptive connections between scientific concepts, draws accurate conclusions and proposes appropriate improvements	analyses and synthesises patterns and trends in data, observations and investigations and makes valid inferences applies effective analytical skills, makes insightful connections between scientific concepts, draws mostly accurate conclusions and proposes appropriate improvements	describes and explains patterns and trends in data, observations and investigations and makes general inferences describes and explains general connections between scientific concepts, draws conclusions and proposes improvements	identifies and describes patterns in data, observations and investigations and makes simple inferences describes connections between scientific concepts, draws conclusions and proposes improvements	identifies patterns in data, observations and investigations identifies connections between scientific concepts
Investigative Skills	demonstrates logical and coherent investigations, acknowledges information using referencing conventions and operates equipment highly effectively and safely	demonstrates well considered investigations, acknowledges information using referencing conventions and operates equipment effectively and safely	demonstrates considered investigations, acknowledges information using referencing conventions and operates equipment safely with some general effectiveness	outlines investigations, inconsistently acknowledges information using referencing conventions and mostly operates equipment effectively and safely	displays emerging skills in investigations, attempts to acknowledge information and operates equipment with limited awareness of safety procedures

Communication	presents highly complex concepts accurately and coherently in a wide range of written and non written formats using appropriate terminology with flair	presents concepts clearly and logically in a range of written and non written formats using appropriate terminology with confidence	presents general concepts clearly in a range of written and non written formats using appropriate terminology generally using terminology appropriately	presents basic concepts in a narrow range of written and non written formats using terminology inconsistently	presents some basic concepts in a limited range of written & non written formats using minimal terminology
Work practices	organises time and resources to work in a highly productive and safe manner both independently and in a team evaluates and analyses risks, acts highly appropriately in all investigations	organises time and resources to work in a productive and safe manner both independently and in a team analyses and explains risks and acts appropriately in all investigations	organises time and resources to work in a generally productive and safe manner both independently and in a team identifies and describes risks and acts appropriately in all investigations	demonstrates inconsistent organisation of time & resources, works with occasional productivity & some awareness of safety independently or in a group identifies risks and acts mostly appropriately in investigations	demonstrates limited organisation of time & resources to work with an emerging awareness of safety demonstrates an emerging awareness of risks, developing approaches to investigations

ATTENDANCE AND PARTICIPATION

Students are expected to submit all assessment items and attend all classes, participate in a positive manner and seek support whenever it is required. Excursions, simulations and presentations by visitors (including lunchtime) may form part of class work. It is your responsibility to catch up on missed work when absent from class.

LATE SUBMISSION OF WORK

Students are encouraged to submit work on time, as it is a valuable organisational skill. Students are also encouraged to complete work even if it is late, as there are educational benefits in doing so.

Late work will receive a penalty of 5% (of possible marks) per calendar day late, unless an extension is granted by the class teacher prior to the deadline. This means that 5% is taken off the possible marks that could have been achieved e.g. If a student achieved a score of 75/100, and the item is one day late, then five marks (5% of 100) would be taken from 75, which leaves the score as 70/100. 'Per calendar day late' means each day late whether it be a weekend or public holiday. Items due on any date must be submitted to the class teacher, faculty staff room, or front office at the college by 3.30pm on that day. After 3.30pm, the item will attract the late penalty. Submission of work on a weekend or public holiday is not acceptable. If you do not submit your work to your class teacher, make sure that it is signed and dated by either another member of staff in the faculty staffroom, or a member of the front office staff.

Achievement in Courses is reported to the Board of Senior Secondary Studies and students with a Grade A-E. Late work submitted without approval will have an impact on the grade awarded to a student.

No work will be accepted after marked work has been returned or accepted after the unit has completed. Computer and/or printer failure will not be accepted as a valid reason for late work. Make sure you backup, keep hard copies and rough notes.

CHEATING AND DISHONEST PRACTICE

The integrity of the College's assessment system relies upon all involved acting in accordance with the highest standards of honesty and fairness. Any departure from such standards will be viewed very seriously. Accordingly:

- Plagiarism - claiming authorship of someone else's work (intentionally or otherwise) - is a serious misdemeanour and attracts severe penalties.
- Students are required to acknowledge the source of all material that is incorporated into their own work.
- Students may not submit the same item for assessment in more than one unit, unless specific agreement has been reached with the class teacher.

RIGHT TO APPEAL

You can appeal against your assessment if you feel that the result you obtained is not fair. You should first talk to your class teacher, and if you are not satisfied with the explanation you must discuss the situation with the Executive Teacher of the faculty concerned. If you still do not feel that your result is fair you should talk to the Deputy Principal Programs for further advice on the 'appeal process'.

Executive Teacher: Jodie Beaumont

Signature: _____

Class Teacher: Helen Souflias-Mantinaos

Date: February 2019