Trinity Bay State High School
Course Planner -
Year 7 Earth and Environment

Week	Curriculum Intent	Monitoring Strategies
Week 1	**Flat Earth Theory:** • How do we know what we know? • Introduction to the solar system – scale of the solar system. **The Vastness of Space.** • Accurately represent the scale of the solar system	
Week 2	**The Earth in Space.** • Identify Earth's position in Space and describe the Heliocentric model of our Solar System. **Sunrise Sunset** • Explain how the Earth's rotation creates day and night	**Homework:** Read 7.3 The Earth in Orbit Complete Ex 7.3 Q 1-4, 10,11
Week 3	**Sun and Seasons** • Explain how the Earth's tilt creates seasons and how these differ between hemispheres. **Changing Models** • Compare historical models of seasons and solar phenomena	**Homework:** Complete Ex 7.3 q 5-9 Read 7.4 The Moon Complete Ex 7.4 Q 1-9
Week 4	**Phases of the moon** • Explain how the Sun, Moon and Earth interact results in the phases of the moon. **Eclipses** • Explain how the Sun, Moon and Earth interactions result in Lunar and Solar Eclipses. • Compare different perspectives on Lunar and Solar eclipses.	**Homework:** Read 7.5 Eclipses Complete Ex 7.5 Q 1-6
Week 5	**What is gravity?** • Examine the concept of gravity and how it affects Solar System interactions. **Tides** • Examine how the gravitational pull of the Earth, Sun and Moon affect tides.	**Homework:** Read 7.6 Tides Complete Ex 7.6 Q 1-10
Week 6	**Differing perspectives** • Use provided research to identify the factors that can influence development of and lead to changes in scientific knowledge. **Assignment Lesson** • Use their notes to construct an introduction to their research task	**Multiple choice test** **Homework:** Read 7.2 First Nations Australians' astronomy knowledge and understanding Complete Ex 7.2: Q 1-6
Week 7	**Assignment Lesson** • Create summary notes to explain how the identified historical context has influenced scientific understandings of today. • Identify the similarities and differences between modern and historical scientific understandings.	**Homework:** Work on your research task Read 7.7 Explaining the Night Sky Complete Ex 7.7 Q 1-12
Week 8	**Assignment Lesson** • Finalise their research task identifying how historical understandings of sun, moon and Earth systems have influences agricultural or fishing practices over time.	**Homework:** Work on your research task
Week 9	**Assignment Lesson** • Finalise their research task identifying how historical understandings of sun, moon and Earth systems have influences agricultural or fishing practices over time.	**Assignment due this week.**
Week 10	**Forces in Action** • Investigate the importance of forces in our everyday lives.	**Homework:** Read 7.8 Mind Maps Complete Ex 7.8 Activity 1

Trinity Bay State High School
Course Planner -
Year 8 Biological Science

Week	Curriculum Intent	Monitoring Strategies
Week 1	**Exploring the Microscope** ❑ Use Practical (OneNote)- **'Getting into Focus with the letter 'e'** ❑ Identify parts of a microscope and explain their purpose. ❑ Calculate the real size of an object given its apparent size and magnification. **Cells, Tissues Organs** ❑ Define the term cell. ❑ *Describe* the levels of organisation: cells, tissues, organs, system. ❑ *Distinguish* between unicellular and multicellular life forms. ❑ Distinguish between bacteria, animal and plant cells.	Quiz Prior Knowledge **Homework** Topic 3.1 to 3.4 Ex 3.2 Q1,2,4 Ex 3.3 Ex1
Week 2	**Multicellular Life – Plant Cells** ❑ Identify general plant cell organelle and describe their function. ❑ Compare prokaryotes and eukaryotes. **Using a microscope** ❑ Use Practical (OneNote)- **'Preparing Stained Wet Mounts'** ❑ Prepare a wet mount slide and safely observe slides under a microscope. ❑ Draw a scientific diagram of objects under a microscope. Use a microscope to observe, identify and illustrate pond life. ❑ Use Practical (OneNote)- **'Observing leaf epidermal cells'**	**Homework** Topic 3.5 Ex 3.5 Ex 1
Week 3	**Specialised Plant Cells** ❑ *Examine* examples of specialised plant cells (e.g. xylem, phloem, mesophyll cell and guard cells), their structure and function. ❑ Use Practical (OneNote)- **'Plant Cells in View'** ❑ Use Practical (OneNote)- **'Flower Dissection'** **Brown Kelp and Fungi link to animal cells…** ❑ Investigate examples of specialised cells of organisms such as brown kelp and fungi, their structure and function.	**Homework** Topic 3.7, 3.8 Ex 3.7 TBQ Class quiz & feedback
Week 4	**Multicellular Life - Animal Cells** ❑ Use Practical (OneNote)- **'Pond Life'** ❑ *Identify* animal cell organelles: cell membrane, cytoplasm, nucleus, mitochondria, (ribosomes, endoplasmic reticulum). ❑ *Describe* the function of selected animal cell organelles **Specialised cells and functions** ❑ Describe specialised animal cells (e.g. muscle, nerve and blood cells), their structure and function. ❑ Connect the function of specialised cells with the variety of their organelles, e.g. mitochondria and muscle cells.	**Homework** Topic 3.6, 4.1-4.3 Ex 3.6 Ex 2
Week 5	❑ Use Practical (OneNote)- **'Mapping Your Organs'** **Circulatory System** ❑ Describe the role of the components of blood (plasma, red and white blood cells, platelets). ❑ Distinguish between and function of the blood vessels (arteries, veins and capillaries).	**Homework** Topic 4.6, 4.7 Ex 4.6 Q1-3
Week 6	**Respiratory System** ❑ Identify and describe the structure and function of the respiratory system components (mouth, trachea, bronchi, bronchioles and alveoli). ❑ Use Practical (OneNote)- **'Measuring Your Vital Capacity'** ○ Determine the vital capacity of the lungs through practical experimentation	**Homework:** Topic 4.8, 4.9 Ex 4.8 Q1,2,3,4
Week 7	**Excretory System** ❑ Describe the structure and function of the excretory system (kidneys, bladder, ureters, urethra). ❑ Explain how the excretory system is closely linked to the circulatory system. ❑ Explain how the composition of blood and urine differs	Multiple choice test **Homework:** Topic 4.10 Ex 4.10 Q1,7-10, 14- 19
Week 8	**Research Task** ❑ Explain how the design of each organism's system supports life in its environment ❑ Explain why this knowledge important from a technological and scientific perspective.	
Week 9	**Research Task Checkpoint 5** ❑ Ethic guidelines and considerations in research.	**Research task due**
Week 10	**Immunity** ❑ Describe specialised immune system cells, their structure and function. ❑ Explain the components of the immune system and their role in protecting against disease.	

Trinity Bay State High School
Course Planner
Year 9 Chemistry

Week	Curriculum Intent	Monitoring Strategies
Week 1	**Chemical Reactions and Conservation of Mass** • Recall the names and symbols of the first twenty elements. • Identify the number of atoms in a chemical formula using subscripts and coefficients. *Friday Cairns Show Public Holiday*	Jacaranda Science Quest 7.3.3
Week 2	• Recall that in a chemical reaction, reactants are transformed into products. • Recall the Law of Conservation of Mass. • Apply knowledge of the Law of Conservation of Mass to balance chemical equations *Thursday Rugby League Home Game*	Jacaranda Science Quest 7.2.2 and 7.3.1 – 7.3.4
Week 3	**Endothermic and exothermic reactions** • Distinguish between exothermic and endothermic reactions. • Conduct an experiment to determine if a reaction is endothermic or exothermic. **Acids and Bases** • Identify some common substances which contain acids. • Identify some common substances which contain bases.	Jacaranda Science Quest 7.4
Week 4	• Recall that an alkali is a base that is soluble in water. • Compare the acidities of solutions by using the pH scale; which is a scale from 1 (very acidic) to 14 (very basic / alkaline). • Conduct an experiment to measure the pH of a variety of household substances.	Jacaranda Science Quest 7.4
Week 5	• Recall that acids are substances that dissociate to release hydrogen ions in water, and bases release hydroxide ions in water. • Distinguish between strong acids/bases and weak acids/bases • Distinguish between concentrated acids/bases and dilute acid bases	Jacaranda Science Quest 7.4 **Formative Quiz**
Week 6	**Reactions of acids** • Recall the word equation for **neutralisation:** acid + base → water + a salt. • Recall the word equation for **acid carbonate reactions:** acid + carbonate → water + salt + carbon dioxide • Recall the word equation for **acid metal reactions:** acid + active metal → salt + hydrogen gas	Jacaranda Science Quest 7.4
Week 7	• Recall that an activity series lists metals in order of reactivity. • Apply the activity series to single displacement reactions, to determine if a reaction will occur. (The more reactive metal replaces the least reactive metal to make a new compound.)	Jacaranda Science Quest 7.4
Week 8	**Combustion Chemistry** • Recall that combustion is another name for burning. • Recall the word equation for **combustion of hydrocarbons:** hydrocarbon + oxygen gas → water + carbon dioxide. *Friday Pupil Free Day*	Jacaranda Science Quest 7.5
Week 9	**Revision**	
Week 10	**Assessment** Green Chemistry *Friday Colour Fun Run*	Jacaranda Science Quest 7.6

Trinity Bay State High School
Course Planner
Year 10 AQS
Marine Vessels

Week	Curriculum Intent	Formative Tasks & Summative Assessment
Week 1	**Introducing Unit** • Different vessel types for different situations • Types of watercrafts from different cultures. • Development of boat-building technologies.	
Week 2	**Building Boats** • Major hull types and the Law of Buoyancy– e.g. displacement, planing, their advantages and disadvantages • Different hull shapes and their purposes – eq punt for sheltered estuary, deep v-hull for open water. What benefits does a particular shape confer and what is its limitations? • Material considerations for vessel construction – e.g. using aluminium or steel, sacrificial anodes and utilising covers. • How does the aquatic environment influence what vessels and equipment can be made from?	
Week 3	**Making them go** • Principles of mechanical and non-mechanical propulsion – e.g. powered, non-powered. • Operating principles of engines and their support systems – e.g. steam, diesel, two stroke engine, fuel lines, ignition sources	
Week 4	**Importance of shipping** • Investigation of global trade routes, immigration routes, cargo. Why are things sent on ships? Who does main export/import? Why are specific routes used? • Important water ways to aquatic industries and activities. Eg Suez Canal, Panama Canal, Rea Sea, Strait of Malacca, Taiwan Strait. • Australian export (eg coal exports, livestock) and imports (eg Consumer goods)	
Week 5	**Ecological impacts** • Pollution from vessels – ballast water, oil pollution, quarantine breaches. • Damage to ecosystems – eg anchors, propellors, running aground, pollution, hitchhiking organisms. • Shipwrecks and shipbreaking. What are the benefits? What are possible negative impacts?	Formative Task
Week 6	**Careers** • Pathways, relevant qualifications and career opportunity in marine vessels. • Adjacent industries pathways – boat-building, naval architecture, marine engineer, mechanic	
Week 7	**Design a model vessel** • Be able to explain the reason for design choices (eg hull shape, materials used, propulsion system) regarding the intended purpose (eg model fishing trawler, speedboat, container ship)	**Summative Task sheet handed out.** **Check-In 1**
Week 8	**Create model vessel**	**Draft Due**
Week 9	**Test and evaluate model vessel**	**Feedback on draft**
Week 10	**Historical role of song and music in Maritime industry**	**Final response to task due.**

Trinity Bay State High School
Course Planner Term A
Year 10 Biology- Genetics

Week	Curriculum Intent	Monitoring Strategies & Summative Assessment
Week 1	**Heredity and the continuity of Life: Variation and Inheritance** • Describe and explain the term variation. • Explain that variation is a result of inheritance. • Apply understanding of variations to population and identify examples. • Recall the contribution(s) of various scientists to our understanding of genetics (i.e. Mendel, Franklin, and Watson & Crick).	
Week 2	**Exploring the anatomy of DNA** • Recall that DNA stands for deoxyribonucleic acid and that it exists within the nuclei of cells. • Describe/label the structure of DNA. • Explain base pairing (Adenine binds with Thymine, Guanine binds with Cytosine). • Apply understanding of how the base pairs work together (shape and bonding properties). • Extract DNA from a kiwi fruit/strawberries. **Karyotypes and Chromosomes** • Compare the structures of chromosomes, genes and DNA. • Explain how genes are responsible for inherited characteristics. • Analyse a human karyotype to determine the sex and if it is normal/abnormal • Examine the types of mutations that can occur to chromosomes including examples of monosomy and trisomy.	

Week 3	**Cell Division: Mitosis**
	• Know the stages and purpose of mitosis
	• Understand that mitosis produces 2 daughter cells that are identical to the parent cell and is used for growth and repair.
	• Know the number of chromosomes in a human somatic cell.
	Cell Division: Meiosis
	• Know the purpose of meiosis is to reduce the chromosome number in gametes, which is essential for sexual reproduction.
	• Understand that meiosis is the key to genetic variation because it results in 4 genetically different daughter cells with half the DNA (haploid) of the parent cell.
	• Recall the process of meiosis – reference should be made to diploid and haploid.
	• Within the process of meiosis I and II:
	  ○ Explain the processes of crossing over (homologous recombination) and independent assortment and how they contribute to genetic variation.
	  ○ Explain how sexual reproduction results in genetically diverse offspring.	

Week 4	**Genetic Terminology** • Differentiate between genes/alleles, dominant/recessive, phenotype/genotype, homozygous/heterozygous, genes/genome. • Use Punnet squares to carry out monohybrid crosses and predict overall phenotypic and genotypic profile of potential offspring.	Monitoring Quiz
Week 5	**Monohybrid crosses** • Use Punnet squares to carry out monohybrid crosses and predict overall phenotypic and genotypic profile of potential offspring. • Understand the principles of co-dominance and use punnet squares to predict genotypes of offspring.	
Week 6	**Pedigrees** • Analyse a pedigree and make predications using the information from a pedigree. • Use pedigrees and Punnet squares to be able to predict traits and justify your decisions. • Use a pedigree to infer whether a trait is dominant or recessive and justify your decision.	Monitoring Quiz
Week 7	**Genetic Mutations and Evolution** • Genetic Mutations and Evolution • Explore factors that cause mutations and changes that occur in the DNA • Describe evolution and its mechanisms	
Week 8	**Revision**	
Week 9	**Block Exams**	

Week 10	**Exam Feedback** **Ethical issues** • Examine differences in genes (e.g. genetic mutations). • Examine genetic research including cloning and genetically modified foods. • Evaluate moral and ethical implications and public opinions e.g. cloning, GMO and IVF. **Types of diseases and pathogens** • Identify the difference between infectious diseases and non-infectious diseases. Identify the following pathogens: prions, viruses, bacteria, fungi, protists and parasites **Infectious Disease –** Antibiotic Resistance Define antibiotics and know which pathogens they are effective at treating. • Describe how bacteria develop antibiotic resistance. • H17 -Video **Suggested Investigation: Viral Packaging-** Getting the Most for your genomic buck	

Trinity Bay State High School
Course Planner
Year 10 Chemistry Term A
Rates of Reaction I Periodic Table & Moles

Week	Curriculum Intent	Summative Assessment Monitoring Strategies
Week 1	**Introduction to Chemistry** • Balance a chemical equation and use it to solve problems involving moles and masses (stoichiometry problems), e.g., calculate the mass of CuCO3 required to react with acid to make 12 g of CO2. • Practice solving stoichiometry problems.	

Week 2	**Practical Considerations**
	Black Snakes Practical
	• Investigate a chemical process by:
	  ○ managing the risks using MSDS data
	  ○ Conducting an experiment
	  ○ Analysis of Evidence and Methods
	HCl and Mg practical
	• Use Excel to display and analyse the experimental data
	  ○ line graphs
	  ○ curve of best fit (linear and non-linear)
	  ○ r^2 value
	• Analyse the evidence provided by the data from our experiment.
		Over the first three weeks, we will write all of the sections of a Student Experiment.

Week 3	**Practice assessment** **H_2SO_4 and $CaCO_3$ practical** • Conduct a given experiment • Modify the experiment to refine and extend it. • Complete and submit a prac request form • Justify the modifications of an experiment by writing a considered rationale. • Analyse the limitations of evidence.	• Rationale • Research Question • Modifications • Safety
Week 4	**Do modified practical** • Evaluate the validity and reliability of experimental methods. • Conclusion and improvements • Report writing time **Practice assessment due Friday**	• Raw data • Trends patterns and relationships • Limitations of evidence, reliability and validity • Conclusions • Improvements and extensions **Practice assessment due Friday**

Week 5	**Assessable Experiment**
	Rates of reaction of sodium thiosulfate
	• Conduct a given experiment to measure the rate of a reaction.
	• Modify the experiment to refine and extend it.
	• Complete and submit a complete prac request form
	• Write the following sections of the report:
	  ○ Rationale
	  ○ Research Question
	  ○ Modifications
	  ○ Safety
	
	Theory – Rates of Reaction
	• Recall the factors which can affect the rate of a reaction:
	  ○ concentration of reactants,
	  ○ surface area of solid reactants,
	  ○ use of a catalyst,
	  ○ change in temperature.
	• Recall collision theory.
	• Use collision theory to explain how the factors listed above affect the rate of a reaction.
		Now you plan, carry out and write up your assessable Student Experiment.
		
		Assessment Student Experiment task sheet handed out
		
		You will have 10 hours of class time for your experiment and report.
		
		Diagnostic quiz and feedback.
		
		Monitoring quiz and feedback.

Week 6	**Carry out your experiment** • Write the following sections of your report: ○ Raw Data	

	○ Processing of Data ○ Trends, Patterns and Relationships	
Week 7	• Write the following sections of your report: ○ Limitations of Evidence, Reliability and Validity of Experimental Process ○ Conclusions ○ Suggested Improvements and Extensions. **Draft due Friday**	**Draft due Friday**
Week 8	**Introduction to Chemical Basics** • Recall the names and symbols of the elements. • Recall the conventions for writing chemical formulae including subscripts (s), (l), (g), (aq). • Interpret the information in a chemical equation and balance it. **Types of chemical equations** • Recall the reactants and products for the following reaction types ○ Combination ○ Decomposition ○ Neutralisation ○ Acid + carbonate ○ Acid + active metal ○ Combustion reactions **Making and testing gasses prac** • Recall the tests for CO2, H2 and O2	Feedback on draft provided at the end of this week
Week 9	• Use the feedback on your draft to improve your Student Experiment report in your own time. You will have one lesson of report writing this week **Periodic Table** • Describe the position of elements on the Periodic Table in terms of groups 1 to 18 and periods 1 to 7, as well as the group names. ○ The first 20 elements on the Periodic Table, plus Cr, Mn, Fe, Ni, Cu, Zn, Br, Ag, Sn, I, Pt, Au, Hg, Pb, U, Ba ○ Group names include: alkali metals, alkaline earth metals, transition metals, semimetals, halogens and noble gases. • Recall the meanings of the terms atomic number and mass number. • Calculate the number of protons, neutrons and electrons in a given atom. **Combustion and formation prac**	**Final student experiment due Friday**
Week 10	• Describe Bohr's model of the atom including electron configuration. • Use Bohr's model of the atom to explain why and how atoms form ions **Ions** • Determine the formula for a monatomic ion from the element's position on the Periodic Table. • Determine the formula of a polyatomic ion from the Data Sheet. • Apply knowledge of charges of monatomic and polyatomic ions to determine formulae of ionic compounds and name the compound.	End of term quiz and feedback

TRINITY BAY STATE HIGH SCHOOL SCIENCE DEPARTMENT

Year 10 Marine Science Term A

Topic *(10 weeks)*

Assessment: Exam

WEEK	SUBJECT MATTER Knowledge, concepts, skills and processes that students are expected to learn and master.	ASSESSMENT Assessment x 3 Feedback x 3
1	**Introduction to coral ecology** • Introduction to the coral reef ecosystem- biotic and abiotic factors affecting coral reefs • *Identify* zones on a single reef such as reef lagoon, reef flat, reef crest and reef slope and know the various abiotic features in each zone • Introduction to coral • *Identify* the various coral morphology types such as: digitate, plate, massive, dead, free living, encrusting and soft	Coursework plan
2	**Coral Ecology** • *Describe* the structure of a typical coral polyp and explain Darwin's paradox and the symbiotic relationship between corals and zooxanthellae • *Explain* the difference between soft corals and hard corals- hard corals multiples of 6 tentacles and hard $CaCO_3$ skeleton. Soft corals have tentacles in multiples of 8 and no $CaCO_3$ skeleton • *Explain* the process of coral bleaching and how it impacts on coral reefs and be able to identify bleaching in the field	
3	**Introduction to classification** • know how to write a scientific name both in type and hand written • *describe* the hierarchical classification system Domain, Kingdom, Phylum, Class, Order, Family, Genus and Species • *Define* the term diagnostic features, describe and identify common diagnostic features such as; symmetry type, segmentation	
4	**Phylum Porifera and Cnidaria** • *identify* the diagnostic features of the phylum Porifera and Cnidaria and describe the structure and function of a Cnidocyte **Phylum Mollusca** • *Describe* the diagnostic features of the phylum Mollusca and the classes Gastropoda, Bivalvia, Cephalopoda • *Compare* and *contrast* classes of Mollusca. Watch Inside Natures Giants: Giant squid	Diagnostic quiz and feedback.
5	• *Squid dissection* **Phylum Arthropoda, class Crustacea** • *Describe* the diagnostic features of the Phylum Arthropoda and the class Crustacea • *Investigate* the structure of a typical crustacean and compare and contrast the structure and function of a biramous and a uniramous appendage through the *dissection of a prawn*	
6	**Phylum Echinodermata** • Describe the diagnostic features of the phylum Echinodermata **Phylum Chordata** • Describe the diagnostic features of the phylum Chordata and subphylums Urochordata, Cephalochordata and Vertebrata • Describe the diagnostic features of Classes Chondricthyes and Osteichthyes	Diagnostic quiz and feedback.
7	• *Dissection of a Mullet* • Describe the diagnostic features of the classes Reptillia and Mammalia • Watch Inside Natures Giants: The Whale	
8	• Revision week	
9	• Revision • Assessment- Exam	
10	• Assessment feedback • Introduction to sampling – Why and how • Introduction to Biodiversity- Calculating Simpson's Diversity Index	Feedback on assessment, ladder

Trinity Bay State High School
Course Planner
Year 10 Marine Science Term A
Coral Reef Ecology

WEEK	SUBJECT MATTER	
1	**Introduction to coral ecology** • Introduction to the coral reef ecosystem- biotic and abiotic factors affecting coral reefs • *Identify* zones on a single reef such as reef lagoon, reef flat, reef crest and reef slope and know the various abiotic features in each zone • Introduction to coral • *Identify* the various coral morphology types such as: digitate, plate, massive, dead, free living, encrusting and soft •	Coursework plan
2	**Coral Ecology** • *Describe* the structure of a typical coral polyp and explain Darwin's paradox and the symbiotic relationship between corals and zooxanthellae • *Explain* the difference between soft corals and hard corals- hard corals multiples of 6 tentacles and hard $CaCO_3$ skeleton. Soft corals have tentacles in multiples of 8 and no $CaCO_3$ skeleton • *Explain* the process of coral bleaching and how it impacts on coral reefs and be able to identify bleaching in the field	
3	**Introduction to classification** • know how to write a scientific name both in type and hand written • *describe* the hierarchical classification system Domain, Kingdom, Phylum, Class, Order, Family, Genus and Species • *Define* the term diagnostic features, describe and identify common diagnostic features such as; symmetry type, segmentation	
4	**Phylum Porifera and Cnidaria** • *identify* the diagnostic features of the phylum Porifera and Cnidaria and describe the structure and function of a Cnidocyte **Phylum Mollusca** • *Describe* the diagnostic features of the phylum Mollusca and the classes Gastropoda, Bivalvia, Cephalopoda • *Compare* and *contrast* classes of Mollusca. Watch Inside Natures Giants: Giant squid	Diagnostic quiz and feedback.
5	• *Squid dissection* **Phylum Arthropoda, class Crustacea** • *Describe* the diagnostic features of the Phylum Arthropoda and the class Crustacea • *Investigate* the structure of a typical crustacean and compare and contrast the structure and function of a biramous and a uniramous appendage through the *dissection of a prawn*	
6	**Phylum Echinodermata** • Describe the diagnostic features of the phylum Echinodermata **Phylum Chordata** • Describe the diagnostic features of the phylum Chordata and subphylums Urochordata, Cephalochordata and Vertebrata • Describe the diagnostic features of Classes Chondricthyes and Osteichthyes	Diagnostic quiz and feedback.
7	• *Dissection of a Mullet* • Describe the diagnostic features of the classes Reptillia and Mammalia • Watch Inside Natures Giants: The Whale	
8	• Revision week	
9	• Revision • Assessment- Exam	
10	• Assessment feedback • Introduction to sampling – Why and how • Introduction to Biodiversity- Calculating Simpson's Diversity Index	Feedback on assessment, ladder

10 Psychology Coursework Planner

Term A

Trinity Bay Science

	Subject matter	Monitoring Strategies
WEEK 1	**Expectations & Introduction to Psychology** • Investigate the history of Psychology • Describe one of the philosophical debates • Summarise the characteristics of Nature & Nurture. • Ethics of psychological studies. **The Nervous system** • Differentiate the central nervous system & the peripheral nervous system • Describe function of the four main lobes and other areas of the brain • Brain Dissection	QLearn Quiz
WEEK 2	**Neurons and Neurotransmission** • Reflex Lab • Describe the structure and function of a Neuron • Describe types of neurons and how they communicate • Structure and function of the synapse.	QLearn Quiz
WEEK 3	**Neuroplasticity** • Describe neurotransmission & types of neurotransmitters • Two-point discrimination Lab • Practical Activity: Brain Models	QLearn Quiz
WEEK 4	**Memory** • Investigate the mechanisms behind remembering and forgetting. • Distinguish between recall, recognition and relearning.	QLearn Quiz
WEEK 5	**Flashbulb memories** • Leading Questions and the misinformation effect/ Reconstructive memory **Emotion & Motivation** • Evaluate Theories of Emotion • Contrast Theories of Motivation • Evaluate the 3 aspects of Cognitive Evaluation Theory.	QLearn Quiz Practice Data Test.
WEEK 6	**Psychopathology** • Mental Health • Categories of Disorder	QLearn Quiz
WEEK 7	• Traumatic brain injury and neuroplasticity **Targeted revision**	QLearn Quiz
WEEK 8	**Targeted revision**	QLearn Quiz
WEEK 9	**Exam** **Study Design and Sampling.** **Introduction to Assessment Task: Research Investigation** • Explain ethical standards psychological research.	QLearn Quiz
WEEK 10	**Guided practice- Data in Detail** **Guided practice-Trends patterns relationships, interpretation**	QLearn Quiz

11 Aquatic Practices
Employment in the Maritime Industry

AQP11**A** Mr Witter

AQP11**C/11B** Ms Singleton

Week	Topic	Resources	Notes
1	***Fish Farming and Aquaculture*** • ***Define*** what this marine industry field does and why • ***Compare and contrast*** the pros and cons of this field • ***Identify*** local businesses and their contribution to this field in the Cairns Region • ***Identify*** pathways into this field • ***Investigate*** skills and qualifications required for this field • ***Investigate*** ATSI specific careers and pathways in this field		Coursework planner issued ***HOT TIP:*** *IF YOU COMPLETE WORKSHEETS FOR WEEKS 1 – 5 PROPERLY, YOU WILL HAVE ALREADY COMPLETED THE RESEARCH PART OF YOUR ASSIGNMENT!*
2	***Wild Fishing and Trawling*** • ***Define*** what this marine industry field does and why • ***Compare and contrast*** the pros and cons of this field • ***Identify*** local businesses and their contribution to this field in the Cairns Region • ***Identify*** pathways into this field • ***Investigate*** skills and qualifications required for this field • ***Investigate*** ATSI specific careers and pathways in this field		
3	***Protection and Conservation of Marine Resources*** • ***Define*** what this marine industry field does and why • ***Compare and contrast*** the pros and cons of this field • ***Identify*** local businesses and their contribution to this field in the Cairns Region • ***Identify*** pathways into this field • ***Investigate*** skills and qualifications required for this field • ***Investigate*** ATSI specific careers and pathways in this field		
4	***Navy, Cargo Shipping, Coxswain Training Industry*** • ***Define*** what this marine industry field does and why • ***Compare and contrast*** the pros and cons of this field • ***Identify*** local businesses and their contribution to this field in the Cairns Region • ***Identify*** pathways into this field • ***Investigate*** skills and qualifications required for this field • ***Investigate*** ATSI specific careers and pathways in this field		
5	***Seafood Processing, Restaurant, Tourism and Aquarium Industry*** • ***Define*** what this marine industry field does and why		

	• ***Compare and contrast*** the pros and cons of this field • ***Identify*** local businesses and their contribution to this field in the Cairns Region • ***Identify*** pathways into this field • ***Investigate*** skills and qualifications required for this field • ***Investigate*** ATSI specific careers and pathways in this field		
6	***Introduction to Assessment*** • **Brochure on a jobs in the Maritime Industry**	Introduction to the Publisher Program	
7	***Assessment - Investigation*** • ***Investigate*** careers in the marine industry • ***Create*** a brochure based on your chosen Maritime job	Using the information you have already researched on particular topic, you now need to start creating your brochure. Topics include: - Fish farming/aquaculture - Wild fishing/trawling - Protection/conservation/rangers - Navy/cargo shipping/coxswain - Seafood processing/restaurant - Tourism/aquarium/tours	Task Sheet Issued ***HOT TIP:*** *IF YOU COMPLETED WORKSHEETS FOR WEEKS 1 – 5 PROPERLY, YOU HAVE ALREADY DONE THE RESEARCH PART OF YOUR ASSIGNMENT! LUCKY YOU!*
8	***Assessment - Investigation*** • ***Investigate*** careers in the marine industry • ***Create*** brochure based on investigation	**SUBMIT DRAFT**	**Draft Due: Monday Week 8 Term 3**
9	***Submit Podcast*** • Incorporate teacher feedback to complete assessment • Present/upload your brochure assessment	**SUBMIT FINAL PODCAST**	**Final Due: Wednesday Week 9 Term 3**
10	***Peer Review*** • ***Prepare*** a peer review	Review one of your peers' by writing a short (150 word) review about: - what they did well, - where they can improve, and - what you enjoyed about their brochure.	**Peer Review Due: Wednesday Week 10**

Biology Coursework Planner

Unit 2: Maintaining the internal environment.

Assessment

Data Test (mid Term 2) Research Investigation (early Term 3) and end of Units 1 and 2 exam (end of Term 3). All assessment for Units 1 and 2 is formative.

	Subject matter	Guidance
T2 Wk 5	**Topic 1: Infectious Diseases and epidemiology** ☐ Distinguish between infectious and non-infectious disease. ☐ Identify key features of prions, viruses, bacteria, fungi, protists and parasites. ☐ Explain how adherence factors, invasion factors, capsules and toxins affect pathogenesis.	
	☐ Explain how host cells recognise self from non-self. ☐ Identify the three lines of defence in vertebrates: - the innate immune response: skin and mucous membranes (non-specific) - inflammatory response and complement system (non-specific) - adaptive immune response (specific).	
	☐ Describe the inflammatory response, including the roles of - prostaglandins and vasodilation - neutrophils and macrophages - natural killer cells.	
T2 Wk 6	☐ Explain the adaptive immune response, including the - humoral response (B lymphocytes, antibodies) - cell-mediated response (T lymphocytes) - role of memory cells. **Suggested Investigation**: Antibody attack **Suggested Investigation:** Skin Shield	Student Experiment Due
	☐ Compare active and passive immunity, both naturally acquired and artificially acquired. ☐ Explore how the work of scientists such as Rosalyn Sussman Yalow and Peter C Doherty has improved our understanding of infectious disease and the immune response.	
	☐ Interpret long-term immune response data. ☐ Describe the innate immune responses in plants, including: - physical defence strategies: barriers and leaf structures - chemical defence strategies: plant defensins and production of toxins.	
T2 Wk 7	☐ Interpret data from an experiment investigating the effect of an antimicrobial agent on the growth of a microorganism. - Appreciate that for thousands of years, First Nations peoples' knowledges of natural antiseptics and bush medicines have been used to prevent and treat infections (Move to Year 10?)	
	☐ Describe modes of disease transmission, including direct contact, contact with body fluids, contaminated food, contaminated water and disease-specific vectors.	
	☐ Explain how the following factors affect the spread of disease: - persistence of pathogens within host. - transmission mechanism. - proportion of the population that are immune or have been immunised. - mobility of individuals in the affected population.	
T2 Wk 8	☐ Explain how personal hygiene measures, contact tracing and quarantine are used to control the spread of disease.	
	☐ Introduction the Research Task: - Claims - Resources - Effective research skills	

	- ISMG - Plan of attack	
	☐ Analyse data to - predict outbreaks, - determine the source of an outbreak, - infer the mode of disease transmission, - determine the effectiveness of different strategies in controlling the spread of disease. **Suggested Investigation**: Modelling Herd Immunity	
T2 Wk 9	☐ Research Investigation – Lesson 1 - Selecting your claim - Identifying evidence.	Checkpoint 1: Evidence Due
	☐ Research Investigation – Lesson 2	
	☐ Critiquing the Evidence: - Analysing evidence - Evaluating Evidence	
T2Wk10	☐ Research Investigation – Lesson 3	Checkpoint 2: Analysis due
	☐ Research Investigation – Lesson 4	
	☐ Drawing a conclusion - Justifying - Quality of evidence	
T3 Wk1	☐ Research Investigation – Lesson 5	**Research Investigation Draft Due Thursday**
	☐ Research Investigation – Lesson 6	
	☐ Research Investigation – Lesson 7	
T3 Wk2	**Topic 2: Homeostasis** ☐ Recall that homeostasis involves a stimulus-response model in which change in the condition of the external or internal environment is detected and appropriate responses occur via negative feedback.	
	☐ Recognise that sensory receptors (chemo, thermos, mechano, photo, noci) detect stimuli and can be classified by the type of stimulus	
	☐ Recall that effectors are either muscles (which contract in response to neural stimuli) or glands (which produce secretions)	
T3 Wk3	☐ Pluck Dissection	**Research Investigation Due Thursday**
	☐ Research Investigation – Lesson 8	
	☐ Research Investigation – Lesson 9	
T3 Wk4	☐ Interpret feedback control diagrams for either nervous or hormonal systems (i.e. recognise stimulus, receptors, control centre, effector and communication pathways)	
	☐ Understand that metabolism describes all of the chemical reactions involved in sustaining life and is either catabolic or anabolic. ☐ Explain why changes in metabolic activity alter the optimum conditions for catalytic activity of enzymes (with reference to tolerance limits).	
	Neural homeostatic control pathways ☐ Identify cells that transport nerve impulses from sensory receptors to neurons to effectors. ☐ Discriminate between a sensory neurone and a motor neurone (consider dendrites, soma, body, axon, myelin sheath, nodes of Ranvier, axon terminal and synapse) ☐ Explain the process of the passage of a nerve impulse in terms of transmission of an action potential (conduction within neuron) and synaptic transmission (communication between neurones). Refer to neurotransmitters, receptors, synaptic cleft, vesicles, postsynaptic and presynaptic neurones and signal transduction.	
T3 Wk5	**Hormonal homeostatic control pathways** ☐ Recall that hormones are chemical messengers (produced mostly in endocrine glands) that relay messages to cells displaying specific receptors for each hormone via the circulatory or lymphatic system: - Size and shape (SA:V ratio) ☐ Organelle composition	Chap. 9.1 *BIOZONE* 123, 124 -1-3, 1251,3-4, 127. *Ex 9.7 Q5,10.*

	☐ Recognise how a cell's sensitivity to a specific hormone is directly related to the number of receptors it displays for that hormone (an increase in receptors = upregulation, a decrease = downregulation) ☐ Describe how receptor binding activates a signal transduction mechanism and alters cellular activity (results in an increase or decrease in normal processes). ** BIOZONE 142 may help/ p248 Oxford.	Review chap. 9 – Q3,8. Chap. 9.5/6/7 *BIOZONE* 130-131 Q1,2,5, 132 Q1-2, 133, 134 Q1-6.
	Thermoregulation ☐ identify and explain the varying thermoregulatory mechanisms of endotherms and how they control heat exchange and metabolic activity in terms of: - structural features (brown adipose tissue, increased number of mitochondria per cell, insulation) - behavioural responses (kleptothermy, hibernation, aestivation and torpor) - physiological mechanisms (vasomotor control, evaporative heat loss, countercurrent heat exchange, thermogenesis/metabolic activity from organs and tissues). homeostatic mechanisms (thyroid hormones, insulin).	
T3 Wk6	**Osmoregulation** ☐ Identify and explain the various homeostatic mechanisms that maintain water balance in animals (osmoregulators and osmoconformers) in terms of: - structural features (excretory system) - behavioural responses - physiological mechanisms homeostatic mechanisms (antidiuretic hormone (ADH) and the kidney)	*OXFORD* 9.5 Q2 9.6 Q2, 5. Review chap. 9 – Q 7,8,12. Chap. 9.2/9.3 *BIOZONE* Read 140,144. 141 (all), 145 Q2. *OXFORD* 9.2 Q.7 Review chap. 9 - Q4,10. Chap. 10
	☐ Identify and explain the various mechanisms that maintain water balance in plants in terms of structural features (stomata, vacuoles, cuticle) and homeostatic mechanisms (abscisic acid); consider xerophytes, hydrophytes, halophytes and mesophytes in responses. **Investigation:** Compare the distribution of stomata and guard cells in plants adapted to different environments (aquatic, terrestrial) as an adaptation for osmoregulation in plant tissue.	
	Revision	
T3 Wk7	Revision	
T3 Wk8		
T3 Wk9	Exam Block	
T3 Wk10	Unit 3	

Chemistry Coursework Planner

Chemistry Coursework Planner
Unit 2: Molecular Interactions and Reactions

Trinity Bay Science

Assessment

Research Investigation (Term 1) and end of Units 1 and 2 exam (end of Term 3). All assessment for Units 1 and 2 is formative.

Italics indicates skills and processes which will be assessed on the Data Test, Student Experiment and / or Research Investigation, but not on the end of Units 1 and 2 exam.

Term Week	Subject matter and textbook work	Guidance / Notes / Feedback x 3
T2 Wk4	**Gases** ☐ State the relationship between the volume of a gas, number of moles and molar volume at standard temperature and pressure (STP). ☐ Apply the kinetic theory of gases to explain the relationships between pressure, temperature, and volume of a gas. ☐ Identify that the kinetic theory of gases applies to ideal gases. ☐ Apply the ideal gas equation to calculate the mass of chemicals and/or the volume of a gas (STP) involved in a chemical reaction. (Formula: PV = *n*RT) ☐ Analyse data to determine the relationships between pressure, temperature, and volume of a gas. ☐ Data processing and analysis – SE prep ☐ Data Test Style Questions – prep for Unit 1 Data Test	**Coursework Plan handed out** **Data booklet handed out** Chapter 12 (all) p. 315
T2 Wk5	**Aqueous solutions and molarity** ☐ Discriminate between the terms solute, solvent, solution. ☐ Discriminate between the terms strength and concentration, e.g. acidic/basic solutions. ☐ State that square brackets ([ ]) are used to denote concentration. ☐ Discriminate between unsaturated, saturated and supersaturated solutions. ☐ Apply the mole concept to calculate moles of solute, concentration and volume of a solution. (Formula: $\text{Molarity / Concentration } (c) = \frac{\text{moles of solute } (n)}{\text{volume of solution } (V)}$) ☐ Data Test Style Questions – prep for Unit 1 Data Test	Chapter 13.1, 13.2, 13.5 p 341 **Research Investigation task given out**
T2 Wk6	**Solubility** ☐ Identify that changes in solvent temperature can affect the solubility of solid and gaseous solutes (solids and gases). ☐ Analyse data, including solubility curves, to determine the solubility of ionic compounds and the concentration of ions in aqueous solutions. **Data Test based on Unit 1 work (10% of Unit 1 and 2 grade)**	Chapter 13.3, 13.4 p. 361 Unit 1 Data Test this week
T2 Wk7	☐ Data analysis and processing – SE prep ☐ Homework - consider Unit 2 experiments so far – what will you modify? How can you modify it? What data analysis will you need? **pH**	Chapter 14

	□ State that pH is dependent on the concentration of hydrogen ions in solution. □ Identify that the pH scale is a logarithmic scale. □ Apply the pH scale to compare the levels of acidity or alkalinity of aqueous solutions. □ Apply the Arrhenius model to explain the behaviour of strong and weak acids and bases in aqueous solutions. **Reactions of acids** □ Determine balanced chemical and ionic equation (including states) for the reactions of acids with bases, metals and carbonates.	
T2 Wk8	Plan Student Experiment and submit prac request form – 1 lesson **Intermolecular forces** □ Apply the valence shell electron pair repulsion (VSEPR) theory to determine the shape and bond angles of linear, bent, trigonal planar, tetrahedral and pyramidal molecules. (Hybridization involving d-orbitals are not required.) □ Determine the polarity of molecules using molecular shape, understanding of symmetry, and comparison of the electronegativity of elements. □ Explain the relationship between vapour pressure, melting point, boiling point and solubility, and the nature and strength of intermolecular forces (e.g. dispersion forces, dipole-dipole attractions, and hydrogen bonding) within molecular covalent substances.	Chapter 11.1, 11.2, 11.2, 11.4 p. 265
T2 Wk9	□ From **Aqueous solutions and molarity** explain that the unique properties of water are related to molecular shape and hydrogen bonding between molecules. □ From **Solubility** - Compare the solubility of ionic and molecular substance in water, and the intermolecular forces between species in the substances and water molecules.	Chapter 13.1 p. 341
T2 Wk 10	**Student Experiment – 3 lessons** □ Data collection should be completed this week □ Checkpoint: Monday – Safety section, Raw Data table with spaces for uncertainties □ Checkpoint: Friday – Raw Data table completed	• .
Holidays		
T3 Wk1	**Student Experiment – 3 lessons** (dependant on Show Holiday) □ Checkpoint – Trends, Patterns and Relationships, Uncertainty and Limitations of the Evidence, Validity and Reliability of Experimental Method	
T3 Wk2	**Student Experiment – 1 lesson** (2 lessons if Show Holiday removed a lesson from Week 1) **Draft due at the end of this week.** **Identifying ions in solution** □ Apply ionic and chemical formulas to construct balanced ionic and chemical equations (including states) for precipitation reactions. □ Apply solubility rules to predict if a precipitation will be formed. □ Analyse data, including precipitation and acid-carbonate reactions, to determine the presence of specific ions in solutions.	Chapter 13.4 p. 370

T3 Wk3	**Rates of reactions** ☐ Explain how temperature, surface area, pressure (gaseous systems), concentration and the presence of a catalyst can affect the rate of the reaction. ☐ Apply the collision theory to determine the effect of concentration, temperature, pressure and surface area on the rate of chemical reactions. ☐ Sketch Maxwell-Boltzmann distribution curves for reactions with and without catalysts.	Chapter 15 (all) p. 415 Diagnostic quiz
T3 Wk4	**Feedback on Student Experiment draft: 1 lesson on Student Experiment** Final Student Experiment due at the end of this week ☐ Describe activation energy (Ea). ☐ Explain the relationship between the strength and number of the existing chemical bonds, the magnitude of the activation energy and the rate of a chemical reaction. ☐ Sketch energy profile diagrams for reactions with and without catalysts.	Chapter 15 (all) p. 415
T3 Wk5	☐ Analyse energy profile diagrams for reactions with and without catalysts, to determine the enthalpy change and activation energy. ☐ Explain how catalysts affect the rate of a chemical reaction. ☐ Calculate the rate of chemical reactions by measuring the rate of formation of products or the depletion of reactants. (Formula: $rate\ of\ reaction = \frac{increase\ in\ product\ concentration\ (\Delta[P])}{time\ taken}$ or $\frac{increase\ in\ product\ concentration\ (-\Delta[R])}{time\ taken}$) ☐ Analyse data and graphical representations of relative changes in the concentration, volume and mass against time to determine rate of reaction. (Order of reaction is not required.)	Diagnostic Quiz Chapter 15.4 (all) p. 431
T3 Wk6	**Chromatography techniques** ☐ Identify that paper and thin layer chromatography can be used to determine the composition and purity of substances. ☐ Explain how variations in the strength of the interactions between atoms, molecules or ions in the mobile and stationary phases can be used to separate components. ☐ Analyse paper and thin layer (TLC) chromatographs to determine the composition and purity of substances, including calculating RF values.	Chapter 11.5 p. 298
T3 Wk7	☐ Practise questions that involve multiple topics, e.g. limiting reagent questions involving solutions and gases. ☐ Revision	Diagnostic Quiz / Revision Chapter 12.3 review page 334 Unit 1 review p. 248 Unit 2 review p. 452
T3 Wk8	☐ Exam on all Unit 1 and 2 content during block exams	
T3 Wk9		
T3 Wk 10		

Earth and Environmental Science Coursework Planner

Unit 2: Earth Processes- energy transfers and transformations

Trinity Bay Science

Assessment

Student Experiment (Unit 1), Research Investigation (Unit 2), and Units 1 & 2 exam (end Term 3). All assessment for Units 1 and 2 is formative.

Term Week	Subject matter and textbook work	Guidance
T2 W1	**Introduction to Unit 2: Topic 1 Energy for Earth Processes** ***Energy*** • *Apply the first law of thermodynamics to Earth systems.* • *Analyse modes of energy transfer, including convection, conduction and radiation.* • *Identify energy transformations and storage in Earth systems, including evaporation, movement of tectonic plates, photosynthesis and the ocean as a heat sink.* • *Interpret data on energy transfer, including convection, conduction and radiation*	**Coursework Plan**
W2	• Student Experiment- Deconstruct A exemplar and scaffold	
W3	**PUB HOLIDAY** **Conduct original experiment-** *RQ: Is there a difference in the abiotic factors (air, soil temp, humidity and wind speed) between sites that are shaded by trees, shaded by buildings, and in full sun?* • Data Entry & Analysis- Excel skills- Average, SD, SE • Data Analysis- Graphing & p-values	
W4	• **Student Experiment Lesson 1- Rationale research** • **Student Experiment Lesson 2 - RQ and plan modifications to the methodology, Submit Prac request form** **SPORTS CARNIVAL**	
W5	• **Student Experiment Lesson 3- Risks/ Modifications to the methodology** • **Student Experiment Lessons 4** **Conduct modified experiment and collect data**	
W6	• **Student Experiment Lessons 5,6,7**	
W7	**Student Experiment Lesson 8** ***Energy and the Water Cycle*** • *describe the water cycle, including the terms evaporation, condensation, precipitation, run-off, snowmelt, infiltration and groundwater storage* • *explain and investigate the relationship between thermal and light energy from the Sun and phase changes of water as it relates to the water cycle* • *construct a flow chart to show the transfer, transformation and storage of energy in the water cycle.* ***Energy and the Earth's core*** • *describe how the decay of radioisotopes is the source of heat in the Earth's core* • *explain how energy is transferred from the core to the crust* *examine how transformations of kinetic, gravitational and thermal energy create movement of tectonic plates, including mantle convection, plume formation and slab pull.*	**Student Experiment Draft due Friday this week.**

W8	**Topic 2: Energy for atmospheric and hydrologic processes**
	Solar Energy
	• *Describe solar energy as electromagnetic radiation, including ultraviolet radiation.*
	• *Analyse how the transfer of solar energy to the Earth's surface is influenced by:*
	  ○ *atmospheric absorption, including ozone*
	  ○ *reflection by aerosols and back-scattering*
	  ○ *physical characteristics of Earth's surface, including albedo.*
	Thermal radiation and the greenhouse effect
	• *State that absorbed solar radiation is emitted as infrared radiation.*
	• *Explain how emitted infrared radiation is mostly absorbed by greenhouse gasses, which re-radiate in all directions, including back towards Earth's surface*
		Feedback on draft

W9	• *Explain how this process leads to the greenhouse effect.* • *Compare the major greenhouse gases and their sources, including carbon dioxide, methane and water vapour.* • *Interpret data relevant to the greenhouse effect* • *Interpret data about the effect of greenhouse conditions on temperature.* • **Student Experiment Lessons 9 & 10**	**Student Experiment Final due Friday this week**
W10	***Atmospheric circulation*** • *Explain how heating and cooling cause differences in atmospheric pressure.* • *Explain how the movement of air masses due to heating and cooling, and Earth's rotation and revolution, cause systematic atmospheric circulation, including* *-geostrophic wind* *-the Walker Circulation.* • *Apply knowledge of air pressure to explain*	

	- patterns of systematic atmospheric circulation *-the transfer of thermal energy around Earth's surface via systematic atmospheric circulation.* ***Atmospheric circulation*** ● *Interpret the features of synoptic charts and satellite images, including high and low pressure and isobars.*	
	HOLIDAYS	
W1	***Ocean currents*** ● *Identify the following key features of the ocean conveyor (also known as the thermohaline circulation)* *- sinking of dense water in the North Atlantic and regions around Antarctica* *- spreading of dense water in the deep ocean* *- broad upwelling of deep water* *- near surface currents, such as the Gulf Stream.* ● *Explain how global oceans act as heat sinks.* ● *Explain how the density of seawater depends on temperature and salinity.* ● *Interpret evidence demonstrating ocean currents are due to* *- differences in density* *- the rotation of Earth* *- the action of the wind.* ***Weather patterns*** *• describe weather as an interaction between the atmosphere and hydrosphere* ● *Describe the effect of the following Australian climate influences on rainfall conditions* *- El Niño and La Niña* *- Madden-Julian Oscillation* *- Indian Ocean Dipole* *- Southern Annular Mode.*	
W2	● *Compare the conditions that cause El Niño and La Niña, including the Southern Oscillation Index (SOI), and their associated effects at local and global levels.* ● *Interpret data to make reasoned decisions about El Niño and La Niña patterns.* ☐ **Research Investigation Introduction- format and exemplar** ☐ **Research Investigation Lesson 1**	**Research Investigation Handed out**
W3	**Topic 3: Energy for biogeochemical processes** ***Net primary production*** *• describe a balanced chemical equation to represent photosynthesis* *•explain how the process of photosynthesis is the principal mechanism for the transformation of energy from the Sun into energy forms that are useful for living things* *• state that net primary production is the rate at which new biomass is generated, mainly through photosynthesis* *•interpret data regarding energy transfer and transformation within ecosystems, eg food chains, webs and pyramids.* ☐ **Research Investigation Lesson 2**	
W4	***Ecosystem carrying capacity*** *• describe the concept of carrying capacity in relation to ecosystems* *•infer how energy and matter directly affect the number of organisms that can be supported in an ecosystem* *• identify the differences in carrying capacity between ecosystems using algebraic, visual and/ or graphical representations.* ☐ **Research Investigation Lesson 3** ☐ **Research Investigation Lesson 4**	
W5	***Biogeochemical cycling*** *• explain the cycling of nitrogen and phosphorus between Earth systems* *• Interpret data (i.e. measured concentrations of nitrogen and phosphorus in different water samples) to make reasoned judgments about the quality of water and health of the system it came from.* ☐ **Research Investigation Lesson 5** ☐ **Research Investigation Lesson 6**	
W6	***Carbon cycle*** *• explain the cycling of carbon between Earth systems* *• identify examples of energy storage, transfer and transformation in the carbon cycle* *•compare different geological elements of carbon storage including hydrocarbons, coal and kerogens* *• compare energy storage timescales between living things and geological elements, including sinks and residency periods.* ☐ **Research Investigation Lesson 7** ☐ **Research Investigation Lesson 8**	**Research Investigation Draft Due Friday**
W7	***Revision of Unit 1 & 2 content***	
W8	***Revision of Unit 1 & 2 content***	**Research Investgn Final Due**
W9	***Assessment Period- FIA4 Unit 1 & 2 Exam***	
W10	***Assessment Period- FIA4 Unit 1 & 2 Exam***	

11 Marine Science

MRN111A
Mr. Guinee

MRN111B
Ms. Singleton

Unit 2: Marine Biology

Topic 2: Marine Environmental Management

***Note - Assessment: Final Exam, Week 9**

Week	Topic	Resources	Notes
UNIT 2: Marine Biology, TOPIC: Biotic Components of Marine Ecosystems			
1	**Biotic components of marine ecosystems** • Identify biotic components of marine ecosystems, i.e. trophic levels, food chains, food webs, interactions and population dynamics. • Classify biotic interactions based on the following terms - symbiosis (i.e. parasitism, mutualism, commensalism and amensalism) - competition (i.e. intraspecific and interspecific) - predation. Draft Feedback Student Experiment Lesson.	**T045** **T046**	Hand out term planner
2	**Biotic components of marine ecosystems** • Identify and describe marine species, using field guides and identification keys. • Identify organisms in trophic levels in a food web based on the following terms - producers - primary consumers - secondary consumers - tertiary consumers - decomposers • Student Experiment Lesson – Final due tonight by 11:59 PM	**T047**	Student Experiment Due 24/07 by 11:59 PM
3	• Describe how matter cycles through food webs, and the process of bioaccumulation (e.g. ciguatera and mackerel (Scomberomorus spp.); mercury and blacktip sharks (Carcharhinus spp.); and toxin accumulation on microplastics. • Describe the concept of population dynamics using the terms population size, density, abundance, distribution (i.e. clumped, uniform, random), carrying capacity, niche, K-strategists and r-strategists, keystone species. Interpret population data to determine population size, density, abundance, distribution, carrying capacity. • Calculate changes in a population, using the BIDE model.	**T048** **T049** **T050** **T056**	
4	**Abiotic components of the marine ecosystem** Describe abiotic components of marine ecosystems: light availability, depth, stratification, temperature, currents (water and wind), tides, sediment type and nutrient availability.	**T052** **T053** **T054** **T055** **T051**	

	• Explain how marine ecosystems are influenced and limited by abiotic factors differently than terrestrial ecosystems due to the different physical and chemical properties of water, e.g. light availability, buoyancy, pressure, temperature, viscosity, sound, salinity and sediment loading. • Explain the concepts of limiting factors and tolerance limits and their importance in population distributions. • Interpret data to identify an organism's tolerance limit, e.g. of intertidal organisms or mangrove zonation. • Explain the concept of zonation using the following terms: intertidal, pelagic (neritic, oceanic), benthic and abyss. • Interpret field data from a local ecosystem		
5	**Topic 2: Marine environmental management (16 hours)** Science understanding Marine conservation • Classify the arguments for preserving species and habitats as ecological, economic, social, aesthetic or ethical. • Describe the direct and indirect values of marine ecosystems of Australia. • Describe the role of stakeholders in the use and management of marine ecosystems. • Discuss the specific value systems that identified stakeholders use, i.e. ecocentric, technocentric and anthropogenic	**T060** **T061** **T062** **T063**	
6	• Identify issues affecting selected marine ecosystem, including erosion, eutrophication, overharvesting, runoff, sedimentation, urbanisation. • Apply the terms ecosystem resilience, disturbance and recovery as indicators of 'health' of marine environments to a chosen case study.	**T064** **T065**	
7	**Resources and sustainable use** • Explain the precautionary principle of the marine environmental planning and management process as well as a requirement that any network of marine protected areas be comprehensive, adequate and representative • Describe the criteria are used to inform decisions regarding the design of protected marine areas • compare the strategies and techniques used for marine environmental planning and management with reference to a specific case study • Interpret data related to the marine environmental planning and management process	**T066** **T067** **T068** **T069**	

8	**Unit 1 and 2 Revision**		
9	**Exam**		**EXAM**
10	**Fitzroy Prep**		

Physics Coursework Planner

Unit 2: Linear motion and waves.

Trinity Bay Science

Assessment

Research Investigation (Unit 1), Data Test (Units 1 and 2), Student Experiment (Unit 2) and end of Units 1 and 2 exam (end of Term 3). All assessment for Units 1 and 2 is formative.

Use of this coursework plan

Use this coursework plan to inform your learning. **1.1 R and CYL** means students need to read this section and complete the Check Your Learning questions.

Term Week	Subject matter and textbook work	Guidance
T2 Wk5	**Vectors** ☐ *Contrast vectors and scalars, and use these terms to categorise physical quantities, e.g. velocity and speed.* ☐ ⍰ *Symbolise vectors graphically and algebraically, e.g. F, F̃ and F⃗.* ☐ ⍰ *Calculate resultant vectors through the addition and subtraction of two vectors in one dimension.* ☐ ⍰ *Describe the concepts of displacement, velocity and acceleration.* ☐ ⍰ *Compare instantaneous and average velocity.* ☐ ⍰ *Interpret linear motion graphs to describe the motion of an object, referring to the* ☐ *- intercepts, gradients and uncertainties (using minimum and maximum lines of best fit) of displacement–time and velocity–time graphs* ☐ *- areas under velocity–time and acceleration–time graphs using simple geometry.* ☐ Conduct an experiment that requires students to construct and interpret displacement–time and velocity–time graphs with resulting data. Where appropriate, students should use vertical error bars when plotting data. This ensures that they can determine the uncertainty of the gradient and intercepts using minimum and maximum lines of best fit.	**Formulas** Vectors can be represented: $F, \tilde{F}, \vec{F}$ *and* ⟶
T2 Wk6	☐ solve problems involving the equations of uniformly accelerated motion in one dimension **10.6 R and CYL** ☐ recall that the acceleration due to gravity is constant near the Earth's surface **10.7 R and CYL** **Mandatory practical:** Conduct an experiment to verify the value of acceleration due to gravity on the Earth's surface. *All* data sets that suggest a non-linear relationship, data (e.g. t^2 versus s) should be linearised and plotted, allowing for the calculation of the equation of a linear trend line. An evaluation of the experimental process undertaken, and of the conclusions drawn, will require students to discuss the reliability and validity of the experimental process with reference to the uncertainty and limitations of the data identify justifiable sources of imprecision and inaccuracy suggest improvements or extensions to the experiment using the uncertainty and limitations identified. **DATA TEST (1)**	
T2 Wk7	**Newton's laws of motion** ☐ ⍰ *Describe the three laws of motion of classical mechanics and give examples of each.* ☐ ⍰ *Identify forces acting on an object.* ☐ ⍰ *Construct free-body diagrams representing forces such as the force due to gravity (weight), the normal force, tension, friction, drag and applied forces acting on an object.* ☐ ⍰ *Determine the resultant force acting on an object in one dimension.* ☐ ⍰ *Solve problems using the laws of classical mechanics and a=Fnetm.* ☐ *determine* the resultant force acting on an object in one dimension ☐ *solve* problems using each of Newton's three laws of motion	**Formulas** $a_{net} = \frac{F_{net}}{m}$

T2 Wk8	☐ *define* the terms *momentum* and *impulse* ☐ *recall* the principle of conservation of momentum ☐ *determine* and *interpret* the area under a force–time graph. ☐ solve problems involving momentum, impulse, the conservation of momentum and collisions in one dimension **STUDENTS TO START PLANNING FOR STUDENT EXPERIMENT**	**Student Experiment Handed Out** **Formulas** $p = mv$ $\sum mv_{before} = \sum mv_{after}$
T2 Wk9	**STUDENT EXPERIMENT (3)**	
T2 Wk 10	**STUDENT EXPERIMENT (3)**	
T3 Wk1	**Energy** ☐ *Describe the concepts of mechanical work, kinetic energy and gravitational potential energy.* ☐ *Solve problems involving work done by a force* ☐ *Solve problems involving kinetic energy and gravitational potential energy* ☐ *Analyse the area under a force–displacement graph using geometric methods.* ☐ *Interpret energy–time graphs.* ☐ *Discuss the differences between elastic and inelastic collisions.* ☐ *Solve problems involving elastic collisions and inelastic collisions (including explosions)*	**Formulas** $W = \Delta E$ $W = Fs$ $E_k = \frac{1}{2}mv^2$ $\Delta E_p = mg\Delta h$ $\sum \frac{1}{2}mv^2_{before} = \sum \frac{1}{2}mv^2_{after}$
T3 Wk2	**Waves** ☐ *Describe the transfer of energy through waves.* ☐ *Describe the concept of mechanical waves.* ☐ *Compare transverse waves and longitudinal waves.* ☐ *Describe examples of transverse and longitudinal waves, such as sound, seismic waves and vibrations of stringed instruments.* ☐ *Describe the concepts of compression, rarefaction, crest, trough, displacement, amplitude, period, frequency, wavelength and velocity and identify them on graphical and visual representations of a wave.* ☐ *Analyse the amplitude, period, frequency and wavelength from graphs of transverse and longitudinal waves.* ☐ *Solve problems involving the period, frequency, wavelength, and velocity of a wave using $v=f\lambda$ and $f=1T$ and using but not limited to vs=346 m s−1.* ☐ *Describe the concepts of reflection, refraction, diffraction and superposition.* ☐ *Explain phenomena related to reflection and refraction using the wave model of light.* ☐ *Describe the reflection and refraction of a wave at a boundary between two media.* ☐ *Explain constructive interference and destructive interference of two simple waves.* ☐ *Determine the resultant amplitude of two simple waves interacting using the principle of superposition.* ☐ *Explain the formation of standing waves in terms of superposition with*	**Formulas** $v = f\lambda$ $f = \frac{1}{T}$
T3 Wk3	**STUDENT EXPERIMENT (1)** **Sound** ☐ *Describe the concepts of fundamental (or first) harmonic and natural frequency.* ☐ *Solve problems involving standing wave formation in pipes open at both ends, closed at one end, and on stretched strings using $L=n\lambda 2$ and $L=(2n-1)\lambda 4$.* ☐ *Describe the concept of resonance in a mechanical system.* ☐ *Identify that energy is transferred efficiently in resonating systems.* **Suggested practicals:** ☐ Conduct an experiment to investigate fundamental and harmonic wavelength in pipes. ☐ Conduct an experiment to calculate the speed of sound in air at a specific temperature.	**STUDENT EXPERIMENT DRAFT DUE** **Formulas** $L = n\frac{\lambda}{2}$ $L = (2n-1)\frac{\lambda}{4}$
T3 Wk4	**STUDENT EXPERIMENT (1)** **Light** ☐ *Describe the concept of Snell's Law.*	

	☐ *Solve problems involving the refraction of light at the boundary between two mediums* ☐ *Contrast the speed of light and the speed of mechanical waves.* ☐ *Describe the concept of intensity and its proportionality to the square of the amplitude.* ☐ *Solve problems involving the proportional relationship between intensity of light and the inverse-square of the distance from the source using I∝1r2.* ☐ *Determine the refractive index of a transparent substance from experimental data.* ☐	
T3 Wk5	**STUDENT EXPERIMENT (1)** ☐ *Describe the concept of Snell's Law.* ☐ *Solve problems involving the refraction of light at the boundary between two mediums u* ☐ *Contrast the speed of light and the speed of mechanical waves.* ☐ *Describe the concept of intensity and its proportionality to the square of the amplitude.* ☐ *Solve problems involving the proportional relationship between intensity of light and the inverse-square of the distance from the source using I∝1r2.* ☐ *Determine the refractive index of a transparent substance from experimental data.* **Mandatory practical:** Conduct an experiment to determine the refractive index of a transparent substance.	**STUDENT EXPERIMENT DUE** **Formulas** $\frac{\sin i}{\sin r} = \frac{v_1}{v_2} = \frac{\lambda_1}{\lambda_2} = \frac{n_2}{n_1}$ $I \propto \frac{1}{r^2}$
T3 Wk6	Revision	
T3 Wk7	Revision	
T3 Wk8	Revision	
T3 Wk9	**Exam Block**	
T3 Wk 10	**Exam Block**	

12 Aquatic Practices
Rod Building

AQP12A	AQP12B	AQP122C - Term 3
Mr Witter	Ms Singleton	Paige Jewell

Week	Topic	Resources	Notes
1	**Rod Building Process** • Watch the video series to familiarise yourself with the rod building process: https://exclusivetackle.com.au/pages/rod-building-basics • Peruse the rod building booklet	Rod building video series: Term planner Booklet	Hand out term planner Watch all Rod Building videos for basic build understanding
2	**Rod Building Process** • ***Identify*** the parts of the rod, their orientation and location on the rod blank • ***Identify*** the order of the grip assembly • Note how to mix and clean up the two-part glue	Rod building video series Booklet	**<u>MUST DO BY THIS WEEK:</u>** **Complete Part A of Workbook**
3	**Types of Rods – Rod Design** • ***Identify*** the type of fishing rod the students will be making: spin rod or bait caster rod • ***Explain*** proper handle and guide orientation to spine depending upon type of rod (spin rod or bait caster rod) **Planning Rod Assembly – Rod Design** • ***Identify*** the grip assembly, binding positions, and calculate the binding positions • ***Identify*** the design for the binds on your rod	Rod building video series Booklet Step-by-step Power Point series	Good idea to watch all Rod Building videos for basic understanding of process
4	**Rod Assembly – Blanks and Handle** • ***Identify*** proper procedures for locating the spine on a blank • ***Identify*** spine on blank to use for handle setup and complete handle and grip assembly • ***Apply*** knowledge of handle kit to assemble the handle	Rod building video series Step-by-step Power Point series	Begin Part B of Workbook **<u>MUST DO:</u>** **Glue handle kit** **Feedback on quality of rear grip assembly** before students continue to reel seat and fore grip
5	**Rod Assembly - Guides** • ***Investigate*** guide preparation, including: spacing, alignment, threading spool holder trimming thread, and burnishing thread • ***Complete*** one practice bind – this bind will be undone as it is only a practice	Step-by-step Power Point series	**<u>MUST DO:</u>** **Finish Part B of Workbook** **Complete a practice bind** **Feedback on quality of practice bind** before students begin actual binds

6	**Rod Assembly - Guides** • ***Apply*** knowledge of guides to begin binding of guides	Step-by-step Power Point series	**<u>MUST DO:</u>** **Complete binding of 2 guides**
7	**Rod Assembly - Guides** • ***Apply*** knowledge of guides to continue binding of guides, **including a decorative bind**	Step-by-step Power Point series	**<u>MUST DO:</u>** **Complete binding of 3 guides**
8	**Rod Assembly - Guides** • ***Apply*** knowledge of guides to complete binding of guides	Step-by-step Power Point series	**<u>MUST DO:</u>** **Complete binding of any remaining guides**
9	**Rod Assembly - Finalising** • ***Explore*** benefits of gel coats and apply **first** clear coat • ***Consider*** need for sanding back of first coat and apply **second** clear coat	Step-by-step Power Point series	**<u>MUST DO:</u>** **Complete initial clear coat this week**
10	**Rod Assembly - Finalising** • ***Investigate*** how to inspect completed rods for stress points or defects in rod • ***Investigate*** how to test rods • ***Reflect*** on own and peers' rods: Show and tell about your rod! Which parts are you proud of, which parts could you have done better? Which of your peers' rods do you like the most and why?	Step-by-step Power Point series	**<u>MUST DO:</u>** **Complete final clear coat** Complete self-assessment section of booklet **SUBMIT ROD AND BOOKLET FOR MARKING**

Biology Coursework Planner

Unit 4: Genetics and Heredity

Trinity Bay Science

Assessment

Student Experiment (Term 1, 20%), Research Investigation (Term 2, 20%), and Unit 3 and 4 exam (Term 4, 50%). All assessment for Units 3 and 4 is summative.

	Subject matter	Guidance
T2 Wk 1	☐ **Topic 1: Genetics and heredity** ☐ Describe the structure and function of DNA, genes and chromosomes in prokaryotes and eukaryotes, including - Helical structure, nucleotide composition (nitrogenous base + sugar + phosphate), complementary base pairing, hydrogen bonds - Introns and exons, promoter region - Homologous chromosomes (i.e. sister chromatids, centromeres, telomeres, gene loci, alleles), role of histones - Circular chromosomes (i.e. prokaryotes, mitochondria, chloroplasts) and plasmids.	
	☐ Describe the process of DNA replication with reference to helicase, DNA polymerase and the joining of Okazaki fragments.	
	☐ Explain how errors in DNA replication and damage by physical/chemical factors in the environment can lead to points and frameshift mutations.	
T2Wk 2	☐ Describe the process of meiosis and explain how crossing over, independent assortment and random fertilisation produce variation in the genotypes of offspring.	
	☐ Compare spermatogenesis and oogenesis.	
	☐ Explain how errors in meiosis can lead to chromosomal abnormalities such as insertions, deletions, duplications, inversions, translocations and aneuploidy.	
T2 Wk 3	☐ ANZAC Day Public Holiday	
	☐ Research investigation handout ☐ *Research investigation*	
	☐ *Research investigation*	
T2 Wk 4	☐ *Research investigation*	
	☐ *Research investigation*	
	☐ Identify ploidy changes within a human karyotype to predict a genetic disorder.	
T2 Wk 5	☐ *Research investigation*	
	☐ *Research investigation*	
	☐ Explain the process of protein synthesis in terms of - Transcription of a gene into messenger RNA in the nucleus - RNA processing (5' cap, RNA splicing, poly-A tail) - Translation of mRNA into an amino acid sequence at the ribosome, referring to transfer RNA, codons and anticodons.	
T2WK 6	☐ *Research investigation*	
	☐ *Research investigation*	
	☐ Determine the effect of point and frameshift mutations on polypeptides using the genetic code.	

T2 WK 7	☐ Explain how gene expression is regulated in response to environmental signals and to allow for cell differentiation, including - Chemical tags that affect chromatin structure (heterochromatin vs. euchromatin). - Proteins that bind to the promoter region of a gene (transcription factors).	
	☐ Explain how HOX transcription factor family regulate morphology.	
	☐ Describe dominant, recessive, autosomal, sex-linked, polygenic and multiple-allele inheritance.	
T2 WK 8	☐ *Research investigation*	
	☐ *Research investigation*	
	☐ Infer patterns of inheritance and predict frequencies of genotypes and phenotypes from genetic data, including - Histograms (polygenic inheritance) - Pedigrees (dominant/recessive, autosomal/sex-linked) - Punnett squares (dominant/recessive, autosomal/sex-linked and multiple-allele)	
T2 WK 9	☐ Describe the process of making recombinant DNA, including the role of restriction enzymes, plasmids and DNA ligase.	
	☐ Describe how PCR and gel electrophoresis are used in DNA profiling and explain how differences in DNA allow for characteristic banding patterns.	
	☐ Interpret DNA profiles from gel electrophoresis.	
T2 WK 10	☐ Interpret DNA profiles from gel electrophoresis (practical)	IA3 Research Investigation Draft Due
	☐ Revision	
	☐ Revision	
T3WK1	☐ **Topic 2: Continuity of Life on Earth** ☐ Distinguish between microevolution and macroevolution.	
	☐ Explain microevolutionary change through the main processes of mutation, gene flow and genetic drift.	
	☐ Explain natural selection and identify the three main types of phenotypic selection: stabilising, directional and disruptive.	
T3WK2	☐ Calculate allele frequencies from genotype data.	IA3 Research investigation Final Due
	☐ Analyse data to determine the effect of a selection pressure on a population, recognising that selection for an allele can be positive or negative.	
	☐ Describe how macroevolutionary changes result from the accumulation of microevolutionary changes using examples of divergent, convergent, parallel and coevolution.	
T3WK3	☐ Explain how geographic, temporal and spatial isolation influence gene flow and may lead to allopatric, sympatric and parapatric speciation.	
	☐ Explain why population with reduced genetic diversity face increased risk of extinction.	
	☐ Explain how comparative genomics provides evidence for the theory of evolution and how conserved sequences can be used to date divergence.	
T3WK4	☐ Infer species relatedness from cladograms, phylograms and molecular sequence data.	
	☐ Determine episodes of evolutionary radiation and mass extinctions from an evolutionary timescale of life on Earth (approximately 3.5 billion years).	
	☐ End of content 😊	

Chemistry Coursework Planner

Unit 4: Structure, Synthesis and Design

Trinity Bay Science

Assessment

Assessment: Research Investigation due Week 9 Term 2. 50% external exam on Units 3 and 4 Weeks 2 – 5 Term 4.
Note: Student Experiment based on Unit 3 work due Week 1 of Term 2.

Highlighting indicates material not in the 2019 syllabus (which therefore won't be on any past exams).

Italics indicates skills and processes which will be assessed on the Student Experiment and / or Research Investigation, but not on the external exam.

Term Week	Subject matter and textbook work	Guidance / Notes / Feedback x 3
T1 Wk9	**Structure of organic compounds** ☐ Identify organic molecules including alkanes, alkenes, alkynes, alcohols, aldehydes, ketones, carboxylic acids, haloalkanes, esters, amines and amides. ☐ Discriminate between class and functional groups, e.g. for OH, hydroxyl is the functional group and alcohol is the class. ☐ Describe the features of a homologous series. ☐ Discriminate between saturated and unsaturated organic molecules. ☐ Discriminate between empirical, molecular and structural formulas. ☐ Determine molecular and structural formulas for organic compounds, up to C10, including simple methyl and ethyl branched chains, for ○ alkanes, alkenes and alkynes ○ alcohols (primary, secondary and tertiary) ○ aldehydes and ketones ○ carboxylic acids ○ amines and amides ○ haloalkanes (primary, secondary and tertiary) ○ esters ☐ Apply IUPAC rules in the nomenclature of organic compounds, up to C10, including simple methyl and ethyl branched chains, for ○ alkanes, alkenes and alkynes ○ alcohols (primary, secondary and tertiary) ○ aldehydes and ketones ○ carboxylic acids ○ haloalkanes (primary, secondary and tertiary) ○ esters. ☐ Identify structural and stereoisomers, including geometrical (cis and trans) and optical isomers. ☐ Deduce the structural formula of geometrical (cis and trans) isomers (non-cyclic alkenes), optical isomers and isomers of the non-cyclic alkanes up to C6. ☐ Sketch the structural formula and apply IUPAC rules in the nomenclature for isomers of alkanes (non-cyclic) and alkenes (straight chain) up to C6, and for the geometrical (cis and trans) isomers of simple alkenes (non-cyclic). ☐ Determine the structural formula of optical isomers for simple organic compounds. ☐ Identify chiral carbon atoms. ☐ Analyse data to determine the structural, molecular and empirical formula of organic compound and the percentage composition of elements in organic compounds. **Give out Research Investigation task sheet. Brainstorming. Homework: Decide on an area of interest, find evidence and draft a Research Question.**	Chapter 8.1, 8.2, 8.3, 8.4, 8.5 (pg 259)

T1 Wk 10	**Physical properties and trends** ☐ Explain the trends (melting point, boiling point, volatility, solubility in water and organic solvents) within and between homologous series (alkanes, alkenes, alcohols, carboxylic acids) in term of intermolecular and intramolecular bonding, e.g. dispersion forces, dipole-dipole interactions and hydrogen bonds. ☐ Analyse data to determine the physical properties of an homologous series, trends in melting point, boiling point, volatility and the solubility alkanes, alkenes, alcohols and carboxylic acids. **1 lesson feedback on draft of student experiment** **Final of Student Experiment (based on Unit 3) due Monday week 1**	Chapter 8.6, 8.7 (pg 322)
	Holidays	
T2 Wk1	**Final of Student Experiment (based on Unit 3) due** **Organic reactions and reaction pathways part 1** ☐ Identify that an organic compound displays characteristic chemical properties and undergoes specific reactions based on the functional group present. ☐ Determine, using equations, the reaction of ○ alkanes with halogens (X2) ○ alkenes with water, halogens(X2), hydrogen (H2) and hydrogen halides (HX) ○ carboxylic acid with alcohol to form esters, and with amines to form amides. ☐ Apply Markovnikov's rule to determine the products for addition reactions of alkenes with hydrogen halides (HX) and water. ☐ Determine, using equations, reactions including the ○ addition of alkenes to form poly(alkenes) ☐ Describe the acid-base properties of carboxylic acids and amines. ☐ Explain that esterification is a reversible reaction.	Chapter 9 (pg 322)
T2 Wk2	**Organic materials: structure and function part 1** ☐ Describe the structural features of ○ ~~amino acids, tripeptides~~, monosaccharides and disaccharides ○ polyethene (LDPE and HDPE), polypropene (syntactic, isotactic and atactic) and polytetrafluorethene (Teflon). ○ polylactic acid (PLA), polyamide (nylon) and polyester. • ☐ Explain how properties, including strength, density and biodegradability of polymers can be related to the structures of the materials.	Chapter 10.3, 10.4, 10.5 (pg 415)
T2 Wk3	**Macromolecules part 1: Polymers** ☐ Describe, using equations, how ○ addition polymers, including polyethene (LDPE and HDPE), polypropene and polytetrafluorethene, can be produced from their monomers ○ condensation polymers, including polysaccharides (carbohydrates), polylactic acid (PLA), polyamide (proteins and nylon) and polyester, can be produced from their monomers. ☐ Identify that disaccharides are formed when monosaccharides monomers are joined by glycosidic bonds.	Chapter 10.4, 10.5 (pg 415)
T2 Wk4	**2 lessons RI**	
T2 Wk 5	**3 lessons RI**	
T2 Wk 6	**3 lessons RI**	
T2 Wk 7	**Organic reactions part 2** ☐ Determine, using equations, the reaction of ○ haloalkanes with halogens (X2), sodium hydroxide and ammonia ○ alcohols with hydrogen halides (HX)	Chapter 9 (pg 322)

	☐ Determine, using equations, reactions including the ○ oxidation of alcohols ○ combustion of alkanes and alcohols ○ reduction of alkynes and alkenes to form alkanes ***Draft of RI due this week***	
T2 Wk 8	○ elimination of haloalkanes to form alkenes. ☐ Identify reactions as addition, elimination, substitution or redox (oxidation-reduction). (Reaction mechanism for substitution and elimination reactions are not required.) ***2 lessons RI***	Chapter 9 (pg 322)
T2 Wk 9	**Organic reactions part 2** ☐ Determine the primary, secondary and tertiary carbon atoms in haloalkanes and alcohols. ☐ Discriminate between ○ alkanes and alkenes using bromine water ○ primary, secondary and tertiary alcohols using acidified potassium dichromate (VI) and potassium manganate (VII). ☐ Interpret chemical tests to distinguish between alkanes and alkenes; and primary, secondary and tertiary alcohols. ***Final Research Investigation due this week***	Chapter 9.4 (pg 383)
T2 Wk 10	**Formal this week (Friday)**	
	Holidays	
T3 Wk 1	**Cairns show public holiday (Friday)** ☐ Determine reaction pathways, including reagents, condition and chemical equations, given the starting materials and the product/s formed. ☐	Chapter 9.4 (pg 383)
T3 Wk 2	☐	Chapter 9.4 (pg 383)
T3 Wk 3	**Organic materials: structure and function** ☐ Explain the acid-base properties of 2-amino acids, including the formation of zwitterions. ☐ Describe the structural features of ○ amino acids, tripeptides, ~~monosaccharides and disaccharides~~ **Macromolecules part 2: Peptides** ☐ Apply amino acid symbols to construct and name tripeptides. ☐ Identify that tripeptides are formed when amino acid monomers are joined by peptide bonds.	Chapter 10.1, 10.2 (pg 399)
T3 Wk 4	**Analytical techniques** ☐ Explain how amino acids can be separated and identified by paper/TLC chromatography, including intermolecular forces/solubility in mobile and stationary phase and retention (RF) values. ☐ Explain how amino acids can be separated and analysed by electrophoresis, including pH of buffer, isoelectric points, and movement of charged ions. ☐ Analyse data, including paper/TLC chromatograms and electrophoresis to determine the identity of amino acids and retention factors. (Formula: RF = distance moved by the amino acid distance moved by the solvent)	Chapter 11 (pg 455)
T3 Wk 5	☐ Analyse data from spectra, including mass spectroscopy and infrared to determine the identity and structure of organic molecules. **Chemical synthesis** ☐ Explain that reagents and reaction conditions are chosen to optimise the yield and rate for chemical synthesis processes, including the production of ammonia (Haber process) and sulfuric acid (contact process).	Chapter 11 (pg 455) Chapter 12 (pg 509)

	☐ Describe, using equations, the ○ production of ammonia by the Haber process ○ production of sulfuric acid using the contact process ○ production of ethanol from fermentation and the hydration of ethene	
T3 Wk 6	○ operation of a hydrogen fuel cell under acidic and alkaline conditions. ☐ Calculate the yield of chemical synthesis reactions by comparing stoichiometric quantities with actual quantities and by determining limiting reagents and/or reaction conditions. ☐ Analyse and interpret data to determine the impact of reagents and reaction conditions on yield and rate of chemical synthesis processes.	Chapter 12 (pg 509)
T3 Wk 7	Review unit 3	Unit 3 Review (pg 241)
T3 Wk 8	Review unit 3 **Student free day (Friday)**	
T3 Wk 9	Review unit 4	Unit 4 Review (pg 531)
T3 Wk 10	***Mock Block Exams this week***	
	Holidays	
T4 Wk 1	☐	
T4 Wk 2	**QCAA exams start week 2**	

Marine Science Coursework Planner

Unit 4: Ocean issues and resource management

Term Week	Subject matter	Guidance
T3 Wk1	• **interpret** fish population data using the Lincoln index (capture–recapture method) and identify the reliability of this data to inform fisheries management decision-making on quota and total allowable catch • **Describe how** factors (e.g. sampling techniques, fish behaviour, temporal and spatial movement, life history) affect the reliability of fisheries population data and how this informs fisheries management decision-making on quota and total allowable catch. • **Identify** an international agreement that is used to manage migratory pelagic species	
T3 Wk2	• **Compare** the use of maximum sustainable yields and maximum economic yields • **Contrast** ecosystem-based fisheries management and traditional single species maximum sustainable yield. • **Explain** the benefits of marine protected areas to fisheries, e.g. spill-over effect, fisheries replenishment, bycatch reduction, insurance. • **Justify** the use of estuarine and open-water marine protected areas for fishery sustainability	
T3 Wk3	**Australia's fisheries management (8 hours)** • **identify** the Australian Fishing Zone (AFZ) • **Explaing** that the status of Australian fisheries is due to science-based management, the rule of law and good governance • **identify** an example of a major Australian edible seafood export product and an import product • **Discuss** the factors that lead to a higher proportion of the seafood consumed in Australia being imported	
T3 Wk4	• **Identify** the economic value of Australian Fisheries • **explain** monitoring and control of total allowable catch and fixed quotas • **describe** dynamic spatial zoning fish management (including e monitoring) as a fish management technique in terms of ecosystem-based management in relation to a case study • **describe** the use of the precautionary principle as applied to ecosystem management.	
T3 W5	**Aquaculture (9 hours)** • **Explain** the importance of aquaculture in addressing global food security • **Interpret evidence** from Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) fisheries reports to determine changes in fisheries practices over the past 10 years, including - economic contribution of aquaculture relative to wild catch - the top five aquaculture species in Australia by volume and value • **Describe** attributes (e.g. resilience, fast growth rate, low-feed conversion ratio) of an aquaculture species detailing its life cycle, adaptations, requirements and marketability that would make a species desirable to farm • **predict** how the size of ponds or tanks, the requirement of a species and farming technique influence the maximum carrying capacity of an aquaculture system.	
T3 W6	• **contrast** different aquaculture systems (e.g. open, closed or recirculating, intensive and extensive) • **Identify and explain** issues associated with aquaculture production, including output pollution, biosecurity, waste removal and feed production	

	• **Topic 2 revision**	
T3 W7	• Revision strategies • Unit 3 Topic 1	
T3 W8	• Unit 3 Topic 2 • Unit 4 Topic 1	
T3 W9	• Unit 4 Topic 2	
T3 W10	• **Revision** • **Block Exam**	

Physics Coursework Planner

Unit 4: Revolutions in Modern Physics.

Assessment

Data Test (Unit 3), Student Experiment (Unit 3), Research Investigation (Unit 4) and External Exam (Units 3 and 4). All assessment for Units 3 and 4 is summative.

Use of this coursework plan

Use this coursework plan to inform your learning. **1.1 R and CYL** means students need to read this section and complete the Check Your Learning questions.

Term Week	Subject matter and textbook work	Guidance
T1 Wk9	**Special relativity** • describe an example of natural phenomena that cannot be explained by Newtonian physics, such as the presence of muons in the atmosphere • define the terms *frame of reference* and *inertial frame of reference* • recall the two postulates of special relativity	**Formulas:** $t = \frac{t_0}{\sqrt{(1-\frac{v^2}{c^2})}}$ $L = L_0\sqrt{(1-\frac{v^2}{c^2})}$
T1 Wk10	• recall that motion can only be measured relative to an observer • explain the concept of simultaneity • recall the consequences of the constant speed of light in a vacuum, e.g. time dilation and length contraction	$p_v = \frac{m_0 v}{\sqrt{(1-\frac{v^2}{c^2})}}$ $\Delta E = \Delta m c^2$
T2 Wk1	• define the terms *time dilation*, *proper time interval*, *relativistic time interval*, *length contraction*, *proper length*, *relativistic length*, *rest mass* and *relativistic momentum* • describe the phenomena of time dilation and length contraction, including examples of experimental evidence of the phenomena • solve problems involving time dilations, length contraction and relativistic momentum	
T2 Wk2	• solve problems involving time dilations, length contraction and relativistic momentum • recall the mass–energy equivalence relationship • explain why no object can travel at the speed of light in a vacuum • explain paradoxical scenarios such as the twins' paradox, flashlights on a train and the ladder in the barn paradox.	
T2 Wk3	• explain paradoxical scenarios such as the twins' paradox, flashlights on a train and the ladder in the barn paradox.	
T2 Wk4	**Quantum theory** • explain how Young's double slit experiment provides evidence for the wave model of light • describe light as an electromagnetic wave produced by an oscillating electric charge that produces mutually perpendicular oscillating electric fields and magnetic fields	$\lambda_{max} = \frac{b}{T}$
T2 Wk5	**Research Investigation (1)** • explain the concept of black-body radiation • identify that black-body radiation provides evidence that electromagnetic radiation is quantised into discrete values • describe the concept of a photon • solve problems involving the energy, frequency and wavelength of a photon	$E = hf$ $h = 6.626 \times 10^{-34} Js$
T2 Wk6	• describe the photoelectric effect in terms of the photon • define the terms *threshold frequency*, *Planck's constant* and *work function* • solve problems involving the photoelectric effect • recall that photons exhibit the characteristics of both waves and particles • describe wave–particle duality of light by identifying evidence that supports the wave characteristics of light and evidence that supports the particle characteristics of light.	**RI Evidence and RQ Due** $E_k = hf - W$ $\lambda = \frac{h}{p}$ $n\lambda = 2\pi r$ $mvr = \frac{nh}{2\pi}$

T2 Wk7	**Research Investigation (2)** • **Mandatory practical:** Conduct an experiment (or use a simulation) to investigate the photoelectric effect. Data such as the photoelectron energy or velocity, or electrical potential difference across the anode and cathode, can be compared with the wavelength or frequency of incident light. Calculation of work functions and Planck's constant using the data would also be appropriate.	**RI Trends, Patterns and Interpretation Due**
T2 Wk8	• describe Rutherford's model of the atom including its limitations • describe the Bohr model of the atom and how it addresses the limitations of Rutherford's model • explain how the Bohr model of the hydrogen atom integrates light quanta and atomic energy states to explain the specific wavelengths in the hydrogen line spectrum • solve problems involving the line spectra of simple atoms using atomic energy states or atomic energy level diagrams	$\frac{1}{\lambda} = R(\frac{1}{{n_f}^2} - \frac{1}{{n_i}^2})$
T2 Wk9	**Research Investigation (3)**	
T2 Wk10	**Research Investigation (1)** **The Standard Model** • define the concept of an elementary particle and antiparticle • recall the six types of quarks	**RI Draft Due**
T3 Wk1	**Research Investigation (2)** • define the terms *baryon* and *meson* • recall the six types of leptons • recall the four gauge bosons	
T3 Wk2	**Research Investigation (1)** • recall the six types of leptons • recall the four gauge bosons • describe the strong nuclear, weak nuclear and electromagnetic forces in terms of the gauge bosons • contrast the fundamental forces experienced by quarks and leptons.	**RI Final Due**
T3 Wk3	**Particle interactions** • define the concept of lepton number and baryon number • recall the conservation of lepton number and baryon number in particle interaction	
T3 Wk4	• explain the following interactions of particles using Feynman diagrams electron and electron electron and positron a neutron decaying into a proton • describe the significance of symmetry in particle interactions	
T3 Wk5	• Conduct practice exam questions, marking them using marking scheme then backward mapping to syllabus topic dot points.	
T3 Wk6	• Preparing a plan of study for Unit 3 and 4 • Review Unit 3, Topic 1: Gravity and Motion - Vectors, Projectile Motion, Inclined Planes • Review Unit 3, Topic 1: Gravity and Motion - Circular Motion, Gravitational Force and Fields, Orbits	
T3 Wk7	• Review Unit 3, Topic 2: Electromagnetism – Electrostatics, Magnetic Fields • Review Unit 3, Topic 2: Electromagnetism – Electromagnetic Induction, Electromagnetic Radiation	
T3 Wk8	• Review Unit 4, Topic 1: Special Relativity • Review Unit 4, Topic 2: Quantum Theory	
T3 Wk9	• Review Unit 4, Topic 3: The Standard Model – The Standard Model • Review Unit 4, Topic 3: The Standard Model – Particle Interactions	
T3 Wk10	Mock External Exam	

Year 12 Psychology

Unit 3: Individual thinking

Unit 4: The influence of others

Week		Learning Advice
1	• Describe stereotypes and identify their advantages and disadvantages. • Describe the formation of prejudice in terms of: scapegoating, direct experience and personal prejudice, group prejudice, and the prejudiced personality. • Contrast prejudice and discrimination. • Interpret data about the relationship between stereotype priming and behaviour from a modification of experiment 2 in Bargh, Chen & Burrows' (1996) study.	
2	**Unit 4 Topic 4: Cross-cultural psychology** • Explain how membership, influence, integration and fulfilment of needs, and shared emotional connection lead to a sense of community. • Describe the concept of culture in the psychological context, with reference to behaviours, beliefs and values, and to individualist and collectivist cultures. • Discriminate between multiculturalism and pluralism, on the basis of the absence or presence of a dominant culture.	
3	• Describe the psychological challenges of immigration and acculturation, including culture shock, assimilation and marginalisation. • Explain how cultural diversity can be a source of conflict, with reference to prejudice expressed as implicit and explicit racism. • Describe ways to reduce prejudice, with reference to intergroup contact that is sustained, with superordinate goals, mutual interdependence and equality of status.	
4	Revision for external exam	
5	Revision for external exam	
6	Revision for external exam	
7	Revision for external exam	
8	Revision for external exam	
9	Revision for external exam	
10	Revision for external exam	
	Easter Holidays	