

**MATHEMATICS, SCIENCE AND IT ACADEMY
SEMESTER 1 2019**

Course Title	Biology integrating Australian Curriculum (T)	Course Code	2427
Semester Unit Title	Unit 2: Cells and Organisms	Semester Unit Code & Unit Value	23235 (1.0)
Term 3 Unit	Unit 2a: Cells and Organisms	Term Unit Code & Unit Value	23236 (0.5)
Term 4 Unit	Unit 2b: Cells and Organisms	Term Unit Code & Unit Value	23237 (0.5)

GOALS - The specific goals of this unit are for students to:

This unit should enable students to:
<ul style="list-style-type: none"> understand that the structure and function of cells and their components are related to the need to exchange matter and energy with their immediate environment
<ul style="list-style-type: none"> understand that multicellular organisms consist of multiple interdependent and hierarchically-organised systems that enable exchange of matter and energy with their immediate environment
<ul style="list-style-type: none"> understand how theories and models have developed based on evidence from multiple disciplines; and the uses and limitations of biological knowledge in a range of contexts
<ul style="list-style-type: none"> use science inquiry skills to design, conduct, evaluate and communicate investigations into the structure and function of cells and multicellular organisms
<ul style="list-style-type: none"> evaluate, with reference to empirical evidence, claims about cellular processes and the structure and function of multicellular organisms
<ul style="list-style-type: none"> communicate biological understanding using qualitative and quantitative representations in appropriate modes and genres

CONTENT SUMMARY

Term 3 Unit 2a: Cells as the basis of life

- Cells require inputs of suitable forms of energy, including light energy or chemical energy in complex molecules, and matter, including gases, simple nutrients, ions, and removal of wastes, to survive (ACSBL044)
- The cell membrane separates the cell from its surroundings and controls the exchange of materials, including gases, nutrients and wastes, between the cell and its environment (ACSBL045)
- Movement of materials across membranes occurs via diffusion, osmosis, active transport and/or endocytosis (ACSBL046)
- Factors that affect exchange of materials across membranes include the surface-area-to-volume ratio of the cell, concentration gradients, and the physical and chemical nature of the materials being exchanged (ACSBL047)
- Prokaryotic and eukaryotic cells have many features in common, which is a reflection of their common evolutionary past, but prokaryotes lack internal membrane bound organelles, do not have a nucleus, are significantly smaller than eukaryotes, usually have a single circular chromosome, and exist as single cells (ACSBL048)
- In eukaryotic cells, specialised organelles facilitate biochemical processes of photosynthesis, cellular respiration, the synthesis of complex molecules (including carbohydrates, proteins, lipids and other biomacromolecules), and the removal of cellular products and wastes (ACSBL049)
- Biochemical processes in the cell are controlled by the nature and arrangement of internal membranes, the presence of specific enzymes, and environmental factors (ACSBL050)

- Enzymes have specific functions, which can be affected by factors including temperature, pH, the presence of inhibitors, and the concentrations of reactants and products (ACSBL051)
- Photosynthesis is a biochemical process that in plant cells occurs in the chloroplast and that uses light energy to synthesise organic compounds; the overall process can be represented as a balanced chemical equation (ACSBL052)
- Cellular respiration is a biochemical process that occurs in different locations in the cytosol and mitochondria and metabolises organic compounds, aerobically or anaerobically, to release useable energy in the form of ATP; the overall process can be represented as a balanced chemical equation (ACSBL053)

Term 4 Unit 2b: Multicellular organisms

- Multicellular organisms have a hierarchical structural organisation of cells, tissues, organs and systems (ACSBL054)
- The specialised structure and function of tissues, organs and systems can be related to cell differentiation and cell specialisation (ACSBL055)
- In animals, the exchange of gases between the internal and external environments of the organism is facilitated by the structure and function of the respiratory system at cell and tissue levels (ACSBL056)
- In animals, the exchange of nutrients and wastes between the internal and external environments of the organism is facilitated by the structure and function of the cells and tissues of the digestive system (for example, villi structure and function), and the excretory system (for example, nephron structure and function) (ACSBL057)
- In animals, the transport of materials within the internal environment for exchange with cells is facilitated by the structure and function of the circulatory system at cell and tissue levels (for example, the structure and function of capillaries) (ACSBL058)
- In plants, gases are exchanged via stomata and the plant surface; their movement within the plant by diffusion does not involve the plant transport system (ACSBL059)
- In plants, transport of water and mineral nutrients from the roots occurs via xylem involving root pressure, transpiration and cohesion of water molecules; transport of the products of photosynthesis and some mineral nutrients occurs by translocation in the phloem (ACSBL060)

Assessment Schedule:

TASK	DUE DATE	WEIGHTING
Assignment 1	Week 6	20%
Exam 1: Unit 2a Cells as the basis of life	Week 8/9	30%
Assignment 2	Week 15	20%
Exam 2: Unit 2b Multicellular organisms	Week 18	30%

Specific Entry & Exit Requirements for Term Units

It is possible to enter this course at Term 2. This is a Semester Unit.

Science Unit Grade Descriptors for T courses

	A student who achieves an A grade typically	A student who achieves a B grade typically	A student who achieves a C grade typically	A student who achieves a D grade typically	A student who achieves an E grade typically
Knowledge and Understanding	<ul style="list-style-type: none"> demonstrates thorough and extensive knowledge and understanding of scientific concepts justifies and applies knowledge to familiar and unfamiliar contexts and across different concept areas and experiences, displays originality and lateral thinking in problem solving 	<ul style="list-style-type: none"> demonstrates broad and in-depth knowledge and understanding of scientific concepts applies knowledge to familiar and unfamiliar contexts and across different concept areas and experiences, displaying originality and effective thinking in problem solving 	<ul style="list-style-type: none"> demonstrates broad and general knowledge and understanding of scientific concepts is able to apply knowledge in a variety of contexts and different concept areas to solve problems 	<ul style="list-style-type: none"> demonstrates general and basic knowledge and understanding of scientific concepts is able to use knowledge in different areas to solve problems 	<ul style="list-style-type: none"> demonstrates a limited knowledge of scientific concepts displays emerging awareness of strategies to solve problems
Critical Thinking	<ul style="list-style-type: none"> evaluates, synthesises and analyses patterns and trends in data, observations and investigations and makes valid and perceptive inferences applies highly effective analytical and evaluative skills, makes perceptive connections between scientific concepts, draws accurate conclusions and proposes appropriate improvements 	<ul style="list-style-type: none"> analyses and synthesises patterns and trends in data, observations and investigations and makes valid inferences applies effective analytical skills, makes insightful connections between scientific concepts, draws mostly accurate conclusions and proposes appropriate improvements 	<ul style="list-style-type: none"> describes and explains patterns and trends in data, observations and investigations and makes general inferences describes and explains general connections between scientific concepts, draws conclusions and proposes improvements 	<ul style="list-style-type: none"> identifies and describes patterns in data, observations and investigations and makes simple inferences describes connections between scientific concepts, draws conclusions and proposes improvements 	<ul style="list-style-type: none"> identifies patterns in data, observations and investigations identifies connections between scientific concepts
Investigative Skills	<ul style="list-style-type: none"> demonstrates logical and coherent investigations, acknowledges information using referencing conventions and operates equipment highly effectively and safely 	<ul style="list-style-type: none"> demonstrates well considered investigations, acknowledges information using referencing conventions and operates equipment effectively and safely 	<ul style="list-style-type: none"> demonstrates considered investigations, acknowledges information using referencing conventions and operates equipment safely with some general effectiveness 	<ul style="list-style-type: none"> outlines investigations, inconsistently acknowledges information using referencing conventions and mostly operates equipment effectively and safely 	<ul style="list-style-type: none"> displays emerging skills in investigations, attempts to acknowledge information and operates equipment with limited awareness of safety procedures
Communication	<ul style="list-style-type: none"> presents highly complex concepts accurately and coherently in a wide range of written and non written formats using appropriate terminology with flair 	<ul style="list-style-type: none"> presents concepts clearly and logically in a range of written and non written formats using appropriate terminology with confidence 	<ul style="list-style-type: none"> presents general concepts clearly in a range of written and non written formats using appropriate terminology generally using terminology appropriately 	<ul style="list-style-type: none"> presents basic concepts in a narrow range of written and non written formats using terminology inconsistently 	<ul style="list-style-type: none"> presents some basic concepts in a limited range of written & non written formats using minimal terminology
Work practices	<ul style="list-style-type: none"> organises time and resources to work in a highly productive and safe manner both independently and in a team evaluates and analyses risks, acts highly appropriately in all investigations 	<ul style="list-style-type: none"> organises time and resources to work in a productive and safe manner both independently and in a team analyses and explains risks and acts appropriately in all investigations 	<ul style="list-style-type: none"> organises time and resources to work in a generally productive and safe manner both independently and in a team identifies and describes risks and acts appropriately in all investigations 	<ul style="list-style-type: none"> demonstrates inconsistent organisation of time & resources, works with occasional productivity & some awareness of safety independently or in a group identifies risks and acts mostly appropriately in investigations 	<ul style="list-style-type: none"> demonstrates limited organisation of time & resources to work with an emerging awareness of safety demonstrates an emerging awareness of risks, developing approaches to investigations

ATTENDANCE AND PARTICIPATION

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

Any student whose attendance falls below the 90% of the scheduled classes/contact time and has not provided substantial documentary evidence to cover the absence will be awarded a V grade. This means that 4 unexplained absences in a term or 8 unexplained absences in a semester could mean that a V grade may be awarded. However, the Principal has the right to exercise discretion in special circumstances if satisfactory documentation is supplied.

LATE SUBMISSION OF WORK

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

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

After 7 days, late work will be awarded the Notional Zero. Calculation of a Notional Zero is based on genuine scores, (items submitted on time or with an extension). The Notional Zero will be a score that lies between 0.1 of the standard deviation below the lowest genuine score for that item and zero. If the lowest genuine score is zero, then the notional score is zero.

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

Unless prior approval is granted, any student who fails to submit assessment tasks worth in total 70% or more of the assessment for the unit will be considered to be unassessable and will receive a V grade. The Principal has the right to exercise discretion in the application of the late penalty in special circumstances where satisfactory documentation is supplied.

CHEATING AND DISHONEST PRACTICE

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

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

MODERATION

Throughout the semester, moderation in the form of common marking schemes, cross marking and joint marking occurs across all units in the Moderation Group to ensure comparability of standards. Moderation is a process whereby student's work is compared so that student performance can be graded fairly and consistently. Moderation takes some time, and so students may not receive their work back until ACT wide moderation of grades across all colleges has occurred. Small Group Moderation is carried out in courses with small class sizes.

RIGHT TO APPEAL

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

Executive Teacher: Ruth Edge

Date 11/02/2019

Class Teacher: Ingrid Bean