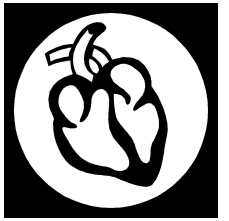
Unit 4 – Year 8 Biology



Key Question: **What is the relationship between structure and function at cell, organ and body system levels?**

Week Allocation	Science Inquiry skills	Science Understanding (Key ACARA Statements)	Elaborations and Science as a Human Endeavour	Text, practical, homework book and other resources
Week 1-3	Skill Focus Includes - ● Designing fair experiments - identifying, selecting and controlling variables ● Understanding the purpose of different types of graphs ● Drawing appropriate graphs for different types of data ● Interpreting graphs and analysing patterns ● Collect a range of information and different types of data with accuracy ● Summarising data and research ● Drawing conclusions based on evidence. ● Justifying their conclusions ● Communicating ideas and understanding ● Reflecting and evaluating theories, and findings. Considering errors and limitations of experiments ● Applying theory to new situations and real world problems (ACSIS124, ACSIS126, ACSIS129, ACSIS130, ACSIS131, ACSIS132, ACSIS133) Essential Practicals ● **Introduction to microscopes and cells: Preparing a wet mount; using the microscope** Pearson page 54-55; ● **Pearson Observing Cells** page 66, ● **Pond Life** Pearson page 68 ● **Lung pluck demo** ● **Heart dissection:** Sci Quest 8 pg131 or Pearson 3.3 page 123	Cells are the basic units of living things and have specialised structures and functions (ACSSU149)	● Parts and use of the microscope o investigating the development of the microscope and the impact it has had on the understanding of cell functions and division (ACSHE134) ● Examining a variety of cells using o a light microscope, o by digital technology or o by viewing a simulation ● distinguish between plant and animal cells ● identifying structures within cells and describing their function o nucleus, o mitochondria, o chloroplasts, o vacuoles o cytoplasm, o cell wall, o cell membrane ● investigating developments in the understanding of cells and how this knowledge has impacted on areas such as health and medicine (ACSHE134) ● Recognising the role of knowledge of cells in the area of disease treatment and control (ACSHE136) ● recognising that some organisms consist of a single cell	**Practicals** ● Getting into focus (p66) ● All in one cell (p73) ● Kitchen and wardrobe detective (p75) ● Onion, banana and rhubarb (p74) ● Pond water (p74) ● Animal cells-What's the difference (p75) ● Observing leaf epidermal cells (p89 ● Looking at chloroplasts (p89) ● Moving in or out? (p90) ● Mitosis (p94) ● Where are those germs? (p90) ● Paramecium etc. (p104) **Other Resources** ● Science by Doing Student Guide and Teacher Guide. ○ Part 2: What are cells? ○ Part 3: What goes on Inside A Cell? **Models** Animal and plant cells **Charts** B.4.d
Week 4		Multi-cellular organisms contain systems of organs that carry out specialised functions that enable them to survive (ACSSU150)	● Year 7 review – Characteristics of life and what are the essential things needed to survive (e.g. oxygen, nutrients, water and removal of waste). How do we get these essential items?	

	● **Heart rate and exercise** Pearson 3.3 page 125		● State the organisation of the body – cells, organs, systems	
Week 5-7	Possible Formal practical write up - ● Investigating the effect of body position on heart rate ● Investigating lung capacity or gas exchange rate in plants ● Plan and conduct an investigation to compare the cardiovascular health of active teenagers (those involved in regular exercise) with inactive teenagers **OR** Inquiry-based Project, possibilities include - ● Creating the perfect cell ● Who does it better? Animal or plants? Mammals or Reptiles? ● Should we be growing organs for transplants?	Multi-cellular organisms contain systems of organs that carry out specialised functions that enable them to survive (ACSSU150)	*1-2 systems (**Circulatory OR Respiratory**) are to be explored in Year 8 Biology using the following criteria -* ● List the organs and overall function of the system ● describing the structure of the heart and lungs relating its function to the overall function of the system ● examine the specialised cells and tissues involved in structure and function of the lung ● comparing similar systems in different organisms such as circulatory systems and respiratory systems in reptiles, fish and mammals ● Comparing animal circulation to plant circulation and vascular systems *(advanced only)* ● Organ transplants o considering how advances in technology, combined with scientific understanding of the functioning of body systems, has enabled medical science to replace or repair organs (ACSHE226) o discussing ethical issues that arise from organ transplantation (ACSHE135)	**Practicals** ● Heart Dissection (p131) ● View blood cells under microscope (p125) ● Measuring heart rate (p132) ● Stem transport (p87) ● Preserved rat **Other Resources** ● Science by Doing Student Guide and Teacher Guide. ○ Part 4: How can little Cells get Together to Make Big Things? **Models** Heart Torso
Week 8-10		Multi-cellular organisms contain systems of organs that carry out specialised functions that enable them to survive (ACSSU150)	● distinguishing between asexual and sexual reproduction (simple mitosis) ● recognising that cells reproduce via cell division ● describing mitosis as cell division for growth and repair *Mammalian Reproductive systems* ● Structure and function ● Fertilization ● Comparison to other organisms (eg reptiles or other mammals) ● researching the use of reproductive technologies and how developments in this field rely on scientific knowledge from different areas of science (ACSHE226) *Flowering plants **(advanced only)*** ● Identify the main parts of a flower and describe their function ● Describe how plants reproduce	**Practicals** ● Timeline activity (p173) ● What's in a flower (p206) ● Angiosperm anatomy (p206) ● Asexual reproduction (p210) ● Fast Plants (CSIRO) **Model** Male & female pelvis Flower Stigma seed germination