**Sample Course Outline**

Human Biology

General Year 11

**Copyright**

© School Curriculum and Standards Authority, 2014

This document – apart from any third party copyright material contained in it – may be freely copied, or communicated on an intranet, for non-commercial purposes in educational institutions, provided that the School Curriculum and Standards Authority is acknowledged as the copyright owner, and that the Authority’s moral rights are not infringed.

Copying or communication for any other purpose can be done only within the terms of the *Copyright Act 1968* or with prior written permission of the School Curriculum and Standards Authority. Copying or communication of any third party copyright material can be done only within the terms of the *Copyright Act 1968* or with permission of the copyright owners.

Any content in this document that has been derived from the Australian Curriculum may be used under the terms of the [Creative Commons Attribution 4.0 International licence](https://creativecommons.org/licenses/by/4.0/).

**Disclaimer**

Any resources such as texts, websites and so on that may be referred to in this document are provided as examples of resources that teachers can use to support their learning programs. Their inclusion does not imply that they are mandatory or that they are the only resources relevant to the course.

# Sample course outline

# Human Biology – General Year 11

## Unit 1 – Healthy body

**Science Inquiry Skills**

Science Inquiry Skills align with the Science Understanding and Science as a Human Endeavour content of the unit and are integrated into the learning experiences.

| **Week** | **Key teaching points** |
| --- | --- |
| 1 | **Characteristics of life*** Life processes
* Cell theory
* Cell structure and function
* Cell membrane, nucleus, mitochondria, ribosomes, lysosomes and cytoplasm

Practical activity – Build a cell model |
| 2 | * Microscopy
* Improved techniques have enhanced cellular understanding
* Microscopy techniques
* Preparation of wet mount slide
* Calculating magnification and field of view
* Estimating cell size
* Drawing labelled diagrams of cells observed under the microscope
* Use electron micrographs to identify cell organelles

Practical activity – Microscopy: Observing cells |
| 3–4 | * Exchange of materials
* Surface area to volume ratio and exchange of materials

**Task 1:** Science inquiry (practical) – Surface area to volume ratio* Passive processes (diffusion and osmosis)

Practical activity – DiffusionPractical activity – Osmosis * Active processes (active transport and endocytosis)
* Cellular respiration
* Aerobic respiration

Practical activity – Aerobic respiration* Anaerobic respiration

Practical activity – Anaerobic respiration |
| 5–6 | **Task 2:** Test –Characteristics of life**Body organisation*** Hierarchical structural organisation – cells, tissues, organs, systems

**Respiratory system*** Structure and function of the respiratory system

Practical activity – Measuring vital capacity* Characteristics for efficient gas exchange
* Mechanics of breathing

Practical activity – Build a lung model**Commence Task 6:** Extended response – Diseases and lifestyle choices that affect body systems |
| 7-9 | **Circulatory system*** Structure and function of the circulatory system
* Structure and function of the heart

Practical activity – Heart dissection* Structure and function of blood vessels (arteries, veins, capillaries)

Practical activity – Microscopy: Observing blood vessel cross-sections **Task 3:** Science inquiry (investigation) – Factors affecting heart rate and blood pressure* Components of blood and their function

Practical activity – Microscopy: Observing prepared slides of blood cells **Task 4:** Test – Respiratory and circulatory systems |
| 10–12 | **Digestive system*** Structure and function of the digestive system
* Mechanical and chemical digestion

Practical activity – Simulating digestion* Elimination of wastes

**Task 5:** Science inquiry (practical) – Enzyme activity |
| 13–14 | **Nutrition and diet*** Maintaining a healthy diet
* Nutrient groups and their uses in the body

Practical activity – Nutrients contained in foods**Task 6:** Extended response – Diseases and lifestyle choices that affect body systems |
| 15–16 | **Urinary system*** Structure and function of the urinary system

Practical activity – Kidney dissection* Water balance
* Diagnosis and treatment of kidney dysfunctions

**Task 7:** Test – Nutrition and diet, digestive and urinary systems |

## Unit 2 – Reproduction and inheritance

**Science Inquiry Skills**

Science Inquiry Skills align with the Science Understanding and Science as a Human Endeavour content of the unit and are integrated into the learning experiences.

| **Week** | **Key teaching points** |
| --- | --- |
| 1 | **Genetic material*** Structure and function of DNA

Practical activity – Build a DNA model* Relationship between chromosomes, genes and DNA
* Difference between genes and alleles
 |
| 2–3 | **Cell division*** Mitosis
* Phases of mitosis

Practical activity – Microscopy: Observing mitosis* Meiosis
* Phases of meiosis
* Difference between mitosis and meiosis

**Task 8:** Science inquiry (practical) – Modelling cell division |
| 4–6 | **Reproductive systems*** Structure and function of male and female reproductive systems

Practical activity – Rat dissection (virtual/real)* Gamete formation
* Male – continuous
* Female – cyclic

Ovarian and menstrual cycle (FSH, LH, oestrogen and progesterone)**Task 9:** Test **–** Genetic material, cell division and reproductive systems |
| 7–10 | **Pregnancy*** Stages of pregnancy
* Fertilisation (zygote)
* Implantation and placenta formation
* Embryonic development
* Foetal development
* Monitoring foetal development using ultrasound
* Maternal lifestyle choices that affect foetal development and baby health (diet, smoking, alcohol, drugs)
* Birth process
* Sequence of events
* Changes in the mother and baby
* Complications during birth
* Methods of delivery
* Milestones of infant development

**Task 10:** Science inquiry (practical) – Milestones of infant development**Task 11:** Test – Pregnancy and birth |
| 11–13 | **Reproductive technologies*** Contraceptive methods
* Preventing fertilisation e.g. condom, diaphragm, IUDs
* Preventing implantation e.g. IUDs
* Controlling menstrual and ovarian cycles e.g. the Pill, injections, implants
* Infertility treatments used to assist reproductive technologies

Practical activity – Simulating artificial fertilisation of an ovum* In vitro fertilisation-embryo transfer (IVF-ET)
* Gamete intrafallopian transfer (GIFT)
* Zygote intrafallopian transfer (ZIFT)
* Frozen embryo transfer (FET)
* Genetic testing
* Parental
* Embryonic
* Foetal

**Task 12:** Extended response – Prenatal testing |
| 13–16 | **Sexually transmitted infections*** Cause, mode of transmission, symptoms and treatment of common STIs
* Bacterial e.g. Chlamydia, Gonorrhoea, Syphilis
* Viral e.g. Genital herpes, Genital warts, HIV
* Fungal e.g. Thrush (not considered STI, however, can be transmitted via sexual contact)
* Parasites e.g. Pubic lice, Trichomoniasis

Task 13: Science inquiry (investigation) – Factors affecting the spread of infectious diseases* Notifiable STIs
* STI trends and targeted education campaigns

**Task 14:** Test – Reproductive technologies and STIs |