**Sample Course Outline**

Human Biology

General Year 11

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# 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 – Diffusion  Practical 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 |