Government of **Western Australia**
School Curriculum and Standards Authority

SAMPLE COURSE OUTLINE

HUMAN BIOLOGY
GENERAL YEAR 11

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)

Week	Key teaching points
	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)

Week	Key teaching points
	▪ 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