

Senior Science A

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Senior Science is a course that prepares you for the workforce and deals with current issues in Science. There is an innate human curiosity and desire to understand the universe. The study of Senior Science encourages and enables students to develop an understanding of the universe through observation, questioning, experimentation, discussion, critical analysis and creative thinking.

Students explore key concepts and models through active enquiry into phenomena and through contexts that exemplify the role of Science in society. They learn how an understanding of Science is central to the identification of, and solutions to, some of the key issues facing an increasingly globalised society. The subject explores ways in which scientists work collaboratively and individually in a range of integrated fields to increase understanding of an ever-expanding body of scientific knowledge.

Scientific processes challenge current understanding and are continually re-evaluated. Students are constantly encouraged to examine and reconsider their understanding of scientific concepts, their inquiry methods and phenomena.

The study of Science equips students with the skills to be independent thinkers and life-long learners who are confident to pursue a wide range of study pathways and careers.

Course Patterns

This course is non-sequential and units are 1.0 units. Students will be encouraged to participate in a broad range of units over the two years of study.

Units

For a standard (1.0) unit, any of the electives listed for each unit may be chosen in no particular order by the school. For the half standard (0.5) unit, students investigate a selection of topics within any one standard (1.0) unit.

Unit 1: Biological Senior Science (Living Organisms)

Genetics and Disease: In this elective, students will study: nature of pathogens, infectious diseases, immune responses, vaccinations, diagnosis and treatment of disease, DNA structure, genes and chromosomes, inheritance patterns, genetic diseases, environmental influences on genes

The Human Body: In this elective, students will study: digestive system, diet and nutrition, respiratory system, circulatory system, excretory system and osmoregulation, musculoskeletal system, energy systems and physical fitness, homeostasis, nervous system, hormones and, reproduction, associated lifestyle diseases

Animal Science: In this elective, students will study: breeding of domestic animals, common animal, diseases and their treatment, animal care and maintenance, nutritional requirements for different animals, impact of feral animals, biological control of feral populations, animal rights and welfare policies, animal living conditions, keeping native animals.

Gardening Science, In this elective, students will study: structure and function of plants. seeds and fruit, plant reproduction – asexual and sexual, pest and weed control, propagation of plants, soil fertility, composting, growing vegetables, planning seasonal gardens, native and exotic plants, garden tool use and maintenance.

Forensic Science, In this elective, students will study: crime scene and evidence. fingerprint characteristics, blood

composition and splatter patterns, DNA profiling, entomology, hair and fibres, castings, ballistics, soil composition, chromatography, drug analysis and poisons.

Unit 2: Environmental Senior Science (Our Changing Planet)

Gardening Science, In this elective, students will study: structure and function of plants. seeds and fruit, plant reproduction – asexual and sexual, pest and weed control, propagation of plants, soil fertility, composting, growing vegetables, planning seasonal gardens, native and exotic plants, garden tool use and maintenance

Perilous Planet, In this elective, students will study: nature of disasters, plate tectonics, geological disasters, hydrological disasters, meteorological disasters, extraterrestrial disasters, man-made disasters, emergency responses, disaster management plans

Sustainability, In this elective, students will study: defining sustainability, renewable resources, recycling, sustainable food production, building design, cutting greenhouse emissions, pollution in the home, waste disposal, energy efficiency within the home, sustainable housing,

Astronomy, In this elective, students will study: the night sky, astronomy vs astrology, telescopes and tools, star navigations, satellites and emerging technologies, origin of the universe, galaxies and their formation, star lifecycles, the solar system and its formation, earth moon system





Unit 3: Chemical Senior Science (Chemistry In Action)

Household Chemistry, In this elective, students will study: acids, bases and salts and their role in the house, detergents soaps and their nature, dyes, bleaches and paints, baking soda and yeast, fermentation, storage and handling of household chemicals, medicines, disposal of household chemicals and waste, chemical reactions and the cooking process, food storage and hygiene

composition and splatter patterns, DNA profiling, entomology, hair and fibres, castings, ballistics, soil composition, chromatography, drug analysis and poisons,

Unit 4 Physical Senior Science (Physics in our lives)

Transport, In this elective, students will study: fuel types and combustion, internal combustion engine, rockets and ramjets, Newton's three laws of motion, speed and acceleration, aerodynamics and design, consequences of collision, braking distances, environmental impact, vehicle design features for safety and fuel efficiency, biological impact of weightlessness and space travel, emerging transport technologies

Light and Sound, In this elective, students will study: wave physics, sound waves and their properties, musical instruments, the structure and function of ears, the nature of light waves, the electromagnetic spectrum and its applications, reflections, refractions and dispersion, optical instruments and cameras, structure and function of eyes, lasers and their applications, fibre optics

Electricity, In this elective, students will study: electrical currents and fields, electric circuits, alternating and direct currents, voltage, current and resistance, energy usage in the home, electrical safety in the home, conductors and insulators, generation of electricity, alternative energy sources and generators, distribution of electricity.

Forensic Science, In this elective, students will study: crime scene and evidence. fingerprint characteristics, blood composition and splatter patterns, DNA profiling, entomology, hair and fibres, castings, ballistics, soil composition, chromatography, drug analysis and poisons.

Unit 5 Independent Study

An independent study unit is possible for students who have completed three units in this course.



Hair Care and Cosmetics, In this elective, students will study: structure and properties of hair, requirements for healthy hair, chemical composition of shampoos and conditioners, structure and properties of the skin, requirements for healthy skin, allergies and disorders of the skin, skin care products, perfumes and essential oils, make up and its application, animal testing ethics, nail care

Forensic Science, In this elective, students will study: crime scene and evidence. fingerprint characteristics, blood

