Junior Science Olympiad Academy

2024 Syllabus Summary

The material in the Academy is taught at an advanced Year 10-Year 11 level.

Term 1

Biology Teacher: Dr Jane Mooney	Chemistry Teacher: Dr Kathryn White
• cell biology: structure and function of cells • the exchange of materials between cells and their external environment. • cell division • genetics: the biochemistry of DNA, patterns and mechanisms of heredity • transcription, translation and genetic variation • evolution: mechanisms and consequences of evolution	• the Periodic Table: basic atomic structure and periodic trends • chemical reactions: classifying chemistry, writing and balancing chemical equations • bonding: principles of ionic, metallic and covalent bonding, and properties of materials • stoichiometry: mole conversions, limiting and excess reactants, solution stoichiometry • numerical skills: significant figures and unit conversions

Term 2

Earth Science Teacher: Dr Leslie Almberg	Physics Teacher: Dr Tammy Humphrey
• the geosphere: the chemistry, physics and biology of rocks and landscapes • the hydrosphere: ocean dynamics, ground- and surface water storage/movement, ocean acidity, biodiversity • the atmosphere: atmospheric composition, dynamics and the greenhouse effect • into space: applying our knowledge of Earth to understand other bodies in the universe	• motion: representing displacement, velocity, acceleration in one dimension using motion diagrams, vectors, graphs and equations. • Newton's Laws • conservation of energy: work, kinetic and potential energy. • waves: mechanical waves, sound, reflection and refraction of light. • thermodynamics: mechanisms for heat transfer, introduction to specific heat capacity and latent heat. • electricity: static electricity, applying Kirchoff's laws in simple circuits.