

# Junior Cycle Science Learning Outcomes



Strands	Nature of Science	Elements	Earth and Space	Chemical World	Physical World	Biological World
Understanding About Science	<ol style="list-style-type: none"> <li>Students should be able to appreciate how scientists work and how scientific ideas are modified over time</li> </ol>	Building Blocks	<ol style="list-style-type: none"> <li>Students should be able to describe the relationships between various celestial objects including moons, asteroids, comets, planets, stars, solar systems, galaxies and space</li> <li>Students should be able to explore a scientific model to illustrate the origin of the universe</li> <li>Students should be able to interpret data to compare the Earth with other planets and moons in the solar system, with respect to properties including mass, gravity, size, and composition</li> </ol>	<ol style="list-style-type: none"> <li>Students should be able to investigate whether mass is unchanged when chemical and physical changes take place</li> <li>Students should be able to develop and use models to describe the atomic nature of matter; demonstrate how they provide a simple way to account for the conservation of mass, changes of state, physical change, chemical change, mixtures, and their separation</li> <li>Students should be able to describe and model the structure of the atom in terms of the nucleus, protons, neutrons and electrons; comparing mass and charge of protons, neutrons and electrons</li> <li>Students should be able to classify substances as elements, compounds, mixtures, metals, non-metals, solids, liquids, gases and solutions</li> </ol>	<ol style="list-style-type: none"> <li>Students should be able to select and use appropriate measuring instruments</li> <li>Students should be able to identify and measure/calculate length, mass, time, temperature, area, volume, density, speed, acceleration, force, potential difference, current, resistance, electrical power</li> </ol>	<ol style="list-style-type: none"> <li>Students should be able to investigate the structures of animal and plant cells and relate them to their functions</li> <li>Students should be able to describe asexual and sexual reproduction; explore patterns in the inheritance and variation of genetically controlled characteristics</li> <li>Students should be able to outline evolution by natural selection and how it explains the diversity of living things</li> </ol>
Investigating in Science	<ol style="list-style-type: none"> <li>Students should be able to recognise questions that are appropriate for scientific investigation, pose testable hypotheses, and evaluate and compare strategies for investigating hypotheses</li> <li>Students should be able to design, plan and conduct investigations; explain how reliability, accuracy, precision, fairness, safety, ethics, and selection of suitable equipment have been considered</li> <li>Students should be able to produce and select data (qualitatively/quantitatively), critically analyse data to identify patterns and relationships, identify anomalous observations, draw and justify conclusions</li> <li>Students should be able to review and reflect on the skills and thinking used in carrying out investigations, and apply their learning and skills to solving problems in unfamiliar contexts</li> </ol>		Systems and Interactions	<ol style="list-style-type: none"> <li>Students should be able to develop and use a model of the Earth-sun-moon system to describe predictable phenomena observable on Earth, including seasons, lunar phases, and eclipses of the sun and moon</li> <li>Students should be able to describe the cycling of matter, including that of carbon and water, associating it with biological and atmospheric phenomena</li> </ol>	<ol style="list-style-type: none"> <li>Students should be able to use the Periodic Table to predict the ratio of atoms in compounds of two elements</li> <li>Students should be able to investigate the properties of different materials including solubilities, conductivity, melting points and boiling points</li> <li>Students should be able to investigate the effect of a number of variables on the rate of chemical reactions including the production of common gases and biochemical reactions</li> <li>Students should be able to investigate the reactions between acids and bases; use indicators and pH scale</li> </ol>	<ol style="list-style-type: none"> <li>Students should be able to investigate patterns and relationships between physical observables</li> <li>Students should be able to research and discuss a technological application of physics in terms of scientific, societal and environmental impact</li> <li>Students should be able to design and build simple electronic circuits</li> </ol>
Communicating in Science	<ol style="list-style-type: none"> <li>Students should be able to conduct research relevant to a scientific issue, evaluate different sources of information including secondary data, understanding that a source may lack detail or show bias</li> <li>Students should be able to organise and communicate their research and investigative findings in a variety of ways fit for purpose and audience, using relevant scientific terminology and representations</li> <li>Students should be able to evaluate media-based arguments concerning science and technology</li> </ol>	Energy		<ol style="list-style-type: none"> <li>Students should be able to research different energy sources; formulate and communicate an informed view of ways that current and future energy needs on Earth can be met</li> </ol>	<ol style="list-style-type: none"> <li>Students should be able to consider chemical reactions in terms of energy, using the terms exothermic, endothermic and activation energy, and use simple energy profile diagrams to illustrate energy changes</li> </ol>	<ol style="list-style-type: none"> <li>Students should be able to explain energy conservation and analyse processes in terms of energy changes and dissipation</li> <li>Students should be able to design, build, and test a device that transforms energy from one form to another in order to perform a function; describe the energy changes and ways of improving efficiency</li> </ol>
Science in Society	<ol style="list-style-type: none"> <li>Students should be able to research and present information on the contribution that scientists make to scientific discovery and invention, and its impact on society</li> <li>Students should be able to appreciate the role of science in society; and its personal, social and global importance; and how society influences scientific research</li> </ol>		Sustainability	<ol style="list-style-type: none"> <li>Students should be able to illustrate how earth processes and human factors influence the Earth's climate, evaluate effects of climate change and initiatives that attempt to address those effects</li> <li>Students should be able to examine some of the current hazards and benefits of space exploration and discuss the future role and implications of space exploration in society</li> </ol>	<ol style="list-style-type: none"> <li>Students should be able to evaluate how humans contribute to sustainability through the extraction, use, disposal, and recycling of materials</li> </ol>	<ol style="list-style-type: none"> <li>Students should be able to research and discuss the ethical and sustainability issues that arise from our generation and consumption of electricity</li> </ol>