An tSraith Shóisearach do Mhúinteoirí

Junior CYCLE for teachers

Junior Cycle Science Learning Outcomes

Strands / Elements

Strands	Nature of Science	Elements	Earth and Space	Chemical World	Physical World	Biological World
Understanding About Science	1. Students should be able to appreciate how scientists work and how scientific ideas are modified over time	Building Blocks	1. Students should be able to describe the relationships between various celestial objects including moons, asteroids, comets, planets, stars, solar systems, galaxies and space 2. Students should be able to explore a scientific model to illustrate the origin of the universe 3. 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	1. Students should be able to investigate whether mass is unchanged when chemical and physical changes take place 2. 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 3. 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 4. Students should be able to classify substances as elements, compounds, mixtures, metals, non-metals, solids, liquids, gases and solutions	1. Students should be able to select and use appropriate measuring instruments 2. 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	1. Students should be able to investigate the structures of animal and plant cells and relate them to their functions 2. Students should be able to describe asexual and sexual reproduction; explore patterns in the inheritance and variation of genetically controlled characteristics 3. Students should be able to outline evolution by natural selection and how it explains the diversity of living things
Investigating in Science	2.Students should be able to recognise questions that are appropriate for scientific investigation, pose testable hypotheses, and evaluate and compare strategies for investigating hypotheses 3.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 4.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 5.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	Systems and Interactions	4. 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 5. Students should be able to describe the cycling of matter, including that of carbon and water, associating it with biological and atmospheric phenomena	5. Students should be able to use the Periodic Table to predict the ratio of atoms in compounds of two elements 6. Students should be able to investigate the properties of different materials including solubilities, conductivity, melting points and boiling points 7. 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 8. Students should be able to investigate the reactions between acids and bases; use indicators and pH scale	3. Students should be able to investigate patterns and relationships between physical observables 4. Students should be able to research and discuss a technological application of physics in terms of scientific, societal and environmental impact 5. Students should be able to design and build simple electronic circuits	4. Students should be able to describe the structure, function, and interactions of the organs of the human digestive, circulatory and respiratory systems 5. Students should be able to conduct a habitat study; research and investigate the adaptation, competition and interdependence of organisms within specific habitats and communities 6. Students should be able to evaluate how human health is affected by: inherited factors and environmental factors including nutrition; lifestyle choices; examine the role of micro-organisms in human health
Communicating in Science	6. 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 7. 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 8. Students should be able to evaluate media-based arguments concerning science and technology	Energy	6. 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	9. 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	6. Students should be able to explain energy conservation and analyse processes in terms of energy changes and dissipation 7. 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	7. Students should be able to describe respiration and photosynthesis as both chemical and biological processes; investigate factors that affect respiration and photosynthesis 8. Students should be able to explain how matter and energy flow through ecosystems
Science in Society	9. 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 10. 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	Sustainability	7. 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 8. 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	10. Students should be able to evaluate how humans contribute to sustainability through the extraction, use, disposal, and recycling of materials	8. Students should be able to research and discuss the ethical and sustainability issues that arise from our generation and consumption of electricity	9. Students should be able to explain human sexual reproduction; discuss medical, ethical, and societal issues 10. Students should be able to evaluate how humans can successfully conserve ecological biodiversity and contribute to global food production; appreciate the benefits that people obtain from ecosystems