



## Linking ON Science Curriculum to Binogi: GRADE 7

• Understanding Life Systems = A • Understanding Structures and Mechanisms = B • Understanding Matter and Energy = C • Understanding Earth and Space Systems = D

Strand	Overall Expectations Category	Overall Expectation	Specific Expectation Category	Specific Expectation	Binogi Video
STEM Skills and Connections	A1	<b>STEM Investigation and Communication Skills:</b> use a scientific research process, a scientific experimentation process, and an engineering design process to conduct investigations, following appropriate health and safety procedures	1.1	use a scientific research process and associated skills to conduct investigations	<a href="#">Science and pseudoscience</a>
			1.2	use a scientific experimentation process and associated skills to conduct investigations	<a href="#">Scientific method – Chemistry</a>
			1.3	use an engineering design process and associated skills to design, build, and test devices, models, structures, and/or systems	<a href="#">The scientific method – Physics</a>
					<a href="#">The scientific method - Biology</a>
			1.4	follow established health and safety procedures during science and technology investigations, including wearing appropriate protective equipment and clothing and safely using tools, instruments, and materials	<a href="#">Scientific knowledge</a> <a href="#">The chemistry lab</a> <a href="#">Heat sources in the science lab</a> <a href="#">Laboratory apparatus</a>
	1.5	communicate their findings, using science and technology vocabulary and formats that are appropriate for specific audiences and purposes	<a href="#">Scientific knowledge</a> <a href="#">Scientific report</a> Videos on <a href="#">Statistics and Data Handling</a>		
	A2	<b>Coding and Emerging Technologies:</b> use coding in investigations and to model concepts, and assess the impact of coding and of emerging technologies on everyday life and in STEM-related fields	2.1	write and execute code in investigations and when modelling concepts, with a focus on obtaining input in different ways for a variety of purposes	Videos on <a href="#">Programming</a>
			2.2	identify and describe impacts of coding and of emerging technologies, such as artificial intelligence systems, on everyday life, including skilled trades	N/A





	A3	<b>Applications, Connections, and Contributions:</b> demonstrate an understanding of the practical applications of science and technology, and of contributions to science and technology from people with diverse lived experiences	3.1	describe practical applications of science and technology concepts in various occupations, including skilled trades, and how these applications address real-world problems	<a href="#">What is biology?</a> <a href="#">What is technology?</a>
			3.2	investigate how science and technology can be used with other subject areas to address real-world problems	
			3.3	analyse contributions to science and technology from various communities	<a href="#">The history of biology</a> <a href="#">From Aristotle to classical physics</a> <a href="#">From classical to modern physics</a>
Life Systems: Interactions in the Environment	B1	<b>Relating Science and Technology to Our Changing World:</b> assess the impact of human activities and technologies on the environment, and analyse ways to mitigate negative impacts and contribute to environmental sustainability	1.1	assess the impact of various technologies on the environment	<a href="#">Environmental impact of transportation</a>
			1.2	assess the effectiveness of various ways of mitigating the negative and enhancing the positive impact of human activities on the environment	<a href="#">The impact of human pollution: Megacities</a>  All videos under <a href="#">“Human Activity and Environmental Impact”</a>
			1.3	analyse how diverse First Nations, Métis, and Inuit practices and perspectives contribute to environmental sustainability, including by using approaches such as Two-Eyed Seeing	N/A
	B2	<b>Exploring and Understanding Concepts:</b> demonstrate an understanding of interactions between and among biotic and abiotic components in the environment	2.1	explain that an ecosystem is a network of interactions among living organisms and their environment	<a href="#">Introduction to Ecology</a> <a href="#">Interaction among species</a> <a href="#">Ecosystem services</a> <a href="#">Marine ecosystems</a> <a href="#">Ocean as an ecosystem</a> <a href="#">The Baltic Sea ecosystem</a>





				<a href="#">Lake ecosystem: Lake zones</a> <a href="#">City and urban ecosystems</a> <a href="#">Tropical rainforest ecosystem</a>
		2.2	identify biotic and abiotic components in an ecosystem, and describe the interactions between them	<a href="#">Introduction to Ecology</a>
		2.3	describe roles and relationships between producers, consumers, and decomposers within an ecosystem	<a href="#">Interaction among species: Lakes</a> <a href="#">The nutrient chain</a> <a href="#">Food chains and food webs</a> <a href="#">Ecological pyramids</a> <a href="#">Ecological niche, biotope and habitat</a>
		2.4	describe the transfer of energy in a food chain, and explain the effects of altering any part of the chain	<a href="#">Food chains and food webs</a> <a href="#">The nutrient chain</a> <a href="#">Ecological pyramids</a>
		2.5	describe how matter is cycled within the environment, and explain how the cycling of matter promotes sustainability	<a href="#">The water cycle</a> <a href="#">The carbon cycle</a> <a href="#">The nitrogen cycle</a> <a href="#">The phosphorus cycle</a> <a href="#">Organic matter cycle</a>
		2.6	explain the difference between primary succession and secondary succession in ecosystems	N/A
		2.7	explain how biotic and abiotic factors limit the number of organisms an ecosystem can sustain	<a href="#">Introduction to Ecology</a>
		2.8	describe how different approaches to agriculture and to harvesting food from the natural environment can impact an ecosystem, and identify strategies that can be used to maintain and/or restore balance to ecosystems	<a href="#">Environmental sustainable development</a> <a href="#">Engineered ecosystems and modern agriculture</a>





Matter and Energy: Pure Substances and Mixtures	C1	<b>Relating Science and Technology to Our Changing World:</b> evaluate the environmental and social impacts of the use and disposal of various pure substances and mixtures	1.1	analyse the social and environment impacts of the use and disposal of pure substances found in technological devices, considering local and global perspectives	<a href="#">The nuclear reactor (pure substance)</a>  <a href="#">Household hazardous waste (mixtures)</a> <a href="#">Hazardous waste (mixtures)</a>
			1.2	assess environmental and social impacts of different industrial methods used to separate mixtures	N/A
	C2	<b>Exploring and Understanding Concepts:</b> demonstrate an understanding of the nature of matter, including the properties of pure substances and mixtures, and describe these properties using particle theory	2.1	demonstrate an understanding of the particle theory of matter	<a href="#">The particle theory of matter</a>
			2.2	use particle theory to distinguish between pure substances and mixtures	<a href="#">The particle theory of matter</a> <a href="#">Mixtures and compounds</a>
			2.3	distinguish between homogenous and heterogenous mixtures	<a href="#">Homogeneous and heterogeneous mixtures</a> <a href="#">Immiscible liquids and emulsions</a> <a href="#">Solutes, solvents, and solutions</a>
			2.4	use the particle theory to describe how different factors affect the solubility of a substance and the rate at which it dissolves	<a href="#">Immiscible liquids and emulsions</a> <a href="#">Solutes, solvents, and solutions</a> <a href="#">Saturated solutions and solubility curves</a>
			2.5	describe the concentration of a saturated solution in both qualitative and quantitative terms, and differentiate between saturated and unsaturated solutions	N/A
			2.6	explain why water is referred to as the universal solvent	<a href="#">The chemical properties of water</a>





			2.7	explain various processes used to separate mixtures, including solutions, into their components, and identify some applications of these processes	<a href="#">Separation of mixtures</a> <a href="#">More ways to separate mixtures</a> <a href="#">Fractional distillation</a>
			2.8	describe pure substances as elements and compounds consisting of atoms and combinations of atoms	<a href="#">Mixtures and compounds</a>
Structures and Mechanisms: Form, Function, and Design of Structures	D1	<b>Relating Science and Technology to Our Changing World:</b> analyse personal, social, economic, and environmental factors that should be considered when designing and building structures	1.1	evaluate environmental, social, and economic factors that should be considered when designing and building structures to meet specific needs for individuals and communities	N/A
			1.2	evaluate the impact of the ergonomic design of various tools, objects, and workspaces on a user's health, safety, and ability to work efficiently, and use this information to describe changes that could be made in their own spaces and activities	N/A
	D2	<b>Exploring and Understanding Concepts:</b> demonstrate an understanding of the relationship between structural forms and the forces acting on them	2.1	classify structures as solid structures, frame structures, or shell structures	N/A
			2.2	describe ways in which the centre of gravity of a structure affects the structure's stability	N/A
			2.3	identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure	N/A
			2.4	describe the role of symmetry in structures, and identify instances of symmetry in various structures	N/A
			2.5	describe factors that can cause a structure to fail	N/A
			2.6	identify the factors that determine the suitability of materials for use in manufacturing a product or constructing a structure	<a href="#">Thermal expansion and its applications</a>
		2.7	describe methods engineers and other professionals use to assess, improve, and maintain the safety of structures		
Earth & Space Systems: Heat in the Environment	E1	<b>Relating Science and Technology to Our Changing World:</b> assess the benefits of technologies that reduce heat loss, and analyse various social and environmental impacts of the use of energy from renewable and non-renewable sources	1.1	assess the social and environmental benefits of technologies that reduce heat loss in enclosed spaces or heat transfer to surrounding spaces	<a href="#">Heat in everyday life</a> <a href="#">Heat pump</a> <a href="#">Thermal insulation</a>
			1.2	analyse various social, economic, and environmental impacts, including impacts related to climate change, of using non-renewable and renewable sources of energy	All the videos under <a href="#">'Fuels and Power Generation'</a>





	E2	<b>Exploring and Understanding Concepts:</b> demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential for many natural processes within Earth's systems	2.1	use particle theory to explain how heat affects the motion of particles in a solid, a liquid, and a gas	<a href="#">The particle theory of matter</a> <a href="#">Heat and phase transitions</a> <a href="#">Melting, freezing, vaporisation, and condensation</a>
			2.2	demonstrate an understanding of various ways in which heat is generated	N/A
			2.3	use particle theory to explain the effects of heat on volume in solids, liquids, and gases, including during changes of states of matter	<a href="#">The particle theory of matter</a> <a href="#">Heat and phase transitions</a> <a href="#">Thermal expansion: Experiments</a>
			2.4	explain how heat is transmitted through conduction, and describe natural processes that are affected by conduction	<a href="#">Heat transfer: Convection, conduction and radiation</a>
			2.5	explain how heat is transmitted in liquids and gases through convection, and describe natural processes that depend on convection	<a href="#">Heat transfer: Convection, conduction and radiation</a>
			2.6	explain how heat is transmitted through radiation, and describe the effects of radiation from the Sun on different kinds of surfaces	<a href="#">Heat transfer: Convection, conduction and radiation</a>
			2.7	describe the role of radiation in heating and cooling Earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere	<a href="#">Climate change – the physics perspective</a>
			2.8	identify common sources of greenhouse gases, including sources resulting from human activity, and describe how humans can reduce emissions of these gases	<a href="#">Greenhouse gases</a> <a href="#">Environmental impact of transportation</a> <a href="#">The environmental impact of biofuels</a> <a href="#">Fossil energy sources</a> <a href="#">Climate change – the biology perspective</a> <a href="#">Climate change – the physics perspective</a>





				<a href="#">Ways to reduce your carbon footprint</a>
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*\*Curriculum Expectation were adapted from The Ontario Curriculum: Science and Technology Grade 7. Toronto: Ministry of Education and Training (2022) [https://assets-us-01.kc-usercontent.com/fbd574c4-da36-0066-a0c5-849ffb2de96e/3e2a353a-2c9c-4b94-ba7f-d138c53cf5b1/SciTech\\_G7\\_2\\_AODA.pdf](https://assets-us-01.kc-usercontent.com/fbd574c4-da36-0066-a0c5-849ffb2de96e/3e2a353a-2c9c-4b94-ba7f-d138c53cf5b1/SciTech_G7_2_AODA.pdf)*

