

## Correlation of Scholastic *The Ten* to Grade 8 Ontario Science and Technology Curriculum

Science and Technology Specific Expectations	Scholastic The Ten
<b>Understanding Life Systems Cells</b>	
<b>1. Relating Science and Technology to Society and the Environment</b>	
1.1 assess the role of selected technologies (e.g., the development of the electron microscope, the ability to infuse dyes into cells, in vitro fertilization) in enhancing our understanding of cells and cellular processes	The 10 Greatest Canadian Innovations of the 20th Century Student Book pages 22 – 25 Teaching Card page 4
1.2 assess the potential that our understanding of cells and cell processes has for both beneficial and harmful effects on human health and the environment, taking different perspectives into account (e.g., the perspectives of farmers, pesticide manufacturers, people with life-threatening illnesses)	
<b>2. Developing Investigation and Communication Skills</b>	
2.1 follow established safety procedures for handling apparatus and materials (e.g., wash hands after preparing materials for slides) and use microscopes correctly and safely (e.g., carry the microscope with both hands, place it near the centre of the desk, ensure that the sun cannot be directly focused through the instrument when sunlight is used for illumination, keep both eyes open when viewing to avoid eye strain)	
2.2 use a microscope correctly and safely to find and observe components of plant and animal cells (e.g., using an onion slice or a prepared slide of a protist) and make accurate drawings of their observations	
2.3 prepare dry- and wet-mount slides of a variety of objects for use with a microscope (e.g., a piece of newspaper, a hair)	
2.4 use scientific inquiry/experimentation to investigate the processes of osmosis and diffusion	
2.5 use appropriate science and technology vocabulary, including organelle, diffusion, osmosis, cell theory, selective permeability, membrane, stage, and eyepiece, in oral and written communication	
2.6 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., using the conventions of science, make a labelled drawing of a cell; create a slide show to explain the results of investigations into the processes of osmosis and diffusion)	

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<b>3. Understanding Basic Concepts</b>	
3.1 demonstrate an understanding of the postulates of the cell theory (e.g., the cell is the basic unit of life; all cells come from pre-existing cells; all living things are made up of one or more cells)	
3.2 identify structures and organelles in cells, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain the basic functions of each (e.g., the nucleus holds all the information needed to make every cell in the body)	
3.3 compare the structure and function of plant and animal cells	
3.4 explain the processes of diffusion and osmosis and their roles within a cell	
3.5 identify unicellular organisms (e.g., amoebae) and multicellular organisms (e.g., invertebrates [worms], vertebrates [frogs]), and compare ways in which they meet their basic needs (e.g., nutrition, movement, gas exchange)	
3.6 describe the organization of cells into tissues, organs, and systems (e.g., groups of cells with similar functions combine to make up tissues; groups of tissues with similar functions combine to make organs; groups of organs work together as organ systems)	
<b>UNDERSTANDING STRUCTURES AND MECHANISMS SYSTEMS IN ACTION</b>	
1.1 assess the social, economic, and environmental impacts of automating systems	
1.2 assess the impact on individuals, society, and the environment of alternative ways of meeting needs that are currently met by existing systems, taking different points of view into consideration	
<b>2. Developing Investigation and Communication Skills</b>	
2.1 follow established safety procedures for working with apparatus, tools, materials, and electrical systems (e.g., tie hair back before working with drills, saws, and sanders)	

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<b>2. Developing Investigation and Communication Skills</b>	
2.2 investigate the work done in a variety of everyday activities and record the findings quantitatively (e.g., calculate the work done when lifting dumbbells by measuring the force required to move the dumbbell and multiplying by the distance the dumbbell moves)	
2.3 use scientific inquiry/experimentation skills to investigate mechanical advantage in a variety of mechanisms and simple machines	
2.4 use technological problem-solving skills to investigate a system (e.g., an optical system, a mechanical system, an electrical system) that performs a function or meets a need	
2.5 investigate the information (e.g., owner's manual for a car, weather advisories for a region, pest forecasts/warnings for a crop/region) and support (e.g., a technical support line for computers) provided to consumers/clients to ensure that a system functions safely and effectively	
2.6 use appropriate science and technology vocabulary, including mechanical advantage, input, output, friction, gravity, forces, and efficiency, in oral and written communication	
2.7 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., using appropriate mathematical conventions, create a graph to represent changes in mechanical advantage when certain factors in a mechanism are manipulated)	
<b>3. Understanding Basic Concepts</b>	
3.1 identify various types of systems (e.g., mechanical systems, body systems, optical systems, mass transit systems, Aboriginal clan systems, health care systems)	
3.2 identify the purpose, inputs, and outputs of various systems (e.g., a garden – purpose: to grow things; input: seeds, water, fertilizer; output: flowers, food)	
3.3 identify the various processes and components of a system (e.g., robot, front-end loader/backhoe, heating system, transportation system, health care system) that allow it to perform its function efficiently and safely	

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<b>3. Understanding Basic Concepts</b>	
3.4 compare, using examples, the scientific definition with the everyday use of the terms work, force, energy, and efficiency	
3.5 understand and use the formula work = force × distance ( $W = F \times d$ ) to establish the relationship between work, force, and distance moved parallel to the force in simple systems	
3.6 calculate the mechanical advantage (MA = force needed without a simple machine divided by force needed with a simple machine) of various mechanical systems (e.g., a wheelbarrow allows a smaller force to lift a larger weight, a hockey stick allows a short movement of hands to move the blade a larger distance, a simple fixed pulley system redirects the effort force)	
3.7 explain ways in which mechanical systems produce heat, and describe ways to make these systems more efficient (e.g., friction produces heat, which can be reduced by lubrication)	
3.8 describe systems that have improved the productivity of various industries (e.g., robotic systems have increased the rate of production in factories that assemble the fine parts of wrist watches)	
3.9 identify social factors that influence the evolution of a system (e.g., growing concern over the amount of waste creates a need for recycling centres, and the recycling centres must grow as population and waste increase; the desire to make tasks easier creates a need for pulley systems, gear systems, and hydraulic and pneumatic systems; changes in traditional work hours created by technological advances can influence changes in a child care system)	

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<b>Understanding Matter and Energy Fluids</b>	
<b>1. Relating Science and Technology to Society and the Environment</b>	
1.1 assess the social, economic, and environmental impacts of selected technologies that are based on the properties of fluids	
1.2 assess the impact of fluid spills on society and the environment, including the cost of the cleanup and the effort involved	<u>The 10 Most Disastrous Accidents</u> Student Book pages 14 – 17 Teaching Card page 3
<b>2. Developing Investigation and Communication Skills</b>	
2.1 follow established safety practices for using apparatus, tools, and materials (e.g., use syringes and tubing for the purposes for which they were designed)	
2.2 determine the mass-to-volume ratio of different amounts of the same substance (e.g., water, corn syrup, copper pennies)	
2.3 investigate and compare the density of a variety of liquids (e.g., water, salt water, corn syrup, liquid soap)	
2.4 investigate applications of the principles of fluid mechanics (e.g., in aeronautical research, shipping, food services, plumbing, hydrodynamic engineering)	
2.5 use scientific inquiry/experimentation skills to identify factors that affect the flow rates of various fluids	
2.6 use technological problem-solving skills to design, build, and test devices that use pneumatic or hydraulic systems	
2.7 use appropriate science and technology vocabulary, including viscosity, density, particle theory of matter, hydraulic, and pneumatic, in oral and written communication	
2.8 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g., using appropriate scientific and/or technological conventions, create a technical drawing of a pneumatic/hydraulic device; create a brochure or a multimedia presentation outlining safe and unsafe uses of the device that was modelled)	

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<b>3. Understanding Basic Concepts</b>	
3.1 demonstrate an understanding of viscosity and compare the viscosity of various liquids (e.g., water, syrup, oil, shampoo, ketchup)	
3.2 describe the relationship between mass, volume, and density as a property of matter	
3.3 explain the difference between solids, liquids, and gases in terms of density, using the particle theory of matter (e.g., in general, solids are more dense than liquids, which are more dense than gases)	
3.4 explain the difference between liquids and gases in terms of their compressibility (e.g., gases are more compressible than liquids) and how their compressibility affects their usage (e.g., pneumatic devices are used to operate bus doors because they work over a larger temperature range and are safer for this purpose than hydraulic devices)	
3.5 determine the buoyancy of an object, given its density, in a variety of fluids (e.g., less dense objects float, more dense objects sink)	
3.6 explain in qualitative terms the relationship between pressure, volume, and temperature when a liquid (e.g., water) or a gas (e.g., air) is compressed or heated	
3.7 explain how forces are transferred in all directions in fluids (Pascal's law)	
3.8 compare the ways in which fluids are used and controlled in living things to the ways in which they are used and controlled in manufactured devices (e.g., compare the role of valves in the circulatory system to the role of valves in an internal combustion engine; compare the role of a fish's swim bladder to the role of the ballast tanks in a submarine)	

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<b>Understanding Earth and Space Systems Water Systems</b>	
<b>1. Relating Science and Technology to Society and the Environment</b>	
1.1 evaluate personal water consumption, compare it with personal water consumption in other countries, and propose a plan of action to reduce personal water consumption to help address water sustainability issues	<u>The 10 Most Essential Natural Resources</u> Student Book page 45 Teaching Card page 6
1.2 assess how various media sources (e.g., Canadian Geographic; the science section in newspapers; Internet websites; local, national, and international news on television and radio) address issues related to the impact of human activities on the long-term sustainability of local, national, or international water systems	The 10 Most Disastrous Accidents Student Book pages 14 – 17 Teaching Card page 3
1.3 assess the impact on local and global water systems of a scientific discovery or technological innovation (e.g., enhancing the efficiency of naturally occurring bacteria that consume hydrocarbons from oil spills and convert them to carbon dioxide and water; development of desalination techniques to provide fresh water from sea water)	<u>The 10 Most Essential Natural Resources</u> Student Book pages 38 -41 Teaching Card page 6
<b>2. Developing Investigation and Communication Skills</b>	
2.1 follow established safety procedures for the use of apparatus and chemicals (e.g., when using water-testing equipment and water-testing chemicals)	
2.2 investigate how municipalities process water (e.g., obtain it, test it, and treat it) and manage water (e.g., distribute it, measure consumption, and dispose of waste water)	
2.3 test water samples for a variety of chemical characteristics (e.g., pH, salinity, chlorine)	
2.4 use scientific inquiry/research skills to investigate local water issues	
2.5 use technological problem-solving skills to design, build, and test a water system device that performs a practical function or meets a need	
2.6 use appropriate science and technology vocabulary, including water table, aquifer, polar ice-cap, and salinity, in oral and written communication	<u>The 10 Most Essential Natural Resources</u> Student Book page 44 Teaching Card page 6

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<b>2. Developing Investigation and Communication Skills</b>	
2.7 use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes (e.g. using appropriate scientific conventions, draw a labelled diagram of a water treatment facility; create a brochure about the safe use of wells and septic tanks)	<u>The 10 Most Essential Natural Resources</u> Teaching Card page 6
<b>3. Understanding Basic Concepts</b>	
3.1 identify the various states of water on the earth's surface, their distribution, relative amounts, and circulation, and the conditions under which they exist (e.g., water is a solid in glaciers, snow, and polar ice-caps; a liquid in oceans, lakes, rivers, and aquifers; and a gas in the atmosphere)	
3.2 demonstrate an understanding of the watershed as a fundamental geographic unit, and explain how it relates to water management and planning	
3.3 explain how human and natural factors cause changes in the water table (e.g., lawn watering, inefficient showers and toilets, drought, floods, overuse of wells, extraction by bottled water industry)	
3.4 identify factors (e.g., annual precipitation, temperature, climate change) that affect the size of glaciers and polar ice-caps, and describe the effects of these changes on local and global water systems	<u>The 10 Most Incredible Landforms</u> Student Book pages 7 – 9 Teaching Card page 2
3.5 explain changes in atmospheric conditions caused by the presence of bodies of water (e.g., differences in temperature near large bodies of water; microclimates; storms off coastal areas)	