



Science and Technology

General Concepts	Orientations	Compulsory Concepts	Possible Cultural References
Organization	<p>Throughout history, different models about the structure of matter have been put forward to explain its properties and the changes it undergoes.</p> <p>In Secondary Cycle One, atoms are viewed as the basis for the organization of matter. The periodic table provides a structured classification of every known element. Under certain conditions and depending on their affinity, atoms combine to form molecules.</p>	<ul style="list-style-type: none"> • Atom • Element • Periodic table • Molecule 	<p><i>History</i></p> <ul style="list-style-type: none"> • Democritus and Aristotle • John Dalton • Francis Bacon • Dmitri Ivanovich Mendeleev

The Living World

By observing the different life forms in their environment, the students become aware of the incredible diversity of living beings. Each life form is the result of successful adaptive strategies. Students realize that reproduction ensures the survival of species. In addition, they discover that life-sustaining processes are closely linked to cell activity.

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Diversity of life forms	<p>Millions of living beings are scattered throughout the globe in various habitats. Their study reveals a multitude of ingenious adaptive strategies and represents a constant source of wonder.</p> <p>Over time and through a process of evolution and natural selection, certain characteristics of living things have changed, and new species have appeared. When variations within a given species improve its ability to adapt, these characteristics are favoured and genetically transmitted to succeeding generations.</p> <p>Observation of differences and similarities between the various species has made it possible to establish and use a classification system.</p>	<ul style="list-style-type: none"> • Habitat • Ecological niche • Species • Population • Physical and behavioural adaptation • Evolution • Taxonomy • Genes and chromosomes 	<p><i>History</i></p> <ul style="list-style-type: none"> • Darwin and Lamarck • Linnaeus <p><i>Natural and Community Resources</i></p> <ul style="list-style-type: none"> • Wildlife and plant life in Québec • Miguasha Park • Biodôme de Montréal • Zoos • Botanical gardens • Aquariums • Museums of natural history <p><i>Environment</i></p> <ul style="list-style-type: none"> • International treaties on environmental protection • Management of forest resources • Protected areas • Biogeographic regions of Québec

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<i>Survival of species</i>	<p>Among other adaptive strategies, reproduction ensures the survival of species.</p> <p>The study of the reproductive function of different species reveals a wide range of original and effective solutions.</p> <p>For humanity as a whole, sexuality is not limited to reproduction, and birth control seems to be a matter of collective survival. Most everywhere on Earth, different birth control methods are available to those who wish to use them.</p>	<ul style="list-style-type: none"> • Asexual and sexual reproduction • Reproductive mechanisms in plants • Reproductive mechanisms in animals • Reproductive organs • Gametes • Fertilization • Pregnancy • Stages of human development • Contraception • Methods of preventing the implantation of the zygote in the uterus • Sexually transmitted diseases 	<p><i>Human Population</i></p> <ul style="list-style-type: none"> • Decrease in the birth rate • Overpopulation <p><i>Human Intervention</i></p> <ul style="list-style-type: none"> • Reproductive technology • Cloning • Methods of contraception • Horticulture • Agriculture <p><i>Natural and Community Resources</i></p> <ul style="list-style-type: none"> • Nature interpretation centres • Hunting and fishing seasons
<i>Life-sustaining processes</i>	<p>In Secondary Cycle One, the cell is regarded as the basic structural and functional unit of life.</p> <p>Despite the astonishing variety of cellular forms, cells ensure similar vital functions.</p> <p>The vital functions are essential for sustaining life.</p>	<ul style="list-style-type: none"> • Characteristics of living things • Plant and animal cells • Photosynthesis and respiration • Cellular components visible under a microscope • Inputs and outputs (energy, nutrients, waste) • Osmosis and diffusion 	<p><i>History</i></p> <ul style="list-style-type: none"> • Discovery of the microscope • History of vaccination <p><i>Physical and Mental Health</i></p> <ul style="list-style-type: none"> • Drugs and poisons <p><i>Human Intervention</i></p> <ul style="list-style-type: none"> • Genetically modified organisms