

CURRICULUM CONNECTIONS

Shaded text indicates that the Prescribed Learning Outcomes will not be assessed on the Science 10 Provincial Examination. It is expected that these PLOs will be assessed in the classroom.

PRESCRIBED LEARNING OUTCOMES

8A APPLICATIONS OF SCIENCE	<p><i>It is expected that students will:</i></p> <p>8A1 – identify dangers in particular procedures and equipment, taking responsibility for their safe and accurate use</p> <p>8A2 – plan appropriate procedures to test hypotheses and predictions</p> <p>8A3 – identify variables responsible for changes in systems</p> <ul style="list-style-type: none"> • variety of <i>cause-and-effect</i> relationships (e.g. the effect of changing current and voltage on resistance) • systems should be in all Grade 10 content area <p>8A4 – use models to demonstrate how systems operate</p> <p>8A5 – use graphs and simple statistics to analyse data</p> <p>8A6 – use information and conclusions as a basis for further comparisons, investigations or analyses</p> <p>8A7 – critique information presented in a variety of media</p> <p>8A8 – analyse the costs and benefits of making alternative choices that impact on a global problem</p> <p>8A9 – describe how scientific principles are applied in technology</p>
9A APPLICATIONS OF SCIENCE	<p><i>It is expected that students will:</i></p> <p>9A1 – assess dangers in particular procedures and equipment, taking responsibility for their safe and accurate use</p> <p>9A2 – identify advantages of controlled experiments</p> <p>9A3 – analyse a system by identifying the interactions between the various parts</p> <p>9A4 – identify sources of error in measurement techniques</p> <p>9A5 – describe relationships and analyse patterns of change</p> <p>9A6 – evaluate the use of data when considering scientific claims</p> <p>9A7 – compare and contrast how different models can be used to represent scientific understandings</p> <p>9A8 – debate a variety of socioscientific issues</p> <p>9A9 – explain how scientific principles are applied in technology</p>

PRESCRIBED LEARNING OUTCOMES

<p>10A APPLICATIONS OF SCIENCE</p>	<p><i>It is expected that students will:</i></p> <p>10A1 – evaluate dangers in particular procedures and equipment, taking responsibility for safety</p> <p>10A2 – relate the limitations of techniques and instruments to the accuracy and reliability of an investigation</p> <p>10A3 – describe some important scientific discoveries that resulted from scientists applying their knowledge and creativity to explore unexpected events</p> <p>10A4 – devise appropriate methods of presenting information</p> <ul style="list-style-type: none">• interpret data from graphs and tables <p>10A5 – analyse data and conclusions that may be subject to bias</p> <p>10A6 – describe the interactions between scientific developments and the beliefs and values of society</p> <p>10A7 – identify and consider ethical implications of scientific investigations</p> <p>10A8 – analyse costs and benefits of alternatives in resolving socioscientific issues</p>
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PRESCRIBED LEARNING OUTCOMES

<p>10B LIFE SCIENCE (Cells)</p>	<p><i>It is expected that students will:</i></p> <p>10B1 – relate organelles to their function within the cell</p> <ul style="list-style-type: none"> • cell structures could include cytoplasm, nucleus, mitochondria, cell wall, cell membrane, chloroplast, vacuole, centriole and ribosomes, including recognizing these structures from illustrations • osmosis and diffusion <p>10B2 – distinguish between cells based on their different structures and functions</p> <ul style="list-style-type: none"> • refer to the differences between <i>plant</i> and <i>animal</i> cells <p>10B3 – describe factors that limit cell size</p> <ul style="list-style-type: none"> • surface area to volume ratio <p>10B4 – compare the changes that occur during the stages of a cell’s development</p> <ul style="list-style-type: none"> • interphase and the stages of mitosis (prophase, metaphase, anaphase, telophase), including their recognition from illustrations and electron micrographs <p>10B5 – describe the ways in which viruses and bacteria can affect cell functioning</p> <p>10B6 – assess the factors that can affect fetal development</p> <ul style="list-style-type: none"> • prescription and non-prescription drugs including caffeine, nicotine, and alcohol <p>10B7 – compare and contrast asexual and sexual reproduction</p> <ul style="list-style-type: none"> • including the outcomes of mitosis and meiosis • including methods of sexual reproduction and asexual reproduction (budding, fragmentation, regeneration, binary fission, vegetative reproduction)
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PRESCRIBED LEARNING OUTCOMES

<p>10C LIFE SCIENCE (<i>Genetics</i>)</p>	<p><i>It is expected that students will:</i></p> <p>10C1 – relate the genetic code to the assembly of different proteins</p> <p>10C2 – apply the principles that govern the inheritance of traits to solve problems involving simple Mendelian genetics</p> <ul style="list-style-type: none"> • including sex linkage, codominance, and incomplete dominance <p>10C3 – summarize factors that may lead to different types of mutations</p> <ul style="list-style-type: none"> • factors include <i>chemical</i> (e.g. PCB), <i>biological</i> (e.g. virus), and <i>physical</i> (e.g. radiation) <p>10C4 – distinguish among positive, neutral, and negative effects of various mutations</p> <p>10C5 – analyse implications of current and emerging biomedical, genetic, and reproductive technologies</p>
<p>10D PHYSICAL SCIENCE (<i>Chemicals and Reactions</i>)</p>	<p><i>It is expected that students will:</i></p> <p>10D1 – research and illustrate the development of our understanding of the structure of matter from early times to the present</p> <p>10D2 – describe the arrangement of subatomic particles (electrons, protons, neutrons) in elements</p> <ul style="list-style-type: none"> • Bohr Model of elements 1 to 20 (atoms and ions) • Bohr Model of simple ionic and covalent compounds using elements 1 to 20 <p>10D3 – distinguish among atoms, isotopes, and ions</p> <p>10D4 – explain how chemical and physical characteristics of substances are due to differences in the bonding of their constituent parts</p> <p>10D5 – demonstrate a knowledge of chemical formulae and balanced chemical equations</p> <ul style="list-style-type: none"> • including ionic and covalent compounds • including writing names, formulae, and balanced equations <p>10D6 – give evidence for and classify the following chemical reactions: synthesis, decomposition, replacement, and acid-base</p> <ul style="list-style-type: none"> • including single and double replacement • including neutralization • including predicting products from word and formula equations

PRESCRIBED LEARNING OUTCOMES

<p>10E PHYSICAL SCIENCE</p> <p><i>(Electricity and Magnetism)</i></p>	<p><i>It is expected that students will:</i></p> <p>10E1 – state the relationships between charged objects</p> <p>10E2 – demonstrate how electricity results from the movement of charged particles such as electrons and ions</p> <ul style="list-style-type: none"> • current and static electricity <p>10E3 – describe the interactions between magnetism and electricity and relate these to common devices</p> <ul style="list-style-type: none"> • common devices include <i>motors, generators, solenoids</i> and <i>electromagnets</i> <p>10E4 – use apparatus to determine the relationships between current, voltage, and resistance in different types of circuits</p> <ul style="list-style-type: none"> • relating to <i>Ohm’s Law</i> • correct placement of apparatus in a circuit • schematic diagrams <p>10E5 – relate power and energy to common electrical devices</p> <p>10E6 – describe the distribution and safety considerations of electricity from its generated source to its use within the home</p> <ul style="list-style-type: none"> • including step-up and step-down transformers • focus on <i>distribution</i> and <i>safety</i> considerations • examples of safety features include circuit breakers, fuses, Ground Fault Circuit Interrupters (GFCI), polarized plugs, 3-pronged (grounded) plugs <p>10E7 – apply knowledge and data to make recommendations for reducing energy waste</p>
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PRESCRIBED LEARNING OUTCOMES

<p>10F PHYSICAL SCIENCE (Radioactivity)</p>	<p><i>It is expected that students will:</i></p> <p>10F1 – summarize the characteristics of the major components of the electromagnetic spectrum</p> <ul style="list-style-type: none">• characteristics include relative <i>wavelength, frequency</i> and <i>energy, penetrating power</i> <p>10F2 – differentiate among the following major decay products: alpha (α) and beta (β) particles, gamma (γ) rays</p> <ul style="list-style-type: none">• including recognizing and completing nuclear equations• including half-life <p>10F3 – compare and contrast fusion and fission reactions and their use in energy production (e.g. plutonium, U-238, U-235)</p> <ul style="list-style-type: none">• including recognizing and completing nuclear equations <p>10F4 – describe technological applications of radiation</p> <ul style="list-style-type: none">• technological applications will include, but are not limited to,<ol style="list-style-type: none">1) home (e.g. microwave ovens, smoke detectors, TV)2) medical (e.g. X rays, cancer therapy, nuclear medicine)3) industry (e.g. structural flaw detection)4) scientific (e.g. carbon dating)5) recreational (e.g. tanning machines) <p>10F5 – evaluate the effects of radiation on living organisms</p>
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<p>10G EARTH AND SPACE SCIENCE (<i>Earth Forces</i>)</p>	<p><i>It is expected that students will:</i></p> <p>10G1 – compare a variety of techniques used to learn about the earth</p> <ul style="list-style-type: none"> • techniques include: seismology (primary, secondary and surface waves), remote sensing, volcanology, geological field work (mapping, drilling, and examining of rocks and structures) • recognizing the Earth’s layers <p>10G2 – use fossil evidence to illustrate how life forms change over time</p> <ul style="list-style-type: none"> • refer to the Geological Time Scale in the Data Booklet • significance of hard parts in fossilization <p>10G3 – compare techniques used for establishing geological time scales</p> <ul style="list-style-type: none"> • relative dating and absolute dating • Law of Superposition • cross-cutting rule • half-life <p>10G4 – identify major factors responsible for earthquakes, volcanic eruptions, mountain building, and formation of ocean ridges</p> <ul style="list-style-type: none"> • including divergent, convergent, and transform fault boundaries and tectonic mapping symbols (see pages 7 and 8 of the Data Pages) • tectonic plates (oceanic, oceanic-continental) • mantle convection • hot spots <p>10G5 – identify evidence that supports the Theory of Plate Tectonics</p> <ul style="list-style-type: none"> • seafloor spreading (magnetic reversals), earthquake and volcano patterns, earthquake activity at plate boundaries (shallow to deep earthquakes), ocean ridges and trenches, mountain building • include Continental Drift Theory (fossil evidence, mountain belts, paleoglaciatiion) <p>10G6 – assess impacts of volcanoes and earthquakes on the environment</p>
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