McGraw-Hill Ryerson

Curriculum Correlation between *McGraw-Hill Ryerson Discovering Science 9* and the Saskatchewan 2009 Curriculum Science, Grade 9

The aim of K-12 science education is to enable all Saskatchewan students to develop scientific literacy. Scientific literacy today embraces Euro-Canadian and Indigenous heritages, both of which have developed an empirical and rational knowledge of nature. A Euro-Canadian way of knowing about the natural and constructed world is called science, while First Nations and Métis ways of knowing nature are found within the broader category of Indigenous knowledge.

Diverse learning experiences based on the outcomes in this curriculum provide students with many opportunities to explore, analyze, evaluate, synthesize, appreciate, and understand the interrelationships among science, technology, society, and the environment (STSE) that will affect their personal lives, their careers, and their future.

Physical Science – Atoms and Elements (AE)

Specific Expectations

	Chapter/Section of Discovering Science 9 Textbook
Outcome AE9.1 Distinguish between physical and chemical properties of common substances, including those found in household, commercial, industrial, and agricultural applications.	Chapter 1 Section 2 – Page 16-23
Indicator a. Demonstrate knowledge of Workplace Hazardous Materials Information System (WHMIS) standards by identifying WHMIS symbols that represent each category, examples of substances that belong within each category, and the risks and cautions associated with each category.	Page 8-11. Sec. 1.1
Indicator d. Investigate common materials and describe them in terms of their physical properties such as smell, colour, melting point, boiling point, density, solubility, ductility, crystal shape, conductivity, hardness, lustre, texture, and malleability.	Page 18. Sec. 1.2
Indicator e. Classify substances found in household, commercial, industrial, and agricultural applications	Page 20. Sec. 1.2 Lab Physical and Chemical Properties

based on their physical and/or chemical properties.	
Indicator f. Provide examples of how society's needs for new products can lead to scientific research and technological developments based on understanding of physical and chemical properties of matter.	Page 22 Sec. 1.2 Activity Wild, Weird and Wonderful
Indicator g. Investigate changes in the properties of materials and identify those that are indicators of chemical changes (e.g., change in colour, change in odour, formation of a gas or precipitate, or the release or absorption of thermal energy).	Page 20. Sec. 1.2 Lab Physical and Chemical Properties
Indicator h. Use equipment, tools, and materials appropriately and safely when conducting investigations into physical and chemical properties of substances.	Page 13. Sec. 1.2 Think About It, Page 10-11 "Safety Rules in the Science Lab"
Indicator j. Differentiate between physical and chemical properties of matter and physical and chemical changes in matter, based on observable evidence.	Page 17. Sec. 1.2 Activity "Bag of Change" Sec. 3.3
Outcome AE9.2 Analyze historical explanations of the structure of matter up to and including: **Dalton model** **Thomson model** **Rutherford model** **Bohr model of the atom.**	Page 24-33. Sec. 1.3
Indicator d. Identify major shifts in understanding matter that have enabled more detailed explanations of the structure and composition of the atom up to and including the Bohr model of the atom.	Page 25-28. Sec. 1.3
Indicator b. Use appropriate scientific terminology when describing atoms and elements (e.g., mass, charge, electron, proton, neutron, nucleus, atom, molecule, element, compound, neutral, positive, negative, ion, isotope, and periodic table).	Page 28-29. Sec. 1.3
Indicator e. Construct models to illustrate the structure and components of matter, including the major historical atomic models (e.g., Dalton, Thomson, Rutherford, and Bohr), using information selected and synthesized from various sources.	Page 25-28. Sec. 1.3
Indicator g. Discuss strengths and limitations of models in science using historical and contemporary examples of atomic models.	Page 25-28 Sec. 1.3
Outcome AE9.3 Demonstrate an understanding of the classification of pure substances (elements and compounds), including the development and nature of the Periodic Table.	Page 38-70 Sec. 2.1 and 2.2

Indicator c. Construct a graphic representation of one or more elements that symbolizes each element in a meaningful way and contains relevant information such as name, atomic number, possible uses, and historical background.	Sec. 2.1, 2.2, 2.3
Indicator d. Identify examples of common elements (e.g., first 18 elements and K, Ca, Fe, Ni, Cu, Zn, I, Ag, Sn, Au, W, Hg, Pb, and U), and compare their atomic structure and physical and chemical properties.	Sec. 2.1
Indicator g. Write and interpret chemical symbols or formulae of common elements and compounds and identify the elements and number of atoms of each in a given compound (e.g., He, Na, C, H□O, H□O□, CO, CO□, CaCO□, SO□, FeO, NO□, O□, CH□, C□H□, NH□, NaHCO□, KCl, HCl, H□SO□, ZnO, and NaCl)	Sec. 3.1, Sec. 3.2
Indicator h. Construct Bohr model representations of the first 18 elements.	Sec. 2.3
Indicator i. Trace the historical development of the modern periodic table and compare alternative arrangements that convey information about the classification of elements.	Sec. 2.2
Indicator j. Apply the concept of systems as a tool by interpreting the organizational structure and patterns inherent within the periodic table, including periods, groups (families), atomic mass (mass number), atomic number, metals, non-metals, and metalloids.	Sec. 2.2
Indicator k. Predict the physical and chemical properties of an element or family of elements (e.g., alkali metals, alkaline-earth metals, hydrogen, halogens, noble gases, and transition metals) based on its position within the periodic table.	Sec. 2.2
Indicator l. Determine the number of protons and electrons in an atom given the atomic number of an element.	Sec. 2.2
Indicator m. Determine the number of electrons, protons, and neutrons of an isotope of an element given the atomic number and mass number of an element.	Sec. 2.2
Indicator n. Discuss the difference between the use of the terms “law” and “theory” in science with reference to the periodic law and the atomic theory of matter.	Sec. 1.3

Life Science – Reproduction and Human Development (RE)

Specific Expectations

	Chapter/Section of Discovering Science 9
Outcome RE9.1 Examine the process of and influences on the transfer of genetic information and the impact of that understanding on society past and present.	Sec. 4.1 and 4.2
Outcome RE9.2 Observe and describe the significance of cellular reproductive processes, including mitosis and meiosis.	Sec. 5.1 and 6.1
Outcome RE9.3 Describe the processes and implications of sexual and asexual reproduction in plants and animals.	Sec. 5.2 and 6.2
Outcome RE9.4 Analyze the process of human reproduction, including the influence of reproductive and contraceptive technologies.	Sec. 6.3

Physical Science – Characteristics of Electricity (CE)

Specific Expectations

	Chapter/Section of Discovering Science 9
Outcome CE9.1 Demonstrate and analyze characteristics of static electric charge and current electricity, including historical and cultural understanding.	Sec. 7.1
Outcome CE9.2 Analyze the relationships that exist among voltage, current, and resistance in series and parallel circuits.	Sec. 8.1, 8.2, 8.3, and 9.1
Outcome CE9.3 Assess operating principles, costs, and efficiencies of devices that produce or use electrical energy.	Sec. 9.2 and 9.3
Outcome CE9.4 Critique impacts of past, current, and possible future methods of small and large scale electrical energy production and distribution in Saskatchewan.	Sec. 9.4

Earth & Space Science – Exploring our Universe (EU)

Specific Expectations

	Chapter/Section of Discovering Science 9
Outcome EU9.1 Inquire into the motion and characteristics of astronomical bodies in our solar system and the universe.	Sec. 10.1
Outcome EU9.2 Analyze scientific explanations of the formation and evolution of our solar system and the universe.	Sec. 12.1,
Outcome EU9.3 Examine how various cultures, past and present, including First Nations and Métis, understand and represent astronomical phenomenon.	Sec. 10.2 and 10.3 (Absence of First Nations and Metis understandings)
Outcome EU9.4 Analyze human capabilities for exploring and understanding the universe, including technologies and programs that support such exploration.	Sec. 11.1, 11.2, 11.3 and 12.3