**Student:**

**Date:**

| **Outcomes** | **R** | **D** | **C** | **A** | **Changed Outcomes** |
| --- | --- | --- | --- | --- | --- |
| **Unit i – Integrated Skills** | | | | | |
| **GCO 2 (Skills)**  Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively, and for making informed decisions. | | | | | |
| 1. 1.0 define and delimit problems to facilitate investigation |  |  |  |  |  |
| 2.0 design an experiment identifying and controlling major variables |  |  |  |  |  |
| 3.0 state a prediction and a hypothesis based on available evidence and background information |  |  |  |  |  |
| 4.0 identify the theoretical basis of an investigation and develop a prediction and a hypothesis that are consistent with the theoretical basis |  |  |  |  |  |
| 5.0 develop appropriate sampling procedures |  |  |  |  |  |
| 6.0 implement appropriate sampling procedures |  |  |  |  |  |
| 7.0 use instruments effectively and accurately for collecting data |  |  |  |  |  |
| 8.0 estimate quantities |  |  |  |  |  |
| 9.0 compile and organize data, using appropriate formats and data treatments to facilitate interpretation of the data |  |  |  |  |  |
| 10.0 use library and electronic research tools to collect information on a given topic |  |  |  |  |  |
| 11.0 select and integrate information from various print and electronic sources or from several parts of the same source |  |  |  |  |  |
| 12.0 select and use apparatus and materials safely |  |  |  |  |  |
| 13.0 demonstrate a knowledge of WHMIS standards by selecting and applying proper techniques for handling and disposing of lab materials |  |  |  |  |  |
| 14.0 describe and apply classification systems and nomenclatures used in the sciences |  |  |  |  |  |
| 15.0 identify limitations of a given classification system and identify alternative ways of classifying to accommodate anomalies |  |  |  |  |  |
| 16.0 compile and display evidence and information, by hand or computer, in a variety of formats, including diagrams, flow charts, tables, graphs, and scatter plots |  |  |  |  |  |
| 17.0 identify and explain sources of error and uncertainty in measurement and express results in a form that acknowledges the degree of uncertainty |  |  |  |  |  |
| 18.0 identify and apply criteria, including the presence of bias, for evaluating evidence and sources of information |  |  |  |  |  |
| 19.0 provide a statement that addresses the problem or answers the question investigated in light of the link between data and the conclusion |  |  |  |  |  |
| 20.0 explain how data support or refute the hypothesis or prediction |  |  |  |  |  |
| 21.0 identify and correct practical problems in the way a technological device or system functions |  |  |  |  |  |
| 22.0 communicate questions, ideas, and intentions, and receive, interpret, understand, support, and respond to ideas of others |  |  |  |  |  |
| 23.0 select and use appropriate numeric, symbolic, graphical and linguistic modes of representation to communicate ideas, plans and results |  |  |  |  |  |
| 24.0 synthesize information from multiple sources or from complex and lengthy texts and make inferences based on this information |  |  |  |  |  |
| 25.0 develop, present, and defend a position or course of action, based on findings |  |  |  |  |  |
| **Unit 1 – Stoichiometry** | | | | | |
| **GCO 1 (STSE)**  Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively, and for making informed decisions. | | | | | |
| 28.0 explain the roles of evidence, theories, and paradigms in the development of scientific knowledge |  |  |  |  |  |
| 29.0 explain how a major scientific milestone revolutionized thinking in the scientific communities |  |  |  |  |  |
| 30.0 analyze and describe examples where scientific understanding was enhanced or revised as a result of the invention of a technology |  |  |  |  |  |
| 34.0 compare processes used in science with those used in technology |  |  |  |  |  |
| 35.0 analyze society’s influence on scientific and technological endeavours |  |  |  |  |  |
| 41.0 identify various constraints that results in trade-offs during the development and improvement of technologies |  |  |  |  |  |
| 42.0 identify and describe science-and technology-based careers related to the science they are studying |  |  |  |  |  |
| **GCO 3 (Knowledge)**  Students will construct knowledge and understandings of concepts in life science, physical science, and Earth and space science, and apply these understandings to interpret, integrate, and extend their knowledge. | | | | | |
| 26.0 write and name the formulas of ionic and molecular compounds, following simple IUPAC rules |  |  |  |  |  |
| 27.0 define molar mass and perform mole-mass inter- conversions for pure substances |  |  |  |  |  |
| 31.0 explain solubility, using the concept of equilibrium |  |  |  |  |  |
| 32.0 define the concept of equilibrium as it pertains to solutions |  |  |  |  |  |
| 3 33.0 explain the variations in the solubility of various pure substances, given the same solvent |  |  |  |  |  |
| 36.0 use the solubility generalizations to predict the formation of precipitates |  |  |  |  |  |
| 37.0 identify mole ratios of reactants and products from balanced chemical equations |  |  |  |  |  |
| 38.0 perform stoichiometric calculations related to chemical equations |  |  |  |  |  |
| 39.0 predict how the yield of a particular chemical process can be maximized |  |  |  |  |  |
| 40.0 identify various stoichiometric applications |  |  |  |  |  |
| **Unit 2 – From Structures to Properties** | | | | | |
| **GCO 1 (STSE)**  Students will develop an understanding of the nature of science and technology, of the relationships between science and technology, and of the social and environmental contexts of science and technology. | | | | | |
| 61.0 analyze and describe examples where technologies were developed based on scientific understanding |  |  |  |  |  |
| 62.0 analyze from a variety of perspectives the risks and benefits to society and the environment of applying scientific knowledge or introducing a particular technology |  |  |  |  |  |
| 63.0 analyze examples of Canadian contributions to science and technology |  |  |  |  |  |
| **GCO 3 (Knowledge)**  Students will construct knowledge and understandings of concepts in life science, physical science, and Earth and space science, and apply these understandings to interpret, integrate, and extend their knowledge. | | | | | |
| 33.0 explain the variations in the solubility of various pure substances, given the same solvent |  |  |  |  |  |
| 43.0 illustrate and explain the formation of covalent bonds |  |  |  |  |  |
| 44.0 explain the structural model of a molecular substance in terms of the various electron pairs that define it |  |  |  |  |  |
| 45.0 illustrate and explain hydrogen bonds and van der Waals’ forces |  |  |  |  |  |
| 46.0 identify and describe the properties of molecular substances |  |  |  |  |  |
| 47.0 describe how intermolecular forces account for the properties of molecular compounds |  |  |  |  |  |
| 48.0 illustrate and explain the formation of ionic bonds |  |  |  |  |  |
| 49.0 explain the structural model of an ionic substance in terms of the various bonds that define it |  |  |  |  |  |
| 50.0 identify and describe the properties of ionic substances |  |  |  |  |  |
| 51.0 describe how ionic bonding accounts for the properties of ionic compounds |  |  |  |  |  |
| 52.0 relate the properties of a substance to its structural model of ionic compounds |  |  |  |  |  |
| 53.0 illustrate and explain the formation of metallic bonds |  |  |  |  |  |
| 54.0 identify and describe the properties of metallic substances |  |  |  |  |  |
| 55.0 describe how metallic bonding accounts for the properties of metals |  |  |  |  |  |
| 56.0 relate the properties of a substance to its structural model |  |  |  |  |  |
| 57.0 describe the process of dissolving, using concepts of intramolecular and intermolecular forces |  |  |  |  |  |
| 58.0 determine the molar solubility of a pure substance in water |  |  |  |  |  |
| 59.0 explain the effect of solutes on the melting point of solid water, using intermolecular forces |  |  |  |  |  |
| 60.0 classify ionic, molecular, and metallic substances according to their properties |  |  |  |  |  |
| **Unit 3 – Organic Chemistry** | | | | | |
| **GCO 1 (STSE)**  Students will develop an understanding of the nature of science and technology, of the relationships between science and technology, and of the social and environmental contexts of science and technology. | | | | | |
| 62.0 analyze from a variety of perspectives the risks and benefits to society and the environment of applying scientific knowledge or introducing a particular technology |  |  |  |  |  |
| 65.0 explain how a major scientific milestone revolutionized thinking in the scientific communities |  |  |  |  |  |
| 66.0 explain how scientific knowledge evolves as new evidence comes to light |  |  |  |  |  |
| 72.0 provide examples of how science and technology are an integral part of their lives and their community |  |  |  |  |  |
| 73.0 debate the merits of funding specific technological endeavours and not others |  |  |  |  |  |
| 75.0 describe and evaluate the design of technological solutions and the way they function using scientific principles |  |  |  |  |  |
| 76.0 analyze natural and technological systems to interpret and explain their structure and dynamics |  |  |  |  |  |
| 77.0 identify various constraints that result in the trade- offs during the development and improvement of technologies |  |  |  |  |  |
| 79.0 distinguish between scientific questions and technological problems |  |  |  |  |  |
| 80.0 evaluate the design of a technology and the way it functions, on the basis of a variety of criteria that they have identified themselves |  |  |  |  |  |
| **GCO 3 (Knowledge)**  Students will construct knowledge and understandings of concepts in life science, physical science, and Earth and space science, and apply these understandings to interpret, integrate, and extend their knowledge. | | | | | |
| 64.0 explain the large number and diversity of organic compounds with reference to the unique nature of the carbon atom |  |  |  |  |  |
| 67.0 classify various organic compounds by determining to which families they belong, based on their names or structures |  |  |  |  |  |
| 68.0 write the formula and provide the IUPAC name for a variety of aliphatic compounds |  |  |  |  |  |
| 69.0 define isomers and illustrate the structural formulas for a variety of organic isomers |  |  |  |  |  |
| 70.0 write the formula and provide the IUPAC name for a variety of aromatic compounds |  |  |  |  |  |
| 71.0 write the formula and provide the IUPAC name for a variety of hydrocarbon derivatives |  |  |  |  |  |
| 74.0 write and balance chemical equations to predict the reactions of selected organic compounds |  |  |  |  |  |
| 78.0 describe processes of polymerization and identify some important natural and synthetic polymers |  |  |  |  |  |