**Area of Learning: SCIENCE — Chemistry Grade 11**

**BIG IDEAS**

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| **Atoms and molecules** are building blocks of matter. |  | **Organic chemistry** and its applications have significant implications for human health, society, and the environment. |  | The **mole** is a quantity used to make atoms and molecules measurable. |  | Matter and energy are conserved in **chemical reactions**. |  | **Solubility** within a solution is determined by the nature of the solute and the solvent. |

**Learning Standards**

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| **Curricular Competencies** | **Content** |
| *Students are expected to be able to do the following:*  Questioning and predicting   * Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local, or global interest * Make observations aimed at identifying their own questions, including increasingly abstract ones, about the natural world * Formulate multiple hypotheses and predict multiple outcomes   Planning and conducting   * Collaboratively and individually plan, select, and use appropriate investigation methods, including field work and lab experiments, to collect reliable data (qualitative and quantitative) * Assess risks and address ethical, cultural, and/or environmental issues associated with their proposed methods * Use appropriate SI units and appropriate equipment, including digital technologies,  to systematically and accurately collect and record data * Apply the concepts of accuracy and precision to experimental procedures and data:   + significant figures   + uncertainty   + scientific notation   Processing and analyzing data and information   * Experience and interpret the local environment * Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information | *Students are expected to know the following:*   * quantum mechanical model and **electron configuration** * valence electrons and Lewis structures * **chemical bonding** based on electronegativity * **bonds/forces** * **organic compounds** * **applications of organic chemistry** * the mole * **dimensional analysis** * **reactions** * **stoichiometric calculations** using significant figures * local and other **chemical processes** * **green chemistry** * **solubility** of molecular and ionic compounds * **stoichiometric calculations in aqueous solutions** * **analysis techniques** |

**Area of Learning: SCIENCE — Chemistry Grade 11**

**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| * Seek and analyze patterns, trends, and connections in data, including describing relationships between variables, performing calculations,  and identifying inconsistencies * Construct, analyze, and interpret graphs, models, and/or diagrams * Use knowledge of scientific concepts to draw conclusions that are consistent with evidence * Analyze cause-and-effect relationships   Evaluating   * Evaluate their methods and experimental conditions, including identifying sources of error or uncertainty, confounding variables, and possible alternative explanations and conclusions * Describe specific ways to improve their investigation methods and  the quality of their data * Evaluate the validity and limitations of a model or analogy in relation  to the phenomenon modelled * Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and in primary and secondary sources * Consider the changes in knowledge over time as tools and technologies have developed * Connect scientific explorations to careers in science * Exercise a healthy, informed skepticism and use scientific knowledge and findings to form their own investigations to evaluate claimsin  primary and secondary sources * Consider social, ethical, and environmental implications of the findings from their own and others’ investigations * Critically analyze the validity of information in primary and secondary sources and evaluate the approaches used to solve problems * Assess risks in the context of personal safety and social responsibility |  |

**Area of Learning: SCIENCE — Chemistry Grade 11**

**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| Applying and innovating   * Contribute to care for self, others, community, and world through individual or collaborative approaches * Cooperatively design projects with local and/or global connections  and applications * Contribute to finding solutions to problems at a local and/or global  level through inquiry * Implement multiple strategies to solve problems inreal-life, applied,  and conceptual situations * Consider the role of scientists in innovation   Communicating   * Formulate physical or mental theoretical models to describe a phenomenon * Communicate scientific ideas and information, and perhaps a suggested course of action, for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions, and representations * Express and reflect on a variety of experiences, perspectives, and worldviews through **place** |  |