Chemistry
Subject Group Overview

Year 5:	Key Concept Related Concept(s) and Global Context	Statement of Inquiry	Inquiry Questions	ATL Skill(s)	Summative Assessment	MYP Objective	Content MN State Standards
Unit 1: Scientific methods	Systems Evidence Patterns Scientific and Technical Innovation	The scientific method is an organized system in which to collect evidence and develop patterns seen in the observable world.	Factual— How do you write a hypothesis as a testable question? What factors need to be included in the steps of an experiment? How to do scientific measurements? Conceptual— What is the difference between a dependent and independent variable? What is the difference between the variables and the control? Debatable— When is a hypothesis correct? How do you improve/change an experiment in the future?	Communication: make hypothesis, make inferences and draw conclusions. Research: collect and analyze data to identify solutions and make informed decisions	Student experiment: Student will be using the supplied materials to design an experiment and investigate how solute concentrations in solutions affect their temperature change ability.	Criterion B: Inquiring and designing Criterion C: Processing and evaluating	9C.1.3.4.1 Use significant figures and an understanding of accuracy and precision in scientific measurements to determine and express the uncertainty of a result.
Unit 2: Atomic Structure	Systems Form Change Movement Transfer Energy Balance	The development of the atomic model throughout history shows the progression of knowledge that all matter	Factual: • What happens when electrons in atoms absorb or release energy? • What are the various ways in which the	In order for students to discuss and evaluate the implications of using science and its	The students are to research the use of radio isotopes in society and prepare a "One World	Criterion A: Knowing and understanding Criterion D: Reflecting the impact of science	9C. 2.1.4.1 Use kinetic molecular theory to explain how changes in energy content affect the state of matter (solid, liquid and gaseous phases)

	Scientific and technical innovation	is composed of atoms.	atom has been represented over the years? Conceptual: • How is it possible that all matter is composed of atoms? Debatable: • How do the various atomic models compare with current scientific evidence?	application to solve a specific problem or issue, interacting with a factor, students must evaluate and select information sources and digital tools based on appropriateness to specific tasks. (ATL Research: Information Literacy Skills) In order for students to explain the ways in which science is applied and used to address a specific problem or issue, students must plan short- and long-term assignments; meet deadlines. (ATL Self-Manageme	Essay" of between 800 and 1200 words that explains how their specific isotope is used to solve or partially solve a problem that arises in society. There will also be a written test that covers the following topics: -subatomic particle identification -Bohr Models -Lewis Dot Models -Electron Configuration Models -Scientists and Contributors to		9C. 2.1.4.2 Use the kinetic molecular theory to explain the behavior of gasses and the relationship among temperature, pressure, volume and the number of particles.

				nt: Organization Skills) .	the Atomic Model The Isotope Paper relates to the Atomic Structure Unit because it causes the students to consider that not all atoms of the same element look or function the same. It also allows them to research direct connections between the static models we have been drawing in class, and how those elemental models are represented in real world application.		

Unit 3: Chemical Bondings	Systems Evidence Patterns Relationships	The relationships between elements on the Periodic Table and the balance of these atoms in nature explain how the natural world is formed.	Factual: (63) • What do electrons do between atoms to create the three major types of bonding? ● Why do elements bond in nature? Conceptual: (63) • Would the periodic table be as meaningful if it was organized differently? ● How can periodic trends be explained? Debatable: (63) • Why is an understanding of intermolecular forces important? ● Why is a consistent system of naming compounds necessary?	ATL Communication-Communication Skills ATL Thinking-Critical Thinking Skills	Ionic vs Covalent Experiment *Objective: You are to write up a lab report, from beginning to end, testing whether compounds are ionic or covalent.* Your job is to test compounds in an experiment, write the formulas, and explain in detail based on all of this gathered information, whether you know that a compound is ionic or covalent. You will complete this by writing a lab report similar to formative experiments you have seen in class. You need to include enough detail that as another chemist is reading it, they understand with full clarity how and	Criterion B: Inquiring and designing Criterion C: Processing and evaluating	The periodic table illustrates how patterns in the physical and chemical properties of elements are related to atomic structure. 9C.2.1.1.1 The periodic table illustrates how patterns in the physical and chemical properties of elements are related to atomic structure. 9C.2.1.1.2 Chemical and physical properties of matter result from the ability of atoms to form bonds. 9C.2.1.2.1 Chemical and physical properties of matter result from the ability of atoms to form bonds. 9C.2.1.2.3 The periodic table illustrates how patterns in the physical and chemical

					what you did in the experiment. There will also be a written test to check students' understanding of the three bond forms.		properties of elements are related to atomic structure. 9C.2.1.1.1
Unit 4: Chemical Equations	Change Balance Conseq uence	The consequences of a chemical reaction are a highly predictable process that maintain the balance and order of matter.	Factual: (63) • How do chemical reactions obey the law of conservation of mass? Conceptual: (63) • How can you predict the products of a chemical reaction? Debatable: (63) • Why must chemical equations be balanced?	ATL Information and Literacy Skills ATL Communication-Communication Skills ATL Thinking-Critical Thinking Skills	Students will take a test in writing and balancing equations	Criterion A: Knowing and understanding	2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.
Unit 5: Chemical Quantities	Communication Transfer Personal and cultural expression	Understanding the units of measurements that chemists use allow us to better communicate within the	Factual: (63) • How do we determine the type of atoms and ratio of each type in a compound to accurately write a chemical formula?		Students are asked to carry out an experiment to find the limiting reactants in a chemical reaction	Criterion C: Processing and evaluating	1.2.1 Students will be able to design and conduct investigations in the classroom, laboratory, and/or field to test students' ideas and questions, and will organize and collect data to provide

		scientific community.	Conceptual: (63) • How can scientists quantize the atoms and molecules that make up matter without being able to see them? Debatable: (63) • Why is the mole an important measurement in chemistry?				evidence to support claims the students make about phenomena. 2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.
Unit 6: Stoichiometry	System Energy Scientific and Technical Innovation	The system with which to discuss chemical reactions at different levels of energy uses mathematical relationships and scientific observations.	Factual: (63) • How can quantities of matter be used to calculate mathematical relations between reactants and products? Conceptual: (63) • How can the amount of reactants and products in a chemical reaction be predicted? Debatable: (63) • What is the significance of a limiting reactant in stoichiometric calculations?	ATL Information and Literacy Skills ATL Communication-Communication Skills ATL Thinking-Critical Thinking Skills	Students are asked to design and make the biggest air bag with the reaction of vinegar and baking soda inside	Criterion B: Inquiring and designing Criterion C: Processing and evaluating	9C.2.2.1.2 Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. (P: 5, CC: 5, CI: PS1 2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.

Unit 7: Properties of Gases	Relationships Conditions Globalization and sustainability	The behavior of gases in the real world discuss the unique conditions that gases undergo to execute a variety of functions and products to benefit mankind.	Factual: (63) • What are the relationships that exist between pressure, temperature, volume, and amount of gas? Conceptual: (63) • How do gases respond to changes in temperature, pressure and volume? Debatable: (63) • Why is an ideal gas useful even though ideal gases do not exist? ● Why do only certain factors determine the physical state of matter?	ATL Information and Literacy Skills ATL Communication-Communication Skills ATL Thinking-Critical Thinking Skills ATL reflective Skills ATL Information Literacy Skills ATL Collaboration Skills	Students will need to do a debate, using information research online to explain the application of science	Criterion D: Reflecting the impact of science	9C.2.2.1.1 Develop a data simulation, based on observations and experimental data of how the pressure, volume, temperature, and mass of a gas are related to each other, to predict the effect on a system of changing one of those variables.** (P: 5, CC: 2, CI: PS1)
Unit 8: Acids and Bases	Logic Evidence Fairness and Development	The system of principles to define matter as an acid or solid reveal unique characteristics that must be maintained for humanity to survive and coexist.	Factual: (63) • Where does pH play a role in our everyday lives? Conceptual: (63) • How can solutions be described and determined? ● What is water? Debatable: (63)	ATL Transfer Skills ATL Thinking-Critical Thinking Skills	Students will take a test about acids and bases, pH and pOH, [H+] and [OH-]. Mostly about balancing equations and calculations.	Criterion A: Knowing and understanding	9C.1.2.1.2 Plan and conduct an investigation of acid-base reactions to test ideas about the concentrations of the hydronium ion in an aqueous solution (pH). (P:3, CC: 3, CI: PS1)

			• Why are there various ways to define and quantify an acidic or basic material?				