



Course: Chemistry 11

Teacher: Alistair Eggo

Unit: Compounds and Molecules

Date: 31st March 2020

Duration: 8 weeks

Description:

This unit will be a culmination of many topics we have looked at previously. We will begin with the naming of inorganic compounds, and will use our prior understanding of valence electrons and Lewis structures to analyse these names further. We will then recap the 5 types of reaction seen in Science 10, and predict products from hypothetical reactions. We will then move on to the complicated mathematical problems using the mole and energy change that we have been building to all year. We will then move on to naming of organic compounds and analysing their structures, by thinking about all the different types of bonding that could occur between atoms.

	Big Ideas	Essential Questions
Understand	<p><i>Which Big Ideas will be the focus of this unit?</i></p> <p>Aspects of each of these:</p> <ul style="list-style-type: none"> - Matter and energy are conserved in chemical reactions. - Atoms and molecules are building blocks of matter. - The mole is a quantity used to make atoms and molecules measurable. - Organic chemistry and its applications have significant implications for human health, society, and the environment. 	<p><i>What questions will be guiding your students' inquiry?</i></p> <ul style="list-style-type: none"> - Why are names important? How can names help us understand chemical structure and properties? - What are common types of reactions? How do we name the reactants and products from these - How can we quantize these common types of reaction? - Why is organic chemistry important? How are our lives impacted by the 3D structures of organic compounds?

	Core Competencies	
Do	<p><i>Choose one or more Core Competencies that will be focused on and developed in this unit: (1) Communication; (2) Creative Thinking; (3) Critical Thinking; (4) Positive Personal and Cultural Identity; (5) Personal Awareness and Responsibility; and (6) Social Responsibility.</i></p> <ul style="list-style-type: none"> - Personal Awareness and Responsibility 	<p><i>Which activities, projects, exercises or discussions will teach this Core Competency? How will they implement the First Peoples Principles of Learning? How will they be inquiry-based?</i></p> <p>As we analyse the reactions that can occur between chemicals, we will think more deeply about our usage of chemicals: what we use, how we use</p>

<ul style="list-style-type: none"> - Social Responsibility. 	<p>it, and what the future impacts of our usage are. This relates to the FNMI principle of learning: Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors. In addition, we will begin to discuss organic compounds (like hydrocarbons) and how these can be a good and a bad thing.</p>
Curricular Competencies	
<p><i>Which Curricular Competencies (specific to your course) will students learn and be assessed on in this unit?</i></p> <p>Questioning and predicting</p> <ul style="list-style-type: none"> - Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local, or global interest <p>Planning and conducting</p> <ul style="list-style-type: none"> - Apply the concepts of accuracy and precision to experimental procedures and data: <ul style="list-style-type: none"> - significant figures - uncertainty - scientific notation <p>Processing and analyzing data and information</p> <ul style="list-style-type: none"> - Use knowledge of scientific concepts to draw conclusions that are consistent with evidence <p>Evaluating</p> <ul style="list-style-type: none"> - Assess risks in the context of personal safety and social responsibility <p>Applying and innovating</p> <ul style="list-style-type: none"> - Contribute to care for self, others, community, and world through individual or collaborative approaches <p>Communicating</p> <ul style="list-style-type: none"> - 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 	<p><i>Which activities, projects, exercises or discussions will teach these Curricular Competencies? How will they implement the First Peoples Principles of Learning? How will they be inquiry-based? How will the Curricular Competencies be assessed?</i></p> <p>Students will research different chemicals, and think about the chemical reactions they may be involved in. We will especially think about organic compounds, and the downstream impact of hydrocarbon use. As we do this, and relate hydrocarbon usage with climate change (on local and global levels), activities will switch to reflection on how we came to view hydrocarbons in the way we do.</p>

Curricular Content	
Know	<p><i>Which Curricular Content (specific to your course) will students learn and be assessed on this unit?</i></p> <ul style="list-style-type: none"> - reactions: predicting products, reactants and energy changes (ΔH) - stoichiometric calculations <ul style="list-style-type: none"> - mass - number of molecules - gas volumes - molar quantities - excess and limiting reactants - using significant figures - local and other chemical processes: First Peoples traditional practices (e.g., tanning hides; preparation of food, soap, and natural bleach), smelting, pulp and paper production, food chemistry, photosynthesis and cellular respiration, development of petrochemical smog - applications of organic chemistry: First Peoples traditional practices (e.g., medicines), pharmaceuticals, petrochemicals, polymers, cosmetics, metabolism, agriculture, food, biotechnology
	<p><i>Which activities, projects, exercises or discussions will teach this Curricular Content? How will they implement the First Peoples Principles of Learning? How will they be inquiry-based? How will the Curricular Content be assessed?</i></p> <p>This unit will involve direct instruction at first, with plenty of exercises to complete. This is to build a foundational knowledge of naming, which does not naturally lend itself to inquiry. Our study of types of reaction may rely on YouTube videos (or videos of Mr. Eggo in school), where students will be able to enquire about reactants and products, and what has changed between them.</p> <p>Inquiry in the organic chemistry section of this unit will relate to hydrocarbon research: a large project to do with our use of fossil fuels. This is also where our reflection about FNMI uses of organic compounds will occur.</p> <p>Assessment will be through homeworks, quizzes, participation and a large project (with a separate rubric).</p>

Required Resources
<p><i>What resources (textbooks, computer programmes, website subscriptions) will students need to complete this unit?</i></p> <p>Standard for the school Some kitchen chemicals may be required, but nothing unusual nor dangerous.</p>