

# Chemistry 11

**Credits:** 4    **Type:** Online

## Course Description:

In this course students will be studying the physical and chemical properties of elements and compounds. They will begin with a study of atomic theory in relation to quantum theory, the shape of molecules in 3D and periodic trends. The atomic and molecular structure of matter is analyzed through experimentation with emphasis on chemical reactions. Students will also be introduced to the concept of a mole and learn about stoichiometry. Solution chemistry (solubility, pH and titrations) and organic chemistry (naming compounds, functional groups and synthesis) are also covered.

These topics are examined using a wide variety of techniques including laboratory activities, analysis, projects and investigations.

A strong background in the chemistry topics from Science 9 and 10 as well as math skills is required.

## Major Units and Topics:

- Atoms and Molecules
- Organic Chemistry
- The Mole
- Chemical Reactions
- Solubility
- Quantum Mechanical Model
- Energy

## Assessment Requirements:

- Response questions
- Students must complete all lessons and assignments
- Various other lesson assignments
- Projects
- Quizzes
- Labs
- Journal Response
- Each lesson designed to take approximately 60-90 minutes, with the exception of major projects and assignments



## Learning Standards Overview:

<b>Content</b> <i>Students are expected to know the following:</i>					
<b>Questioning and Predicting</b>	<b>Module 1</b>	<b>Module 2</b>	<b>Module 3</b>	<b>Module 4</b>	<b>Module 5</b>
Demonstrate a sustained curiosity about a scientific topic or problem of personal interest	✓		✓	✓	✓
Make observations aimed at identifying their own questions about the natural world	✓		✓		
Formulate multiple hypotheses and predict multiple outcomes	✓	✓	✓		✓
<b>Planning and Conduction</b>	<b>Module 1</b>	<b>Module 2</b>	<b>Module 3</b>	<b>Module 4</b>	<b>Module 5</b>
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:		✓			



<ul style="list-style-type: none"> <li>significant figures</li> <li>uncertainty</li> <li>scientific notation</li> </ul>					
<b>Processing and Analyzing Data and Information</b>	<b>Module 1</b>	<b>Module 2</b>	<b>Module 3</b>	<b>Module 4</b>	<b>Module 5</b>
Experience and interpret the local environment			✓	✓	
Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information			✓	✓	✓
Seek and analyze patterns, trends, and connections in data, including describing relationships between variables (dependent and independent) and identifying inconsistencies	✓		✓	✓	
Construct, analyze and interpret graphs (including interpolation and extrapolation), models and/or diagrams	✓	✓	✓	✓	
Use knowledge of scientific concepts to draw conclusions that are consistent with evidence	✓	✓	✓	✓	
Analyze cause-and-effect relationships	✓	✓		✓	✓
<b>Evaluating</b>	<b>Module 1</b>	<b>Module 2</b>	<b>Module 3</b>	<b>Module 4</b>	<b>Module 5</b>
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 the 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 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 and to evaluate claims in secondary sources	✓		✓		✓
Consider social, ethical, and environmental implications of the findings from their own and others' investigations			✓		
Critically analyze the validity of information in secondary sources and evaluate the approaches used to solve problems			✓		
Assess risks in the context of personal safety and social responsibility			✓		
<b>Applying and Innovating</b>	<b>Module 1</b>	<b>Module 2</b>	<b>Module 3</b>	<b>Module 4</b>	<b>Module 5</b>
Contribute to care for self, others, and community through personal or collaborative	✓		✓	✓	



approaches					
Co-operatively 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 in real-life, applied, and conceptual situations	✓				
Consider the role of scientists in innovation	✓		✓		✓
<b>Communicating</b>	<b>Module 1</b>	<b>Module 2</b>	<b>Module 3</b>	<b>Module 4</b>	<b>Module 5</b>
Formulate physical or mental theoretical models to describe a phenomenon	✓		✓	✓	✓
Communicate scientific ideas, claims, 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	✓	✓	✓		

