



Course: Chemistry 11

Course Length: 10 months (approx 100 hours)

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Chemistry 11

Course Description

Chemistry is the branch of science concerned with matter – the thing that has mass and occupies space. Chemistry 11 offers a broad introduction to chemistry. You will study the composition and properties of matter and the changes that matter undergoes.

The seven major topics covered in Chemistry 11 include:

- Introduction to Chemistry (measurement, significant figures and units)
- Atoms, molecules and ions (naming and writing formulas)
- Mole Concept
- Chemical Reactions (balancing, predicting products and phases)
- Atomic Theory (history, periodic table and chemical bonding)
- Solution Chemistry
- Organic Chemistry (chemistry of carbon)

To be successful in this course a student should have strong mathematics skills and problem-solving abilities as there is an emphasis on applying mathematics to solving problems. Remember, to achieve success in Chemistry 11, like in all courses, you must invest time and effort to learn and practice course material. A few tips for helping you succeed are:

- Review daily and work through lots of problems. You can NEVER do enough problems. Remember to practice perfect - do not practice bad habits. Keep an eye on the significant figures, units, and ion CHARGES all of the time!
- Start preparing early for unit tests and the Final exam. Summarize your notes, practice additional problems, and try some of the supplied links.
- Get help early.

How will your mark be calculated?

Assignments	40%
Unit Tests	50%
Final Exam	10%

Resources

The text used in this course is Hebden: Chemistry 11 Workbook for Students. This text is very useful and will help you gain confidence with the material in this course.

Please download and print a copy of the Periodic Table Data Booklet provided as a resource in this introductory section. It is important that you learn how to use the information presented in this booklet.

The Course Timeline is a resource that can be used as you work through each unit to ensure you have a sound understanding of the material covered.

Communication

Communication is key to success in this course. Please be sure to contact your instructor by phone or email any time a problem arises. We hope you achieve great success in this course. You will be required to complete all assignments and submit them to be marked. When completing each assignment remember to show a good level of understanding of the material covered. All tests and exams will be written at the Burnaby Online office.

Students are expected to:

- Contact the teacher by instant messaging, email or phone when help is needed or questions arise.
- Be actively engaged and submitting work on a regular basis.
- Inform the teacher when they will be inactive for two or more weeks.
- Be aware that if they are inactive in a course for four or more weeks they may be removed from that course.
- Check their email at least twice a week.
- Create and submit completed solutions for all activities in the unit/chapter before requesting a test.
- Cite all sources properly.
- Answer in their own words.
- Check that their work and tests have been marked.
- Make time available to come in to Burnaby Online to write tests.
- Make appointments to write tests at least 2 school days in advance.

Course Learning Activities

UNIT	SECTION	COMPLETED
Unit 1 Introduction to Chemistry	1.0: Science and Chemistry	
	1.1: The Scientific Method	
	1.2: Scientific Notation, Uncertainty, Precision and Accuracy	
	1.3: Significant Figures and Rounding	
	1.4: The International System of Units	
	1.5: Lab Safety	
	1.6: WHMIS	
	1.7: Dimensional Analysis	
	1.8: Density, Graphs, and Slope	
	1.9: Matter	
	1.10: Mixtures	
	Unit Review - Jeopardy	
	Unit 1.1 Assignment	
	Unit 1.2 Assignment	
Unit 1 Test		
Unit 2 Naming Compounds	2.1: Combining Capacity and Naming Compounds	
	2.2: Writing the Formula of a Compound	
	2.3: Multivalent Metals and Polyatomic Ions	
	2.4: Names and Formulas of Acids	
	Unit 2.1 Assignment	
	Unit 2.2 Assignment	
Unit 3 The Mole Concept	3.1: The Mole	
	3.2: Molar Mass and Compounds	
	3.3: Characteristics & Molar Volume of Gases	
	3.4: Percent Composition	
	3.5: Empirical Formula	
	3.6: Molecular Formula	
	3.7: Molar Concentration	
	3.8: Solutions and Dilutions	
	Unit 3.1 Assignment	
	Unit 3.2 Assignment	
	Unit 3.3 Assignment	
Unit 3 Test		
Unit 4 Chemical Reactions	4.1: Chemical Equations	
	4.2: Balancing Equations	
	4.3: Types of Chemical Reactions	
	4.4: Energy	
	4.5: Stoichiometry	
	4.6: Limiting Reagents	
	Unit 4.1 Assignment	
	Unit 4.2 Assignment	

	Unit 4.3 Assignment	
	Unit 4 Test	
Midterm	Midterm Exam	
Unit 5 Atomic Theory	5.1: History of Elements and Compounds	
	5.2: The Periodic Table	
	5.3: Periodic Table Groups 13-16	
	5.4: Atoms, Molecules, and Ions Classification	
	5.5: Isotopes	
	5.6: Bohr & Quantum Theory	
	5.7 Lewis Diagrams	
	Unit 5.1 Assignment	
	Unit 5.2 Assignment	
	Unit 5.3 Assignment	
	Unit 5.4 Assignment	
	Unit 5 Test	
Unit 6 Solution Chemistry	6.1: Mixtures and Solutions	
	6.2: Molar Concentration	
	6.3: Polarity in Molecules	
	6.4: Dissociation & Ionic Equations	
	6.5: Electrolytes	
	6.6: Chemical Reactions and Solutions	
	Unit 6.1 Assignment	
	Unit 6.2 Assignment	
	Unit 6 Test	
Unit 7 Organic Chemistry	7.1: Organic Chemistry	
	7.2: Alkanes	
	7.3: Structural Representations	
	7.4: Isomers of Alkanes	
	7.5: Naming Organic Compounds	
	7.6: Naming and Drawing Alkenes	
	7.7: Alkynes and Cycloalkanes	
	7.8: Drawing and Naming Alcohols	
	7.9: Hydrocarbon Derivatives and Synthesis	
	Unit 7.1 Assignment	
	Unit 7.2 Assignment	
	Unit 7.3 Assignment	
	Unit 7 Test	
Final	Final Exam	

B.C. Curriculum

The B.C. Ministry of Education Chemistry 11 Curriculum Guide is built around 5 Core Big Ideas:

BIG IDEAS

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

SCIENCE – Chemistry Content – Elaborations

- **electron configuration:** molecular geometry, valence shell electron pair repulsion (VSEPR) theory
- **chemical bonding:** Lewis structures of compounds, polarity
- **bonds/forces:**
 - covalent bond
 - hydrogen bond
 - intra- and intermolecular forces
 - impact on properties
- **organic compounds:** names, structures, geometry
- **applications of organic chemistry:** First Peoples traditional practices (e.g., medicines), pharmaceuticals, petrochemicals, polymers, cosmetics, metabolism, agriculture, food, biotechnology
- **dimensional analysis:**
 - factor-label method (unit-analysis method)
 - calculation of mass and molar quantities (using significant figures)
- **reactions:** predicting products, reactants and energy changes (ΔH)
- **stoichiometric calculations:**
 - mass
 - number of molecules
 - gas volumes
 - molar quantities
 - excess and limiting reactants
- **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
- **green chemistry:** development of sustainable processes and technologies that reduce negative impacts on the environment (e.g., reducing toxicity, designing benign solvents, increasing energy efficiency)
- **solubility:** dissociation of ions, dissociation equation
- **stoichiometric calculations in aqueous solutions:**
 - molarity
 - dilution effect
 - concentration of ions in solution when two solutions are mixed
- **analysis techniques:** e.g., dissolved oxygen, pH, nitrates, phosphorus