

Course: Chemistry 12

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Course Description:

In Chemistry 12 students use skills and knowledge acquired in Chemistry 11 to explore the concepts of equilibrium in chemical reactions, acid-base chemistry and oxidation-reduction equations. We query the role of industrial chemistry within British Columbia's economy, and via sustained, solo and collaborative inquiry, probe the relationship between matter, energetics and equilibrium in chemical processes.

Summer Learning Beliefs:

Summer Learning provides an engaging learning environment where all students can challenge themselves academically and fulfill their learning goals. To ensure this, students will:

- abide by the student Code of Conduct
- adhere to the Academic Honesty Policy
- adhere to the Summer Learning Student Engagement policy
- respect themselves and others
- attend every class and be punctual
- inquire, think, and participate to the best of their ability
- access technology in class when instructed to do so and for learning purposes only
- challenge themselves and have fun learning

All Summer Learning policies can be accessed at:

<https://www.sd44.ca/school/summer/policies/Pages/default>.

Course Syllabus:

<p>Curricular Competencies</p>	<p>What the students will do:</p> <ul style="list-style-type: none"> • Predict, with reference to entropy and enthalpy, whether reacting systems will reach equilibrium. • Predict qualitative changes in the solubility equilibrium upon the addition of a common ion or the removal of an ion. • Devise a method for determining the concentration of a specific ion by titration or gravimetric methods. • Construct an electrochemical cell. Determine the half-reactions that take place at each electrode, the overall reaction, and the resulting mass of the electrodes. • Interpret titration curves plotted from experimental data. • Design, perform, and analyze a titration experiment. • Compare and contrast factors affecting the rates of both homogeneous and heterogeneous reactions. • Communicate findings and conclusions in small focus groups and to the greater class.
<p>Summative Assessments</p>	<p>What the students will understand:</p> <ul style="list-style-type: none"> • Kinetics and Equilibrium: Chemical reactions can reach or move out of equilibrium based upon changes in the conditions of the reaction process. • Solution Chemistry: Solutions are systems which by their very nature, are in equilibrium. • Acid-Base Chemistry: Strong and weak acids or bases are described as such due to the behavior of their ions in solution. • Oxidation and Reduction: RedOx reactions involve the movement of electrons from one reactant to another, depending on their relationship.
<p>Content</p>	<p>What the students will know:</p> <ul style="list-style-type: none"> • reaction rate • collision theory • energy change during a chemical reaction • reaction mechanism • catalysts • dynamic nature of chemical equilibrium • Le Châtelier's principle and equilibrium shift • equilibrium constant (K_{eq}) • saturated solutions and solubility product (K_{sp})

Content (continued)	What the students will know (continued): <ul style="list-style-type: none"> • relative strength of acids and bases in solution • weak acids and weak bases • water as an equilibrium system • hydrolysis of ions in salt solutions • applications of acid-base reactions • the oxidation-reduction process • electrochemical cells • electrolytic cells • quantitative relationships
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Grade Boundaries:

An "A" student will/can....

Produce high-quality, frequently innovative work. Communicate scientific ideas to connect and synthesize concepts and skills learned over time. Consistently demonstrate sophisticated critical and creative thinking. Collect, present, and transform experimental data. Interpret, analyze and critique scientific findings and experimental data. Frequently transfer knowledge and skills and use concepts to solve non-routine problems.

A "B" student will /can ...

Sometimes produces high-quality, innovative work. Communicate scientific ideas to compare and critique concepts and skills learned over time. Consistently demonstrate a degree of critical and creative thinking. Collect and present scientific data in an appropriate manner. Assess, interpret, and revise scientific findings and experimental data. Transfer knowledge and skills and use concepts to consistently solve routine problems correctly with few mistakes.

A "C" student will /can ...

Sometimes produces high-quality work. Communicate scientific ideas to compare and critique concepts and skills learned over time. Sometimes demonstrate a degree of critical and creative thinking with assistance. Periodically collect and present scientific data in an appropriate manner. Assess, interpret, and revise scientific findings and experimental data with structure and support. Transfer knowledge and skills and use concepts to solve routine problems, but often with significant mistakes.

Celebration of Learning:

The 2019 Celebration of Learning is shaped around “Connections”. All scientists are keenly aware of the interconnectedness of topics they master, regardless of the branch of science they follow. Chemistry is a discipline with many valid, real-life connections-arguably, society is built upon chemistry! We must always question acquired knowledge, reflect upon it and see it not only for its own purity, but for what it means in a broader context of lifelong learning and experience.

This year, each class will have a sister class who will connect for this celebration. Each of us (myself included!) will complete a connections card and display it on July 23.

Resources:

Hebden: <u>Chemistry 12-A Workbook for Students</u>
Scientific Calculator
Stationery supplies as fitting a senior science course.