

# What your student will study in Chemistry 30

## What the course covers

The first unit, Thermochemical Changes, looks at the energy absorbed or released during chemical reactions. Your student will learn to calculate enthalpy of reaction and enthalpy of formation, use Hess's law to combine reaction equations, read and draw energy diagrams that show activation energy and the effect of catalysts, and run calorimetry experiments (measuring heat using temperature change in water) to determine how much energy a reaction produces or absorbs. Expect discussion of fuels and energy efficiency and their impact on society and the environment. This unit takes up about 20 percent of course time. [See the curriculum: 1, 2, 3.](#)

The second unit, Electrochemical Changes, covers oxidation-reduction (redox) reactions, in which electrons transfer from one substance to another. Your student will assign oxidation numbers, write and balance half-reactions, and use standard reduction potentials to predict whether a reaction happens on its own (spontaneity). The unit applies these ideas to voltaic cells (which generate electricity from a chemical reaction, like a battery) and electrolytic cells (which use electricity to force a reaction, as in electroplating or refining metals), and covers Faraday's law for calculating quantities in electrolysis, along with real-world corrosion. This is the largest unit, at about 30 percent of course time. [See the curriculum: 1, 2, 3.](#)

The third unit, Chemical Changes of Organic Compounds, introduces organic chemistry, the study of carbon-based compounds. Your student will learn the naming system (nomenclature) for hydrocarbons and compounds with functional groups such as alcohols, carboxylic acids, esters and halogenated hydrocarbons, draw structural formulas, and identify structural isomers (compounds with the same formula but different arrangements of atoms). Reaction types studied include combustion, esterification, polymerization, addition, substitution and elimination. The unit also asks students to weigh the benefits and risks of organic chemistry technologies for quality of life and the environment. It takes up about 20 percent of course time. [See the curriculum: 1, 2, 3.](#)

The fourth unit, Chemical Equilibrium Focusing on Acid-Base Systems, examines what happens when a chemical reaction reaches a balance point where the forward and reverse reactions occur at the same rate (equilibrium). Your student will apply Le Chatelier's principle to predict how a system at equilibrium responds to a change in concentration, pressure or temperature, write equilibrium law expressions, and calculate equilibrium constants ( $K_c$ ,  $K_w$ ,  $K_a$ ,  $K_b$ ). The unit then applies equilibrium concepts to Brønsted-Lowry acids and bases, covering conjugate acid-base pairs, amphiprotic substances (which can act as either an acid or a base), buffers, titration curves and indicators. This math-heavy unit, which draws on logarithms from Math 30-1, takes up about 30 percent of course time. [See the curriculum: 1, 2, 3.](#)

Throughout all four units, the course also builds attitudes around the responsible use of scientific knowledge, alongside the content and skills of each unit. [See the curriculum.](#)

## How the course is assessed

Alberta high school science courses are typically assessed through a mix of unit tests, quizzes, lab reports and assignments set by the classroom teacher throughout the semester, reflecting the knowledge, Science-Technology-Society, and skills outcomes in each unit. Because Chemistry 30 is a diploma examination course, part of your student's final mark comes from the province-wide Chemistry 30 diploma exam, with the remainder based on the school-awarded mark from classroom work across all four units. Expect labs in electrochemistry (building simple voltaic cells) and in acid-base chemistry (titrations), since these units carry the heaviest weighting and the most hands-on skill-building. [See the curriculum: 1, 2, 3.](#)

## How to support study at home

Ask your student to walk you through a calorimetry calculation step by step, explaining what each number represents; teaching the math back to you helps solidify the enthalpy concepts from Unit A. [See the curriculum.](#)

Keep a periodic table and a list of common polyatomic ions posted somewhere visible, since oxidation number assignment and redox half-reactions in Unit B go faster when these are close at hand rather than looked up every time. [See the curriculum.](#)

If there is a chemistry model kit or even a box of toothpicks and gumdrops in the house, ask your student to build a few organic molecules and name them out loud; converting between a structure and its name is the core skill in Unit C. [See the curriculum.](#)

Set aside a regular homework block in the weeks covering Unit D, since equilibrium calculations build on logarithms and algebra, and a little consistent practice with pH and  $K_a$  problems prevents a last-minute scramble before a unit test. [See the curriculum.](#)

Check in about how your student feels heading into the diploma exam and encourage use of any teacher-provided review sessions or practice exams well before the exam date, since the diploma result combines with the whole semester's classroom work.

If a particular unit, especially the math-heavy equilibrium unit, is causing ongoing frustration, reach out to the teacher early rather than waiting for a report card; a short conversation can catch a misunderstanding before it compounds across several tests.