Chemical Reactions: Unit Overview

SNC2D, Grade 10 Science (Academic), Unit 3. 15 classes of 75 minutes, plus one summative work period and one class for the unit test (17 classes, about three and a half weeks).

The big question

How can we describe, predict and use chemical reactions, and how do they affect our safety and environment?

Students name and write formulas for ionic and molecular compounds, then investigate reactions with household-safe labs (change stations, molecular models, sealed-bag mass lab, peroxide and yeast, copper-plated nails, an Epsom salt precipitate, red cabbage indicator and neutralization). They balance equations, classify reaction types, analyse real safety and environmental issues, and meet Canadian chemists and careers. All data sets and problems are original.

Lessons

#	Lesson	Classes	Question	Expectations	What's inside
1	**Ions and the Periodic Table**	1	How do atoms become ions?	C3.8, C2.1	Bohr diagrams; group charges; ionic vs molecular
2	**Naming Ionic Compounds**	1	How do we name and write ionic compounds?	C3.1, C3.8	Zero total charge; ion cards; Roman numerals
3	**Polyatomic Ions and Molecular Compounds**	1	What about groups of atoms and molecules?	C3.8, C3.1	Polyatomic ion reference sheet; brackets; prefixes
4	**Evidence of Chemical Change Lab**	1	How do we know a new substance formed?	C2.5, C3.3, A1.4	Four household stations; exothermic and endothermic
5	**Word Equations and Molecular Models**	1	What happens to atoms in a reaction?	C2.2, C3.4, C2.1	Word equations; clay or gumdrop models
6	**Conservation of Mass Lab**	1	Is mass conserved?	C2.4, C3.2, A1.8	Open cup vs sealed bag; discrepancies
7	**Balancing Equations**	1	How do we balance an equation?	C3.2, C3.4, A1.13	Atom inventory; balancing ladder; mass check
8	**Synthesis and Decomposition**	1	Building up or breaking down?	C2.3, C3.5	Peroxide and yeast with a balloon; magnesium video
9	**Single Displacement**	1	Which element wins the swap?	C2.3, C3.5, A1.5	Penny solution copper-plates a nail; activity series
10	**Double Displacement**	1	When do partners swap?	C2.3, C3.5	Epsom salt and washing soda precipitate; solubility

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#	Lesson	Classes	Question	Expectations	What's inside
11	**Acids, Bases and pH**	1	How acidic is it?	C3.7, C2.6, C3.8	Red cabbage indicator; naming acids; tenfold pH
12	**Neutralization**	1	What happens when acids meet bases?	C3.6, C2.6	Vinegar and baking soda with indicator; salts
13	**Reactions and Safety**	1	When are useful reactions risky?	C1.1, A1.7	Jigsaw: cyanide, bridges, pools, cleaners
14	**Chemistry for a Cleaner World**	1	How can reactions fix problems?	C1.2	Great Lakes, acid spills, scrubbers, Sudbury
15	**Careers and Summative Workshop**	1	Who does chemistry?	A2.1, A2.2, C1.1	Canadian chemists; careers; inquiry plan

Assessment

Type	In this unit
Assessment for learning	A handout task in every lesson, quick checks and exit tickets
Assessment as learning	Self-checks against success criteria; plan feedback before the summative
Assessment of learning	Antacid inquiry and report with rubric (suggested weight 7% of the final mark) and Unit Test with answer key (suggested weight 5%)

What's included

In the Start Here folder:

- **Summative Task and Rubric:** “Which antacid neutralizes the most acid?” controlled inquiry, report and research, with a Growing Success rubric and checklist
- **Unit Test and Answer Key:** multiple choice, names and formulas, balancing, reaction types, pH, neutralization and an acid spill application question, with worked answers and marking

Safety: every hands-on activity has safety notes in its lesson plan. Labs use small amounts of household materials; copper(II) sulphate is an optional teacher-supply version only. No open flames by students. Every balanced equation was checked atom by atom.

What's in each lesson

- Teacher lesson plan with expectations, timed sequence, differentiation, look-fors and answer guides
- Slides with speaker notes
- Student handouts and organizers
- Editable Word and PowerPoint files, plus PDFs

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