

High School Chemistry

Module 1: Foundations of Chemistry

Week 1	Introducing chemistry	Teaching
	Particles	Teaching
	Quiz: Introducing chemistry, particles	Quiz
	Lab: The solubility of sodium chloride in water	Lab
	Solubility	Teaching
	Units and Terminology	Teaching
	Particles in solids, liquids, and gases	Teaching
	Questions students ask: States of matter	Qus students ask
	The kinetic theory of matter	Teaching
	Quiz: Solubility, kinetic theory	Quiz
	Lab: The diffusion of food coloring in water (part 1)	Lab
	Change of state	Teaching
	Elements and atoms	Teaching
	Compounds, molecules, and mixtures	Teaching
	Quiz: Change of state, exploring particles	Quiz
	Lab: The diffusion of food coloring in water (part 2)	Lab
Week 2	Physical and chemical changes	Teaching
	Particles in gases	Teaching
	Separation methods	Teaching
	Questions students ask: Separating oil and water	Qus students ask
	Quiz: Physical and chemical changes, gases, separation methods	Quiz
	Lab: Separating inks using paper chromatography (part 1)	Lab
	Paper chromatography and Rf values	Teaching
	Quiz: Chromatography	Quiz
Week 3	Lab: Separating inks using paper chromatography (part 2)	Lab
	Lab: Separating sand and salt	Lab
	The structure of the atom	Teaching
	Questions students ask: The Bohr Model	Qus students ask
	Relative atomic mass	Teaching
	Relative formula mass	Teaching
	Quiz: The structure of the atom, relative mass	Quiz
	Electron configuration	Teaching
	Ions	Teaching
	Introducing the Periodic Table of the Elements	Teaching
	Exploring the Periodic Table of the Elements	Teaching
	Questions students ask: Iodine	Qus students ask
Week 4	Quiz: Electron configuration, ions, the Periodic Table	Quiz
	Isotopes	Teaching
	Introducing the noble gases	Teaching
	Uses of noble gases	Teaching
	Questions students ask: The location of electrons in transition metals	Qus students ask

	Experimental data Quiz: Isotopes, noble gases, data Summary: Foundations of chemistry Worked examples: Foundations of chemistry (1) Worked examples: Foundations of chemistry (2)	Teaching Quiz Summary Worked examples Worked examples
Week 5	Review: Foundations of chemistry Module test: Foundations of chemistry	Review Module test

Module 2: Bonding and Structure

Week 6	The mole Moles and relative mass Moles and empirical formulae Determining empirical formulae from experimental results Quiz: The mole Covalent bonds Questions students ask: Dihydrogen monoxide Ionic bonds Metallic bonds Quiz: Covalent, ionic and metallic bonding Chemical formulae of covalent molecules Chemical formulae of ionic compounds Chemical equations Quiz: Chemical formulae, chemical equations	Teaching Teaching Teaching Teaching Quiz Teaching Qus students ask Teaching Teaching Teaching Teaching Teaching Quiz
Week 7	Calculating mole fractions Calculating mass fractions Decomposition reactions Quiz: Mole and mass fractions, decomposition reactions Lab: The decomposition of sodium bicarbonate Using chemical equations Yield Volume of a gas Quiz: Using chemical equations, yield, gas volume	Teaching Teaching Teaching Quiz Lab Teaching Teaching Teaching Quiz
Week 8	Lab: Observing that gases take up space Structure of materials Giant ionic structures Simple molecular structures Quiz: Giant ionic and molecular structures Lab: Observing crystal shapes (part 1)	Lab Teaching Teaching Teaching Quiz Lab
Week 9	Lab: Observing crystal shapes (part 2) Questions students ask: The shape of the water molecule Giant covalent structures Allotropes Questions students ask: Pencils Quiz: Giant covalent structures, allotropes Metallic structures Alloys Electricity and electrical properties of materials	Lab Qus students ask Teaching Teaching Qus students ask Quiz Teaching Teaching Teaching

	Quiz: Metals, electrical properties of materials	Quiz
Week 10	Introducing electrolysis	Teaching
	Exploring electrolysis	Teaching
	Electrolysis of dilute sulfuric acid	Teaching
	Uses of electrolysis	Teaching
	Quiz: Electrolysis	Quiz
	Lab: Electrolysis of water	Lab
Week 11	Summary: Bonding and structure	Summary
	Worked examples: Bonding and structure (1)	Worked examples
	Worked examples: Bonding and structure (2)	Worked examples
	Worked examples: Bonding and structure (3)	Worked examples
	Worked examples: Bonding and structure (4)	Worked examples
Week 12	Review: Bonding and structure	Review
	Module test: Bonding and structure	Module test

Summary of Modules 1- 2

Week 13	Summary modules 1-2: Foundations of chemistry	Summary
	Summary modules 1-2: Bonding and structure	Summary
	Worked examples modules 1 and 2	Worked examples
	Review: Modules 1-2	Review
	Summary test: Modules 1-2	Summary test

Module 3: Inorganic Chemistry

Week 14	Introducing acids, bases and salts	Teaching
	The pH scale	Teaching
	Using indicator paper	Teaching
	Acid strength and concentration	Teaching
	Using acid concentration	Teaching
	Quiz: Acids, bases and salts	Quiz
	Reactions of acids	Teaching
	Electrolysis of acids	Teaching
	Questions students ask: Salts and hydration	Qus students ask
	Neutralization reactions	Teaching
	Titration	Teaching
	Questions students ask: Cleaning products	Qus students ask
	Quiz: Acid reactions	Quiz
	Lab: Investigating the pH of household substances	Lab
	Lab: The impact of concentration on pH	Lab
Week 15	Salts	Teaching
	Worked examples: Acids, alkalis, bases and salts (1)	Worked examples
	Worked examples: Acids, alkalis, bases and salts (2)	Worked examples
	Questions students ask: Salt on roads	Qus students ask
	Quiz: Salts	Quiz
	The air	Teaching
	Oxygen	Teaching
	Quiz: Air, oxygen	Quiz
	Lab: Measuring the percentage of oxygen in air (part 1)	Lab

	Oxides of metals Oxides of non metals Oxidation and reduction Exploring REDOX reactions Quiz: Oxides, REDOX reactions	Teaching Teaching Teaching Teaching Quiz
Week 16	Lab: Measuring the percentage of oxygen in air (part 2) Properties and uses of carbon dioxide Making and testing for carbon dioxide Quiz: Carbon dioxide Lab: The impact of oxygen on combustion Lab: The impact of carbon dioxide on combustion	Lab Teaching Teaching Quiz Lab Lab
Week 17	Introducing halogens Halogen displacement reactions Halogen containing compounds and their uses Quiz: Halogens Lab: Testing for iodine in salts Group 1 metals Group 2 metals Reactions of metals Questions students ask: Metals and food Quiz: Metals Rusting Lab: The conditions required for rusting (part 1)	Teaching Teaching Teaching Quiz Lab Teaching Teaching Teaching Qus students ask Quiz Teaching Lab
Week 18	Lab: The conditions required for rusting (part 2) Preventing iron from rusting Quiz: Rusting Lab: Inhibiting rust formation (part 1) Extracting metals from raw materials Metals and their uses Quiz: Extracting metals, uses of metals	Lab Teaching Quiz Lab Teaching Teaching Quiz
Week 19	Lab: Inhibiting rust formation (part 2) Chemical tests 1: Testing for gases Chemical tests 2: Testing for water Questions students ask: Hard and soft water Chemical tests 3: Testing for positive and negative ions Questions students ask: Flame colors Quiz: Chemical tests	Lab Teaching Teaching Qus students ask Teaching Qus students ask Quiz
Week 20	Summary: Inorganic chemistry (1) Summary: Inorganic chemistry (2) Summary: Inorganic chemistry (3) Worked examples: Inorganic chemistry (1) Worked examples: Inorganic chemistry (2) Worked examples: Inorganic chemistry (3)	Summary Summary Summary Worked examples Worked examples Worked examples
Week 21	Review: Inorganic chemistry Module test: Inorganic chemistry	Review Module test

Summary of Modules 1-3

Week 22	Summary modules 1-3: Foundations of chemistry	Summary
	Summary modules 1-3: Bonding and structure	Summary
	Summary modules 1-3: Inorganic chemistry (1)	Summary
	Summary modules 1-3: Inorganic chemistry (2)	Summary
	Summary modules 1-3: Inorganic chemistry (3)	Summary
	Worked examples modules 1-3 (1)	Worked examples
	Worked examples modules 1-3 (2)	Worked examples
	Review: Modules 1-3	Review
	Summary test: Modules 1-3	Summary test

Module 4: Organic Chemistry

Week 23	Introducing organic chemistry	Teaching
	Fractional distillation of crude oil	Teaching
	Catalytic cracking	Teaching
	Burning fossil fuels and air quality	Teaching
	Questions students ask: Oil reserves	Qus students ask
	Quiz: Fractional distillation, catalytic cracking, fossil fuels	Quiz
	Lab: Distillation	Lab
	Introducing alkanes	Teaching
	Exploring alkanes	Teaching
	Isomers	Teaching
	Alkenes	Teaching
	Quiz: Alkanes, isomers, alkenes	Quiz
Week 24	Alcohols	Teaching
	Manufacturing ethanol	Teaching
	Questions students ask: Sourdough bread	Qus students ask
	Carboxylic acids	Teaching
	Esters	Teaching
	Quiz: Alcohols, carboxylic acids, esters	Quiz
	Introducing polymers	Teaching
	Addition polymerization	Teaching
	Condensation polymerization	Teaching
	Quiz: Polymers	Quiz
Week 25	Lab: Making a bioplastic from cornstarch	Lab
	Summary: Organic chemistry	Summary
	Worked examples: Organic chemistry (1)	Teaching
	Worked examples: Organic chemistry (2)	Teaching
	Worked examples: Organic chemistry (3)	Teaching
Week 26	Review: Organic chemistry	Review
	Module test: Organic chemistry	Module test

Summary of Modules 1-4

Week 27	Summary modules 1-4: Foundations of chemistry	Summary
	Summary modules 1-4: Bonding and structure	Summary
	Summary modules 1-4: Inorganic chemistry (1)	Summary

	Summary modules 1-4: Inorganic chemistry (2)	Summary
	Summary modules 1-4: Inorganic chemistry (3)	Summary
	Summary modules 1-4: Organic chemistry	Summary
	Worked examples modules 1-4 (1)	Worked examples
	Worked examples modules 1-4 (2)	Worked examples
Week 28	Review: Modules 1-4	Review
	Summary test: Modules 1-4	Summary test

Module 5: Physical Chemistry

Week 29	Exothermic and endothermic reactions	Teaching
	Enthalpy	Teaching
	Enthalpy changes and bond energy	Teaching
	Quiz: Exothermic and endothermic reactions, bond energy	Quiz
	Lab: Investigating enthalpy changes	Lab
	Specific heat capacity	Teaching
	Using specific heat capacity	Teaching
	Quiz: Specific Heat Capacity	Quiz
	Lab: Calculating the specific heat capacity of a metal	Lab
Week 30	Reaction rates	Teaching
	Collision theory	Teaching
	Impact of temperature on reaction rate	Teaching
	Impact of surface area on reaction rate	Teaching
	Impact of concentration and pressure on reaction rate	Teaching
	Questions students ask: Fireworks	Qus students ask
	Quiz: Reaction rates	Quiz
	Lab: The impact of temperature on reaction rate	Lab
	Lab: The impact of surface area on reaction rate	Lab
Week 31	Activation energy	Teaching
	Catalysts	Teaching
	Questions students ask: Coke and Mentos	Qus students ask
	Quiz: Activation energy, catalysis	Quiz
	Lab: The catalysis of hydrogen peroxide decomposition	Lab
Week 32	Reversible reactions	Teaching
	Questions students ask: Rusting	Qus students ask
	Dynamic equilibrium	Teaching
	Exploring equilibrium	Teaching
	Questions students ask: Swimming pools	Qus students ask
	Quiz: Reversible reactions, equilibrium	Quiz
	The impact of pressure on the equilibrium position	Teaching
	Other variables which impact equilibrium position	Teaching
	Quiz: Equilibrium position	Quiz
	Summary: Physical chemistry	Summary
	Worked examples: Physical chemistry (1)	Worked examples
	Worked examples: Physical chemistry (2)	Worked examples
Week 33	Review: Physical chemistry	Review
	Module test: Physical chemistry	Module test

Summary of Modules 1-5

Week 34	Summary modules 1-5: Foundations of chemistry	Summary
	Summary modules 1-5: Bonding and structure	Summary
	Summary modules 1-5: Inorganic chemistry (1)	Summary
	Summary modules 1-5: Inorganic chemistry (2)	Summary
	Summary modules 1-5: Inorganic chemistry (3)	Summary
	Summary modules 1-5: Organic chemistry	Summary
	Summary modules 1-5: Physical chemistry	Summary
	Worked examples modules 1-5 (1)	Examples
	Worked examples modules 1-5 (2)	Examples
	Worked examples modules 1-5 (3)	Examples
	Worked examples modules 1-5 (4)	Examples
Week 35	Review: Modules 1-5	Review
Week 36	Final test 1a: Concepts (i)	Final test
	Final test 1b: Concepts (ii)	Final test
	Final test 2: Calculations	Final test
	Final test 3: Lab work	Final test
	Axiom chemistry conclusion	Teaching