

Week		Lesson title	Lesson objectives
1/2		Elements and compounds	<ul style="list-style-type: none"> ● symbols of elements from the periodic table. ● Recognise the properties of elements and compounds. ● Identify the elements in a compound.
1/2		Atoms, formulae and equations	<ul style="list-style-type: none"> ● Learn the symbols of the first 20 elements. ● Use symbols to describe elements and compounds. ● Use formulae to write equations.
1/2		Mixtures	<ul style="list-style-type: none"> ● Recognise that all substances are chemicals. ● Understand that mixtures can be separated into their components. ● Suggest suitable separation and purification techniques for mixtures.
3/4		Changing ideas about atoms	<ul style="list-style-type: none"> ● Learn how models of the atom changed as scientists gathered more data. ● Consider the data Rutherford and Marsden collected. ● Link their data to our model of the atom.
3/4		Modelling the atom	<ul style="list-style-type: none"> ● Explore the structure of atoms. ● Consider the sizes of atoms. ● Explore the way atomic radius changes with position in the periodic table.
5/6		Relating charges and masses	<ul style="list-style-type: none"> ● Compare protons, neutrons and electrons. ● Find out why atoms are neutral.
			<ul style="list-style-type: none"> ● Relate the number of charged particles in atoms to their position in the periodic table.
5/6		Sub-atomic particles	<ul style="list-style-type: none"> ● Find out what the periodic table tells us about each element's atoms. ● Learn what isotopes are. ● Use symbols to represent isotopes.
7/8		Electronic structure	<ul style="list-style-type: none"> ● Find out how electrons are arranged in atoms. ● Use diagrams and symbols to show which energy levels they occupy. ● Use symbols to represent isotopes.
7/8		The periodic table	<ul style="list-style-type: none"> ● Explain how the electronic structure of atoms follows a pattern. ● Recognise that the number of electrons in an element's atoms outer shell corresponds to the element's group number. ● Use the periodic table to make predictions.
7/8		Developing the periodic table	<ul style="list-style-type: none"> ● Find out how the periodic table has changed over the years. ● Explore Mendeleev's role in its development. ● Consider the accuracy of Mendeleev's predictions.
9/10		Comparing metals and non-metals	<ul style="list-style-type: none"> ● Review the physical properties of metals and non-metals. ● Compare oxides of metals and non-metals. ● Make predictions about unknown metals and non-metals.
9/10		Metals and non-metals	<ul style="list-style-type: none"> ● Explore the links between electron configurations of elements and their properties. ● Find out what happens to the outer electrons when metals react.

		<ul style="list-style-type: none"> ● Draw diagrams to show how ions form.
11/12	Key concept: The outer electrons	<ul style="list-style-type: none"> ● Review the patterns in the periodic table. ● Compare the trends in Group 1 and Group 7. ● Relate these trends to the number of outer electrons and the sizes of atoms.
11/12	Exploring Group 0	<ul style="list-style-type: none"> ● Explore the properties of noble gases. ● Find out how the mass of their atoms affects their boiling points. ● Relate their chemical properties to their electronic structures.
13/14	Exploring Group 1	<ul style="list-style-type: none"> ● Explore the properties of Group 1 metals. ● Compare their reactivity. ● Relate their reactivity to their electronic structures.
13/14	Exploring Group 7	<ul style="list-style-type: none"> ● Explain why Group 7 non-metals are known as halogens. ● Compare their reactivity. ● Relate their reactivity to their electronic structures.
15/16	Reaction trends and predicting reactions	<ul style="list-style-type: none"> ● Review the patterns in the periodic table. ● Compare the trends in Group 1 and Group 7. ● Relate these trends to the way atoms form ions.
15/16	Maths skills: Standard form and making estimates	<ul style="list-style-type: none"> ● Consider the sizes of particles. ● Use numbers in standard form to compare sizes. ● Use numbers in standard form in calculations.
15/16	Key concept: Conservation of mass and balanced equations	<ul style="list-style-type: none"> ● Explore ideas about the conservation of mass. ● Consider what the numbers in equations stand for. ● Write balanced symbol equations.
17/18	Relative formula mass	<ul style="list-style-type: none"> ● Review the differences between the isotopes of an element. ● Distinguish between the mass of an atom and the relative atomic mass of an element. ● Use relative atomic masses to calculate relative formula masses.
19/20	Mass changes when gases are in reactions	<ul style="list-style-type: none"> ● Find out how mass can be gained or lost during a reaction. ● Find the mass of carbon dioxide released per gram of copper carbonate decomposed. ● Assess the accuracy of our measurements.
19/20	Chemical measurements and uncertainty	<ul style="list-style-type: none"> ● Explore ideas about the accuracy of measurements. ● Consider how closely measurements reflect true values. ● Explore ways of estimating the uncertainty in a set of measurements.
19/20	Moles	<ul style="list-style-type: none"> ● Describe the measurements of amounts of substances in moles. ● Calculate the amount of moles in a given mass of a substance. ● Calculate the mass of a given number of moles of a substance.
21/22	Amounts of substances in equations	<ul style="list-style-type: none"> ● Calculate the masses of substances in a balanced symbol equation. ● Calculate the masses of reactants and products from balanced symbol equations. ● Calculate the mass of a given reactant or product.
21/22	Using moles to balance equations	<ul style="list-style-type: none"> ● Convert masses in grams to amounts in moles. ● Balance an equation given the masses of reactants and products.

		<ul style="list-style-type: none"> ● Change the subject of a mathematical equation.
21/22	Concentration of solutions	<ul style="list-style-type: none"> ● Relate mass, volume and concentration. ● Calculate the mass of solute in solution. ● Relate concentration in mol/dm³ to mass and volume.
23/24	Key concept: Amounts in chemistry	<ul style="list-style-type: none"> ● Use atomic masses to calculate formula masses. ● Explain how formula mass relates to the number of moles. ● Explain how the number of moles relates to other quantities.
25/26	Maths skills: Change the subject of an equation	<ul style="list-style-type: none"> ● Use equations to demonstrate conservation. ● Rearrange the subject of an equation. ● Carry out multi-step calculations.
25/26	Key concept: Endothermic and exothermic reactions	<ul style="list-style-type: none"> ● Explore the temperature changes produced by chemical reactions. ● Consider how reactions are used to heat or cool their surroundings. ● Investigate how these temperature changes can be controlled.
27/28	Required practical: Investigate the variables that affect temperature changes in reacting solutions, such as acid plus metals, acid plus carbonates, neutralisations, displacement of metals	<ul style="list-style-type: none"> ● Devise a hypothesis. ● Devise an investigation to test your hypothesis. ● Decide whether the evidence supports your hypothesis.
27/28	Reaction profiles	<ul style="list-style-type: none"> ● Use diagrams to show the energy changes during reactions. ● Show the difference between exothermic and endothermic reactions using energy profiles. ● Find out why many reactions start only when energy or a catalyst is added.
27/28	Energy change of reactions	<ul style="list-style-type: none"> ● Identify the bonds broken and formed during a chemical reaction. ● Consider why some reactions are exothermic and others are endothermic. ● Use bond energies to calculate overall energy changes.
29/30	Maths skills: Recognise and use expressions in decimal form	<ul style="list-style-type: none"> ● Read scales in integers and using decimals. ● Calculate the energy change during a reaction. ● Calculate energy transferred for comparison.
31/32	Measuring rates	<ul style="list-style-type: none"> ● Measure the volume of gas given off during a reaction. ● Use the results to measure the reaction rate. ● Explore how the rate changes during the reaction.
31/32	Key concept: Limiting reactants and molar masses	<ul style="list-style-type: none"> ● Recognise when one reactant is in excess. ● Consider how this affects the amount of product made. ● Explore ways of increasing the amount of product.
31/32	Calculating rates	<ul style="list-style-type: none"> ● Find out how to calculate rates of reaction. ● Use graphs to compare reaction rates. ● Use tangents to measure rates that change.
33/34	Factors affecting rates	<ul style="list-style-type: none"> ● Measure the time taken to produce a specific amount of product. ● See how a reactant's temperature or concentration can affect this time. ● Investigate the effect of breaking up a solid reactant into smaller pieces.

33/34	Required practical: Investigate how changes in concentration affect the rates of reactions by a method involving the production of a gas and a method involving a colour change	<ul style="list-style-type: none"> ● Devise a hypothesis. ● Devise an investigation to test a hypothesis. ● Decide whether the evidence supports a hypothesis.
35/36	Factors increasing the rate	<ul style="list-style-type: none"> ● Interpret graphs. ● Consider what determines the reaction rate. ● Explore the effect of changing the amounts of reactants used.
35/36	Collision theory	<ul style="list-style-type: none"> ● Find out about the collision theory. ● Use collision theory to make predictions about reaction rates. ● Relate activation energies to collision theory.
35/36	Catalysts	<ul style="list-style-type: none"> ● Investigate catalysts. ● Find out how catalysts work. ● Learn how they affect activation energy.