

YEAR 9 CHEMISTRY SEMESTER 1

TITLE: ATOMIC STRUCTURE AND THE PERIODIC TABLE

LESSON	TITLE	OBJECTIVES	Check your progress		
			MEG 2	MEG 5	MEG 8
1	Elements and compounds	<ul style="list-style-type: none"> -Identify symbols of elements from the Periodic Table -Recognise the properties of elements and compounds -Identify the elements in a compound 	Name compounds from their formula	Recall the names of the first 20 elements in the periodic table and the elements in Group 1 and 7	Use symbol equations to describe chemical reactions
2	Atoms, formulae and equations	<ul style="list-style-type: none"> -Learn the symbols of the first 20 elements in the Periodic Table -Use symbols to describe elements and compounds -Use formulae to write equations 			
3	Mixtures	<ul style="list-style-type: none"> -Recognise that all substances are chemicals -Understand that mixtures can be separated into their compounds -Suggest suitable separation and purification techniques for mixtures 	Describe how to separate mixtures of elements and compounds	Use word equations to describe chemical reactions	Use balanced equations to describe reactions
4	Changing ideas about atoms and Modelling the atom	-Learn how models of the atom changed as scientists gathered more data	Explain that early models of the atom did not have shells with electrons	Explain that early models of atoms developed as new evidence became available	Explain why the scattering experiment led to a change in the atomic model

		<ul style="list-style-type: none"> -Consider the data Rutherford and Marsden collected -Link their data to our model of the atom -Explore the structure of atoms -Consider the sizes of atoms -Explore the way atomic radius changes with position in the Periodic Table 			
5	Relating charges and masses	<ul style="list-style-type: none"> -Compare protons, neutrons and electrons -Find out why atoms are neutral -Relate the number of charged particles in atoms to their position in the periodic table 	Draw a diagram of a small nucleus containing protons and neutrons with orbiting electrons at a distance	Calculate the numbers of subatomic particles in ions and isotopes given the atomic and mass numbers	Complete data tables showing the atomic numbers, mass numbers and numbers of subatomic particles from symbols
6	Sub-atomic particles and electronic structure	<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 -Find out how electrons are arranged in atoms -Use diagrams and symbols to show which energy levels they occupy 	Describe the pattern of electrons in shells for the first 20 elements	Explain how the electronic arrangement of atoms follows a pattern up to the atomic number 20	Explain how the electronic arrangement of transition metal atoms put them into a period

		-Use number notation to represent electronic structure			
7	The Periodic Table and Developing the Periodic Table	<p>-Explain how the electronic structure of atoms follows a pattern</p> <p>-Recognise that the number of electrons in an element's atoms outer shell corresponds to the elements group number</p> <p>-Use the periodic table to make predictions</p> <p>-Find out the periodic table has changed over the years</p> <p>-Explore Mendeleev's role in its development</p> <p>-Consider the accuracy of Mendeleev's predictions</p>	Describe how Mendeleev was able to leave spaces for elements that had not been discovered yet	Explain why the modern periodic table has the elements in order of atomic number	Explain how Mendeleev was able to make predictions of as yet undiscovered elements such as eka-silicon
8	Metals and non-metals (comparing their chemical and physical properties)	<p>-Review the physical properties of metals and non-metals</p> <p>-Compare the oxides of metals and non-metals</p> <p>Make predictions about unknown metals and non-metals</p> <p>-Explore the links between electron configurations of elements and their properties</p>	<p>Describe a number of physical properties of metals and non-metals</p> <p>Explain that non-metals are on the right-hand side of the periodic table</p>	<p>Explain that atoms of metals have 1, 2 or 3 electrons in their outer shell</p> <p>Explain that non-metals have 4, 5, 6, 7 or 8 electrons in their outer shell</p>	<p>Explain that non-metals need to gain or share electrons during reactions and that metals need to lose electrons during reactions</p> <p>Predict the relative reactivity across the periods and give reasons</p>

12	Transition metals	<ul style="list-style-type: none"> -Compare the properties of transition metals with those of group 1 metals -Explore the uses of transition metals -Find out why they can form compounds with different colours 	Explain that transition metals have higher melting points and are stronger and harder than Group 1 metals	Explain that transition metals are less reactive than Group 1 metals and form coloured solutions	Explain that transition metals form ions of different charges and are useful as catalysts
<p><u>KEY TERM LIST:</u> Element, compound, balanced, symbol, equation, molecule Chromatography, filtration, mixture, separation Electron shell, Ernest Rutherford, Geiger and Marsden experiment, J. J. Thomson, James Chadwick, John Dalton, Neils Bohr Charge, electron, nucleus, electron shell Atomic number, neutron, proton, symbol Atomic mass, isotope, electronic structure, shell, energy level Group, period, periodicity, predictions, properties, patterns Electrical conductor, lustrous, tensile strength, thermal conductivity, ions, atomic structure, metalloids Elements, helium, neon, argon, density, unreactive Alkali, indicator, ion, reactivity, stable electronic structure Bromine, chlorine, halogen, iodine Electron arrangement, reactivity, trend Catalyst, chromium, cobalt, manganese, nickel, transition element</p>					
<p><u>MATHEMATICAL SKILLS:</u> Translate information between graphical and numerical form Use ratios Use prefixes and powers of ten; plot two variables from data Subtracting negative numbers Visualise and represent 2D and 3D forms including two dimensional representations of 3D objects Plot two variables from data using negative numbers Interpolate and extrapolate graphs Recognise and use expressions in decimal and standard form Solve simple algebraic equations</p>					

Understand and use simple mathematical symbols

Construct and interpret frequency tables and diagrams, bar charts and histograms

Make estimates of the results of simple calculations