



AQA GCSE Combined Science: Trilogy

Topic Checklists

6.4 Atomic Structure

6.4.1 Atoms and Isotopes

Topic	Success Criteria	Progress		
The Structure of an Atom	I can state the radius of an atom.			
	I can describe how the radius of a nucleus compares to the radius of an atom.			
	I can describe the basic structure of an atom.			
	I can state the charge of the nucleus of an atom.			
	I can state the charge of an electron.			
	I can describe how electrons are arranged in atoms.			
	I can describe how electron arrangements may change with the absorption of electromagnetic radiation.			
	I can describe how electron arrangements may change with the emission of electromagnetic radiation.			
Mass Number, Atomic Number and Isotopes	I can describe how the number of electrons in an atom relates to the number of protons in the nucleus.			
	I can explain why atoms have no overall electrical charge.			
	I can describe how the number of protons in an atom of an element relates to its atomic number.			
	I can describe how the number of protons and neutrons in an atom relates to its mass number.			
	I can give a definition for the term 'isotope'.			
	I can explain how atoms turn into positive ions.			
	I can identify the difference between isotopes given appropriate information.			



Topic	Success Criteria	Progress		
The Development of the Model of the Atom	I can describe what atoms were thought to be like before the discovery of the electron.			
	I can describe the difference between the plum pudding model of the atom and the nuclear model of the atom.			
	I can describe how the results from the alpha particle scattering experiment led to the nuclear model.			
	I can describe how Niels Bohr adapted the nuclear model.			
	I can describe how developments in scientific methods led to the discovery of protons and neutrons.			
	I can describe how the experimental work of James Chadwick led to the development of the nuclear model.			

**6.4.2 Atoms and Nuclear Radiation**

Topic	Success Criteria	Progress		
Radioactive Decay and Nuclear Radiation	I can describe what is meant by radioactive decay.			
	I can describe what is meant by the activity of an unstable nuclei.			
	I can describe what is meant by the count-rate of an unstable nuclei.			
	I can describe four types of nuclear radiation.			
	I can describe the penetration of alpha, beta and gamma radiation through materials.			
	I can describe the range of alpha, beta and gamma radiation in air.			
	I can describe the ionising power of alpha, beta and gamma radiation.			
	I can evaluate the best sources of radiation to use in a given situation.			
Nuclear Equations	I can represent alpha radiation in a nuclear equation.			
	I can represent beta radiation in a nuclear equation.			
	I can describe how alpha decay affects the mass and charge of the nucleus.			
	I can describe how beta decay affects the mass and charge of the nucleus.			
	I can describe how gamma decay affects the mass and charge of the nucleus.			
	I can balance the atomic numbers and mass numbers in nuclear equations to show single alpha and beta decay.			
Half-Lives and the Random Nature of Radioactive Decay	I know that radioactive decay is random.			
	I can give a definition for half-life in terms of number of nuclei or the count-rate.			
	I can explain the concept of half-life and how it is related to the random nature of radioactive decay.			
	I can determine the half-life of a radioactive isotope from given information.			
	(HT only) I can calculate the net decline, expressed as a ratio, in a radioactive emission after a given number of half-lives.			



Topic	Success Criteria	Progress		
Radioactive Contamination	I can describe what is meant by radioactive contamination.			
	I can explain what is meant by irradiation.			
	I can compare the hazards associated with contamination and irradiation.			
	I can suggest how to manage the use of radioactive sources during irradiation to protect against hazards.			
	I can explain why the findings of studies into the effects of radiation on humans should be published and shared with other scientists.			

