

Designed for: Year 9 Science **Sub-strand(s):** Chemical Sciences

Content Descriptors:

All matter is made of atoms that are composed of protons, neutrons and electrons; natural radioactivity arises from the decay of nuclei in atoms ([ACSSU177](#))

Context:

Atoms make up everything. The geological formations that contain oil and gas also consist of naturally occurring radioactive materials. Elements are combined to create compounds, such as steel, which is a major output of the resources sector.

Intent:

The following resources may be used as a mini-unit on the topic indicated above with some additional scaffolding, structure and differentiation for each individual classroom, or can be used as stand-alone resources to assist with providing the minerals and energy context within the designated content descriptors.

Resource Types:

This pack of resources links to:

- Worksheets
- Activities
- Fact Sheets

About Oresome Resources:

The Oresome Resources website is a collaborative educational initiative supported by the minerals and energy industry in Australia. These resources have been developed by teachers for teachers to provide syllabus support to the key learning areas of Science, Maths, Technologies and Humanities and Social Sciences.

Each of the resources are free to use by teachers and students to assist in meeting the learning objectives and achievement of students within their studies.



Resource	Name	Link	Description	Other Notes
1	Building Elements Worksheet	https://www.oresomerresources.com/resource/building-elements-worksheet/	This worksheet introduces the atom and uncovers the properties of protons, neutrons, electrons, ions and isotopes. A table allows for comparing the mass and charge of protons, neutrons and electrons, and their relation to elements in the periodic table.	A Printed or online copy of the Periodic Table can be used. Alternatively there are a number of interactive apps available at https://www.ansto.gov.au/education/apps Augmented reality interactive periodic table ANSTO Elementals game
2	XR App	XRAppwithVirtualtour: https://www.ansto.gov.au/education/apps	Introduces Protons, Neutrons and Electrons and the Periodic table	XR is a large App (Approx. 1 GB, so ideally loaded onto device at school)
3	Types of Radiation Graphic Organiser	https://www.oresomerresources.com/resource/types-of-radiation-graphic-organiser/	This graphic organiser is used to identify similarities and differences between three types of radiation – alpha, beta and gamma	Some information can be found in the 'Radiation types factsheet' resource. Other information can be found in textbooks or from reliable online sources such as the ANSTO website. Encourage students to evaluate the credibility and reliability of their research sources
4	Radiation Types Factsheet	https://www.oresomerresources.com/resource/radiation-types-fact-sheet/	In this fact sheet, the types of radiation and measures necessary to record and protect from radiation are briefly explained.	
5	Unstable Isotopes Worksheet	https://www.oresomerresources.com/resource/unstable-isotopes-worksheet/	This worksheet explains how isotopes can become unstable and investigates the number of protons and neutrons in example isotopes. Students then use	

			the ANSTO Atom Builder online to construct isotopes and record if they are stable or unstable.	
6	ANSTO Atom Builder	ANSTO App: https://www.ansto.gov.au/education/apps	Build stable and radioactive isotopes using neutrons, protons and electrons with the ANSTO Atom Builder. Discover the uses and properties of common isotopes, and locate elements in the periodic table.	This resource is found at the bottom of this webpage.
7	What's half-life Worksheet	https://www.oresomeresources.com/resource/whats-half-life-worksheet/	This worksheet defines radioactive isotopes and half-life and provides examples of radioactive decay applications. It outlines an engaging activity using everyday items to simulate radioactive decay to calculate half-life.	Extensions can involve graphing and interrogation of results. Can be linked to Maths curriculum.

