

Module map

GCSE Science	Module story	Science ideas and explanations	GCSE Additional Science
<p>Air molecules feature in C1 <i>Air quality</i>. Weak attractive forces between molecules and stronger cross-links are used to explain polymer properties in C2 <i>Material choices</i>.</p> <p>Silk appears as a natural polymer in C2 <i>Material choices</i>. The importance of proteins and carbohydrates is covered in C3 <i>Food matters</i>.</p> <p>The carbon cycle is covered in P2 <i>Radiation and life</i>. The impacts of agriculture on natural cycles appear in C3 <i>Food matters</i>.</p> <p>Life cycle assessment is applied to articles made from polymers in C2 <i>Material choices</i>.</p>	<p>Molecules in the atmosphere and hydrosphere</p> <p>↓</p> <p>Salts in the hydrosphere and lithosphere</p> <p>↓</p> <p>Silica and silicates</p> <p>↓</p> <p>Polymers in the biosphere</p> <p>↓</p> <p>Elements cycling in the environment</p> <p>↓</p> <p>Extracting metals with carbon</p> <p>↓</p> <p>Extracting aluminium by electrolysis</p> <p>↓</p> <p>Metallic bonding</p> <p>↓</p> <p>Metal life cycles</p> <p>↓</p>	<p>The properties of molecular compounds can be explained in terms of strong covalent bonding within molecules and weak attractions between molecules. Chemists represents molecules and the bonding between atoms with diagrams and models.</p> <p>The properties of a salt can be explained in terms of a giant structure of ions. Salts conduct when molten, or when in solution, because the ions are free to move.</p> <p>Silicon and oxygen are abundant in the lithosphere. Silicon dioxide consists of a giant structure of atoms held together by strong covalent bonds. This structure helps to account for its properties.</p> <p>Carbohydrates, proteins, and DNA are all molecular. Important elements in these compounds are carbon, hydrogen, oxygen, and nitrogen, plus other elements such as phosphorus.</p> <p>The elements such as carbon and nitrogen cycle between spheres with the help of living things in the biosphere. Some human activities are on a large enough scale to have an impact on natural cycles: examples are burning fuels and making fertilizers.</p> <p>Some metals can be extracted by reducing ores with carbon. It is possible to calculate how much metal is available given the formula and the relative atomic masses.</p> <p>Electrolysis is used to extract more reactive metals such as aluminium. Ionic theory can explain what happens during electrolysis.</p> <p>The properties of a metal can be explained in terms of a giant structure of atoms held together by metallic bonding.</p> <p>The extraction, use, and disposal of metals can have major impacts on the environment.</p>	<p>Ions and properties of ionic salts are covered in C4 <i>Chemical patterns</i>. An ionic explanation of neutralizations features in C6 <i>Chemical synthesis</i>.</p> <p>DNA and proteins feature in B5 <i>Growth and development</i>.</p> <p>Balanced symbol equations are used to describe reactions in C4 <i>Chemical patterns</i>. The quantitative meaning of equations is covered in C6 <i>Chemical synthesis</i>.</p>