Structure and bonding

General

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| **Key term** | **Definition** |
| Atom | the smallest possible particle of an element; atoms are made up of protons, neutrons and electrons |
| Chemical bond | a strong electrostatic force of attraction holding atoms together |
| Compound | a pure substance made of two or more different elements whose atoms are joined by chemical bonds; the atoms are in a fixed ratio |
| Conductor of electricity | a substance that allows charged particles to move through it easily |
| Dot and cross diagram | used to show how electrons from the outer shells/energy levels of atoms are shared or transferred when atoms form molecules or ions |
| Electron | a negatively charged subatomic particle with very little mass found in the electron shells/energy levels of atoms |
| Electron shells/energy level | the part of an atom outside the nucleus occupied by electrons |
| Element | a pure substance made of only one type of atom |
| Giant lattice | the regular arrangement of atoms or ions that form extended structures |
| Inelastic | is not flexible |
| Regular lattice | an arrangement of repeating atoms or ions that form a 3D structure |
| Subatomic particle | a particle smaller than an atom |

Covalent structure and bonding

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| **Key term** | **Definition** |
| Covalent bond | a type of bond formed by atoms sharing one or more pairs of electrons |
| Diatomic | when a molecule is composed of two atoms |
| Intermolecular forces | the relatively weak attractive and repulsive forces between molecules |
| Intramolecular forces | the attractive and repulsive forces within a molecule |
| Macromolecule | a very large molecule |
| Molecule | two or more atoms connected by chemical bonds |

Ionic structure and bonding

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| **Key term** | **Definition** |
| Anion | a negative ion |
| Brittle | something that cracks or breaks when force is applied to it |
| Ion | a charged particle formed when one or more electrons are lost or gained from an atom or molecule |
| Ionic bond | an electrostatic force of attraction between oppositely charged ions in a regular lattice that forms between a metal and a non-metal |
| Polyatomic ion | a charged particle made of two or more atoms joined together |

Metallic structure and bonding

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| **Key term** | **Definition** |
| Alloy | a mixture of two or more elements at least one of which is a metal, where the resulting mixture has metallic properties |
| Cation | a positive ion |
| Delocalised electron | an electron in a molecule or structure that is not associated with any particular atom, ion, or covalent bond and which is free to move |
| Ductile | can be drawn out into wires |
| Electrostatic force of attraction | a force of attraction between particles with opposite charges |
| Malleable | can be hammered or bent into shape |
| Metal | an element that is shiny when cut, malleable and conducts electricity well; metals are found on the left and middle of the periodic table and tend to lose electrons to form positive ions |
| Metallic bond | an electrostatic force of attraction between delocalised electrons and the positive ions in a regular lattice |
| Thermal conductivity | a measure of how easily a substance allows heat to move through it |

Structure and bonding of carbon

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| **Key term** | **Definition** |
| Allotropes | different forms of the same element in the same physical state; for example, allotropes of carbon are diamond, graphite, graphene and fullerenes |
| Tetrahedral | molecules and structures that have one atom in the centre and four atoms at the corners of a triangular pyramid |