Term	Definition
Atomic Number	Number of protons in the nucleus
Aufbau Principle	Theory that an atom is built up by the addition of electrons, which fill orbital starting at the lowest energy orbital before filling higher energy orbitals (for example, 1s before 2s)
Bonding Electron Pair	Electron pair that is involved in bonding, found in the space between 2 atoms
Bose-Einstein Condensate (BEC)	State of matter that consists of a collection of atoms near absolute zero; all the atoms have the lowest possible quantum energy state
Buckyball	Spherical arrangement of carbon atoms that form a hollow, cage-like structure
Capillary Action	Spontaneous rising of a liquid in a narrow tube
Carbon Nanotube	Solid made of carbon atoms similar to graphite rolled into a cylinder
Composite Material	Material composed of two or more distinct materials that remain separate from each other in the solid phase
Continuous Spectrum	Emission spectrum that contains all the wavelengths in a specific region of the electromagnetic spectrum
Cooridinate Covalent Bond	Covalent bond in which the electrons involved in bonding are from one atom
Covalent Bond	A chemical bond in which atoms share the bonding electrons
Covalent Network Crystal	Solid in which the atoms form covalent bonds in an interwoven network
Dipole	Separation of positive and negative charges in a region in space
Dipole-dipole Force	Intermolecular force that is caused when the dipoles of polar molecules position their positive and negative ends near each other
Duet Rule	Observation that the complete outher shell of valence electrons when and hydrogen and a period 2 metal are involved in bonding
Electron	Negatively charged subatomic particle
Electron Configuration	Location and number of electrons in the electron energy levels of an atom

Electron Probability Density	Probability of finding an electron at a given location, derived from wave equations and used to determine the shapes of orbitals, also called electron probability distribution
Electron Sea Theory	Theory that states that the electrons in a metallic crystal move freely around the positively charged nuclei
Electronegativity	Ability of an atom in a molecule to attract shared electrons to itself
Electron-pair Repulsion	Repulsive force that occurs between electron pairs, causing them to be positioned as far apart as possible in a molecule
Emission Spectrum	Spectrum of electromagnetic radiation emitted by an atom; results when an atom is returned to a lower energy state from a higher energy state
Energy-level diagram (orbital diagram)	Diagram that represents the relative energies of the electrons in an atom
Ferromagnetism	Very strong magnetism commonly exhibited by materials that contain nickel, iron, and cobalt
Ground State	Lowest energy state for an atom
Heisenberg's Uncertainty Principle	Idea that is impossible to know the exact position and speed of an electron at a given time
Hund's Rule	Rule stating that in a particular set of orbitals of the same energy configuration for an atom is the one with maximum number of unpaired electrons allowed by the Pauli exclusion principle' unpaired electrons represented as having parallel spins
Hybrid Orbital	Orbital that forms from the combination of at least 2 different orbitals
Hybridization	Process of forming hybrid orbitals from the combination of at least 2 different orbitals
Hydrogen Bond	Strong dipole-dipole force that occurs when a hydrogen atom bonded to a highly electronegative atom (oxygen, nitrogen, or fluorine) is attracted to a partially negative atom on a nearby molecule
Intermolecular Force	Force that causes one molecule to interact with another molecule; occurs between molecules
Intramolecular Bond	Chemical bond within a molecule
Ionic Bond	Electrostatic attraction between oppositely charged ions

Isoelectronic	Having the same number of electrons per atom, ion, or molecule
Isotope	Atoms with the same number of protons but different numbers of neutrons
Laser (light stimulated emission of radiation)	Device that produces light of a single colour with all waves travelling parallel to each other
Lewis Structure	Diagram that represents the arrangement of covalent electrons and bonds in a molecule or polyatomic ion
Line Spectrum	Emmission spectrum that contains only those wavelengths characteristic of the element being studied
London-dispersion Forces	Intermolecular forces that exist in non-polar molecules; they increase as the molecular mass increases
Lone Electron Pair	Pair of valence electrons that is localized to a given atom but not involved in bonding
Magnetic Quantum Number (*m*)	Quantum number that describes the orientation of an atomic orbital in space relative to other orbitals in the atom, with whole-number values between +*l* and -*l*, including 0
Magnetic Resonance Imaging (MRI)	Medical tool in which magnetic fields interact with atoms in the human body, producing images that doctors can use to diagnose injuries and diseases
Mass Number	Total number of protons and neutrons in a nucleus
Metallic Bonding	Bonding that holds the nuclei and electrons of metals together
Metallic Crystal	Solid with closely packed atoms held together by electrostatic interactions and free-moving electrons
Molecular Crystal	Solid composed of individual molecules held together by intermolecular forces of attraction
Neutron	Electrically neutral subatomic particle
Non-polar Covalent Bond	Covalent bond in which the electrons are shared equally between atoms
Non-polar Molecule	Molecule that has only non-polar bonds, or a bond dipole sum of zero
Nucleus	Dense centre of an atom with a positive charge
Octet Rule	Observation that many atoms tend to form the most stable substances when they are surrounded by 8 electrons in their valence shells

Orbital	Region around the nucleus where an electron has a high probability of being found
Paramagnetism	Weak attraction of a substance to a magnet; applies to individual atoms
Pauli Exlusion Principle	No two electrons in the same atom can be in the same quantum state
Photoelectric Effect	electrons emitted by matter that absorbs energy from shortwave electromagnetic radiation
Photon	Unit of light energy
Pi Bond	Bond that is formed when the sides of the lobes of 2 orbitals overlap
Polar Covalent Bond	Covalent bond in which the electrons are not shared equally because 1 atom attracts them more strongly than the other atom
Polar Molecule	Molecule that has a net dipole
Polarizability	Ability of a substance to form a dipolar charge distribution
Principal Quantum Number	Quantum number that describes the size and energy of an atomic orbital
Proton	Positively charged subatomic particle
Quantum	Unit of packet of energy
Quantum Mechanical Model	Model for the atom based on quantum theory and the calculation of probabilities for the location of electrons
Quantum Mechanics	Application of quantum theory to explain the properties of matter, particularly electrons in atoms
Quantum Numbers	Numbers that describe the quantum mechanical properties of orbitals; from the solutions to Schrodinger's wave equation
Radioactivity	Spontaneious decay of disintegration of the nucleus of an atom
Radioisotope	Isotope that emits radioactive gamma rays and/or subatomic particles
Representative Elements	Elements in the main blocks of the periodic table, which are Groups 1 to 18
Secondary Quantum Number (*l*)	Quantum number that describes the shape and energy of an atomic orbital, with whole-number values from 0 to *n* -1 for each value of *n*

Semiconductor	Substance that conducts a slight electric current at room temperature but has increasing conductivity at higher temperatures
Shell	Atom's main energy level, where the shell number is given by the principal quantum number, n = 1, 2, 3, …
Sigma Bond	Bond that is formed when the lobes of 2 orbitals directly overlap end to end
Simplified Lewis Structure	Lewis structure in which bonding electron pairs are represented by solid lines and lone electron pairs by dots
Space-filling Models	Model of a molecule showing the relative sizes of the atoms and their relative orientations
Spectroscopy	Analysis of spectra to determine properties of their source
Spin Quantum Number (*ms*)	Quantum number that relates to the spin of the electron
Subshells	Orbitals of different shapes and energies, as given by the secondary quantum number, often referred to as *s, p, d,* and *f*
Surface Tension	Resistance of a liquid to increase its surface area
Three-dimensional Structure	Three-dimensional arrangement of ions or atoms making up a pure substance
Transition	Movement of an electron from one energy level to another
Transition metal	Element whose highest-energy electrons are in *d* orbitals
Valence Bond Theory	Theory stating that atomic orbitals overlap to form a new orbital with a pair of opposite-spin electrons
Valence Electron	Electron in the outermost principal quantum level of an atom
Valence Shell Electron-Pair Repulsion (VSEPR) Theory	Method to determine the geometry of a molecule based on the idea that electron pairs are as far apart as possible
van der Waals Forces	Many types of intermolecular forces, including dipole-dipole forces, London dispersion forces, and hydrogen bonding
Viscosity	Measure of a liquid's resistance to flow
Wave Function	Mathematical probability of finding an electron in a certain region of space