SC9a Masses and empirical formulae

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| Word | Pronunciation | Meaning |
| **empirical formula** | *em-****pir****-ical formula* | The formula showing the simplest whole number ratio of atoms of each element in a compound. |
| **molecular formula** | *mol-****ec****-ular formula* | The formula showing the actual number of atoms of each element in a molecule of a compound. |
| **relative formula mass** |  | The sum of the relative atomic masses of all the atoms in a formula. |

SC9b Conservation of mass

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| Word | Pronunciation | Meaning |
| **concentration** | *con-cen-****tray****-shion* | The amount of a solute dissolved in a certain volume of solvent. |
| **solute** | ***sol****-ute* | A substance that dissolves in a liquid to make a solution. |
| **solvent** | ***sol****-vent* | Describes the liquid in which a substance dissolves to make a solution. |
| **precipitate** |  | An insoluble substance that is formed when two soluble substances react together in solution. |
| **closed system** |  | When substances cannot enter or leave an observed environment, e.g. a stoppered test tube. |
| **law of conservation of mass** |  | The idea that mass is never lost or gained during a chemical reaction or physical change.  |
| **non-enclosed system** |  | When substances can enter or leave an observed environment e.g. stoppered test tube |

SC9c Moles

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| Word | Pronunciation | Meaning |
| **Avogadro constant** | *Avo-****gadro*** | This is the number of particles in one mole of a substance (6.02 ×1023 mol−1). |
| **limiting reactant** |  | The reactant that determines the amount of product formed in a chemical reaction. Any other reactants will be present in excess. |
| **mole** |  | The mass of a mole of a substance is the relative formula mass expressed in grams. |
| **stoichiometry** | *stoi-key-****om****-etry* | The molar ratio of the reactants and products in a chemical reaction. |

SC10a Electrolysis

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| Word | Pronunciation | Meaning |
| **anion** | **an**-I-on | A negatively charged ion, formed by gaining electrons (usually a non-metal ion). |
| **anode** |  | Positive electrode. |
| **cathode** |  | Negative electrode. |
| **cation** | **cat**-I-on | A positively charged ion formed by losing electrons. |
| **electrode** |  | A rod made of a metal or graphite that carries the current into or out of the electrolyte. |
| **electrolysis** | e-lek-**trol**-is-is | The process in which energy transferred by a direct electrical current decomposes electrolytes. |
| **electrolyte** | e-**lek**-trO-lite | An ionic compound that is molten or dissolved in water. |
| **half equation** |  | An ionic equation showing the electrons gained or lost in oxidation or reduction reactions. |
| **oxidation** | ox-id-**ay**-shun | A reaction in which oxygen is added to a chemical substance; loss of electrons by an atom or negative ion. |
| **reduction** | re-**duck**-shun | A reaction in which oxygen is lost by a chemical substance; gain of electrons by an atom or negative ion. |

SC10b Products from electrolysis

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| Word | Pronunciation | Meaning |
| **discharged** | dis-**charged** | In electrolysis, an ion is discharged when it gains or loses electrons to form a neutral atom or molecule. |
| **inert** |  | An electrode that is unreactive, such as graphite or platinum. |

SC11a Reactivity

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| Word | Pronunciation | Meaning |
| **cation** | **cat**-I-on | Ion with one or more positive charges. |
| **displacement reaction** |  | A reaction where a more reactive element takes the place of a less reactive element in a compound. |
| **half equation** |  | Ionic equation showing electron transfers in oxidation or reduction. |
| **oxidation** | ox-id-**ay**-shun | A reaction in which a substance gains oxygen or loses electrons. |
| **reactivity series** |  | A list of metals in order of reactivity with the most reactive at the top. |
| **redox reaction** |  | A reaction in which oxidation and reduction take place. |
| **reduction** | re-**duck**-shun | A reaction in which a substance loses oxygen or gains electrons. |
| **spectator ions** |  | Ions that do not change during a reaction. |

SC11b Ores

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| Word | Pronunciation | Meaning |
| **bioleaching** | **By**-Oh-leech-ing | Using bacteria to extract metals from their ores. |
| **electrolysis** | e-lek-**trol**-is-is | A process in which electrical energy from a direct current supply decomposes electrolytes. |
| **extraction** |  | A process in which a metal is obtained from its ore. |
| **leachate** | **leech**-ate | A solution produced when water or another solvent passes through a mixture of substances and dissolves some of them. |
| **native state** |  | A metal that occurs uncombined with any other element. |
| **ore** |  | A rock that contains a high concentration of a metal or metal compound. |
| **phytoextraction** | fye-tow-ex-**track**-shun | Using plants to extract metals from their ores. |

SC11c Oxidation and reduction

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| Word | Pronunciation | Meaning |
| **corrosion** | cor-**Oh**-shun | A reaction in which a metal reacts with air and sometimes water to form a metal oxide or hydroxide. |
| **oxidation** | ox-id-**ay**-shun | A reaction in which a substance gains oxygen or loses electrons. |
| **redox** |  | A reaction in which reduction and oxidation take place. |
| **reduction** | re-**duck**-shun | A reaction in which a substance loses oxygen or gains electrons. |

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| **rusting** |  | The reaction between iron, air and water to form hydrated iron(III) oxide (rust). |
| **tarnish** |  | A dull film on a metal’s surface. |

SC11d Life cycle assessment and recycling

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| Word | Pronunciation | Meaning |
| **life cycle assessment (LCA)** |  | A technique used to assess the environmental impact associated with all the stages in the life of a product from cradle to grave. |
| **recycling** |  | Converting waste materials into new products. |

SC12a Dynamic equilibrium

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| Word | Pronunciation | Meaning |
| **closed system** |  | When substances cannot enter or leave an observed environment, e.g. a stoppered test tube. |
| **dynamic equilibrium** |  | When the forwards and backwards reactions in a reversible chemical reaction are occurring at the same rate. |
| **endothermic** |  | A type of reaction in which energy from the surroundings is transferred to the products, e.g. photosynthesis. |
| **exothermic** |  | A type of reaction in which energy is transferred to the surroundings from the reactants, e.g. combustion. |
| **open system** |  | A system into or from which substances can enter or leave, such as a reaction inside an open test tube. |
| **reversible reaction** |  | A chemical reaction that can work in both directions. |

SC13a Transition metals

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| Word | Pronunciation | Meaning |
| catalyst | **cat**-a-list | A substance that speeds up a process, without itself being used up. |
| ductile | **duk**-tile | A substance that can be stretched out to make a thin wire. |
| malleable | **mal**-ee-uh-buhl | A substance that can be hammered or rolled into shape without shattering. |
| transition metal | tran-**zi**-shun **met**-al | Metal element in the block between groups 2 and 3 in the periodic table. |

SC13b Corrosion

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| Word | Pronunciation | Meaning |
| corrosion | kuh-**rOh**-zshun | The gradual deterioration of a substance when it reacts with substances in the environment, for example when a metal oxidises in air. |
| desiccant |  | A substance that absorbs water or water vapour. |
| oxidise |  | To gain oxygen in a chemical reaction, or to lose electrons. |
| rusting |  | The corrosion of iron or steel. (Water and oxygen must be present for rusting to occur.) |
| sacrificial protection |  | Using a more reactive metal to protect iron from rusting. |
| tarnish |  | A thin layer that forms on a metal due to oxidation. A metal is also said to tarnish as this layer forms. |

SC13c Electroplating

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| Word | Pronunciation | Meaning |
| anode | **an**-ode | The positive electrode. |
| cathode | **cath**-ode | The negative electrode. |
| electrolyte | e-**lek**-trO-lyte | An ionic compound that is molten or dissolved in water.  |
| electroplating |  | Using electricity to coat one metal with a thin layer of another metal. |
| galvanising | **gal**-van-eYe-zing | Coating iron or steel with a thin layer of zinc to improve its resistance to rusting. |

SC13d Alloying

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| Word | Pronunciation | Meaning |
| alloy | **al**-oi | A metal with one or more other elements (usually metals) added to improve its properties. |
| alloy steel | **al**-oi **steel** | Iron with other elements added to make an alloy. |
| stainless steel |  | Alloy steel containing elements such as chromium, to resist rusting. |

SC13e Uses of metals and their alloys

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| Word | Pronunciation | Meaning |
| ductile | **duk**-tile | A substance that can be stretched to make a thin wire. |
| malleable | **mal**-ee-uh-buhl | A substance that can be hammered or rolled into shape without shattering. |