## Sacred Heart Newcastle SCITT

## Subject Knowledge Audit - Chemistry

| Please decide on your ability to teach the content/skills listed below at KS3/KS4 | |
|---|---|
| **KEY:** | |
| 4 No knowledge – Currently a gap in my subject area | |
| 3 Limited knowledge – Would not feel confident to teach this content | |
| 2 Good knowledge – Confident in ability to teach with some guidance | |
| 1 Expert knowledge - Confident to teach | |
| | |
| The completed subject audit will be used by your Mentor to create your Individual Training Plan. Your progress will be reviewed on a fortnightly basis.<br><br>**You should review and record your progress at each review window below (and share this with your Mentor)** | |

| Subject Area: | Science – Chemistry KS3 | Baseline (4 -1) | Dec. (3 -1) | May (3 -1) | Target for ECT year if applicable |
|---|---|---|---|---|---|
| The particulate nature of matter | The properties of the different states of matter in terms of the particle model, including gas pressure | | | | |
| | Changes of state in terms of the particle model | | | | |
| Atoms, elements and compounds | A simple atomic model | | | | |
| | The differences between atoms, elements and compounds | | | | |
| | Chemical symbols and formulae for elements and compounds | | | | |
| | Conservation of mass, changes of state, and chemical reactions | | | | |
| Pure and impure substances | The concept of a pure substance | | | | |
| | Mixtures, including dissolving | | | | |
| | Diffusion in terms of the particle model | | | | |

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| Subject Area: | Science – Chemistry KS3 | Baseline (4 -1) | Dec. (3 -1) | May (3 -1) | Target for ECT year if applicable |
|---|---|---|---|---|---|
| | Simple techniques for separating mixtures; filtration, evaporation, distillation, chromatography | | | | |
| | The identification of pure substances | | | | |
| Chemical reactions | Chemical reactions as a rearrangement of atoms | | | | |
| | Representing chemical reactions using formulae and using equations | | | | |
| | Combustion, thermal decomposition, oxidation and displacement reactions | | | | |
| | Defining acids and alkalis in terms of neutralisation reactions | | | | |
| | The PH scale, indicators, reactions of acids | | | | |
| | What catalysts do | | | | |
| Energetics | Energy changes on changes of state | | | | |
| | Exothermic and endothermic chemical reactions | | | | |
| The Periodic table | The varying physical and chemical properties of different elements | | | | |
| | The principles underpinning the Mendeleev Periodic table | | | | |
| | How patterns in reactions can be predicted with reference to the periodic table | | | | |
| | Properties of metals, non-metals and oxides | | | | |

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| Subject Area: | Science – Chemistry KS3 | Baseline (4 -1) | Dec. (3 -1) | May (3 -1) | Target for ECT year if applicable |
|---|---|---|---|---|---|
| Materials | The order of metals and carbon in the reactivity series | | | | |
| | The use of carbon in obtaining metals from metal oxides | | | | |
| | Properties of ceramics, polymers and composites | | | | |
| Earth and Atmosphere | The composition and structure of the Earth | | | | |
| | The rock cycle | | | | |
| | Earth as a source of limited resources and the efficacy of recycling | | | | |
| | The carbon cycle | | | | |
| | The composition of the atmosphere | | | | |
| | The production of carbon dioxide by human activity and the impact on climate | | | | |

| Subject Area: | Science – Chemistry KS4 | Baseline (4 -1) | Dec. (3 -1) | May (3 -1) | Target for ECT year if applicable |
|---|---|---|---|---|---|
| Atomic structure and the Periodic Table | A simple model of the atom consisting of the nucleus and electrons, relative atomic mass, electronic charge and isotopes | | | | |
| | The number of particles in a given mass of a substance | | | | |
| | The modern Periodic Table, showing elements arranged in order of atomic number | | | | |

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## Subject Knowledge Audit - Chemistry

| Subject Area: | Science – Chemistry KS4 | Baseline (4 -1) | Dec. (3 -1) | May (3 -1) | Target for ECT year if applicable |
|---|---|---|---|---|---|
| | Position of elements in the Periodic Table in relation to their atomic structure and arrangement of outer electrons | | | | |
| | Properties and trends in properties of elements in the same group | | | | |
| | Characteristic properties of metals and non-metals | | | | |
| | Chemical reactivity of elements in relation to their position in the Periodic Table | | | | |
| Structure, bonding and the properties of matter | Changes of state of matter in terms of particle kinetics, energy transfers and the relative strength of chemical bonds and intermolecular forces | | | | |
| | Changes of types of chemical bonding: ionic, covalent, and metallic | | | | |
| | Bulk properties of materials related to bonding and intermolecular forces | | | | |
| | Bonding of carbon leading to the vast array of natural and synthetic organic compounds that occur due to the ability of carbon to form families of similar compounds, chains and rings | | | | |
| | Structures, bonding and properties of diamond, graphite, fullerenes and graphene | | | | |

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## Subject Knowledge Audit - Chemistry

| Subject Area: | Science – Chemistry KS4 | Baseline (4 -1) | Dec. (3 -1) | May (3 -1) | Target for ECT year if applicable |
|---|---|---|---|---|---|
| Chemical changes | Determination of empirical formulae from the ratio of atoms of different kinds | | | | |
| | Balanced chemical equations, ionic equations and state symbols | | | | |
| | Identification of common gases | | | | |
| | The chemistry of acids; reactions with some metals and carbonates | | | | |
| | pH as a measure of hydrogen ion concentration and its numerical scale | | | | |
| | Electrolysis of molten ionic liquids and aqueous ionic solutions | | | | |
| | Reduction and oxidation in terms of loss or gain of oxygen. | | | | |
| Energy changes in chemistry | Measurement of energy changes in chemical reactions (qualitative) | | | | |
| | Bond breaking, bond making, activation energy and reaction profiles (qualitative) | | | | |
| Rate and extent of chemical change | Factors that influence the rate of reaction: varying temperature or concentration, changing the surface area of a solid reactant or by adding a catalyst | | | | |
| | Factors affecting reversible reactions | | | | |
| Chemical analysis | Distinguishing between pure and impure substances | | | | |
| | Separation techniques for mixtures of substances: filtration, crystallisation, | | | | |

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| Subject Area: | Science – Chemistry KS4 | Baseline (4 -1) | Dec. (3 -1) | May (3 -1) | Target for ECT year if applicable |
|---|---|---|---|---|---|
| | chromatography, simple and fractional distillation | | | | |
| | Quantitative interpretation of balanced equations | | | | |
| | Concentrations of solutions in relation to mass of solute and volume of solvent | | | | |
| Chemical and allied industries | Life cycle assessment and recycling to assess environmental impacts associated with all the stages of a product's life | | | | |
| | The viability of recycling of certain materials | | | | |
| | Carbon compounds, both as fuels and feedstock, and the competing demands for limited resources | | | | |
| | Fractional distillation of crude oil and cracking to make more useful materials | | | | |
| | Extraction and purification of metals related to the position of carbon in a reactivity series | | | | |
| Earth and atmospheric science | Evidence for composition and evolution of the Earth's atmosphere since its formation | | | | |
| | Evidence, and uncertainties in evidence, for additional anthropogenic causes of climate change | | | | |
| | Potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth's climate | | | | |

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| Subject Area: | Science – Chemistry KS4 | Baseline (4 -1) | Dec. (3 -1) | May (3 -1) | Target for ECT year if applicable |
|---|---|---|---|---|---|
| | Common atmospheric pollutants: sulphur dioxide, oxides of nitrogen, particulates and their sources | | | | |
| | The Earth's water resources and obtaining potable water | | | | |

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## Subject Knowledge Audit - Chemistry

**Evidence of subject knowledge development**
Record below the things you have **read and researched** to improve your subject knowledge in the boxes below.

| | | |
|---|---|---|
| Term 1 | September/ October | November/ December |

| | | |
|---|---|---|
| Term 2 | January/ February | March/ April |

| | | |
|---|---|---|
| Term 3 | May/ June | June/ July |

Please sign this sheet off at the end of the training year:

Signed:_____ (Trainee) Date: _____

Signed:_____ (Mentor) Date: _____