## KS3 Science Curriculum Audit – YEAR 7 : 2022 – 2023

**Year 7**

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| Sequenced | **Practical Skills & Safety**  **(Autumn term)** | **Cells & Reproduction**  **(Autumn term)** | **Particles**  **(Spring term)** | **Energy**  **(Spring term)** | **Separation techniques**  **(Summer term)** | **Fast & Furious**  **(Summer term)** |
| **Key Knowledge** | **To know:**   * The names of lab equipment used in science. * The hazard symbols. * The metric units of length, mass, volume, time and temperature. * The meaning of independent, dependent and control variables. | **To know:**   * How to label an animal and plant cell. * The functions of the different sub cellular structures. * The different specialised cells and how they are adapted to carry out their function. * How organisms are made up… cells → tissues → Organs → Organ systems * The male and female gametes, where they are produced and how they are involved in fertilisation. | **To know:**   * The differences between atoms, elements and compounds. * The arrangement and movement of particles in solids, liquids and gases. * The changes of state - melting, freezing, evaporating, condensing, sublimating. * The meaning of density and how to calculate it. (rearrangement not compulsory) * How particles move via diffusion. | **To know:**   * The energy stores and energy pathways. * How to calculate the efficiency of devices. * The processes of conduction, convection and radiation and examples of where these occur. * The difference between a thermal conductor and a thermal insulator. * The different renewable and non-renewable energy resources, including advantages and disadvantages. | **To know:**   * The terms solute, solvent, solution, soluble and insoluble. * The separation processes of filtering, evaporation, distillation and chromatography and examples of what each process can be used to separate. * Examples of acids, alkalis and neutral substances. * An indicator can be used to identify the pH of a substance. * The process of neutralisation. * The 4 layers that make up the earth’s structure. * The three types of rocks and how they are formed. * The problems with climate change. | **To know:**   * Where metals and non-metals are positioned on a periodic table. * The columns and called groups and the rows are called periods on the periodic table. * The sub-atomic particles that make up an atom and their relative mass and relative charge. * Group 1 elements are known as the alkali metals and they get more reactive as you go down the group. * Group 7 elements are known as the halogens and they get less reactive as you go down the group. * Why the noble gases are unreactive. * A more reactive metal can displace a less reactive metal. * The factors that affect the rate of a reaction. |
| **Key Skills** | **To be able to:**   * Convert between different units. * Identify the variables of an investigation. * Draw a line graph including the labelling and scaling of axes. This includes drawing a line of best fit. * Set up and use a Bunsen burner safely. | **To be able to:**   * Use a microscope to observe cells and identify organelles. * Compare similarities and differences between animal and plant cells. * Convert between measurements of length. * Calculate the actual size of a cell from an image using the magnification formula (rearrangement not compulsory) | **To be able to:**   * Measure the temperature of a substance using a thermometer at regular intervals. (stearic acid practical) * Draw and enter data into a results table. * Measure the density of an object by: measuring the mass of an object using a balance; and measuring the volume using either formula or displacement method. * Explain zero error using a balance, and random error using a thermometer as well as the resolution of both pieces of equipment. | **To be able to:**   * Describe the changes in energy stores of different scenarios (energy circus) * Identify the independent, dependent and control variables in various energy practicals (conduction, radiation, insulation) * Draw and entering data into a results table. * Draw a bar chart including the labelling of both axes. * Compare the advantages and disadvantages of renewable and non-renewable energy resources. | **To be able to:**   * Set up a funnel and filter a mixture (e.g. sand and water and/or copper sulfate) * Produce and analyse a Chromatogram to identify different colours within a dye. * Identify the pH of chemicals using Universal indicator and the pH Scale. * Compare different types of rocks and their formation. * Analyse pie charts showing the composition of gases in the earth’s early atmosphere and the earth today. | **To be able to:**   * Identify the numbers of protons, neutrons and electrons in an atom given the atomic number and mass number of an element. * Write word equations for displacement reactions using the reactivity series of metals. * Record observations of a chemical reaction (e.g. fizzing, temperature change, colour change) * Identify the independent, dependent and control variables of an investigation (rates of reaction) * Explain why temperature, concentration and surface area will affect the rate of a reaction. |
|  | **Tier 3 key vocabulary** | **Tier 3 key vocabulary** | **Tier 3 key vocabulary** | **Tier 3 key vocabulary** | **Tier 3 key vocabulary** | **Tier 3 key vocabulary** |
| **Subject specific** | Beaker, conical flask, thermometer, balance, Bunsen burner, flammable, corrosive, toxic, independent, dependent, control, line of best fit. | Nucleus, cell membrane, cytoplasm, mitochondria, ribosomes, cell wall, chloroplast, vacuole, specialised, adaptation, function, gamete, fertilisation | Atom, element, compound, particles, melting, freezing, evaporating, condensation, temperature, density, mass, volume | Chemical, thermal, kinetic, gravitational potential, elastic potential, vibrational, efficiency, useful output, wasted output, conduction, convection, radiation, renewable, non-renewable, fossil fuel. | Solute, solvent, solution, soluble, insoluble, dissolve, filtration, evaporation, distillation, chromatography, acid, alkali, neutral, neutralisation, indictor, pH, core, mantle, crust, sedimentary, igneous, metamorphic | Element, atom, nucleus, proton, neutron, electron, groups, periods, alkali metals, halogens, noble gases, reactivity, displacement, rate of reaction, temperature, concentration, surface area, collisions. |

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| **Does the knowledge above marry up with KO? If not, what needs to be amended?** | Identifying equipment needs to be added. | Yes | Yes | Yes | Yes | Yes |
| **How does this knowledge link to/build on prior knowledge?** | Basic understanding of variables and equipment from KS2  planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary’  taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate | Structure and function of plant and animal structures.  Describe the life process of reproduction in some plants and animals  describe the changes as humans develop to old age. | observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) | Energy is not explicitly taught at any KS prior to KS3.  give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic | use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating#  demonstrate that dissolving, mixing and changes of state are reversible changes  know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution  explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda | Basic understanding of variables and equipment from KS2 |
| **Is knowledge embedded consistently across the SOW?** | Yes | Yes | Yes | Yes | Yes | Yes |
| **Is all of the vocabulary embedded throughout the SOW?** | Yes | Yes | Yes | Yes | Yes | Yes |
| **What (if any) additional vocabulary is needed to access this SOW?** | No | No | No | No | No | No |
| **What grammatical knowledge is required to access this SOW? Is this embedded across the SOW?** | ? | ? |  |  |  |  |
| **Does remembering the knowledge help students to develop the skill? If not, what is missing?** | Yes | Yes | Yes | Yes | Yes | Yes |

**Current Year 7 Cohort 2022-2023**

**Topics to study in Year 8:**

* Forces
* Keeping Healthy
* Electricity & Magnetism
* Chemical Reactions
* Energy from Food

**Topics to study in Year 9:**

* Ecology, Inheritance & Evolution
* Waves
* Cellular Biology
* Atomic Structure & Periodic Table
* Energy & resources