## KS3 Science Curriculum Audit – YEAR 8 : 2024 – 2025

**Year 8**

| Sequenced | **Practical Skills & Safety**  **(Year 8 throughout)** | **Forces (Autumn term)** | **Keeping Healthy**  **(Autumn term)** | **Electricity and Magnetism**  **(Spring term)** | **Chemical Reactions**  **(Spring and continues into the summer term)** | **Energy from Food**  **(Summer term)** | **Ecology**  **(Summer Term)** |
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| **Key Knowledge** | **To know:**   * Identify and describe the use of:   Newton metre,  Ammeter, volt meter, | **To know:**   * Identify forces as contact and non * Identify and describe scalar and vector quantities * Extension of an elastic object is directly proportional to the force applied. * Describe the factors that affect the force of friction. * Define streamlining and its applications. * Levers are used to transmit a rotational force. * Recall the typical values of speed for walking, jogging and cycling. * If an object moves along a straight line, the distance travelled can be represented by a distance-time graph. * Every object exerts a gravitational force on every other object. The force increases with mass and decreases with distance. * Weight is affected by both Mass and gravity. | **To know:**   * The word equations for aerobic and anaerobic respiration. * The function of the lungs and how the alveoli are adapted for gas exchange. * The function of the heart and the names of the 4 chambers. * The function of the blood vessels - arteries, veins, and capillaries. * The 4 components of blood and their functions – plasma, red blood cells, white blood cells, platelets. * How the body responds the exercise (breathing rate and heart rate) * The 4 types of microorganisms. * How the body can protect itself from becoming ill. (First lines of defence and white blood cells) * What a vaccine contains. | **To know:**   * Examples of conductors and insulators. * Electrical symbols (Cell, battery, filament lamp, open switch, closed switch, voltmeter, ammeter, resistor) * How increasing the number of cells or number of bulbs will affect the brightness of an individual bulb. * The definitions of current and potential difference and the equipment needed to measure them. * The difference between a series and a parallel circuit. * What is meant by resistance and know the ohms law equation. * The 4 magnetic materials (Cobalt, Iron, Nickel, Steel). * The definitions of attract and repel and give examples when these happen. * What is meant by a permanent and an induced magnet. | **To know:**   * The differences between atoms, elements, and compounds (recap from year 7) * That we can use symbols to represent atoms and chemical formula to represent molecules. * The difference and give examples of chemical and physical changes. * What the reactants are and what the products are when given a word equation. * The particles that make up an atom along with their relative mass and relative charge (recap from year 7) * That ionic bonding occurs between metals and non-metals and that covalent bonding occurs between 2 or more non-metals. * That the total mass is conserved in chemical reactions. * The tests for gases (chlorine, oxygen, hydrogen, and carbon dioxide) * The difference between exothermic and endothermic reactions. * The role of a catalyst in a chemical reaction. | **To know:**   * The 7 food groups that make up a balanced diet and give examples for each food group. * The food tests for starch, sugar, protein, and fats. * The function of enzymes within the digestive system. * The function of the mouth, oesophagus, stomach, liver, pancreas, small intestine, large intestine, rectum, and anus within the digestive system. * The word equation for photosynthesis. * The features of a root hair cell. * What plants need to survive. * The parts of the flower and their function (anther, filament, stigma, style, ovary) * The two types of pollination. | **To know:**   * The major Kingdom Groups * How DNA is structured * How a mutations affect organisms and future offspring * The difference between inherited and genetic variation * What an extremophile is * What natural selection is and how evolution occurs * What extinction is and how is can be caused * Recall what selective breeding is |
| **Key Skills** | **To be able to:**   * Convert between different units of higher resolution e.g Amps to milliamps   Amps to Mega amps   * Describe the variables of an investigation and suggest suitable control variables. * Record raw data in an appropriate table. * Identify anomalous results and calculate an accurate mean average. * Plot data of discrete and continuous data on an appropriate graph including a line of best fit. * Draw simple conclusions from their graphs. * Record observations from an investigation | **To be able to:**   * Measure forces accurately with a Newton metre * Describe the motion of an object with unbalanced forces * Draw free body diagrams and represent vector forces with an arrow. * Design a car/aeroplane wing that is streamlined. * Calculate the rotational force of a lever. * Apply the speed equation. * Calculate speed from a distance time graph. * Calculate weight using mass and gravity. | **To be able to:**   * Compare the similarities and differences between the different types of respiration. * Describe how a red blood cell moves through the circulatory system. * Carry out a dissection of an organ safely (lungs and/or heart) * Analyse a graph of breathing rate and/or heart rate during exercise. * Explain how vaccines can enable us to become immune from an illness. | **To be able to:**   * Draw/make electrical circuits using circuit symbols. * Measure the current using an ammeter, and the potential difference using a voltmeter * Identify the resolution of an ammeter & voltmeter. * Calculate the resistance using ohms law. * Identify the independent, dependent and control variables of an investigation (resistance of wire). * Drawing a graph for the magnetism practical. * Draw the magnetic field around a bar magnet, including the direction going north to south. | **To be able to:**   * Identify the number of atoms and number of elements in a molecule when given the chemical formula. * Identify elements/compounds/mixtures using ball and stick diagrams. * Record observations of physical and chemical reactions (practicals throughout the unit). * Draw the electronic structures of atoms and write the electron configuration. * Draw a graph of neutralisation. | **To be able to:**   * Record observations of the food tests. * Describe how a ham and cheese sandwich is digested and absorbed. * Test a leaf for starch. * Explain how the leaves and the roots are adapted for photosynthesis. * Identify the independent, dependent and control variables of an investigation (pondweed practical) * Label the reproductive parts of a flower. | **To be able to:**   * Explain how a binomial name is formed * Draw a pyramid of biomass * draw a food chain and web * Identify and describe how organisms are adapted for different environments * Explain how biodiversity can affect an ecosystem. |
|  | **Tier 3 key vocabulary** | **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. | Equilibrium, newton, compression, tension, resultant force, vector, scalar, magnitude, Deformation, linear relationship, weight, mass, inelastic, elastic | Cell, Tissue, Organ, Organ system, Organism, Respiration, Aerobic, Anaerobic, Oxygen, Carbon dioxide, Heart, Circulatory, Veins, Arteries, Capillaries, Red Blood Cell, White Blood Cell, Plasma, Platelets, Microorganism, Virus, Bacteria, Fungi, Protist, Antibodies, Antitoxins, Antibiotics, Vaccination, Immunity. | Conductor, Insulator, Circuit, Cell, Battery, Open Switch, Closed Switch, Filament lamp, voltmeter, ammeter, resistor, potential difference, current, resistance, series, parallel, magnetic, attract, repel, magnetic field, electromagnet, coil, iron core. | Atom, Element, Compound, Mixture, Molecule, Chemical, Physical, Reactant, Product, Proton, Neutron, Electron, Ionic, Covalent, Conservation of mass, Exothermic, Endothermic, Neutralisation, Catalyst | Carbohydrate, Protein, Fats, Vitamins, Minerals, Fibre, Water, Iodine, Benedict’s, Biuret, Ethanol, Digestion, Absorption, Enzymes, Active site, Mouth, Oesophagus, Stomach, Liver, Pancreas, Intestine, Rectum, Anus, Photosynthesis, Palisade mesophyll, Spongy Mesophyll, Chloroplasts, Stomata, Guard cells, Waxy cuticle, Root hair cell, Anther, Filament, Stigma, Style, Ovary, Pollination. |  |

| **How does this knowledge link to/build on prior knowledge?**  **Year 7 knowledge and skills science curriculum** | **explain that unsupported objects fall towards the Earth because of the force of gravity** acting between the Earth and the falling object.  **Identify the effects of air resistance, water resistance and friction**, which act between moving surfaces  Recognise that some **mechanisms, including levers, pulleys and gears**, allow a smaller force to have a greater effect. | Builds upon the Cells unit in Year 7  describe the simple functions of the basic parts of the digestive system in humans  identify the different types of teeth in humans and their simple functions  identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood  recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function  describe the ways in which nutrients and water are transported within animals, including humans | associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit  compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches  use recognised symbols when representing a simple circuit in a diagram.  observe how magnets attract or repel each other and attract some materials and not others  compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials  describe magnets as having two poles  predict whether two magnets will attract or repel each other, depending on which poles are facing. | Builds upon the fast and furious unit. | Builds upon the keeping healthy unit  recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function  describe the ways in which nutrients and water are transported within animals, including humans |
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| **Is all of the vocabulary embedded throughout the SOW?** | Yes | Yes | Yes | Yes | Yes |
| **What (if any) additional vocabulary is needed to access this SOW?** | 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 |

**Current Year 8 Cohort 2022-2023**

**Topics already studied in Year 7:**

* Cells & Reproduction
* Particles
* Energy
* Separation Techniques
* Fast & Furious
* Forces

**Topics to study in 9:**

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