**ScienceCurriculum Map (2022-2023)**

**YEAR 7**

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| Intent statement | The science curriculum at Emmanuel will provide students with the new knowledge needed to navigate the modern world. This will allow our students to develop their scientific literacy which will enable them to make informed decisions. This will give them hope and equip our students to be good role models, who are mindful of their community and the world around them and give them the skills to make meaningful contributions to society. We aim to remove barriers to learning through raising aspirations via an inclusive and diverse curriculum for everyone in our school community. |
| Diversity across the curriculum | Our curriculum represents the diversity of our school community by promoting science as accessible to all. We will use inclusive language, images and texts and promote scientific role models that represent the diversity of our school community. We will deliver the science curriculum with dignity and an awareness of the different religious beliefs of our students whilst being mindful of any unconscious bias. |
|  |  | **AUT 1** | **AUT 2** | **SPR 1** | **SPR 2** | **SUM 1** | **SUM 2** |
| ear 7 | Title and objectives | **Cells** | **Particle Model and Properties of Matter** | **Energy Stores** | **Reproduction** | **Elements and Compounds** | **Contact Forces** | **Life Diversity** | **Chemical Reactions** | **Gravity, Space and Our Solar System** |
| Core knowledge | * Cell theory
* Advances in microscopy
* Observing cells
* Eukaryotic cells and organelle function
* Specialised cells
* Unicellular organisms and diffusion
* Cell division, differentiation and stem cells
 | * Solids, liquids and gases
* Investigating properties of states of matter
* Particle theory and model
* Changes of state
* Use of melting and boiling point to determine state
* Diffusion
* Density
 | * Food and fuels
* Energy stores
* Transferring energy
* Energy and power
* Work, energy and machines
* Energy resources
* Generating electricity
* Domestic fuel bills, fuel uses and costs
* Renewable energy
 | * Reproductive organs
* Gametes
* Fertilisation and implantation
* Gestation and birth
* Maternal lifestyle
* Menstrual cycle (not including hormones)
 | * Elements, compounds and mixtures
* Chemical symbols and formulae
* Making compounds
 | * Contact forces
* Force arrows
* Scalars, vectors and measuring forces
* Drag and friction
* Balanced and unbalanced forces
* Investigating squashing and stretching
* Hooke’s law
 | * Genetics
* Chromosomes genes and DNA
* History of DNA discovery
* Variation between species and individuals
* Variation driving natural selection
* Maintaining biodiversity
 | * Chemical and physical changes
* Rearrangement of atoms in chemical reactions
* Word equations
* Balanced symbol equations
* Conservation of mass
* Acids and Alkalis
* Neutralisation
* Metal reactivity series
* Displacement reactions
* Testing for carbon dioxide, hydrogen and oxygen
 | * The Earth
* The night sky
* Seasons
* Solar system
* The Sun
* Gravity, mass and weight
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**Year 8**

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|  |  | **AUT 1** | **AUT 2** | **SPR 1** | **SPR 2** | **SUM 1** | **SUM 2** |
| Year 8 | Title and objectives | **Working scientifically and solutions****Electricity (series and parallel)**  | **Chemical reactions including endo + exo****Plants as organisms** | **Acids and Alkalis****Magnetism** | **Science of reproduction (including plants)****Forces** | **Earth & atmosphere****Speed and motion** | **Heat transfers****Variation and evolution** |
| Core knowledge | * Pure and impure substances
* Mixtures, including dissolving
* Diffusion in terms of the particle model
* Separating mixtures: filtration, evaporation, distillation and chromatography
* Identification of pure substances
* electric current, in circuits, series and parallel circuits,
* potential difference, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current
* differences in resistance between conducting and insulating components (quantitative)
 | * chemical reactions as the rearrangement of atoms
* representing chemical reactions using formulae and equations
* combustion, thermal decomposition, oxidation and displacement reactions
* energy changes on changes of state (qualitative)
* exothermic and endothermic chemical reactions (qualitative).
* the reactants and products of, photosynthesis,
* Word equation for photosynthesis
* Dependence of almost all life on Earth on photosynthetic organisms,
* Adaptations of leaves for photosynthesis.
 | * Defining acids and alkalis in terms of neutralisation reactions
* The pH scale
* Indicators
* Reactions of acids with metals to produce a salt plus hydrogen
* Reactions of acids with alkalis to produce a salt plus water
* What catalysts do.
* Magnetic poles, attraction and repulsion
* magnetic fields by plotting with compass, representation by field lines
* Earth’s magnetism, compass and navigation
* Magnetic effect of a current, electromagnets, D.C. motors (principles only).
 | * Structure and function of the male and female reproductive systems,
* menstrual cycle (without details of hormones),
* gametes, fertilisation,
* gestation and birth,
* effect of maternal lifestyle on the foetus through the placenta
* reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal,
* Introduction to forces
* Force Diagrams
* balanced and unbalanced forces
* moments
* Forces: associated with deforming
* forces measured in Newtons,
* Hooke’s Law
* work done and energy changes on deformation
* non-contact forces: gravity, magnets, static electricity
 | * the composition of the Earth
* the structure of the Earth
* the rock cycle and the formation of igneous, sedimentary and metamorphic rocks
* 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
* speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time)
* the representation of a journey on a distance-time graph
* relative motion: trains and cars passing one another
 | * heating and thermal equilibrium:
* Conduction
* Insulators
* energy transfer:
* genetic information is transmitted from one generation to the next
* chromosomes, genes and DNA in heredity,
* differences between species
* the variation between individuals within a species being continuous or discontinuous,
* Variation driving natural selection
* extinction
* maintaining biodiversity including gene banks
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**Year 9**

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|  |  | **AUT 1** | **AUT 2** | **SPR 1** | **SPR 2** | **SUM 1** | **SUM 2** |
| Year 9 | Title and objectives | **Cell Biology** | **Atomic Structure** | **Heating** | **Organisation 1**  | **Periodic Table**  | **Light and Sound** | **Organisation 2**  | **Bonding and Structures**  | **Electricity** |
| Core knowledge | * Eukaryotes and prokaryotes
* Animal and plant cells
* Cell specialisation
* Cell differentiation
* Microscopy RP1
* Culturing Microorganisms (Biology only) RP2
* Chromosomes
* Mitosis and the cell cycle
* Stem cells
* Diffusion
* Osmosis RP3
* Active Transport
 | * Atoms and elements
* Atomic structure (sub-atomic particles, size and mass of atoms)
* Isotopes
* Electronic structure
* History of the atom
* Compounds and mixtures

Separation techniques (filtration, crystallisation, distillation and chromatography). | * Heat and Temperature
* Changes of State
* Investigating Density
* Energy transfers by conduction
* Energy transfers by convection
* Energy Transfers by infrared radiation
* Practically investigate surfaces emitting heat by infrared radiation
* Insulators in the home
* Practical investigating insulators
* Practical Specific Heat Capacity
 | * Cells, tissues, organs, organ systems
* The digestive system
* Carbohydrates, lipids, proteins
* Enzymes
 | * Development of the periodic table
* Modern periodic table
* Metals and Non-metals
* Group 1 elements
* Group 7 elements
* Group 0 elements

*Transition metals* | * Light
* Reflection
* Reflected Images
* Refraction
* The eye and the camera
* Colour
 | * Blood and blood vessels
* The Heart
* Cardiovascular disease
* The lungs
* Health and disease
* Cancer
* Plant tissues, organs and organ systems
* Transpiration
 | * States of matter
* Changing state
* Formation of ions
* Ionic bonding
* Ionic compounds
* Covalent bonding
* Simple molecular substances
* Polymers
* Giant covalent structures
* Allotropes of carbon
* Metallic bonding
* *Nanoparticles*

*Uses of nanoparticles* | * Recap series and parallel circuits
* Symbols and current
* current and charge
* potential difference
* resistance
* Length and resistance RPA
* ohm’s law
* Non ohmic conductors RPA
* resistors in series and parallel RPA
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