# CURRICULUM MAP – PHYSICS

TRINITY ACADEMY

3rd Form study P1 for terms 1-3, then P2 for terms 4-6. 4th & 5th from study P2 then P1.

| Term | 1 | 2 | 3 | 4 | 5 | 6 |
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| **Title** | (P1)Particles at work<br>(P1)Atomic structure<br>(P1) Electricity | (P1) Energy and energy resources | (P2)Forces (in balance and motion) | (P2)Waves<br>(P2) Magnetism and Electromagnetism | | |
| **Prior Knowledge** | Recall conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving<br><br>Recall the structure of atoms.<br><br>Be able to complete calculations of fuel uses and the costs in the domestic context.<br><br>Be able to name the components in a circuit, understand how to set up series and parallel circuits, and describe how current, potential difference and resistance are affected. | Recall, describe and compare renewable and non-renewable energy sources.<br><br>Describe energy stores and transfers. | Understand Newton's laws of motion.<br><br>Understand speed and the quantitative relationship between average speed, distance and time.<br><br>Describe the objects in our galaxy and the force of gravity. | Describe wave diagrams and explain how sound waves and light waves travel.<br><br>Describe static electricity and magnetism. | | |
| **Core Knowledge** | Describe and calculate energy changes involved on heating, using specific heat capacity; and those involved in changes of state, using specific latent heat<br><br>Describe the nuclear model and its development in the light of changing evidence; the masses and sizes of nuclei, atoms and small molecules; how differences in numbers of protons, and neutrons related to masses and identities of nuclei, isotope characteristics and equations to represent changes.<br><br>Describe the emission of alpha or beta particles, neutrons, or gamma- rays, related to changes | Understand the conservation of energy in a closed system, dissipation<br><br>Describe energy changes in a system involving heating, doing work using forces, or doing work using an electric current: calculating the stored energies and energy changes involved<br><br>Calculate energy efficiency for any energy transfers<br><br>Analyse the use of renewable and non-renewable energy sources used on Earth and the changes in how these are used. | Understand forces and fields: electrostatic, magnetic, gravity, and forces as vectors.<br><br>Calculate the speed of sound, estimating speeds and accelerations in everyday contexts<br><br>Interpret graphs of distance, time, and speed.<br><br>Recall, understand and use formula related to Newton's laws of motion.<br><br>Describe and explain acceleration, deceleration and | Know that waves transfer energy; what amplitude, wavelength, frequency are, relating velocity to frequency and wavelength; and complete calculations related to this.<br><br>Describe the difference between transverse and longitudinal waves, and give examples.<br><br>Recall the electromagnetic waves; describe their velocity in vacuums; wavelengths and frequencies from radio to gamma-rays. Also describe | .<br><br>. | |

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| | | in the nuclear mass and/or charge and hence describe and explain radioactive materials, half-life, irradiation, contamination and their associated hazardous effects, waste disposal.<br><br>Explain nuclear fission, nuclear fusion and our Sun's energy.<br><br>Calculate current, resistance and voltage explore the relationships for different circuit elements; including their graphical representations.<br><br>Understand the domestic a.c. supply and describe live, neutral and earth mains wires and safety measures. | | braking distances involved on roads and thus road safety. | their uses and hazardous effects.<br><br>Describe magnetic fields of permanent and induced magnets, and the Earth's magnetic field.<br><br>Explain magnetic effects of currents, how solenoids enhance the effect – relate this to the creation and uses of electromagnets. | | |
| | **By the end of KS4 students are able to:** | • Apply and relate knowledge from different topics within the physics, chemistry and mathematics curriculum.<br>• Complete a variety of calculations linked to electricity, forces, magnetism, energy and atomic structure.<br>• Understand that that proportionality, for example between weight and mass of an object or between force and extension in a spring, is an important aspect of many models in science.<br>• Apply the concept of cause and effect in explaining such links as those between force and acceleration, or between changes in atomic nuclei and radioactive emissions<br>• Carry out experiments appropriately, having due regard to the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations.<br>• Describe reversible changes such as melting, evaporation, and sublimation at a molecular level.<br>• Explain concepts related to radiation.<br>• Analyse the use of renewable and non-renewable energy sources used on Earth<br>• Explain magnetism and the practical use of magnets.<br>• Understand and name a variety of forces and their effect on objects. | | | | | |