

The KS4 physics curriculum at St Anthony's and St Aidan Catholic Sixth Form Academy is designed to secure the knowledge of KS4 and build the skills to continue to develop all students to become the next generation of physicists. We use prior learning and the crossover of curriculum areas together with hands on practical work to support a challenging journey into the world of critical thinking and work/ further study.

# Physics Curriculum Map



## Understanding and Applying Scientific Skills

Follow written instructions

Applies investigative approaches and methods when using instruments and equipment

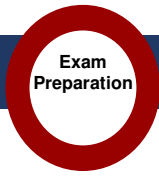
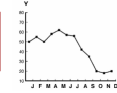
Safely uses a range of practical equipment and materials

Makes accurate observations and records sufficient data for experimental and investigative procedures

Researches references and reports

Uses appropriate scientific units and conventions.

Applies mathematical skills to analyse scientific concepts



## Periodic motion

Circular motion, SHM, force vibration and resonance.

## Thermal physics

Thermal energy transfer, ideal gases and molecular kinetic theory model.

## Astrophysics

### Classification of stars

Absolute magnitude, stellar spectral classes, HR diagram, supernovae, neutron stars and black holes

### Telescopes

Reflecting telescopes, radio telescope, I-R, U-V and X-ray telescopes

## Further mechanics and thermal physics

## Nuclear Physics

### Magnetism

Magnetic flux density, moving charges in a magnetic field, magnetic flux and flux linkage, electromagnetic induction, ac and transformers.

### Radioactivity

Rutherford scattering, alpha, beta gamma radiation, radioactive decay, nuclear instability, nuclear radius, mass and energy, and induced fission.

### Electric fields

Coulomb's law, electric field strength and electric potential

## Fields and their consequences

### Capacitance

Parallel plate capacitor, energy stored in a capacitor, capacitor charge and discharge.

### Gravitational fields

Newton's law, gravitational field strength, gravitational potential and orbits

## Particle physics

Particles, antiparticles, photons, particle interaction, classification of particles, quarks and antiquarks.



## Particles and radiation

### Quantum phenomena

The photoelectric effect, electron-volt and wave-particle duality.

## Mechanics and materials

### Materials

Bulk properties of solids and Young modulus

### Force, energy and momentum

Scalar and vectors, moments, motion, projectile motion, Newton's laws of motion, momentum, work, energy, power and conservation of energy.

## Current electricity

Current-voltage characteristics, resistivity, circuits, emf and internal resistance

## Electricity

## Progressive and stationary waves

Longitudinal and transverse waves, properties of electromagnetic waves, superposition and stationary waves.

## Waves



## Refraction, diffraction and interference Measurement and errors

Coherence, path difference, double slit experiment, single slit diffraction and Snell's law



"Physics is about questioning, studying, probing nature. You probe, and, if you're lucky, you get strange clues.."

Lene Hau, physicist