Physics Learning Routes

Year 7 | Year 8 | Year 9 | Year 10 ✓ | Year 11

Progress Stops

1) Autumn Assessment
2) Spring Assessment
3) Year 10 Mock Exam

Atomic structure

Timeline of the atom; α, β and γ properties; half-life; dangers of nuclear radiation

1

Energy stores

Energy types; k.e. and g.p.e.; work; elastic p.e.; energy transfer; specific heat capacity; heat transfer

Energy resources

Evaluating fossil fuels vs the various alternatives

Current electricity

Static; series & parallel; current & p.d.; resistance.

2

Mains electricity

Plugs & fuses; power calculations; mains supply; the National Grid

Particle model

States of matter; density; s.h.c.; specific latent heat; kinetic & potential energies

3

Forces 1

Types; resultant forces; effects.

AO1 Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures.

AO2 Apply knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures.

AO3 Analyse information and ideas to: interpret and evaluate; make judgments and draw conclusions; develop and improve experimental procedures.

By the end of Year 10

Students will be developing understanding of the key ideas of science:

- ❑ the use of conceptual models and theories to make sense of the observed diversity of natural phenomena
- ❑ the assumption that every effect has one or more cause
- ❑ that change is driven by interactions between different objects and systems
- ❑ that many such interactions occur over a distance and over time
- ❑ that science progresses through a cycle of hypothesis, practical experimentation, observation, theory development and review
- ❑ that quantitative analysis is a central element both of many theories and of scientific methods of inquiry

Physics Learning Routes

Year 7 — Year 8 — Year 9 — Year 10 — Year 11 ✓

Progress Stops

1) Autumn Assessment
2) Mock Exam
3) Spring Assessment
4) GCSE Exam

Forces 2
Resultant forces, F = ma; Hooke's law; weight, mass & gravity; moments & equilibrium; Newton's laws; inertia.

1

Forces (motion & pressure)
Distance-time graphs; speed; velocity-time graphs; acceleration; momentum; stopping distances; surface, fluid & atmospheric pressures.

2

Waves 1
Transverse & longitudinal; mechanical & non-mechanical; reflection & refraction.

3

Waves 2
Frequency, amplitude & period; wave speed; the EM spectrum

Electromagnetism
Magnetic materials; magnetic fields; electromagnets; motor effect.

Space (triple science only)
Objects in the Universe; orbital speed & distance; the Big Bang.

Revision & exam preparation

4

AO1 Demonstrate knowledge and understanding of: scientific ideas; scientific techniques and procedures.

AO2 Apply knowledge and understanding of: scientific ideas; scientific enquiry, techniques and procedures.

AO3 Analyse information and ideas to: interpret and evaluate; make judgments and draw conclusions; develop and improve experimental procedures.

By the end of Year 11

Students will have developed an understanding of the key ideas of science:

- ❑ the use of conceptual models and theories to make sense of the observed diversity of natural phenomena
- ❑ the assumption that every effect has one or more cause
- ❑ that change is driven by interactions between different objects and systems
- ❑ that many such interactions occur over a distance and over time
- ❑ that science progresses through a cycle of hypothesis, practical experimentation, observation, theory development and review
- ❑ that quantitative analysis is a central element both of many theories and of scientific methods of inquiry