Science-Physics Learning Journey

"Not only is the Universe stranger than we think, it is stranger than we can think"
– Werner Heisenberg

A level

OR

Apprenticeships
www.futureme.ac.uk

University

www.ucas.com

Year 11

GCSE Preparation & revision

P8: Space Physics (*Triple*)
HQT: Life on other planets?

HQT: Superconductors in the National Grid
P7: Magnetism & electromagnetism

HQT: JWST
P6: Waves

P5: Forces
HQT: Physics of formula 1

HQT: Lasers or LEDs?
P2: Electricity

P3: Particle model
HQT: Low density aerogels

P4: Atomic structure
HQT: The standard model

Year 10

HQT: Will nuclear fusion save us from the climate crisis?
P1: Energy

ENG
Pressure & fluids
HQT: Submarines & deep-sea technology

Forces & motion
ENG
HQT: Factors affecting running speed

Sound
HQT: The stethoscope story

Year 9

HQT: Tesla
Current & static electricity

Magnetism
ENG
HQT: The science of phone chargers

Light
HQT: Does the Universe have a speed limit?

Year 8

ENG
Energy changes & transfers
HQT: Absolute zero

ENG
Space physics
HQT: Asteroid impact

Forces
HQT: How to launch things into space?

Energy for domestic use
HQT: A clockwork radio

Year 7

Measurements & their errors

Particles & radiation

Waves

Electricity

Mechanics & energy

Further mechanics & thermal physics

Fields

Nuclear physics

Option:
- Astrophysics
- Turning points
- Medical physics

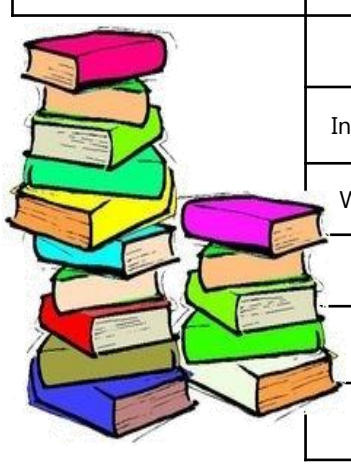
Physics Required Practicals	
1	Specific Heat Capacity (AT 1,5)
2	Thermal Insulation (Triple) (AT 1,5)
3	Resistance (AT 1,6,7)
4	IV Characteristics (AT 6,7)
5	Density (AT 1)
6	Light (Triple) (AT 4,8)
7	Force and Extension (AT 1,2)
8	Acceleration (AT 1,2,3)
9	Waves (AT 4)
10	Radiation and Absorption (AT 1,4)

Enquiry Processes		
	W.S	**Skill**
A	The development of scientific thinking	• How theories and models develop over time • Appreciating the limitations of science and/or ethical issues • Evaluating implications on evidence • Evaluating risks • Recognising the importance of peer review
B	Experimental skills & strategies	• Develop hypotheses • Plan experiments • Make observations or explore phenomena • Use a range of apparatus • Suggest improvements
C	Analysis & evaluation	• Apply the cycle of collecting, presenting and analysing data • Communicate rationale, methods, findings and conclusions
D	Vocabulary, units, symbols & nomenclature	• Develop use of scientific vocabulary • Recognise importance of scientific quantities and understanding how they are determined • Use mathematical notation correctly

HQT= High Quality Text

Read like a Physicist

A brief history of time	Why does $E=mc^2$?
Big Bang	The goldilocks enigma
Smashing physics	How to build a Universe
	Reality is not what it seems
	In search of Schrodinger's cat
	We need to talk about Kelvin
	Hidden Figures
	How to teach quantum physics to your dog
	An astronaut's guide to life on Earth



Physics Careers

Physics Teacher	Astronomer & Astrophysics
Medical Physicist	Nuclear Engineer
Energy & Renewable Energy	Aerospace & Defence
Lab Technician	Finance
Research Scientist	Software Developer
Planetary Physicist	Laser Engineer
Nanotechnologist	Sound Engineer

Curriculum Links

	Maths		MFL
ENG	English		IT
	P.E		RE
	Geography		Careers
	Art		PHSE
	Design Technology		Chemistry
	Music		Biology

Key Concepts in Physics

	Forces can be a quantitative description of an interaction that causes a change in an object's motion or shape. Forces can directly affect objects or affect them from a distance.
	A system possesses energy if it has the ability to do work. Energy is a scalar quantity, abstract and cannot always be perceived and given meaning through calculation. The total amount of energy in the Universe is always the same but can be transferred from one energy store to another during an event.
	All matter is composed of tiny indivisible particles too small to see. These particles do not share the properties of the material they make up. There is nothing in the space between the particles that make up matter. The particles which make up matter are in constant motion in all physical states.