

Curriculum Intent

Physics involves the study of matter, its motion and behaviour through space and time, and studies of forces and energy. The main goal of Physics is to understand how the universe behaves. The study of physical concepts over time has led, sometimes inadvertently, to the development of many technologies that have transformed modern-day society. We aim for all students to:

- be curious and interested in Physics
- to know how to use specialist Physics vocabulary
- to apply their knowledge to develop their scientific practical skills
- to extend students' preconceptions of Physics and progress their understanding
- appreciate that the behaviour of the universe can be described mathematically
- embed core concepts so that they can access and apply the key skills needed to enjoy and succeed in Physics

Autumn Term | Energy

Students will learn:-

- Conservation of Energy
- Energy Resources
- Energy and Fuel
- Power and Efficiency
- Work Done
- Thermal Energy
- Transfer of Thermal Energy

What does excellence look like?

- Be able to compare different energy values
- Explain the advantages and disadvantages of different types of energy resource
- Compare and evaluate between renewable and non-renewable resources
- Compare energy usage in the home
- Describe and calculate energy costs in the home
- Describe the processes that lead to work being done
- Be able to calculate energy dissipation and efficiency
- Compare and calculate work done by simple machines
- Explain in terms of energy why objects change temperature
- Be able to explain convection, conduction and radiation
- Compare methods of insulation

How will we assess impact?

Peer and self-assessment
Previous lesson recap quiz
Land mark tasks
End of topic test

Knowledge, understanding & Skills

- State the law of conservation of energy
- State the unit of energy and identify different fuels
- Identify different types of energy resources
- Use the term renewable and non-renewable when talking about energy resources
- Be able to calculate power and efficiency
- Show how energy is transferred between stores by doing work
- Describe thermal energy and energy dissipation
- Identify and describe simple machines
- State the difference between energy and temperature
- Describe energy transfer by particles
- Describe thermal insulation
- Describe energy transfer from the Sun

How is homework used to enhance learning?

Kerboodle <https://www.kerboodle.com/app>

BBC bitesize <https://www.bbc.co.uk/bitesize/subjects/zh2xsbk>

AES student science website

<https://sites.google.com/view/angloscience>

Suggested homework tasks

- Learn spelling and definitions of key words
- How much energy am I using?
- Power and efficiency calculations
- Research simple machines
- Research insulation



Students will learn:-

- What is a force?
- Balanced and unbalanced forces
- How to calculate and measure speed, including the speed of sound.
- Distance-time graphs
- The effects of gravity
- Friction and drag
- Squashing and stretching
- Turning forces
- Pressure in gases
- Pressure in liquids

What does excellence look like?

- Explain the link between non-contact forces, contact forces, and interaction pairs
- Describe a range of situations that are in equilibrium
- Use the speed equation to explain unfamiliar situations
- Manipulate data appropriately to present in a distance-time graph
- Compare and contrast gravity with other forces
- Plan and carry out an experiment to measure friction, stating the independent, dependent, and control variables
- Present Hooke's law measured data in a graph and recognise quantitative patterns and errors
- Apply the concept of moments to everyday situations
- Calculate fluid pressure in a range of situations
- Explain why liquid pressure changes with depth
- Calculate stress in multistep problems

How will we assess impact?

Peer and self-assessment
 Previous lesson recap quiz
 Land mark tasks
 End of topic test

Knowledge, understanding & Skills

- Use a Newton Meter to make predictions about sizes of forces
- Identify when the speed or direction of motion of an object changes
- Use appropriate techniques and equipment to measure times and distances
- Use a distance-time graph to describe a journey qualitatively
- Describe simply how gravity varies with mass and distance
- Carry out an experiment to test a prediction of friction caused by different surfaces.
- Use Hooke's Law to identify proportional stretching
- State the equation to calculate a turning force
- Describe the motion of particles in a fluid
- Describe characteristics of some objects that float and some that
- State the equation of stress

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Suggested homework tasks

- Learn spelling and definitions of key words
- Observe and record times taken and distances travelled for a variety of journeys
- Write a holiday brochure for a trip to another planet explaining conditions and how to prepare
- Produce a car safety leaflet using Physics to explain why car drivers should slow down



Students will learn:-

- How to plan a scientific investigation
- Independent, dependent and control variables
- How to process and present scientific data
- How to present their investigation to a wider audience

What does excellence look like?

- Well planned scientific experiment
- Variables clearly identified
- Sufficient data collected to produce a conclusion
- Data processed correctly
- Data well presented
- Investigation presented and explained to a wider audience

How will we assess impact?

Peer and self-assessment
Presentation of investigation

Knowledge, understanding & Skills

- Planning a scientific investigation
- Identifying all variables and carrying out a fair test
- Identifying hazards and working safely
- Data collection and processing
- Presentation of results using tables and graphs
- Analysing results and coming to a conclusion
- Presentation skills

How is homework used to enhance learning?

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Suggested homework tasks

- Learn spelling and definitions of key words
- Mathematical skills for data processing
- Graph drawing practice



International Opportunities

Visits Programmes

La Coupole - Planetarium – Solar system

La Coupole Bunker – secret Nazi V2 launch site (Wernher von Braun – Nazi scientist and space travel)

Within the curriculum

The KS3 Physics curriculum is designed to introduce students to the key scientific concepts, supported through the study of international examples and theories.

Students are encouraged to engage with scientific concepts and theories beyond the syllabus by exploring key examples of international collaboration, or scientific discovery where the common language of scientific discovery is utilised.

Reference is additionally made to key scientists with connections to countries and cities visited as part of the school's international exchange programme.