Physics Year 7

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 | Forces

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

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.
- Compare evaporation, boiling and sublimation based on the arrangement, movement, and energy transfers of particles.
- Justify whether evaporation or distillation would be suitable for obtaining given substances from solution.

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 newtonmeter 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.

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.
- 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.

Spring Term | Circuits

Students will learn:-
Potential difference

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Suggested homework tasks
Learn spelling and definitions of key words.
Prepare a list of pieces of electrical equipment used at home and the potential difference supplied, either from batteries or the mains (230 V).

How will we assess impact? (3D)
Peer and self-assessment
Previous lesson recap quiz
Land mark tasks
End of topic test

Knowledge, understanding & Skills
- Use appropriate equipment to measure potential difference.
- Describe the difference between conductors and insulators in terms of resistance.
- Construct simple series and parallel circuits to measure the current and voltage of components.
- Use an ammeter to measure current.
- Describe what happens when you bring similarly charged objects together, and when you bring differently charged objects together.

What does excellence look like?
Predict the effect of changing the rating of a battery or bulb in a circuit.
Explain what factors affect the resistance of a resistor.
Explain why p.d. varies in series and parallel circuits.
Use a model to explain how current flows in a circuit.
Explain, in terms of electrons, why something becomes charged.
Metals for different applications.
Justify the method chosen to investigate which indigestion remedy is 'better'.

Summer Term | Waves

Students will learn:-
- Sound waves and speed
- Loudness and amplitude
- Frequency and pitch
- The ear and hearing Light
- Reflection
- Refraction
- The eye and vision
- Colour

Knowledge, understanding & Skills
- Use data to compare the speed of sound in different materials.
- Label amplitude on a diagram of an oscilloscope trace of a wave.
- Label time period on a diagram of a sound wave on an oscilloscope.
- State some ways that hearing can be damaged.
- Explain how ray diagrams can explain the formation of shadows.
- Use appropriate equipment safely with guidance.
- Record some observations as a diagram.
- Name parts of the eye.
- State the effect of coloured filters on light.

How will we assess impact? (3D)
Peer and self-assessment
Previous lesson recap quiz
Land mark tasks
End of topic test

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Suggested homework tasks
- Learn spelling and definitions of key words.
- Research supersonic travel.
- Plan an investigation to see how far different types of seeds can be dispersed
- Identify and write about items that use lenses (or refraction) at home.
- Write a guide telling police how to collect accurate witness statements for crimes committed in yellow street light.

What does excellence look like?
- Describe sound as the transfer of energy through vibrations and explain why sound cannot travel through a vacuum.
- Explain how you can make measurements of the amplitude of a sound wave.
- Present a reasoned prediction using data of how sounds will be differently heard by different animals.
- Predict how light will interact with different materials
- Predict how light will reflect from different types of surface.
- Predict whether light will refract when it hits a surface.
- Explain how the eye forms an image.
- Explain the formation of secondary colours.

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.