



## Curriculum Intent

Physics is the study of energy and matter and their interactions. The GCSE Physics course provides an interesting and challenging experience to link key physical ideas and understand how they relate to each other.

The course aims for all students to:

- develop essential knowledge, understanding and application of different areas of the subject and how they relate to each other
- understand how society makes decisions about scientific issues and how Physics contributes to the success of the economy and society
- develop competence and confidence in a variety of practical, mathematical and problem solving skills
- develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods
- promote students' interest in and enthusiasm for the subject, including an interest in further study and careers associated with the subject.

## Autumn Term | Particle Model of Matter

### Students will learn:-

Density  
 Changes of state  
 Internal energy  
 Temperature changes and specific heat capacity  
 Specific latent heat  
 Particle model and pressure  
 Pressure in gases

### What does excellence look like?

Explain the differences in density between the different states of matter in terms of the arrangement of atoms or molecules.

Able to use and accurately read the scales on Vernier callipers and micrometers.

Explain how and when heating will either change state or raise temperature.

Manipulate the equation for specific heat capacity to calculate mass and temperature changes.

Extract information from a power time graph to calculate the energy required to change state.

Explain the relationship between pressure and temperature of a gas at constant volume.



### How will we assess impact?

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

### Knowledge, understanding & Skills

Recall and apply the equation linking density, mass, and volume

Draw simple diagrams to model the difference between solids, liquids and gases.

Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids.

Describe how, when substances change state (melt, freeze, boil, evaporate, condense or sublimate), mass is conserved.

Use the equation for specific heat capacity to calculate energy changes

Use the equation for specific latent heat to calculate the energy required to change state

Interpret cooling and heating graphs to measure energy transfers

Calculate the change in pressure or volume of a gas by applying the gas equation

### How is homework used to enhance learning?

- ✓ AQA website <https://www.aqa.org.uk/subjects/science/gcse/physics-8463/specification-at-a-glance>
- ✓ BBC bitesize <https://www.bbc.co.uk/bitesize/examspecs/zsc9rdm>
- ✓ Grade gorilla <https://gradegorilla.com/>
- ✓ Isaac Physics <https://isaacphysics.org/>
- ✓ Physics tube <http://physicstube.org/>
- ✓ Minute physics <https://www.youtube.com/user/minutephysics>
- ✓ Hyperphysics <http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>

### Suggested homework tasks

- Learn definitions of key terms.
- Group and independent research projects

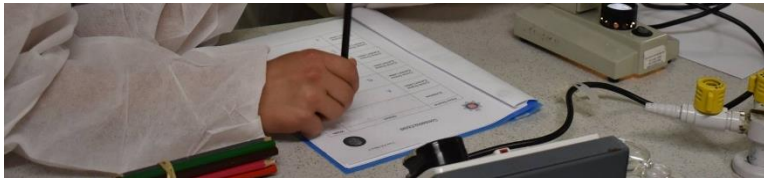
## Students will learn:-

National and global energy resources  
Energy transfers

## Knowledge, understanding & Skills

Describe the main energy sources available  
Distinguish between energy resources that are renewable and energy resources that are non-renewable  
Compare ways that different energy resources are used, the uses to include transport, electricity generation and heating  
Understand why some energy resources are more reliable than others

Determine the specific heat capacity of one or materials experimentally and using the equation for specific heat capacity  
Describe with examples where there are energy transfers in a closed system, that there is no net change to the total energy.  
Describe, with examples, how in all system changes energy is dissipated, so that it is stored in less useful ways.  
Investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material.



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  - ✓ Hyperphysics <http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>
- Suggested homework tasks
- Learn definitions of key terms.
  - Group and independent research projects
  - Past examination questions practice

## What does excellence look like?

Describe the environmental impact arising from the use of different energy resources

Explain patterns and trends in the use of energy resources.

Explain ways of reducing unwanted energy transfers, for example through lubrication and the use of thermal insulation

## How will we assess impact?

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

# Summer | Domestic Electricity

## Students will learn:-

Direct and alternating potential difference  
Mains electricity  
Energy transfers in everyday appliances  
The National Grid

## What does excellence look like?

Measure time periods and frequency of an AC supply from a voltage-time graph  
Explain the choice of materials used in a plug with reference to conduction and insulation  
Calculate the appropriate fuse for an appliance when told the current it draws

## How will we assess impact?

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

## Knowledge, understanding & Skills

Be able to state the mains frequency and voltage in the UK  
Describe the differences between AC and DC current  
State the names and colours of the cables in a UK mains plug  
Describe the dangers associated with the use of mains electricity  
Describe the use of fuses and other safety features in a plug  
Recognise the use of AC or DC in every day home and laboratory appliances

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- Suggested homework tasks
- Learn definitions of key terms.
  - Group and independent research projects
  - Past examination questions practice
- Practical activity preparation, simulations and follow-up.

## International Opportunities

### Visits Programmes

- Cruise guided visit on the River Rance
- "Fontaine les Vaucluse – water mills
- La Camargue – marshes vegetation.
- Roussillon – ochre ridge.
- Senckenberg Museum – National History Museum.
- "Physics lesson in school.
- Science Museum"
- "Lake Como – Villa Carlotta and botanical gardens in Tremezza + Villa Monastero in Varenna
- Science and tech museum
- Arese - historical museum Alfa Romeo"
- "Science museum - foucault's pendulum
- Biology - botanical gardens"
- "Alcázar – guided tour and Camera Obscura
- Tarifa harbour - Whale watching
- Arcos - visit to El Rancho Cortesano (Bee/Honey Museum) - workshop"

### Within the curriculum

The GCSE Physics curriculum is designed to deepen understanding and appreciation of how the International scientific society collaborates and makes decisions about world scientific issues.

Students are encouraged to research each theme beyond lessons, exploring topical international scientific examples.

Classwork and homework is designed to ensure that they can draw upon a worldwide knowledge of skills, techniques and theoretical understanding required for their examinations and the potential further study of Physics at an International level at global universities.