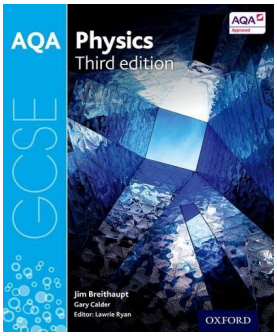
Separate Science - Physics Overview

Term: Autumn
Year: 11
Teacher: Mrs Aziza Helaly
Textbook title: AQA GCSE Physics Oxford



What will we be covering this term?

1st Half Term:

Forces in balance: In this chapter, students will compare vectors and scalars using the examples of distance and displacement along with the nature of forces. Representations of vectors using scale diagrams led to descriptions of the forces acting in a wide variety of situations and the identification of Newton's third law. The concept of balanced and unbalanced forces will use to determine the behaviour of objects and the application of Newton's first law of motion. Finally, students will resolve forces at right angles to analyse systems and determine if a system is in equilibrium.

Forces and motion: Students began this chapter by experimentally determining the relationships between a force acting on an object and the acceleration, and the mass of the object and the acceleration. The results led of the formulation for Newton's second law of motion and its application. Higher-tier students have also defined the inertial mass of an object. They will investigate the concept of momentum and its conservation. They will use the principle of conservation of momentum to allow them to determine the velocity of objects after collisions or explosion have taken place in a range of scenarios.

Finally, students will investigate the effect of forces on the stretching of a range of materials identifying both linear and non-linear relationships between the force and extension.

2nd Half Term:

Forces and pressure: In this chapter, students will define pressure as a force acting over a surface before measuring pressure and describing its effects on materials and calculating the pressure acting on a surface. Students will then discuss the cause of atmospheric pressure in terms of the behaviour of particles in the air, variations in density, and temperature. Finally, the students will continue with their examination of the effects of particles in fluids by investigating upthrust and then explaining the effect by considering the effects of differences in pressure inside the fluid.

Wave properties: In this chapter, students will observe and describe the properties of mechanical and electromagnetic waves in terms of energy transfer with or without the need for a transfer medium. They will compare transverse waves and longitudinal waves by examining the relationship between the direction of propagation and the direction of the oscillations. In addition, they will investigate and describe both the reflection and refraction of waves describing these effects in terms of wave fronts.
Light: In this chapter, student will continue to develop their understanding of Light. The students began this chapter by looking at the reflection of light by plane mirrors using both a wave front and ray model. This led to descriptions of real and virtual images and their properties and why images are not formed by 'rough' surfaces.

Teacher's Marking Key:

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EBI	Even better if
WWW	What went well
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How will my child be assessed this term?

There will be at least 2 assessed pieces this term.
In more detail;
Triple Science:
1st Assessment: Forces and motion & Forces and motion
2nd Assessment: Forces and pressure

Combined Science:
1st Assessment: Forces and motion & Wave properties
2nd Assessment: Electromagnetism & The electromagnetic spectrum

At the end of the term there will summative exam that will test their knowledge for what they've covered during the course of the entire term.

How can I help my child in this subject?

- Ensure homework is complete; you can track students' homework assignments at https://www.showmyhomework.co.uk
- Encouragement, praise, ensuring that they do their homework; and checking their student planner.
- Encouraging them to read around the subject.
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Resources

Useful Websites

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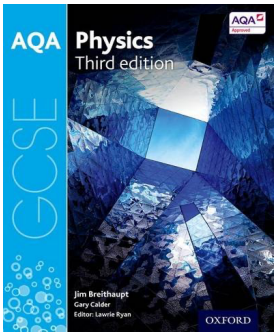
Combined Science - Physics Overview



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2nd Half Term:

The electromagnetic spectrum: In this chapter, students will describe the electromagnetic spectrum in terms of different regions related to wavelength. The speed of electromagnetic waves in a vacuum will be described as constant allowing the use of the wave equation to link wavelength and frequency which as then been tied to the energy carried by the wave. The use of radio waves in communications for television and mobile phones will be described along with outlining transmissions of signals through optical fibres.

Electromagnetism: Students began this chapter by reinforcing their knowledge of magnetism by looking at the magnetic fields around permanent magnets and the concept of induced magnetism in some materials. They will be able to describe how a current carrying wire placed in a magnetic field would experience the motor effect before going on to explain how this effect could be used to create an electric motor.

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Combined Science:

Separate Science - Physics Overview

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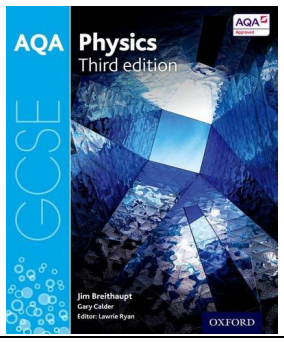

What will we be covering this term?

1st Half Term:

Light: The students will describe the action of lenses using the ray model of light and a range of ray diagrams. This includes the behaviour of converging and diverging lenses with an investigation of image formation for a converging lens.

Electromagnetism: Students began this chapter by reinforcing their knowledge of magnetism by looking at the magnetic fields around permanent magnets and the concept of induced magnetism in some materials. They will be able to describe how a current carrying wire placed in a magnetic field would experience the motor effect before going on to explain how this effect could be used to create an electric motor. Students will also be able to describe the operation of a transformer in terms of changes in magnetic fields before constructing a practical transformer. Finally, they will be able to describe the application of transformers in the National Grid.

Molecules and matter: The students will investigate the relationship between gas pressure and volume, determining that as the pressure increases the volume of the gas is decreased or vice versa. The behaviour of the gas during compression was again explained using a particle model.

2nd Half Term:

Space: In this chapter, students will study the formation of the solar system from a nebula, particularly the formation of the Sun from hydrogen gas into a protostar until it reaches the main sequence. They will be able to evaluate the evidence for an expanding universe prompted by the red shift of the majority of galaxies leading to Edwin Hubble's conclusions. Finally, the students will discuss the models predicting the distant future of the universe touching on the role of dark matter and dark energy.

The electromagnetic spectrum: In this chapter, students will describe the electromagnetic spectrum in terms of different regions related to wavelength. The speed of electromagnetic waves in a vacuum will be described as constant allowing the use of the wave equation to link wavelength and frequency which as then been tied to the energy carried by the wave. The use of radio waves in communications for television and mobile phones will be described along with outlining transmissions of signals through optical fibres.

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How will my child be assessed this term?

There will be mock exams, these will include;
Physics Paper 1 – 1 hour 45 minutes
Physics Paper 2 – 1 hour 45 minutes

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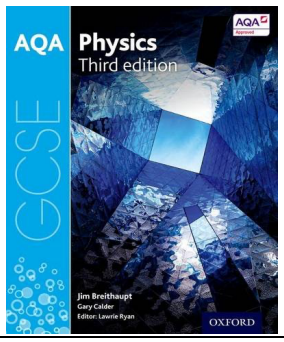

What will we be covering this term?

1st Half Term:

Molecules and matter: Students will revise and increase their understanding of the concept of density as a property of a material or object by measuring and calculating the density of solids and liquids. This leads to a discussion of the states of matter, solid liquid and gas, the properties of matter which is in these states and the changes which occur as a material change from one state to another.

2nd Half Term:

- *Forces in balance revision*
- *Electric circuits revision*

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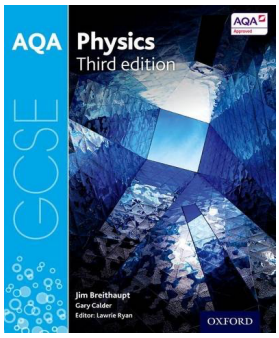

What will we be covering this term?

Triple Science:
Energy transfer by heating: The students will describe the transfer of energy between objects through absorption and emission of infra-red radiation as a part of the electromagnetic spectrum. This includes the factors that affect the rate of this transfer such as temperature and surface colour.

During this term, pupils would be revising for their GCSE exams and practicing past paper questions.

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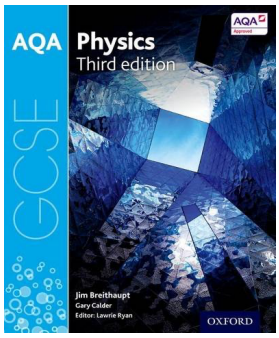

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