

Subject:

# PHYSICS

Physics Intent:

We study Science because Science is about understanding. Understanding of how everything works, our place, impact, role and responsibilities in the Universe. To explore how scientific ideas develop and how we learn through experimentation. We provide stimulating, engaging and intellectually challenging learning environments to enable all our students to develop their scientific investigative and analytical skills. We are committed to promoting equal opportunity and take up of STEM careers. We want ALL of our students to be able to ask good questions, and thereby make informed decisions.

Our Exam Board is: AQA

## The Big Questions...

Year 9&10 (Bold italics Treble Only)	Year 11 (Bold italics Treble Only)
<p><b>Energy:</b> Where is energy stored? How do you calculate how much energy there is in a given store? How is energy moved between different stores? What do we mean by the law of conservation of energy? How efficient are energy transfers? How are energy &amp; power related? How do we generate a distribute electricity?</p> <p><b>Particle model of matter:</b> How do we measure density? What are the states of matter &amp; what properties do they have? How much energy is needed to increase temperature and/or change state? How do particles behave in a gas? <b>How are pressure and volume related in a gas?</b></p> <p><b>Atomic Structure:</b> What is the structure of an atom? What discoveries led to our understanding of the structure of the atom? What are the types of nuclear radiation &amp; what are their properties? <b>What are the hazards &amp; uses of nuclear radiation? What are nuclear fission &amp; fusion?</b></p> <p><b>Electricity:</b> What is meant by electrical current, potential difference and resistance? What are electrical components and what characteristics do they have? What is meant by series &amp; parallel circuits? What is meant by 'mains electricity' and how is our home wired? How do we calculate the energy transferred and power from an electrical device? <b>What is static electricity? What are electrical fields?</b></p>	<p><b>Forces:</b> What do we mean by a force? What is the difference between mass &amp; weight? What is work done? What is Hooke's law? <b>How do levers &amp; gears work? How can you calculate the pressure in a fluid?</b> How do you calculate distance, speed and acceleration? What are Newton's laws and how do you apply them? What factors are involved in a cars stopping distance? What is momentum? <b>How do you use momentum to calculate the outcome of collisions &amp; explosions?</b></p> <p><b>Waves:</b> What types of waves are there? How do you find the wave speed? <b>How do waves reflect? How do we hear? How do we use waves to explore?</b> What are electromagnetic waves and how do we use them? What happens when waves change medium? What harm can electromagnetic waves cause? <b>How do lenses work? What determines the colour of an object? What is a black body?</b></p> <p><b>Magnets &amp; Electromagnetism:</b> What are magnets, solenoids &amp; electromagnets? What is a magnetic field? What is the motor effect? <b>How do loudspeakers &amp; microphones work? What is the generator effect? What is a transformer?</b></p> <p><b>Space:</b> What makes up the solar system? What is the lifecycle of a star? What are satellites &amp; how do they stay in orbit? What are the Doppler effect and Red Shift? How do they provide evidence that the Universe is expanding so started from the Big Bang? Why do we think the Universe includes dark matter &amp; dark energy?</p>

### What skills will I develop?

Science forms the basis of our understanding of the Universe and the theory that underpins the machines & technology we depend on every day. Students develop the practical and analytical skills to explore, understand and evaluate their world. Physics is at the core of research from subatomic particles (CERN) to the Universe (Hubble), is increasingly explaining how life works and expects to provide 'clean energy' for all in the future. Physics is the Science that underpins Engineering. Because of its complex conceptual and quantitative nature the skills developed whilst studying Physics are sought in any discipline from Computing to Investment Banking, Medicine to Law.

### How will I be assessed?

At Key stage 4 work is assessed through a series of GCSE graded exams on the units shown above so that students can understand their strengths and weaknesses on each unit. Students sit Paper 1 GCSE exams at the end of Year 10 to give an accurate measure of attainment. Teacher written feedback is given on a series of 'Teacher Assessed Tasks'.  
**Examination:** The end of the GCSE course is 100% exam-based. Double students will sit two 1hr15min papers that count towards their double award. Trebles will sit two 1hr45min papers for their Physics GCSE.

### What great resources can I use?

- The "Science Read Only Drive" (<https://yateleyschool.sharepoint.com/sites/Science-ReadOnly>) has the best resources we can find including past papers & question packs.
- [www.senecalearning.com](http://www.senecalearning.com) covers all the core information. Make sure you choose AQA!
- [https://www.youtube.com/channel/UCqbOeHaAUxw9II7sBVG3\\_bw](https://www.youtube.com/channel/UCqbOeHaAUxw9II7sBVG3_bw) has excellent short videos covering the whole of the course.
- <https://myonlinesciencetutor.com/> has multiple choice questions linked to videos  
If you can't find what you need ask Mr Stacey !!!

### Three ways that parents/carers can help...

1. Physics programmes are increasingly popular on TV and available to stream. Anything presented by Brian Cox or Jim Al-khalili would be excellent and should inspire students to look further into Physics.
- 2.
3. Set time aside to talk through the Physics that they're learning in class. Ask them to explain it to you, and/or try and relate it to your daily life.

