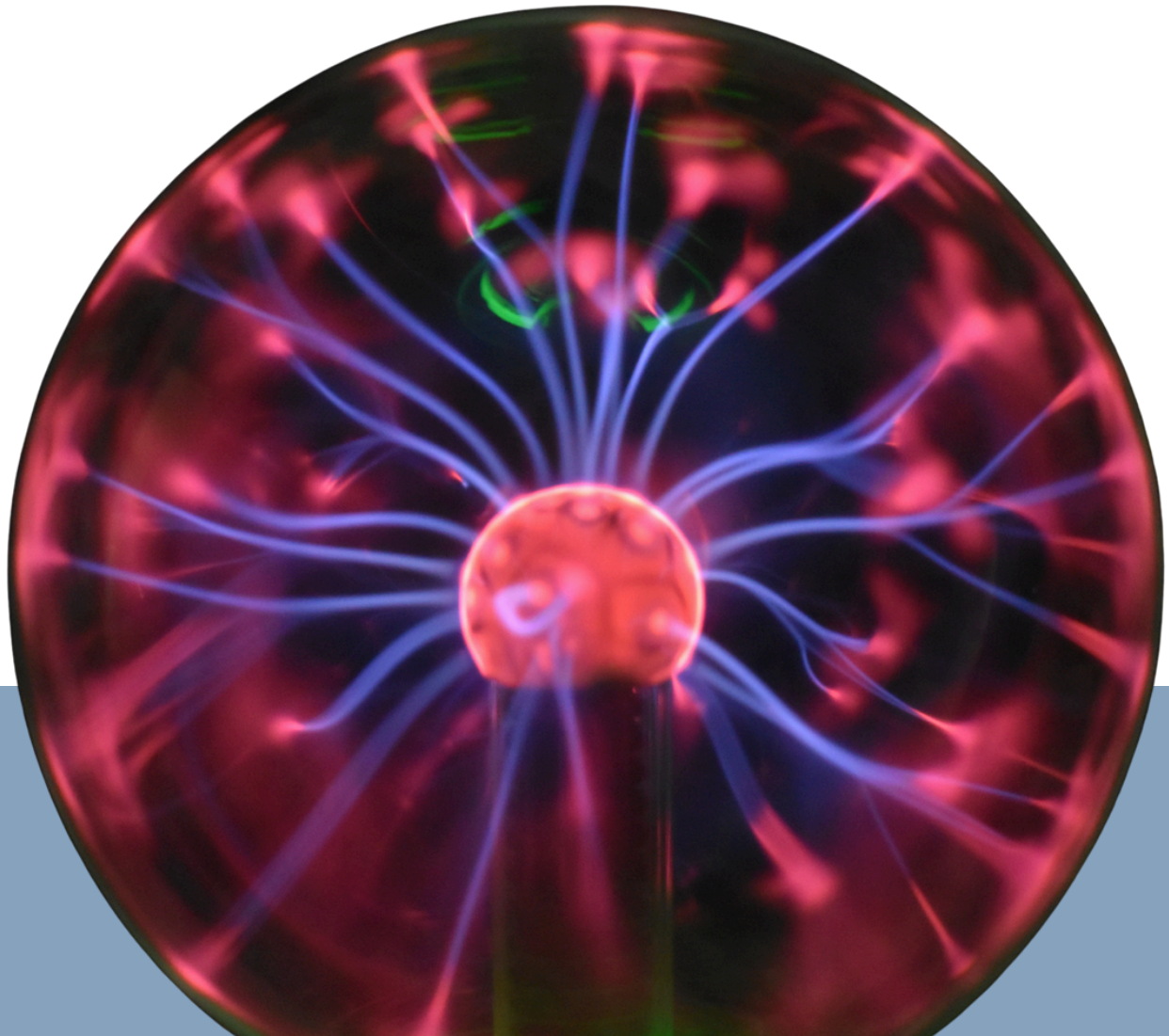
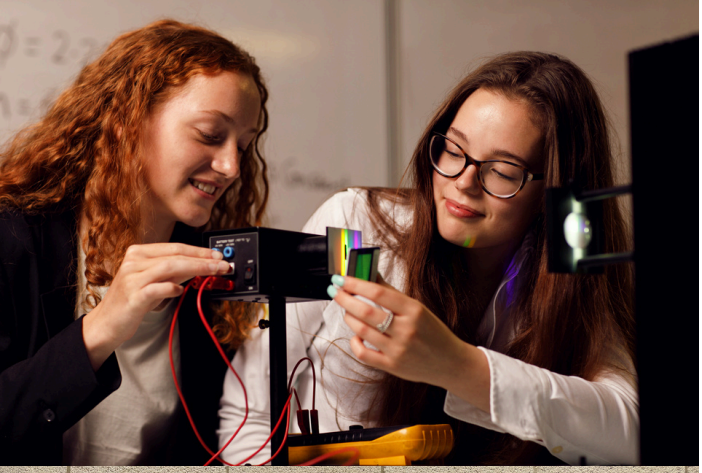
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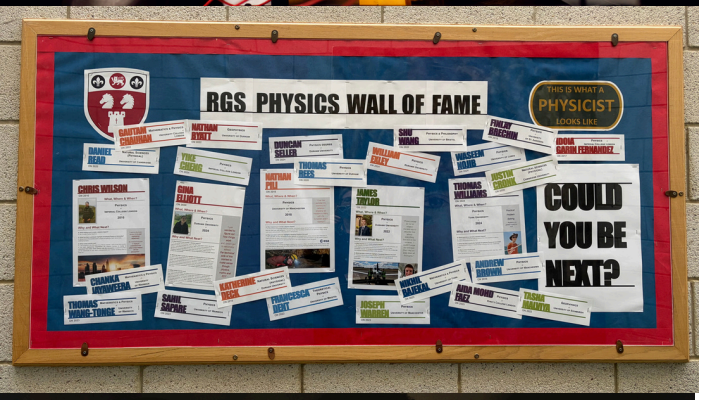
INTRODUCTION TO

PHYSICS

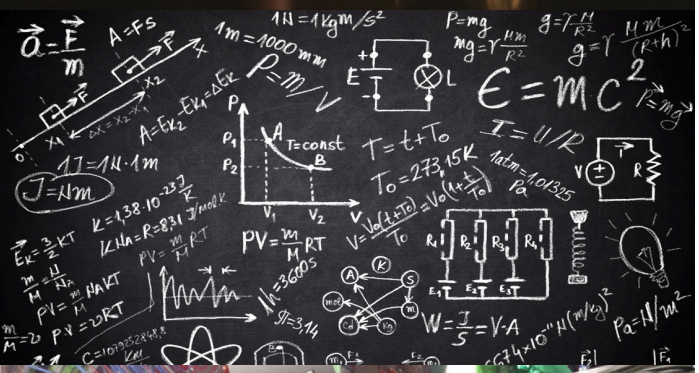
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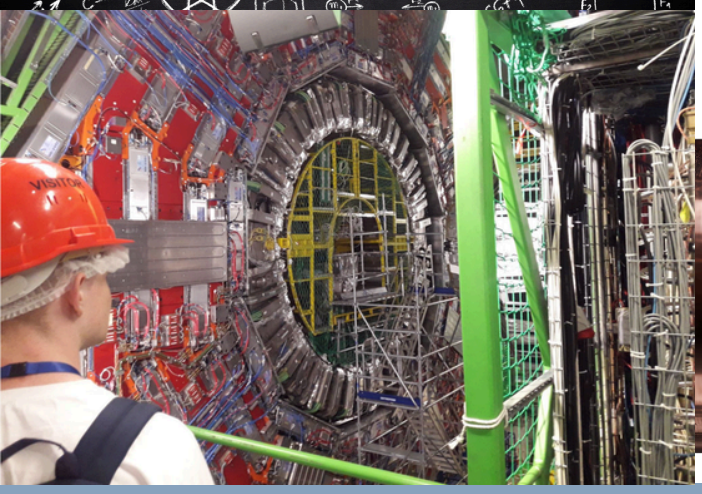












Physics at RGS is a subject that inspires curiosity, develops problem-solving skills and unlocks a deeper understanding of the universe.

From Year 7, Physics is taught as a distinct science by specialist teachers whose expertise and enthusiasm help students understand the processes shaping the world around them. There are five full-time and two part-time Physics teachers, as well as two technicians in the Physics Department.

Through the study of Physics, students explore phenomena across an extraordinary range of scales, from the infinitesimally small particles that make up matter to the vast structures of the cosmos.

The subject develops logical reasoning, mathematical confidence and analytical thinking, alongside the ability to communicate complex ideas clearly and effectively.

From Year 7 through to Year 13, students are immersed in a stimulating and intellectually demanding learning environment that encourages investigation, innovation and independent thought.



YEAR 7 AND YEAR 8

Through a carefully sequenced curriculum, students develop an understanding of how the physical world works while building practical, mathematical and investigative skills.

In Year 7, students begin by exploring sound, learning about frequency, pitch, volume and the way sound waves travel. Through practical investigations, they measure the speed of sound and discover how the human ear detects and processes sound.

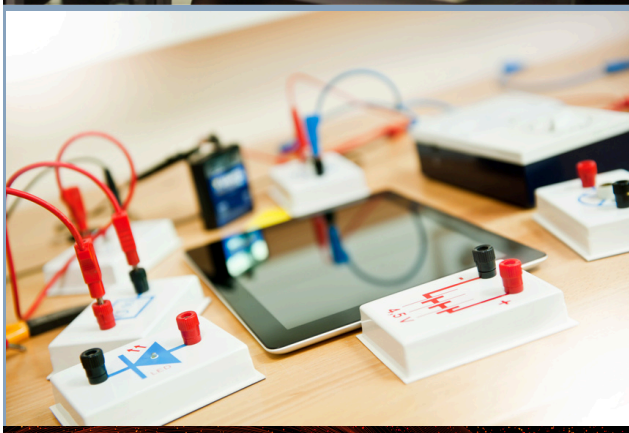
Students then study energy, including energy stores, energy transfers, work done and efficiency, before moving on to Earth and Space. Here they explore topics such as day and night, the phases of the Moon, seasons, eclipses, the Solar System and the life cycles of stars.

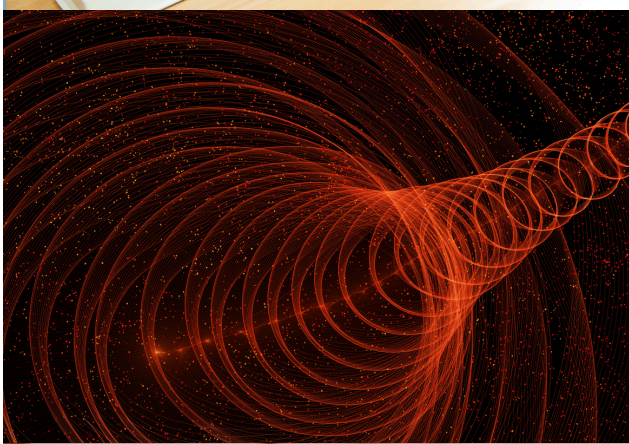
In Year 8, students build on these foundations through the study of forces, motion and electricity. They learn about how forces arise and investigate the characteristic of gravitational, magnetic and electrostatic forces. They then study how to calculate resultant forces and how these affect the motion of objects. Students are also introduced to electrical circuits, how they work, how to build them and learn about current, voltage and resistance.

Throughout both years, practical work plays a central role in developing confidence, curiosity and scientific thinking.

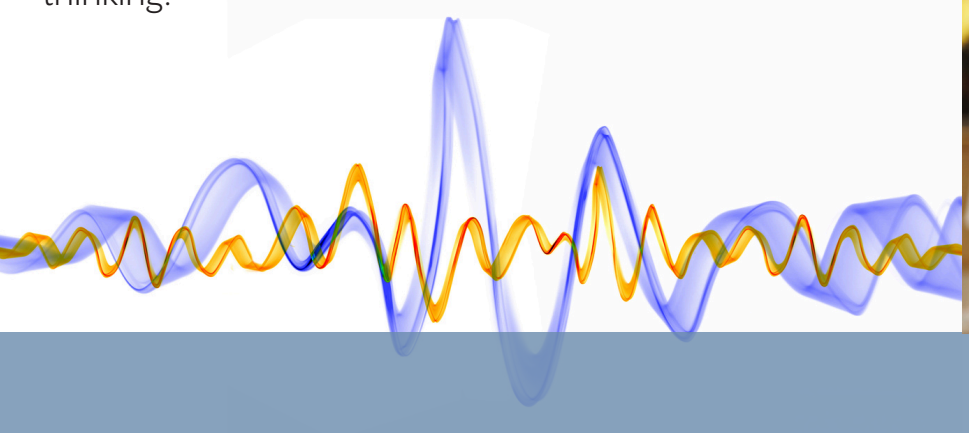










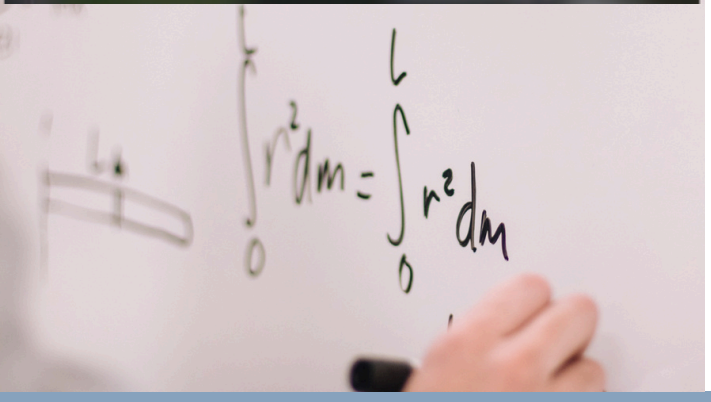












YEAR 9 to YEAR 11

Students follow the Edexcel IGCSE Physics course, which provides a stimulating introduction to the fundamental principles of Physics.

In Year 9, students explore energy transfers, work, power and efficiency before investigating thermal energy transfer by conduction, convection and radiation. They then undertake a detailed study of waves, including reflection, refraction, total internal reflection, the electromagnetic spectrum, light and sound.

In Year 10, students focus on describing motion verbally, graphically and mathematically. They study momentum and associated laws, applying them to the Physics of collisions and explosions. They explore the properties of materials through practical investigations and study astrophysics, which looks at stellar evolution, motion throughout the Universe and the evidence supporting Big Bang Theory. The year concludes with electricity, taking a more quantitative approach to understanding current, voltage, resistance and electrical power.

In Year 11, students study magnetism and electromagnetism before moving onto atomic structure and radioactivity. They study the properties of matter, including density, pressure and gas behaviour. The course concludes Electromagnetic Induction, providing students with an understanding of the principles underlying motors, generators and transformers.

The course is assessed through externally examined written papers at the end of Year 11 and provides an excellent platform for further study in Physics, Engineering and other STEM disciplines.

YEAR 12 & YEAR 13

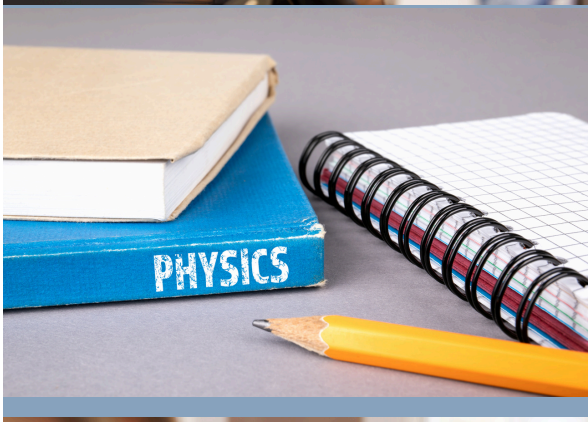
At A-Level, students follow the AQA Physics specification, building on the knowledge and skills developed at GCSE whilst exploring some of the most exciting and challenging concepts in modern Physics.

In Year 12, students study quantum physics, particle physics, mechanics, materials, electricity and waves, developing a deeper understanding of familiar topics whilst encountering new theoretical and mathematical challenges. Practical work is embedded throughout the course, helping students develop confidence in experimental techniques, data analysis and scientific communication.

In Year 13, students study gravitational, electric and magnetic fields, thermal physics, nuclear physics and advanced mechanics. Students also explore the Turning Points in Physics option, examining landmark scientific discoveries that transformed our understanding of the universe, including wave-particle duality and special relativity.

Physics at RGS is highly student-centred. Teachers seek to challenge every student in lessons while providing extensive support beyond the classroom through regular academic clinics, individual guidance and targeted extension sessions for students preparing for university admissions tests and applications to highly competitive courses.







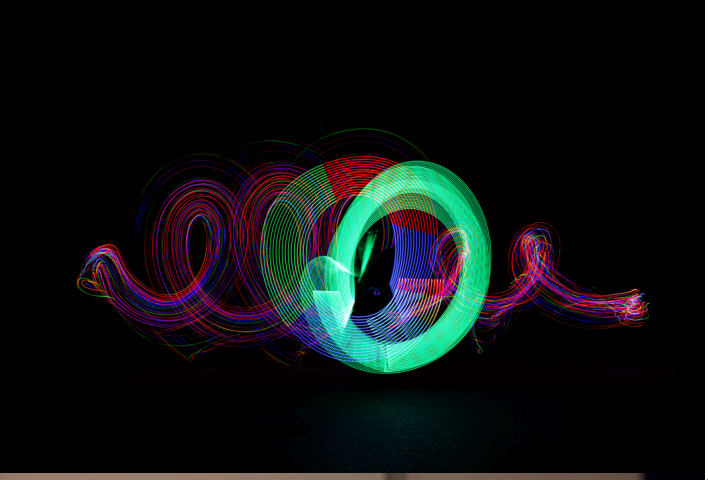


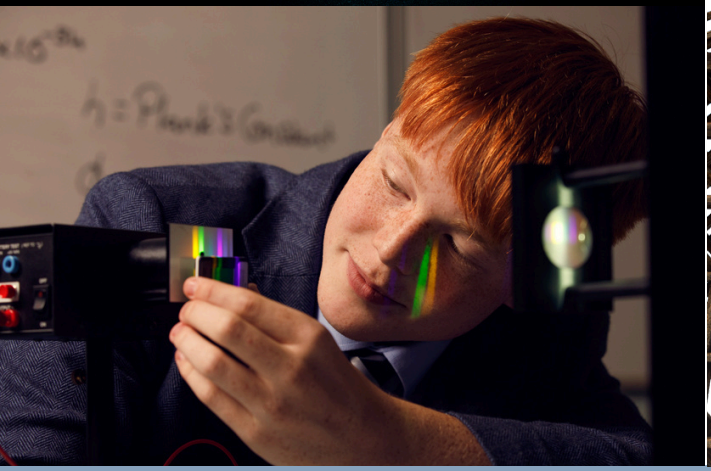












BRINGING PHYSICS TO LIFE

Physics is best understood through observation, experimentation and exploration.

Our specialist teachers use practical demonstrations, investigations and digital resources to bring abstract concepts to life and deepen students' understanding. Practical work remains central to the curriculum, helping students connect theory with real-world applications, while simulations, modelling software and interactive activities enrich classroom learning.

Strong relationships between teachers and students enable personalised support and appropriate challenge. Regular academic clinics provide additional help when needed, while Sixth Form students benefit from targeted preparation for university admissions tests and competitive applications.

This combination of specialist teaching, academic challenge and individual support ensures that students are exceptionally well prepared for further study and future careers.



CO-CURRICULAR OPPORTUNITIES

Physics at RGS extends far beyond the classroom through a rich and varied programme of enrichment activities, competitions and educational visits. A key component of this is our active Physics Society which meets weekly.

A-Level students can participate in the Nissan Engineering Project, working in teams to tackle real-world engineering challenges and develop solutions to industry-based problems, or the STEM Racing project, an internationally recognised competition that combines engineering, graphic design, business and finance as teams design, manufacture and race miniature Formula One cars.

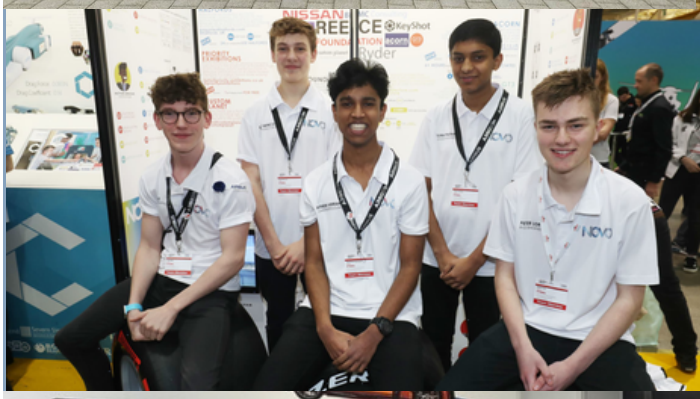
Regular trips include:

- the Sixth Form visit to CERN in Geneva, home to the world's largest particle physics laboratory ;
- the Physics Society trips to DNV Spadeadam, exploring the physics of explosions through spectacular demonstrations and experiments, and the Durham University Christmas Lecture;
- the Year 8 trip to the Physics Olympics in York.

These experiences encourage teamwork, creativity and resilience while helping students appreciate the relevance and excitement of Physics beyond the classroom.













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Whether it's measuring the speed of sound in Year 7, investigating the origins of the universe at GCSE, or exploring quantum physics and relativity in the Sixth Form, Physics at RGS offers a journey of discovery, challenge and achievement.

If you would like further information about Physics at RGS please contact
Dr Rachael Houchin , Head of Physics via r.houchin@rgs.newcastle.sch.uk

