RMGS CURRICULUM MAP PHYSICS DEPARTMENT

CURRICULUM INTENT

GCSE Our course has been structured so that the key principles of physics from KS3 are built on in year 9 to give students a foundation of the "core principles" of physics (energy, forces, waves, particles, electricity and motion). Given that our students are not identified as being "triple" or "double" until later in the course, we have designed this "Core physics" course so that neither cohort will be disadvantaged by their choice of path.
In years 10 and 11 this foundation is built on by returning to the ideas already established, but with ever increasing depth and breadth. We have found that this enables the teacher and pupil to reflect upon what they already know and be more active in constructing good synoptic links between topic areas.

The aim of this of course is to establish good problem-solving skill through the practising of lateral thinking between the different sub-disciplines of physics. In conversation with our colleagues in the maths department we have aimed to develop key mathematical skills and techniques in such a way that mirrors or follows what they do in maths. For example, we have arranged with maths so that we both do gradients of tangents as instantaneous rates of change in the autumn of year 10.

Our course has practical work at its heart. Indeed, although more emphasis is placed on the "Required practicals", we go well over and above that number of experiments, and aim to supplement theoretical work as often as is feasible and effective. The experiments we do are an intrinsic part of learning in our department, and are aimed at increasing understanding of key principles, as well as developing investigative and evaluative skills. In recent years we have also embedded much more learning about practical work via online portals, and the pupils themselves will receive a "lab book" which they fill in during the course, which can be used as a revision resource for final exams.

We hope that our course will give our pupils really good understanding of what physics is, what physicists do, and how they work. Moreover, we are confident that we have structured the course so that they will be able to successfully continue their studies into A-level and beyond, irrespective of whether or not they have two or three GCSEs in science.

A-level We chose the OCR course as we felt this had a good balance between content and accessibility. Indeed, it has a rich mixture of classical physics and more modern approaches, which we feel mirrors the tension between these two areas of physics at the academic and professional level. We also feel that it builds nicely on the content of GCSE in a way that swiftly opens up to a picture of what physics at A-level can teach us about how our knowledge of the natural world can solve problems in medicine, cosmology and engineering (for example).

We team teach the course which effectively means we deliver the AS part in year 12 with one teacher doing the "mechanics" and one doing the "waves and electricity". In the year 13/"A2" part of the course one teacher teachers thermal, circular motion, oscillations and cosmology, whilst the other teaches fields, radioactivity, particles and nuclear. By in large we are happy with the prescribed order as we feel it builds effectively from those first principles of mechanics, waves and electricity into the more modern/less familiar applications of capacitors, fields, particles etc.

That said in year 13 we change the order so that electric and magnetic fields are not encountered until the "other teacher" has taught the gravitational fields in the circular motion of orbits context. We also teach chapter 27 directly after the quantum as we feel the students benefit from studying the practical applications of quantum phenomena to help embed and crystallise what is ultimately a very abstract topic.

	Termly Curriculum Overview					
Year Group	Autumn 1	2	Spring 3	4	Summer 5	6
9	Forces End of unit assessment – doddle assignment + Hooke's law required practical	Energy End of unit assessment – exam + insulation required practical	Waves End of unit assessment – reflection and refraction required practical	Electricity End of unit assessment – exam + Ohm's law required practical	Particles End of unit assessment – measuring density required practical	Motion End of unit assessment - exam
10	Forces - Newton's laws End of unit assessment – exam+ Newton's 2nd law required practical	Electromagnetism End of unit assessment - exam	Energy transfers End of unit assessment - exam	Radioactivity End of unit assessment - exam	Thermal physics End of unit assessment – exam + specific heat capacity required practical	Electricity – current and mains End of unit assessment – exam + series & parallel circuits required practical
11	Momentum + Thermal physics End of unit assessment – exam + specific heat capacity required prac	**Separate** Pressure and surfaces + Space **Trilogy** Investigating waves End of unit assessment - exam	**Separate** Electromagnetism – induction + waves in action **Trilogy** Forces in action End of unit assessment - exam	**Separate** Forces in action End of unit assessment - exam **Trilogy** Recap of year 9+10 work	Revision Exam paper practice	The Periodic Table End of unit assessment - exam

12	Motion + Electric current and resistance End of unit assessment - exam	Forces in action + Electric circuits End of unit assessment - exam	Work, energy, and power + Properties of waves End of unit assessment - exam	Materials +Superposition of waves End of unit assessment - exam	Laws of motion and momentum + Quantum physics End of unit assessment - exam	Thermal physics + Particle physics End of unit assessment - exam
13	Ideal gases + Medical imaging End of unit assessment - exam	Circular motion and oscillations + Radioactivity End of unit assessment - exam	Gravitational fields + Nuclear physics End of unit assessment - exam	Cosmology + Capacitance, and Electric and magnetic fields End of unit assessment - exam	Revision Exam practice	