Physics at Samuel Whitbread Academy

Intent	Physics A Level is a highly respected A level, with its broad variety of tested skills, and it is a good choice for many degrees and careers. The current challenges facing the world can only be solved by scientists, of which there is a disturbing shortage. The problems of creating renewable energy sources, developing fusion power, solving global warming and revealing the mysteries of the cosmos can only be solved by those who have the skills of a physicist. The intent of the course is to develop students so that they become inquisitive and curious about the physical world. Being able to continually question why things are happening in a certain way, or how a certain dynamic system works helps provide numerous skills that students can use in later life. Thinking scientifically and critically will not only help them with their studies, it will enable them to rationalise any future experiences they may have in life. The course involves and wide range of topics covering everything from the very smallest particles in the universe, to the very largest galaxies and distances. It will challenge students to think about the meaning of concepts such as time and space, as well as considering how life became possible on Earth. Students will develop excellent numerical, analytical, critical thinking, practical and evaluative skills during their time on the course.
Implementation	The A-level Physics course comprises 6 different units of study. These are delivered by two teachers over the two years. Generally speaking one teacher delivers a force/mechanics-based sequence, while the other delivers a electricity/waves based sequence. Year 12 will deliver the most content with all AS topics being covered, with two year 13 topics also being delivered in the summer term. This allows a whole half-term to be dedicated to revision at the end of the course. Teaching and learning will include the regular use of practical work, calculations, past-paper questions, group work and homework, amongst others. Students will complete regular homework for their teachers, including the following that will be recorded for tracking purposes: -Key Homework's (formative assessment) -Key Tests (summative assessment) These will be completed at a frequency of once per course section, approximately every two or three weeks.

Implementation	**Key Stage 5: Year 12**	We start by introducing some of the basic numerical skills that students will need throughout the rest of the course. These include using numerical prefixes and units, as well as some basic trigonometry. The rest of the year has one teacher covering a mechanics course including motion, forces, work and energy, materials and Newton's laws of motion. The other teacher covers topics more related to electricity and waves. These include charge, resistance, circuits, progressive waves, stationary waves, interference and quantum physics. We will also cover two year 13 topics at the end of the year, in order to allow for lots of revision time at the end of the course. These topics will be astrophysics/cosmology with one teacher, and medical physics with the other.
	Key Stage 5: Year 13	This year builds on all the content of year 12, by introducing new topics that use previous skills and knowledge as a foundation. One teacher will again cover a mechanics-based schedule, including: thermal physics, circular motion, gravitational fields and oscillations. The second teacher will cover topics including electric fields, capacitors, electromagnetism and nuclear physics. Practical work and experiment are an integral part of the course. Throughout both years, students will complete Practical Activity Group (PAG) experiments. These cumulatively build up skills over the two years and students are regularly monitored to see if they are demonstrating the required competencies. At the end of the course having demonstrated the necessary skills, students will receive a pass mark in their Practical Endorsement and receive a certificate from the exam board. This is separate to their grade.

Impact	We aim for the physics course to impact students in the following ways: -Improve their practical skills. -Develop their subject knowledge and learn new ideas. -Enable them to use numerical and mathematical skills to a high level of competency. -Help them to make progress towards achieving their ALPS target*. -Allow them to develop a love of learning, so that they become life-long learners. -Develop them into independent learners who take responsibility for their own progress. Any student who is averaging <u>more than one</u> grade below their ALPS target will receive intervention. This will be specific to the student, but could include a mixture of: -Extra homework. -Formally set weekly past-paper questions. -Supervised study in the back of a teacher's lesson. -Lunch/afterschool sessions. -Parental contact/meetings.