



# **A-Level Physics**

## **Student Handbook**

**Kingsdale Foundation School**

**2016-17**

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# A-Level Physics Student Charter

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## In A-Level Physics we believe:

1. **All students should be able to become the best physicist and independent learner possible that they can**

### You can expect:

- To be supported and educated to the highest standards possible
- To have a specialist physics teacher teach you on a regular basis
- To have support outside of class through Physics after school support
- To receive guidance on how to develop as a physicist and independent learner
- To have work which challenges you
- Your work to be marked within a fortnight and appropriate feedback given
- Support to supplement your learning

### In return we expect you:

- to have an excellent attendance record (above 90%) and always arrive punctually for school and class (you should never be absent from either class or school without good cause)
- to be committed to your academic studies, using both class and study time profitably
- Work should be completed to the highest standard and always be **submitted on time**
- to be hardworking and ambitious, setting out to achieve the highest standards and develop their potential to the full.
- to have Home study be an integral part of your daily routine – to truly develop students should do a **minimum of 5 hours independent study per week** (outside of class)
- to ensure that any work missed is caught up within a week of returning to school
- to seek help when you do not understand something

2. **All students have the right to live in a safe and supportive academic and social environment.**

### We will endeavour:

- to maintain and refine the quality of community life at the School
- to ensure you are treated in an equal and fair manner by staff, fellow students and other members of the institution
- to provide a safe and supportive environment, free from harassment, and conducive to educational success

### In return we expect you:

- to co-operate fully with all policies that relate to your well-being, such as health and safety, equal opportunities and social conduct
- to act in a civil, considerate and responsible manner towards all other members of the College and to visitors, and contribute to the life of the community in a positive way
- to actively 'look out for' yourselves and for all other members of the College community

3. **All students have the right to be treated as equals and to be part of a community free from unlawful discrimination and harassment. We celebrate and actively promote the diverse community in which we live and we recognise the equality of each member.**

**You can expect:**

- From the start of your first physics until your last examination and beyond, to be part of a community, which is free from unlawful discrimination or harassment
- to express your opinions openly and freely, provided that you do so within the law

**In return we expect you:**

- to treat all members of the College equally and respectfully, regardless of any factor.
- to respect the right of others to express their opinions
- to follow the College's rules and policies relating to anti-discrimination, harassment and freedom of speech

4. **All students have the right to receive an appropriate academic programme of high quality.**

**You can expect:**

- a programme of study in line with the details outlined in the programme documentation
- to be taught by staff who are appropriately qualified, competent in their field, and committed to attaining high standards of professional development in both their research and teaching
- robust mechanisms to be in place to ensure that you are assessed fairly

**In return we expect you:**

- to participate fully in your programme of study, including full attendance at timetabled classes, or equivalent events, and completion and prompt submission of all assignments and projects
- to work co-operatively with other students
- to meet our required standards in relation to academic honesty when submitting work for assessment and when taking examinations
- to accept that we, together with our appointed external examiners, will be both rigorous and fair in judging the standard you have attained.
- to ensure that you have **all the equipment** necessary for you to actively engage and progress in lessons (see page 13)

**5. All students have the right to safe and secure access to learning resources, study spaces, services and facilities.**

**We endeavour to:**

- provide you with the technology, support and services you require to carry out your study and research
- provide access to the Library resources you need to support your study and research
- maintain, improve and extend our learning resources, spaces and facilities to meet your needs

**You can expect:**

- To carry out practical investigations necessary and relevant to your development
- access to appropriate learning environments conducive to study and research
- access to PCs in a range of locations across the campus to supplement your use of your own IT equipment
- access to the schools' virtual learning environment

**We expect you:**

- to actively develop your practical skills in Science
- to supplement your study and research with those materials, equipment or resources not usually provided by the College, for instance purchasing/borrowing certain course textbooks, as recommended by the Department, and paying for services such as printing and photocopying when necessary
- to utilise (where available) your own laptop or PC installed with the appropriate general software tools to support your course of study

# Studying Physics

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Unlike the other sciences, Physics has no limits – everything in your life, on this planet, other planets, to the far reaches of universe and beyond is in Physics' job description.

We'd be a bit lost without Physics. All the gadgets that we take for granted like laptops and mobile phones wouldn't be here. Nor would the electricity supply that charges them and powers so many other things we use every day. Did you know that a Physicist invented the World Wide Web? It's hard to imagine a world without the Internet, but when you were born almost no one had heard of it. Physicists are constantly finding new things. They have recently shown that teleportation is possible – who knows what that will lead to in a few years time? Physics also deals with the big questions: How do we search for aliens? Are there parallel universes? Will we ever travel back in time? Why do we always find the smallest bits of cereal at the bottom of the packet?

## What is A-Level Physics like?

You will already have come across some of the concepts of physics at GCSE: forces, energy, waves, radioactivity, electricity and magnetism. At A-level you will start to see how these ideas work together, and begin to grasp the universal principles that apply to everything from the smallest atoms to the largest galaxies. You will also be able to impress your mates by knowing how things like MP3 players and plasma screen TVs work.

## Why should you study A-Level Physics?

Well, do you want to investigate the limits of space, the beginning of time and everything in between?

How about understanding how the technology around you works? Want to save the planet or maybe just help people get better when they are ill? Or maybe you don't care about any of this and just want to earn lots of money?

Well it doesn't really matter. Whatever you do the knowledge and skills you gain by studying physics will be useful. Physics is more than a subject – it trains your brain to think beyond boundaries.

## How much maths is necessary?

Physics at A Level comprises significantly more mathematics than at GCSE, so your maths skills will need to be up to scratch. If not you can buy books or we offer some support for students not taking Maths to A Level as well. The course starts at the basics and works up to some pretty tricky puzzles, such as working out collision speeds in an atom collider.

## How will it differ from GCSE?

### Difficulty

As stressed before, there is much more maths. Also, the work is much more in depth and riveting than at GCSE. It's very much a puzzle, and most questions you tackle, once finished, will give you increasing levels of satisfaction as you work through the course. Thankfully in most classes, people will find some things very easy you will find tough and vice versa, and there is a lot of

emphasis on working together and collaborating to solve equations. The teachers generally hold a Physics degree, and thus will always not only help you, but answer questions in more depth than at school, which is awesome!

Taking A-Level Maths can be helpful, especially if you have the option to take Mechanics modules (M1, M2). By doing so, you should have covered some Mechanics in your Maths lessons, reducing workload and making the easier mechanics questions in the Physics exams an easy topic to pick up marks. Some content covered in your Physics course does touch on stuff covered in the Maths module M3, however this isn't really strenuous and you are given the formulae anyway.

### Workload

The workload is a bit larger than at school but thankfully, unlike essay based subjects, you can answer a sheet of problems and be done with it - which is much better than staring at an essay for a wee, constantly adding things in! There is no coursework but a good number of lab reports that need to be written up! Deadlines are very important – they're set to help ease your workload (even if it might not seem like it at the time). Try and stick to them as much as possible!

## Degrees which you can take with A-Level Physics

Nearly all courses at University will recognise the benefits of A-Level Physics and accept it as an A-Level. That said studying A-Level Physics lends itself well to the following well:

Accountancy	Actuarial Science/Studies	Aeronautical Engineering
Archaeology	Art and Design	Banking
Chemical Engineering	Chemistry	Computing
Dentistry	Earth Sciences	Economics
Electrical Engineering	Engineering	Environmental Science
Finance	Geography	Law
Management Studies	Materials Science	Mathematics
Mechanical Engineering	Medical Science	Medicine
Music	Optometry	Pharmacy
Philosophy	Physics	Physiotherapy
Speech Therapy	Sports Science	Surveying
Veterinary Science		

# Course Overview

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Physics A Level now follow a linear course. This means that any exams taken at the end of Year 12 do not count towards the A Level. Exams taken at the end of Year 12 will give you an AS Level Physics qualification and exams taken at the end of Year 13 will provide you with an A Level qualification.

Although the qualification route may be different for both courses, the content for the one year course is the same as the first year course for the A Level.

## AS Course

### Measurements and their errors

This unit isn't a separate unit like the others. The skills required in this topic will be used throughout the course, in both theory work and practical work. The teacher will continuously test you on this, helping you gain confidence in error calculations.

### Particles and Radiation

In this topic, you'll learn about matter and what an atom is made of – not as simple as protons, neutrons and electrons! You'll also learn about interactions between particles and their anti-selves. You'll then touch on Quantum Physics and how electrons behave as both a particle and a wave. Confusing stuff!

### Waves

As the unit title suggests, we'll look at waves much like we did at GCSE. We look at wave characteristics in more detail and introduce progressive and stationary waves. Within this topic includes two Core Practicals – this will be touched on later.

### Mechanics and Materials

This topic is where your Maths skills are required. We'll start off with looking at scalars and vectors before introducing the equations of motion. We'll look at calculating motion in a straight line to start with before going into more complicated scenarios with projectile motions. Newton's laws of motion are looked at alongside momentum and energy.

Within the topic materials, we'll look at key definitions and interpretation of graphs used by engineers.

### Electricity

As with the GCSE course, you'll touch on the basics of electricity before diving into the depths of circuits and learning the derivations for equations you've seen and used before. You'll also look at resistance as an external component and within a battery (internal resistance).



## A Level course

As mentioned earlier, the first year is the same as the AS Level course. Your second year will be more challenging, looking more in depth at the topics covered in your first year.

### Further Mechanics and Thermal Physics

In the first year, you looked at motion in a straight line. This year, you look at motion in a circle. You'll look at the pendulum and energy displacement within a closed system. There's a lot of room to expand on this topic, with a lot of real life scenarios and uses then looking at resonance.

### Thermal Physics

In this topic, we'll be looking at the atom in different scenarios, looking at its behaviour and the evidence of an atoms existence. This unit will have a few complicated looking equations but are well linked with the theories and should be easily understood.

### Fields and their consequences

We'll be looking at gravitational, electric and magnetic fields and how particles behave in these environments. A number of key equations and concepts will be introduced within this unit and it is vital that they are understood as they are being taught. Electromagnetism will be further explained from GCSE, with emphasis on Faraday's and Lenz's law.

### Nuclear Physics

We will be building on the knowledge taught in the Particle and Radiation topic by looking at nuclear energy and unstable nuclei. We will be looking at the social as well as the scientific impact of nuclear energy and look at the link between energy and mass.

### Turning Point in Physics (option unit)

In this option unit, we will look at the key concepts in Physics, the theories presented at the time and the proofs linked with what we know today. We will look further into the proofs, calculating known variables and discussing the possibilities in Physics with what we know today.

# Assessment

## AS Level

Paper 1	+	Paper 2
<b>What's assessed</b> Sections 1–5		<b>What's assessed</b> Sections 1–5
<b>Assessed</b> <ul style="list-style-type: none"><li>• written exam: 1 hour 30 minutes</li><li>• 70 marks</li><li>• 50% of AS</li></ul>		<b>Assessed</b> <ul style="list-style-type: none"><li>• written exam: 1 hour 30 minutes</li><li>• 70 marks</li><li>• 50% of AS</li></ul>
<b>Questions</b> 70 marks of short and long answer questions split by topic.		<b>Questions</b> Section A: 20 marks of short and long answer questions on practical skills and data analysis  Section B: 20 marks of short and long answer questions from across all areas of AS content  Section C: 30 multiple choice questions

## A Level

Paper 1	+	Paper 2	+	Paper 3
<b>What's assessed</b> Sections 1–5 and 6.1 (Periodic motion)		<b>What's assessed</b> Sections 6.2 (Thermal Physics), 7 and 8  Assumed knowledge from sections 1 to 6.1		<b>What's assessed</b> Section A: Compulsory section: Practical skills and data analysis  Section B: Students enter for <b>one</b> of sections 9, 10, 11, 12 or 13
<b>Assessed</b> <ul style="list-style-type: none"><li>• written exam: 2 hours</li><li>• 85 marks</li><li>• 34% of A-level</li></ul>		<b>Assessed</b> <ul style="list-style-type: none"><li>• written exam: 2 hours</li><li>• 85 marks</li><li>• 34% of A-level</li></ul>		<b>Assessed</b> <ul style="list-style-type: none"><li>• written exam: 2 hours</li><li>• 80 marks</li><li>• 32% of A-level</li></ul>
<b>Questions</b> 60 marks of short and long answer questions and 25 multiple choice questions on content.		<b>Questions</b> 60 marks of short and long answer questions and 25 multiple choice questions on content.		<b>Questions</b> 45 marks of short and long answer questions on practical experiments and data analysis.  35 marks of short and long answer questions on optional topic.

# Classwork, Homework and Lab books

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## Written/Classwork

You will have two exercise books, red (3 hour teacher) and orange (2 hour teacher). Notes and classwork must be completed in your exercise book. It must be legible and neat – they will be marked and looked at by any Physics teacher!

## Homework

Homework should be completed on paper. Make sure a gap is left for homework to be stuck in (leave a gap on the day it is set). Once it has been marked, it should be stuck into your exercise book with the correct topic.

## Your work

In Physics there is not much in the way of written work. Any written work must have accurate spelling and punctuation. What is truly imperative, however, is how calculations are laid out.

When setting out your calculation work, it is important that you structure your answers. Marks are given not only for the correct answer but also for a clear communication of your thinking as you tackled the problem.

### Steps to follow for Calculations

1. **Read the question carefully** and extract the information from it by listing the data given to you on the right hand side of your page.
2. Make a **neat column of the figures given and the UNITS!!!** (and change them into SI units if necessary - for example, times given in minutes should be changed into seconds there and then!)
3. Think about what is happening in the question and if appropriate **sketch a diagram** to illustrate it - marking on forces, distances etc.
4. **Quote the general equation** that you are going to use to solve the problem - saying what the letters/symbols stand for.
5. **Manipulate the equation**
6. Calculate the unknown - **put each line of mathematical reasoning on a separate line** - use WORDS to explain what you are doing
7. **Substitute the symbols/letters with the data** you have at the top of the page to leave you with the unknown.
8. Do **NOT** simply put a string of = signs between sets of numbers that are not equal

For example - some students when changing 5 minutes into seconds write:

$$5 = 5 \times 60 = 300$$

$$5 = 300 \text{ ????? } \textit{No way! Illogical maths!}$$

**It should be written:**

$$5 \text{ mins} = 5 \times 60 \text{ seconds} = 300\text{s}$$

Consider the number of **significant figures** that the question has been written in and then quote the numerical answer to that number.

Consider the **unit of your answer** carefully and add it to the **numerical answer**.

It is a good idea to make your final answer stand out clearly by putting it on a separate line.

### Common ways to lose marks

- omitting the general equation
- omitting units
- using the wrong case of letter for a unit or a symbol
- illogical maths

Here is an example of correct layout:

**Q. Calculate the displacement of an object which moves at 30m/s in 3s.**

**A.       $v = 30\text{m/s}$        $t=3\text{s}$**

**$v$       =       $s/t$       ← General formula**

**$s$       =       $v \times t$       ← Rearranged formula**

**=       $30 \times 3$       ← Inserted Values**

**=       $90\text{m}$       ← Correct Answer**

### Essential Equipment

In order to carry out work required all students will be expected to own the following equipment and bring them to all lessons.

Pens (black/blue, red, as many colours as you like)

A pencil

A ruler (30cm)

A scientific calculator

A protractor

A compass

An eraser

# Reading List

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In A-level Physics there is not the need to read many books or write essays weekly. Instead we recommend students go through problems and exam questions. Below, however, are some books that may help with the conceptual understanding of some of the parts of Physics.

The department does **STRONGLY** recommend, though, that students purchase a copy of Advanced Physics for You (Keith Johnson, Simmone Hewett, Sue Holt, John Miller; Publisher: Nelson Thornes; ISBN-13: 978-0748752966). Whilst this is a general A-Level Physics book it is extremely easy to access and has information and questions on the majority of areas which will be studied.

An alternative to the textbook you will be provided is the AQA A-Level Physics Year 1 and AS Student book (Dave Kelly; Publisher Collins; ISBN 978-000759022-3). This follows the course to the letter and provides alternative explanations and questions.

## Astrophysics and Cosmology

- **A Brief History of Time** - *Stephen Hawking*

Not as good as its mythological status suggests but definitely worth a read to give a broad overview of cosmology. A little out of date now and a little mind blowing in places but it certainly opens your eyes to the principles of cosmology. There's nothing really in the way of scary mathematics. There's only 1 equation in the entire book, as Hawking likes to point out - The famous  $E = mc^2$ .

If you don't fancy this you may like to try *a Briefer History of Time* which is more up to date. It's also apparently much easier to read.

- **The Elegant Universe** - *Brian Greene*

Another of these mythical "must read" books, which has become extremely popular of late. For all its popularity, make no mistake that it is not an easy read. It's pitched at quite a high level but does give just about everything on string theory you could possibly want to know, without the mathematical complexities inherent in string theory. As you'd expect it's very biased towards string theory. Read it if you like, but in my opinion there are far better books out there. Save yourself the trouble and watch the TV series.

- **The First Three Minutes** - *Steven Weinberg*

This is a book that is always highly recommended. It's very well explained to the lay person (but with glossaries and mathematical derivations at the end for those who want it) and concentrates more on a step by step occurrence of what happened in the first 3 minutes after the big bang, in a level of detail not covered elsewhere. It does have one drawback - it is seriously starting to show its age. It shows just how far astronomy has come in the last 25 years as many areas known today are not mentioned, and often he guards his back against the then latest (and now accepted

theories) by describing others. Inflation is not mentioned at all. If you bear this in mind though, it's worth a read just for being well-written and slightly different in topic.

- **Blackholes and Timewarps: Einstein's Outrageous Legacy** - *Kip Thorne*

A really excellent book that I would highly recommend. It's quite difficult to obtain, and rather epic in physical dimensions, but it covers all areas of astronomy - right through from relativity to black holes to the search for gravitational waves. I particularly like the way it focuses on the scientific method, and how physics at that level is carried out as a research group. It's interesting to see the inter-relationships between the different groups and gives a nice insight as to what research would be like, quite aside from the actual physics contained in the book.

- **The Fifth Essence** - *Lawrence Krauss*

A really good read no maths whatsoever, but still challenging and interesting. Whilst primarily about Dark Matter, it covers a real breadth of subject matter Gravitation, light/ether/Michelson and Morley, Big Bang and Nucleosynthesis, Particle Physics, Relativity and Gravitational Lensing, Super-symmetry...everything really. A really refreshing view away from A Level which always seemed to be modularised with little or no interrelation between different parts of Physics.

## Quantum Physics

- **In Search of Schrodinger's Cat** - *John Gribbin*

Again, not completely accurate and a little out of date now, but a compelling read for all that. It was this book that awoke my enthusiasm for the world of the quantum, which has remained ever since. It's all just so bizarre. The book is basically a history of quantum physics and how it came about, with some good analogies and a final discussion on how it is used in everyday life.

- **QED - The Strange Theory of Light and Matter** - *Richard Feynman*

BEST QUANTUM BOOK EVER! Feynman has encapsulated this utterly baffling topic in just 4 short lectures/chapters, and QED is a very good read even for the lesser informed of us out there. He refrains from the torrent of maths and formulae that other books might throw at us, and more focuses on the actual method behind his calculations, whilst giving us a unique insight into his thought processes. Feynman even brings himself down to the reader's level, and reassures us that it's quite alright to not really understand QED, since "not even I do - nobody does". The level of the content is such that most people with even a slight interest in Physics or the Quantum will be able to grasp, and simple diagrams with descriptive annotations aid this greatly. A brilliant read!

## General

- **Feynman Lectures In Physics (Vol I-III)** - *Richard Feynman*

These are the classic lecture series books produced by Feynman which every degree student likes to claim to have read. I would not advise purchasing them (they are expensive) or indeed reading them cover to cover, but they do offer a different perspective of things and Feynman is unparalleled in his ability to explain. Make no mistake, these are degree level books, although they would not be useful as a core text book in any degree course you do. If you want lighter reading I suggest the extracts below. I really include these to try and discourage you from buying them at A Level. The extracts are far more suitable (and cheaper).

- **Six Easy Pieces/Six Not So Easy Pieces** - *Richard Feynman*

These are the best bits from the above lectures in physics. The first is clearly simpler to read than the not so easy ones, as should be obvious from the title. I would definitely advise reading 6 easy pieces, just for the discussions of quantum theory. Feynman sees things differently too everyone else and his analogies are excellent.

- **A Short History of Nearly Everything** - *Bill Bryson*

A really interesting read that tells the story of science, right back from the beginning when the philosophers were thinking about the stars, to the latest theories on unifying quantum mechanics with general relativity. It's filled with all sorts of anecdotes and really makes you interested in how all these discoveries came about!

- **Hidden Unity in Nature's Laws** - *John C. Taylor*

A fantastic account of developments in physics starting with Newton's work and getting as far as String Theory. Following a historical but ultimately detailed and scientific tack, physics is presented in a very accessible and clear manner with the interesting quirk that most of the (mathematical) equations are expressed in words. I found the level of the mathematics to be low enough to make a relaxing read, but high enough to support details of the main ideas. This book is so good that I've struggled to read more on subjects such as relativity without wishing for the clarity and precision of Taylor's writing.

- **Why does  $E=mc^2$  ?** - *Brian Cox and Jeff Forshaw*

This book derives the famous equation by first explaining the notions of light and space and then shows the equation's applications. It also has a few chapters on particle physics and quantum theory. The book is not very maths-heavy but after may require a re-read to fully comprehend everything.

# Websites

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<http://www.aplusphysics.com/>

Great videos for learning physics

<http://www.online-exam-solutions.co.uk/subjects/physics>

Great site for practising physics exam questions. It's not free but the questions are very useful prep for exams and the solutions are fully explained.

<http://www.physicshelp.co.uk/>

Free website explaining A level physics in simple terms. Great to understand concepts. With video tutorials too!

<http://physicsasrevision.teachphysics.org/>

Great eBook revision guide that isn't free, but is well worth the money. It's basically a guide to answering exam questions for AS Physics.

<http://physics.andreadecapoa.net>

A collection of YouTube videos selected by a physics teacher for their educational value.

<http://www.swotrevision.com/pages/alevel/physics.html>

A good website covering AS-Level physics.

<http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html>

This is a very useful website. Just to note this is aimed at university level physics - in fact first year undergrads are warned some of it will go over them but a lot is still very useful for A-levels and Advanced Placement.

<http://www.physicsforums.com/>

Is pretty useful.



<http://mathworld.wolfram.com/>

Very useful site.

[http://www.antonine-education.co.uk/antonine\\_education\\_contents.htm](http://www.antonine-education.co.uk/antonine_education_contents.htm)

A Teachers Notes specifically for A-level Physics.

<http://scienceworld.wolfram.com/physics/>

Very useful site.

<http://www.scool.co.uk/>

Good revision website for GCSE and AS /A level for all subjects including physics.

<http://www.npl.co.uk/>

They have a phone number that you can call during normal working hours and get assistance on physics issues.

<http://www.splung.com/>

Is a site for teaching and revising physics. It is aimed at A-level students and pre-university students. The site uses flash to demonstrate key ideas and there is a forum where you can ask a physicist questions.

<http://www.youtube.com/thephysicsidiot>

Interesting Videos.

<http://www.physicsinfo.co.uk/>

Great for physics past papers and notes for GCSE and AS/A Level

<http://www.iop.org/>

Really good for finding resources, and links to some other great sites!

<http://www.khanacademy.org/>

This guy is a legend. Awesome for Physics, as well as other subjects.

<http://www.online-exam-solutions.co.uk/subjects/physics/physics-a-level/astrophysics>

Very good exam preparation for the Astrophysics module of the exam.

<https://courses.toktol.com/guest/index/Physics>

Adaptive self-study platform for physics A-levels; you select the topic and study by answering questions that are repeated if you get things wrong; questions get harder as you get better.

<https://www.youtube.com/channel/UCj47ano5Unwl1TTsEpeJfQw?feature=guide>

A new podcast/video type channel that has stuff on the AQA physics syllabus and is adding videos all the time.

<https://sites.google.com/site/advancedphysicstutor/>

A new website that aims to cover all A-level physics specs and boards, through podcast, videos, games, past paper questions etc.

<http://www.vivaxsolutions.com/>

A website with a great deal of resources for GCSE, iGCSE, AS and A-Level for all exam boards.

# Out of Class Activities

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## Physics Revision

The Physics department regularly conducts out of class revision sessions during the holidays and weekends. Closer to exam period, weekly sessions will be run after school and will have specific topics being covered.

## Extra Curricula Activities

The department conduct trips to lectures, problem solving challenges and excursions. In summer 2017 we are planning to go to Switzerland to visit CERN.

## CREST Award

CREST is an award from the British Science Association that crosses the boundaries of Science, technology, engineering and maths (STEM).

CREST is viewed very favourably by higher education institutions because:

- Develops problem-solving skills
- Develops practical and thinking skills as well as supporting presentation and communication skills
- Allows students to explore their own ideas and interests within science, engineering and technology
- Encourages team work
- Helps to bridge the gap between science and technology in the classroom and the 'real world', preparing students for the world of work
- Raises awareness of different careers in science, engineering and technology
- Provides opportunities for involvement in regional and national events
- It is offered as part of the enrichment programme for sixth form on a Wednesday afternoon.



We are hoping to run a CREST Award activity if enough students show an interest in this. It is excellent to put on your Personal Statement for university!

# Final note

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We're here to help. If you need anything, come and find any of us Physicists. If you're struggling with any topics, please don't stay quiet. Ask for help! Even if the teacher does not teach that specific topic, we can help! Do not leave it to a week before the exam before asking for help.

Enjoy the course! It's fun, interesting and very rewarding.