



# ST EDMUND'S SCHOOL CANTERBURY

## PREPARING FOR A-LEVEL

### PHYSICS

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Welcome to A-level Physics. This guide has been put together to give you the best possible start to your study of Physics and to develop your interest for the wider context of the subject.

We follow the AQA specification for Physics.

The full specification, including the mathematical skills required, specimen papers and some past papers may be found [here](#).

#### Breakdown of the specification during the first year of study

1. **Measurements and their errors**, including use of SI units and their prefixes, limitations of physical measurement and estimation of physical quantities;
2. **Particles and radiation**, including constituents of the atom, particle interactions and collisions of electrons with atoms;
3. **Waves**, including progressive waves, standing waves, interference and diffraction;
4. **Mechanics and energy**, including projectile motion and Newton's laws of motion;
5. **Electricity**, including current/ voltage characteristics, circuits, electromotive force and internal resistance.

#### Breakdown of the specification during the second year of study

6. **Further mechanics and thermal physics**, including periodic motion, thermal energy transfer and molecular kinetic theory;
7. **Fields**, including Newton's laws of gravitation, orbits of planets and satellites and magnetic flux density;
8. **Nuclear physics**, including evidence for the nucleus, radioactive decay and nuclear instability.
9. **'Turning points in physics'**, including discovery of the electron, wave particle duality and Einstein's theory of special relativity.

## Tasks

### 1. Particle Physics

One of the first topics of study is particle Physics and the following list of videos should give you a real flavour for this topic which will be new to most, if not all of you.

Use the suggested resources to learn about Particle Physics which is one of the first topics covered in sixth form Physics. Make short notes on each one.

Go to this web-site and open chapters 2.1 to 2.11 inclusive

<https://www.flippedaroundphysics.com/a-level.html>

Use the suggested resources to learn about Particle Physics which is one of the first topics covered in sixth form Physics:

#### Constituents of the atom

- <http://physicsnet.co.uk/a-level-physics-as-a2/particles-radiation/constituents-of-the-atom/>
- <https://youtu.be/5PyVoMnRTIQ>

#### Stable and unstable nuclei

- <http://physicsnet.co.uk/a-level-physics-as-a2/particles-radiation/stable-and-unstable-nuclei/>
- <https://youtu.be/F66eXoP109E>
- <https://youtu.be/ZmhlO1rgbdM>

#### Particles and antiparticles

- <http://physicsnet.co.uk/a-level-physics-as-a2/particles-radiation/particles-antiparticles-photons/>
- <https://youtu.be/Lo8NmoDL9T8>
- <https://youtu.be/j22nxWX4w9c>

#### Particle interactions

- <https://youtu.be/yTBi4ExpTrw>
- <https://youtu.be/rZKfqQ5RT34>

#### Classification of particles

- <https://youtu.be/edgsmtUH954>

#### Quarks and antiquarks

- <https://youtu.be/ORhXRIhrbG0>
- [https://youtu.be/flOA\\_5MlqZ4](https://youtu.be/flOA_5MlqZ4)

### Conservation rules

- <http://hyperphysics.phy-astr.gsu.edu/hbase/Particles/parint.html>
- <https://youtu.be/SHDqGySUvA8>
- <https://youtu.be/gBHzUt7oV98>

You may also find these sources helpful in your research, knowledge and understanding of Particle Physics but you are free to find your own resources and conduct your own research.

- <http://www.particleadventure.org/>
- [https://en.wikipedia.org/wiki/Particle\\_physics](https://en.wikipedia.org/wiki/Particle_physics)
- <https://www.youtube.com/watch?v=2zZ1kv6vlq0>
- <https://www.youtube.com/watch?v=j50ZssEojtM>

### 2. [Dwyernathaniel](#). An invaluable resource – free to download!

Go to this site and download, for free, these two documents:

- A level Physics notes
- A level Physics Practicals (I know that you cannot undertake the practical work but there are some really good paper based data analysis activities included).