

BOURNE GRAMMAR SCHOOL PHYSICS DEPARTMENT

A LEVEL PHYSICS WELCOME BOOKLET

COURSE STRUCTURE

1. Specification

We follow **AQA Physics** for A Level (course code: 7408).

The specification can be found here:

<https://filestore.aqa.org.uk/resources/physics/specifications/AQA-7407-7408-SP-2015.PDF>

2. Teaching

In year 12 (and year 13), you will have two teachers, one of whom will teach you for 5 periods per fortnight, while the other you will have for 4 periods per fortnight.

The A level content is split into the following topics:

- | | |
|----------------------------|------------------------------|
| 1. Measurements and Errors | 6. Periodic Motion |
| 2. Particles and Radiation | 7. Thermal Physics and Gases |
| 3. Waves | 8. Fields |
| 4. Mechanics and Materials | 9. Nuclear Physics |
| 5. Electricity | 10. Year 13 Optional Topic |

One of your two physics teachers will teach you topics 2 and 3 during the course of year 12. The other teacher will cover topic 4 as well as topic 5. At the end of each topic, you will sit a short assessment to test your understanding of the material within it.

Topic 1 will be covered by both of your teachers and you will carry out practical tasks with both of them as part of your lessons during both years 12 and 13 (more on this in 'Practical Endorsement' below).

Towards the end of year 12, if there is time, we will begin some of the year 13 topics (topics 6-10).

3. Assessment

There are no public examinations at the end of year 12. You will, however, sit a number of internal exams during the year. The first of these are in the spring, and are known as the Provisional UCAS Predicted Grade (PUPG) exams. These will give you and your teachers an idea of how you are progressing and which areas you need particularly to work on.

At the end of year 12, you will sit further exams known as the Final UCAS Predicted Grade (FUPG) exams. These will consist of two papers in physics and will cover all of the content that you have been taught in year 12. They will be used to help decide your predicted grade for the purpose of UCAS applications.

At the end of year 13, you will sit public exams. These will consist of three papers in physics, the structure and content of which is summarised in the table below.

	Paper 1	Paper 2	Paper 3
What is assessed?	Topics 1-6	Topics 7, 8 and 9 Assumed knowledge from topics 1-6	Section A: Practical skills and data analysis Section B: Year 13 Optional Topic
Exam Structure	2 hour paper 85 marks 34% of A Level	2 hour paper 85 marks 34% of A Level	2 hour paper 80 marks 32% of A Level
Questions	60 marks short and long answer questions 25 multiple choice questions (MCQs)	60 marks short and long answer questions 25 MCQs	Section A: 45 marks short and long answer questions Section B: 35 marks short and long answer questions

4. Practical Skills Endorsement

The previous A Level specification included a 'controlled assessment' component which was used to assess students' practical and investigative skills. These assessments have now been removed, so there is **no controlled assessment** in physics in either year 12 or year 13.

To make sure that you are still developing your practical and data analysis skills during your time studying physics in the sixth form, the old assessments have been replaced with something called the 'Practical Skills Endorsement' (PSE). This is awarded at the end of year 13 on a **pass/fail** basis, i.e. you will receive an A Level in physics either with or without the practical endorsement. Most universities will want students to have received the PSE, so it is very important if you are considering going on to higher education.

To receive the endorsement, you will need to have satisfactorily completed 12 required practicals (6 in year 12 and 6 in year 13). These will be completed in your physics lessons, and consist of three parts: a pre-lab worksheet that you will complete before doing the practical, a practical task (which may include drawing a graph and analysing data), and a post-lab worksheet to be completed once the practical is done. Practical work will all be completed in lab books which will be provided by the physics department for this purpose. Your practical work will not be marked, but your teacher will record that you have completed each of the tasks, will check that you have a record of the practical along with the relevant worksheets in your lab book, and will judge whether you have demonstrated all of the skills necessary to receive the practical skills endorsement.

Key Facts about the Practical Skills Endorsement

- You **must** complete all of the required practical tasks (your teachers will give you notice of when these are to be undertaken in lessons).
- If you are unable to attend one of the required practicals, you **must** inform your teacher **in advance** so that they can make arrangements for you to complete the task at another time, if possible.
- Failure to complete all of the required practicals may mean that the school is unable to sign off your practical endorsement for physics and you will not receive it.
- If you miss the completion of the pre- or post-lab worksheet for a required practical, it is **your responsibility** to ensure that you catch up with the work and have a complete record in your lab book.
- The PSE does not affect the final grade that you receive in A level physics – this is based entirely on the final exams taken at the end of year 13.
- Tasks are not carried out in exam conditions and they are not marked on the “correct answer” – instead your teacher will check that you have completed the practical task and have a complete record of it (this will include graphs, analysis of data, plus the completion of all relevant worksheets).

5. Practical and data analysis skills

As well as contributing towards you gaining the PSE at the end of year 13, your practical and data analysis skills are also tested in the final exams in Paper 3 (and therefore will contribute towards the grade that you receive for A Level physics). There are 45 marks out of the 80 available in total for the paper which are based on these skills. Typical questions might ask you to calculate the uncertainty in an experimental measurement or calculated value, to determine information (such as the gradient or y-intercept) from a graph, or to comment on a particular experiment or its results.

The worksheets that you complete for the required practicals during the year are designed to help you develop the skills you will need to answer these questions on Paper 3. Your teachers will also give you further practice on these types of exam question. It is important that you ensure that you are confident with these skills, as well as the subject content learned during years 12 and 13.

HOW IS A LEVEL DIFFERENT FROM GCSE?

1. Workload

Although you will only probably be studying three subjects, instead of perhaps nine or ten as you may have done for GCSE, your workload in year 12 will be higher than it was last year. As a general rule, you need to spend around one hour working outside of class for every hour that you spend in lessons. This may consist of completing homework that you have been set by your teacher, but even if you have not, you should be busy reading and organizing your notes, answering practice questions, or reading through your textbook.

2. Difficulty

You may have been told this before by your teachers at GCSE or by older students, but it really is true to say that A Level physics is much more difficult than GCSE was. While many of the concepts and topics will be familiar to you from your GCSE studies (such as waves, electricity or forces), you will find that we go into these topics in much more detail in A Level. In particular, you will find that the subject is treated in a way that uses mathematics more than you will have been used to previously.

3. Notes

At A Level, you are responsible for ensuring that you have a comprehensive and comprehensible set of notes on all of the material covered in lessons. While your teachers will make sure that you have covered everything you need, they may not tell you explicitly “Write this point down...”. You will need to use your initiative in getting down the key points from each physics lesson, and cross referencing these with the exam specification and textbook.

4. Exercise Books

Exercise books are provided for you to record your physics notes in. Again, it is your responsibility to ensure that these notes are neat, ordered and up to date. Your teacher will not be marking your exercise book, but will carry out a number of checks on your book and organisation throughout the year, and will advise you of anything you need to improve on. At GCSE you can “get away” with a certain amount of disorganisation, because the content is delivered at a slower pace and is less challenging than A Level. From now on, organisation will be key to your success. You will need to keep on top of your notes, homework and revision, in particular remembering to catch up on any work or notes that you have missed through absence.

5. Textbooks

You will be provided with a textbook to use during the course and for revision. You will not be expected, however, to bring this textbook to lessons. You will have to return the book at the end of the course, so you will need to keep it in good condition and will not be able to write in it. It is not necessary for you to purchase any other textbooks, although you may do so if you wish. Many students have found it useful in the past instead to invest in a high-quality revision guide.

WHAT SHOULD I BE DOING NOW?

1. Specification

The Specification is a list of everything that you are expected to know and can be tested on in your A Level exams. The very first thing you should do (in fact, you should do it now before you read any further) is **print out** the Specification and put it with your notes. It can be found online here:

<https://filestore.aqa.org.uk/resources/physics/specifications/AQA-7407-7408-SP-2015.PDF>

2. Equipment

You will need to bring to each physics lesson:

- Exercise book and lab book
- Pens (ideally a few colours – at *least* blue, red and green)
- Pencil, eraser, sharpener and ruler
- Scientific calculator
- Highlighter pen
- Glue stick

3. What should I revise from GCSE?

As mentioned above, a number of topics will be familiar to you from the physics that you have studied at GCSE level. In particular, you should look over your GCSE notes on the following:

- Waves
- Electricity
- Forces and Motion
- Momentum
- Atomic Structure

You also need to ensure that you are comfortable with the mathematics that you will be using regularly in A Level physics. This is an area that students often overlook, but it is very important. The good news is that the maths you need in year 12 should all be familiar to you from GCSE (or earlier). You don't need to be doing A Level maths for the purposes of A Level physics (although the two do go well together). For year 12, you will need to practise your maths skills in relation to the following:

- Rearranging equations
- Algebra
- Trigonometry (i.e. sines, cosines and tangents)

In year 13, you will require a little bit of maths that you may not have seen before if you do not do A Level maths, but your teacher will explain this to you when it is needed.

WHAT SHOULD I BE DOING OUTSIDE OF LESSONS?

There are lots of different things you can do to help yourself to make progress in years 12 and 13. Here are a few ideas.

1. Study Periods

Use these timetabled periods wisely, they are a precious resource. Plan ahead, bring your exercise book, textbook/revision guide, iPad/phone and your headphones. Get your head down and get some work done. Don't be tempted to be distracted by social chat or playing games.

2. Study Groups

Outside the silent study sessions, successful A Level students help each other along. Set up a group chat (using whatever social media service you want to use) and ask each other questions, share tips and pass on useful resources you find. Meet up in school, at home or in the park to get some revision done in an informal and enjoyable atmosphere.

3. Go Online – Useful Revision Sites

There are lots, though some should be treated with care (like all internet sources). Here are a few suggestions:

www.s-cool.co.uk/a-level/physics

www.hyperphysics.phyastr.gsu.edu/hphys

www.phet.colorado.edu/en/simulations/category/physics

4. Ask for help

We are very lucky at this school to have a department staffed by well-qualified, specialist physics teachers. Make sure you make use of this resource if there is anything you do not understand, or simply want clarification about. You will have two teachers in year 12, and you can ask either of them about any of the material that you are studying, regardless of whether they happen to be teaching you that particular topic. Sometimes students find it helpful to ask the other teacher about a topic they are stuck on as different teachers will often have different ways of explaining the same thing. You can also ask one of the physics teachers who doesn't teach you. They will still be happy to help.

With asking for help, as with other things in year 12, the onus is on you to take responsibility. If you need assistance, it is up to you to approach a teacher. Make sure you do so politely and ask them if you can arrange a convenient time to come and see them. If you do so, they will readily give up their time to make sure that you understand whatever it is.

AND FINALLY...

We hope this booklet is helpful. You are about to embark on studying A Level physics – one of the most interesting, stimulating and rewarding choices that you have ever made, and we look forward to welcoming you to year 12. Remember to come and find any of us if you need any help or advice with your studies. Enjoy your time studying physics at Bourne Grammar School.

Best wishes

Mr A L Mitchell (Subject Leader: Physics)

Mr R Fleckney

Mr S Sutherland

Mr G Miller

Mr C Lennox