



Transition Pack AS level Physics

Summer 2021

Name: _____

Deadline for completion **Friday 10th September 2021**

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Introduction

Welcome to the Physics Department at Wigston College, Leicester. We are glad that you have chosen to study Physics at A-level with us. Firstly, let us introduce ourselves:

Mr John Shepherd – Head of Physics Department

Mrs Sophie Fearnley – Head of Science Faculty

At Wigston College, we study the OCR Physics A course at AS level. This has a modern approach to current physics topics whilst still including more traditional aspects. We strongly advise that you do some preparation reading of the course. The specification can be found at

<https://www.ocr.org.uk/qualifications/as-and-a-level/physics-a-h156-h556-from-2015/>

H158 is AS level and H558 is A2 Level.

An excellent place to do some preparation is A Level Physics online.

<https://www.alevelphysicsonline.com/ocr-spec-a> This website gives a clear explanation of each of the year 12 topics illustrated with videos (and Lego), with practice questions and answers to test your understanding. If you spend time regularly over the Summer, you will have a huge advantage as we begin to study.

What to expect

So far in your education, you may have found GCSE's a breeze, sailed through your exams and coursework having been predicted great grades. In contrast, you may have worked hard for your exams and know that rewards come because you apply yourself. It makes no difference which side of success you start on, the following year will be one of the most challenging you will have faced in your schooling so far.

The jump from key stage 3 to 4 is small compared from the key stage 4 to 5 bridge you are currently crossing. Some students cross carefully, with caution and preparation, others jump head-first without understanding the step they are making. Either way we prepare, support and guide. The rest is up to you!

How to succeed

You will be taught by a partnership of teachers that split the course unit content between them. We find that this gives the student a variety of approaches for learning and allows students access to a wider range of specialist knowledge. Now we come down to the basics. You have decided that the course is for you and you are looking forward to Physics at Wigston College. What should you do to make sure that you succeed? The following may seem obvious but are nevertheless, essentials for a successful outcome to your time studying Physics.

What you should do:

- Make notes in class. These notes will be handed in for marking to ensure that you are meeting a standard. Notes will need to be added to when you leave the lesson through your own additional reading.
- Complete out of class activities and questions and return them for marking. Exam style questions will be set for each part of the unit. You must complete all question sets to have a complete set of assessments. No missing assessments are acceptable.
- Read up in preparation for your next lesson. Forewarned is forearmed! It will be your responsibility to read in advance, the text, the slides, the practical work that we will be covering in the lessons.
- Ask questions, no matter how basic. You will have to push yourself out of your comfort zone at times and we fully expect you to ask what seem to be silly questions. They're not! All questions are relevant if it helps you to achieve.
- Talk about it. Get to know your class members so you can discuss lesson content. Make study groups or a study buddy.
- Study outside of the classroom. For every hour in class you should complete in the lab, an additional hour reading up and revising the lesson should be planned in to your study timetable.
These may seem obvious but once you have your study periods and what seems like 'free time' it's too easy to relax into A-levels.

What not to do...

Don't take it easy and expect that you'll do well. A level Physics takes commitment right from the first lesson. You will be assessed from the start and need to make good progress throughout the year.

Don't expect that you'll be given all the answers. Self directed learning will enrich your lessons and give you a fuller picture of the subject matter. Through learning your own way, you personalise the journey.

Don't ignore the bits that you are struggling with. They won't go away until you deal with them.

First steps at A-level

Be prepared from the first day.

The first lesson bring:

- A well-equipped pencil case with protractor ruler etc and a good scientific calculator.
- Summer transition work – you will be expected to hand in your transition tasks and open book exam work on the first lesson of the course.
- Paper and a ring-binder – taking notes during lessons is an essential part of A-levels and this is a task that will become more independent as you progress through the year.

You may want to buy a text book/revision guide in addition to the course text; your teacher will be able to recommend some text books.

Summer starter tasks

As an introduction to the course and to enable you to start you're a level Physics with confidence, you are required to complete four tasks over the summer.

1) Over the summer, your brain may start to forget some of the subject knowledge you tried so hard to remember before your exams. To allow us to assess your level of understanding at GCSE you are asked to complete the physics exam paper at higher level that is sent out with this pack in your induction lesson. This is an open book assessment that means you can use your text book to help with answers. This assessment must be handed in to your teacher during the first lesson.

2) Whilst you are working on your exam paper, revise and remember the work that you completed in year 11. This is the foundation that you will be building on so give yourself the best start that you can.

3) During the induction lessons your teacher will have completed a practical demonstration. You now need to write up the practical investigation. The outline at the end of the booklet will guide you in this. Hand your write up in with the past exam paper during your first lesson.

4) Researching information is a key skill required to extend your learning from the lessons. As part of the assessment you are required to recall information which you then need to use and remember.

To practise, research the following and hand it in with your exam paper and write up on the first lesson. Do not copy and paste information. Read and write notes with your current understanding on:

- Kirchhoff's first and second laws
- Define and draw the reflection, refraction and diffraction of light waves
- Typical values for the wavelengths of the different regions of the electromagnetic spectrum
- Define torque of a couple and moment of a force

Summary

After reading through our transition pack, we hope that you are excited about starting AS Physics with us in September, but more importantly, that you are prepared for working towards your future. All the preparation is worth the effort and once you have started, we hope that you take every opportunity to succeed in your studies.

Investigating the I/V characteristics of a filament bulb

This exercise allows you to use the skills you developed in unit P5 of GCSE. You will need to be able to set up a simple circuit with a power supply, lamp, ammeter and voltmeter to be able to record the current (I) through the lamp at different potential differences (V).

You will then need to plot the results on a graph and reach a conclusion based on the graph and results. Finally, you will then need to explain why the graph has this characteristic shape, perhaps describing on an atomic level what is happening inside the filament.

Some hints:

- the psu can give a variable voltage output by adjusting the link, but don't believe the values it claims, measure them.
- the psu can give either ac (the yellow sockets) or dc (the red and black sockets). Make sure you use dc.
- Connect voltmeter in parallel across the lamp; ammeter in series.
- Resistance = voltage/current power = current x voltage
- If you want to set a particular voltage, you could include a variable resistor in the circuit. This is not necessary but some like to do so.
- You need to collect enough I, V data points across the available range to be able to plot a 'good' graph.
- Things sometimes go wrong with electricity experiments. If it is not working as expected try some faultfinding. Potential culprits are the psu fuse, the lamp 'loose' in the holder, wires not connected inside the plugs.

The write-up.

Finding something out, then explaining it and then conveying that to a reader is why we do experiments!

Your write up should include:

- an introductory sentence
- a circuit diagram
- a description of the procedure
- a table of the results
- a graph (possibly using EXCEL or similar)
- an analysis
- a conclusion
- an explanation
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If you get stuck, you will find a lot of information online that may corroborate your findings. Use it, but you must recognise your sources in your write-up.

Write ups will be collected at your first lesson next term, then marked and returned for you to treasure!

Good luck 😊