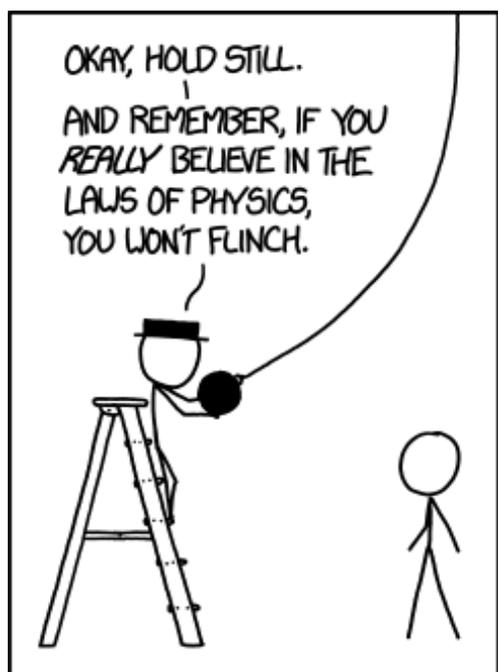


Name \_\_\_\_\_

# Vyners School

## Physics Handbook



This handbook contains important information for your Physics A level. Make sure you read and understand the contents.

If you are unsure of anything please ask for clarification from one of the Physics team. If you lose this handbook an electronic copy can be found in the Google Classroom "Physics 2019-2021" which will be available for September 2018.

**Google Classroom code: ykb7r56**

On the Google Classroom you'll find the specification, reading list, practical handbook and more to come. Joining the classroom is your first task.

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<sup>1</sup> <http://xkcd.com/1670/> Can you spot the principle the character in the black hat is referencing? Should the other character be worried?

# Introduction

Welcome to A-Level Physics! Your eyes are about to open to wonder in the world around us and the vital role that Physics plays in this. One of the vital attributes required to be successful in Physics is curiosity: curiosity with hard work will ensure that you achieve well on this course.

You may have been asking yourself questions like:

- Do heavy objects fall faster than lighter ones, and is it any different on the moon?
- If I get thrown out of a cannon can I figure out how high I will go and where I will land, and does it depend on my weight or my speed?
- How does the speed camera know how fast I am going, and the SatNav know where I am? And what safety features does my car have built in when I find myself in a jam?
- What makes Christmas tree lights flash on and off, and how can I make them brighter?
- How does a microwave do what it does, and why can I hear around corners?

We will be supplying the answers to questions like these and many, many more in AS-level Physics.

If you continue to pursue the subject at university you will find that Physics graduates are in great demand, as pilots, engineers, accountants, management/computer analysts, in the City – anywhere that profound analytical skills are required.

## Top tips for now from our current students:

Practice rearranging equations.

Really learn Standard Form.

It's not all maths.

The definitions are the hardest...make a list and learn them early on.

Make notes in every lesson and get a calculator.

Don't underestimate Physics...do questions throughout the year...revise early.

Use your formula booklet EVERY lesson.

There will always be help online from 'Doctor Physics' on YouTube.

## The team

You're lucky to be joining a department with a range of teachers and teaching styles. It can sometimes be helpful to hear things explained a different way. We're all very approachable. Drop in for a cup of tea and some Physics Wednesday afternoons in room 134 (or any time really!)

**Miss Edwards** leads the team of physics teachers and mainly teaches in lab 165. She can usually be found here or hiding in the prep room between labs 134 & 132. She will be teaching Years 12 and 13 this year.

**Mrs Bennett** is an experienced Science teacher, having previously worked as Deputy Head of Science. She will be teaching Year 12 Physics this year.

**Dr Abbas** has been a teacher at Vyners School for 2 years, who has worked previously in Materials Physics! He will be teaching Years 12 and 13 this year.

**Ms Paul** Our Head Technician, helping us run a range of experiments.

Note: roomings may change in September.

## We aim:

- To develop your interest in and enthusiasm for Physics
- To develop skills, including practical techniques, that will allow further study and careers in Physics and Physics-related subjects
- To develop your knowledge and understanding of the many different areas of Physics and how they relate to each other
- To develop critical thinking
- To give an insight into how society makes decisions about scientific issues and the importance of science in world economies
- To extend your knowledge beyond the specification providing you with a broader and more in-depth understanding of physical principles

## Mathematical requirements

Almost every aspect of the Physics course involves mathematics. There are a limited number of derivations. The Physics teachers will support pupils with the mathematical content during the year.

**Physics students are required to bring a scientific calculator to every lesson.**

## Specification Details

Course Title: AQA Physics 7407/7408

### Year 12

Measurement and their errors

Particles and radiation

Waves

Mechanics and materials

Electricity

### Year 13

Further mechanics

Fields and their consequences

Thermal physics

Nuclear physics

Turning points in physics

## Assessment

### A2

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.

## Practical assessment CPAC

The assessment of practical skills is a compulsory requirement of the course of study for A level physics. It will appear on all students' certificates as a separately reported result, alongside the overall grade for the qualification.

Students' practical work will be assessed by teachers, using common practical assessment criteria (CPAC) that are consistent across exam boards. A shorthand description of the criteria is shown in the table below, however a full description can be found in your specification in the Google classroom.

Students who demonstrate the required standard across all the requirements of the CPAC will receive a 'pass' grade.

There are 12 mandatory practicals across the two years of Physics A-Level. Attendance for these practicals is mandatory.

CPAC Criteria and marking points:

- 1a- Follows instructions **Assessed in the practical**
- 2a- Correctly uses equipment **Assessed in the practical**
- 2b- Carries out techniques methodically **Assessed in the practical**
- 2c- Identifies controls (control listed and explained)
- 3a- Identifies risks (risk assessment produced)
- 3b- Uses equipment safely **Assessed in the practical**
- 4a- Makes accurate observations **Assessed in the practical**
- 4b- Data placed in well labelled tables (units given)
- 5a- Data processed and evaluated (graph, analysis and evaluation)
- 5b- Uses references effectively to support conclusions and gives a clear bibliography

## Guidelines:

Attendance records, punctuality to lessons, independent study and meeting deadlines are included in assessments together with a current performance grade, which is based on your test results and school examinations. If your current performance grade is *three sub-levels* or more below your target grade then you are *NOT* to be on track to reach your target grade in your A level examinations. If this is the case, you cannot be using independent study time effectively and you need to re-assess your learning strategies with teacher intervention and help as necessary. Excellence is a habit.

## Tests

You will be tested regularly on sections of work. Prepare for tests as you go through the section of work. Regular testing serves to consolidate and reinforce. After the test you will be given time to ReACT to identify weaker areas. You will discover if you have a particular problem and can seek help in good time; further, you will gain valuable examination practice. If you have been working well you should feel encouraged by your performance in tests: if you gain less than half marks you need to repeat the test. Record your test marks on your tracking sheet. This will give you an overview of your progress. Your teacher may annotate your tests to indicate areas for improvement. These should be included in your targets for improvement when you are reviewing your overall performance for that section of work.

You will be given adequate warning of when a test will take place. Results are recorded centrally and are used to assess your current performance. If you miss a test, for any reason, it is your responsibility to do the test in a study period, at lunch time or after school with the permission of your teacher.

## Attendance

Avoid missing lessons unless it is completely necessary. Appointments such as medical or dental appointments should be made outside of lesson time unless urgent. If you do miss lessons you are expected to be proactive and catch up on the work missed. If you know in advance that you will miss a lesson you should see the member of staff before the lesson. If you miss a test you must find your teacher and arrange to do the test as soon as possible (see above). Attendance of lessons is imperative to success. The onus is on you to keep up to date with your work. Good working routines and organising your work between lessons will help to lead to successful outcomes.

If attendance falls below 80%, unless there are valid and substantiated reasons (e.g. medical concerns with certification), we will consider withdrawing your entry into the public examinations.

## Punctuality

You are expected to arrive punctually to all lessons. If you are very late for a lesson, your teacher may send you to the study room to do work as self-study. Your teacher will ask you to make up this time outside of lessons (during lunchtime and/or after school).

## Homework

You should spend a *minimum* of 3 hours a week doing physics outside lessons. You may be revising for tests, practising questions, writing up practical assignments or researching new areas. You must always read through your notes and the appropriate section of the textbook as you go through the course and check on any topics that are not clear to you. **For all topics you must complete the PLC and the summary questions from the book. Good grades are not achieved by last minute cramming.**

**Your first homework task will be set during induction day (5th July). This must be completed before the start of September.**

## What to do when stuck...

*'Anyone who has never made a mistake has never tried anything new'*

Albert Einstein

Have you used your textbook?

Have you consulted with your classmates?

Have you checked online?

Have you asked your Physics teacher?

Your teachers are available throughout the day to speak to. A good time to catch your teacher might be after a lesson, before school, at morning break, at lunch time or after school. Your teacher might then arrange a specific time to meet you depending on the support that you need. There will be a drop in session on Wednesday after school in 165. Remember that you are responsible for your own learning and the onus is on you to seek out help. If you struggle to find your teacher, then an email may be appropriate:

Miss Edwards

Mrs Bennett

Dr Abbas

[aedwards@vynersschool.org.uk](mailto:aedwards@vynersschool.org.uk)

[bbennett@vynersschool.org.uk](mailto:bbennett@vynersschool.org.uk)

[gabbas@vynersschool.org.uk](mailto:gabbas@vynersschool.org.uk)

***Use your email address that you use regularly for school work***

## **Opportunities**

**Mentoring:** There are a number of opportunities for you to support the wider school community in Science.

- Science Club: For Year 7 and 8
  - Once a fortnight
  - Run by Miss Edwards
  - Practical sessions mainly
- STEM club: for Year 9 and 10
  - Once a fortnight
  - Run by Miss Jamshad
  - Practical and theory sessions covering all three of the Science subjects
- Genius bar: For Year 11
  - Tutoring weaker Year 11 students
  - After school once a week

**Reading list:** A document covering a wide range of reading materials can be found on the Google Classroom.

## **Resources and Equipment**

**Text books:** Pupils will be provided with text books for their time in Vyners. You will be expected to buy the A-Level Physics AQA CGP Exam Practice Workbook in September. This is available through the school for £5.50. Revision guides can be purchased through the school at a discounted rate approximately £5.00.

**Equipment** Pupils should have for every class:

- A scientific calculator (most Vyners pupils use Casio)
- Folder for notes
- A4 notepad
- Maths set (compass, ruler, set squares, protractor)
- Pencil suitable for diagrams
- Three colours of pen (black, blue and green)

## **And finally**

Physics is an exciting and beautiful subject. Take all opportunities to broaden your knowledge: read newspapers and magazines, watch television programmes, listen to the radio, attend lectures and visit exhibitions. That unfamiliar situation in an examination may not be so unfamiliar! Physics will also demand that you gain deep knowledge. Find something you're interested in and immerse yourself in it!

**Good luck with the course and ENJOY your study of Physics!**