IGCSE Physics

Introduction

Welcome to your IGCSE Physics course. This introduction will serve as a guide to what you can expect from the course, and it will show you how to plan your study effectively. Take the time to read this Introduction thoroughly before you start the lessons.

The course is designed to prepare students for the **Edexcel IGCSE in Physics.**

The Edexcel subject code is **4PH0.**

Please note that this course has two examined components:

Examination paper Physics 1
Examination paper Physics 2

Full details of these components are given below and during the course.

Oxford Open Learning

The Course

The course is ideal preparation for those who wish to go on to study Physics at AS and A2 Level.

If you have some background in Physics then you will find that some of the lessons touch upon things that you have encountered before, but the course is designed to be fully understandable by those who have little or no previous background in science. There is some overlap with our Year 9 Physics course, for instance.

Arrangement of Lessons

The lessons are planned so that material for the two examination papers, Physics Paper 1 and Physics Paper 2, is covered by the seven modules of the course. Topics that will be examined only in Paper 2 are given in **bold type** in the lesson aims at the beginning of each lesson. (For further details see below: Structure of Lessons.)

Textbook

The textbook that is referred to throughout this course is

***Edexcel IGCSE Physics* (2009)**

Authors: **Brian Arnold, Steve Woolley and Penny Johnson**

Publisher: **Pearson Educational Ltd, ISBN 978 0 435966 90 4)**

You will need a copy of *Edexcel IGCSE Physics* throughout the course; you can buy a copy through the Oxford Open Learning website. The textbook is referred to in almost every lesson and provides excellent coverage of the material. By using the textbook and the course together you will be fully prepared for the examinations at the end.

You should not need other books during the course, but you may like to look in other science books from time to time. If you feel that you would like to use a revision guide before the examination, you should ask your tutor which one they recommend.

Lesson Contents and Textbook References

Module 1 – Forces and Motion		
Lesson	*Title*	*Textbook pages*
1	Movement 1	1 -10
2	Movement 2 **TMA A**	12 - 17, 23 - 25, 34 - 37
3	Movement 3	26 - 31, 38 - 40
4	Turning Effects and Stretching Effects	18 - 20, 42 - 48
5	Astronomy **TMA B**	49 - 56

Module 2 – Electricity		
Lesson	*Title*	*Textbook pages*
6	Electrical Appliances	59 - 65
7	Static Electricity 1	66 - 69
8	Static Electricity 2 **TMA C**	70 - 72
9	Electrical Circuits 1	74 - 80
10	Electrical Circuits 2 **TMA D**	82 - 88

Module 3 – Waves		
Lesson	*Title*	*Textbook pages*
11	Properties of Waves	91 - 98
12	The Electromagnetic Spectrum	99 –103, 136
13	Light: Reflection and Refraction	107 - 115
14	Sound	104 - 105, 118 - 126
15	Investigative Skills A: Taking a Reading **TMA E**	235

Module 4 – Energy Resources and Energy Transfer		
Lesson	*Title*	*Textbook pages*
16	Energy Transfers	127 - 132
17	Thermal Energy	133 - 141
18	Work and Power **TMA F**	142 - 149
19	Energy Resources and Electricity Generation	150 - 159
20	Investigative Skills B: Experimental Design	234 - 236

Module 5 – Solids, Liquids and Gases		
Lesson	*Title*	*Textbook pages*
21	Density and Pressure **TMA G**	162 - 168

22	Solids, Liquids and Gases	169 - 176
23	Investigative Skills C: Interpreting Investigations	236 - 241

Module 6 – Magnetism and Electromagnetism		
Lesson	*Title*	*Textbook pages*
24	Magnetism **TMA H**	179 - 186
25	Electric Motors and Electromagnetic Induction	187 - 195

Module 7 – Radioactivity and Particles		
Lesson	*Title*	*Textbook pages*
26	Atoms and Radioactivity **TMA I**	199 - 207
27	Radiation and Half-life	209 - 214
28	Applications of Radioactivity	216 - 224
29	Atomic Theory and Nuclear Fission **TMA J** **TMA K – Mock Exam**	226 - 231

Appendices		
	A: Electrical circuit symbols	242
	B: Physical Quantities and Units	245

Internet Resources

In most lessons of the course, references to internet sites are given. These have been carefully selected to illustrate points in the lesson and to provide additional activities. These are an important tool in your understanding of your Physics course and you should make every effort to view them and use the activities that they contain. If you do not have an internet connection at home, consider building in regular trips to a library or internet café as part of your study schedule.

There are two ways of finding the correct webpage:

- type in the full webpage address given in the text
- search using the search phrase given in the text.

When you type in either the address or the search phrase it is important that you do not make typing errors, or miss out

words. The search phrases have been carefully tested to bring the required website to the top of the list of sites returned by the search engine. If you cannot see the site you need in the first six websites on the list, you should try retyping the phrase and searching again. If you still have a problem ask your tutor for help.

The Structure within each Lesson: how to study

Front Page

The front page of each lesson shows:

- The title.
- **Aim(s)** for the lesson. These set out what you should know, and be able to do, after working through the lesson. Keep these aims in mind while reading the lesson material. Aims printed in **bold** will not be examined in Paper 1, but will appear in Paper 2.
- **Context**. This tells you which sections of Edexcel course specification are covered by the lesson.
- **Reading**. This tells you which pages of your textbook cover the same ground as the lesson. Reading them will help to reinforce what you have learned from the course notes.

Lesson Notes

The body of the lesson, from the heading "Introduction" onwards, contains the subject material to be mastered. Read these notes carefully several times until you feel that you have thoroughly understood the theory involved.

Then tackle the reading from the textbook. This will deal with some of the topics in greater detail than the notes. As with the notes, you will probably need to read some of the passages in the textbook several times.

The Textbook CD and Answers Download

Textbook CD When you receive your textbook it will either have a CD attached, or will have instructions about how you can obtain the CD. The CD contains a copy of the textbook with additional resources for most pages. You may need your invoice number for the textbook in order to obtain the CD. If you do not understand how to use the CD you should ask your tutor.

If you are taking the IGCSE exam in one year, you may find it better to leave the interactive pages on the CD until you start your revision. If you are taking your exam over two years, then you might spend time on the interactive resources as you progress through this course, or leave them for revision.

Textbook questions After each chapter in the textbook there are questions. You are recommended to try these as part of your study of the chapter. So that you have some questions to practise when you revise, you might like to work on alternate questions when you first study the chapter, e.g. try odd number questions, leaving even number questions for revision. You will get a spread of topics if you tackle odd and even questions, rather than only those at the start of the set of questions. Organise your answers so they are easy to refer back to; for example, use a separate notebook and write down the textbook page number as well as the question number next to your answer.

Textbook answers These are available for downloading at

http://www.edexcel.com/resources/pages/viewItem.aspx?item=320

If you have difficulty finding the download on www.edexcel.com please ask your tutor to help you.

Activities

Activities are placed in the notes at relevant points. They are indicated as follows:

Activity 7	Make a list giving examples of situations in which friction operates. Record the effect friction has and state whether it is an advantage or a disadvantage.
	

The pencil symbol indicates that you should make your own notes in the space provided.

Self-Assessment Tests

When you feel that you have mastered all of the topics in the lesson, and have completed the activities, tackle the Self-Assessment test (SAT). This is to be found at the end of the lesson, unless it concludes with a TMA (see below). The answers to the SAT are found right at the end of the lesson.

Ask your tutor if there is a question in the SAT you do not understand, but do *not* send your self-assessment answers to your tutor.

Tutor-marked Assignments

After every two or three lessons there is a Tutor-Marked Assignment (TMA). Most of these are in IGCSE examination style. These tests will thoroughly test your understanding of the previous few lessons. You should send your answers to each TMA to your tutor, and you will then receive a marked script together with a set of suggested answers.

Some students may opt to tackle TMAs under timed conditions as examination practice. However, they are intended to check your understanding, so it can be helpful also to look back at the lessons.

Revision

Do **not** leave all your revision until the end of the course. You will need to revise thoroughly for your examination, but frequent revision throughout the course is **helpful**. Plan your revision sensibly and re-read as much as you feel necessary if your knowledge is beginning to fade.

If you intend to revise all the work after studying the lessons, you should allow at least 2 months of concentrated study for revision and past papers. You can find past exam papers on the Edexcel website (see below).

Coursework

The IGCSE Physics course does not contain coursework. However the skills involved in designing, carrying out and interpreting scientific investigations are tested in both of the written exam papers. These skills are addressed directly in Lessons 15, 20 and 23, but you should be improving them throughout the course. Read any experimental detail covered in the notes or textbook carefully, and think about how you would do any practical work mentioned.

Checking the Specification/Syllabus

This course has been written to cover the contents of the **Edexcel Physics 4PH0** syllabus, which is available to download on the Board's website (www.edexcel.com). You will need an Adobe Acrobat® reader on your computer to download it.

You should check the syllabus throughout the course, so either keep a copy on your computer or print it out.

Past Papers

Edexcel now makes some past papers available online for free download at www.edexcel.com. The most recent papers are not made available immediately.

Discuss with your tutor how to approach using these past papers.

Tiering and Assessment

The Edexcel IGCSE Physics examination is not tiered. This means that all abilities are tested in the same examination.

Paper 1 does not examine items printed in **bold** in the aims section at the start of each lesson.

Paper 2 covers *all* items in the aims section, both those in bold and non-bold (regular) text.

We normally include details of lengths of papers, sections, marks awarded, style of questions, etc.

Your Tutor

You have a lot of resources to help you in your studies: your course file, your textbook, the interactive CD, internet resources and your tutor. You should make good use of your tutor to help you with any difficulties that you may have during the course.

And finally... good luck with your studies!

Marian Green and Philip West