Thinking about choosing to study Physics at Advanced level?

or

Already studying it and wondering what your next step might be?

This worksheet has been designed to help you consider how you can use what you learn from an Advanced level course in Physics in your future career planning.

⊕ What to study it with?

When choosing to study A level courses full time it is usual to study four subjects at AS level in the first year then three at A2 level in the second year. It is also possible to study some subjects via the vocationally related route (Applied A level double awards and BTEC Diplomas). Physics would come under Science on this route. The other subjects you choose to combine with Physics may have an influence upon what you can choose beyond Advanced level, so check out your choice. Although some Advanced level subjects require a good grade at GCSE as a foundation for study at the advanced level, others can be studied from scratch. It's a good idea to check this out before finalising your Advanced level course choices.

CAREER WARNING

PHYSICS

Studying any Advanced level course will give you two main things, knowledge about the content of the subject (mechanics, electricity, matter, wave behaviour, dimensional analysis, etc.) and skills in how to deal with that content. Although you may not need to remember the content for very much longer than your course, the skills you develop can be built on and used throughout the rest of your life.

MIX & MATCH ⊕

Physics is usually taken with Mathematics and another science subject. Physics students who take other sciences can progress to a wide range of careers in science and technology. Physics with Mathematics and Chemistry opens up the widest variety of career options including those non-scientific careers which take students with any subject background. Other possibilities include Physics, Mathematics and a technical subject such as Geography or Computer Science. Students seeking a complete contrast might take arts subjects such as English, History, Drama/Theatre Studies and Media Studies or opt take a modern language which could possibly lead into careers overseas. Many universities now include language options for Physicists. Students taking Science via the vocationally related route will often focus on this area in greater depth and choose only one other subject at AS/A2 level to study alongside it.

The higher education and employment scenes are continually changing due to social, economic and political pressures. This worksheet, therefore, is not a definitive guide to your future career but is more of a prompt to get you thinking about making connections between your choice of Advanced level courses and higher education and career opportunities.

Physics Skills		⊗Ways in which you might learn
Numerical skills:	✹ collecting and recording data ✹ reading, understanding and interpreting diagrams, data and charts in a logical and systematic way ✹ calculating with fractions, percentages, ratios and formulae ✹ estimating, calculating and predicting sequences and outcomes using mathematical models and formulae ✹ converting units of measurements using scales and tables	✹ measuring and calculating a wide range of things including the density of solids, energy consumed by electrical devices, planetary motion, rates of radioactive decay ✹ using formulas to measure and calculate change and resistance in things like fission/fusion processes, current and voltage of resistors, speeds of molecules, gravitational field strength and light years and galactic distance
Problem solving:	✹ investigating and clarifying problems by developing hypotheses ✹ selecting suitable techniques to test hypotheses and investigate physical phenomena ✹ carrying out practical investigations and experiments	✹ designing and carrying out experiments to investigate such things as force, motion, energy, power and resistance using scientific equipment ✹ paying strict attention to detail to produce accurate results
Communication skills - written and visual:	✹ putting across clear, coherent and relevant information ✹ presenting observations and conclusions in reports	✹ writing essays and reports on experiments, individual projects and studies ✹ illustrating written materials with scientific drawings, diagrams and charts
Communication skills - verbal:	✹ taking part in discussions and making relevant contributions ✹ listening and responding to others	✹ discussing such topics as Nuclear Power and 'Stars and Black Holes - do we need to know?'
Research skills:	✹ selecting and analysing relevant information from a range of sources ✹ extracting key pieces of information ✹ summarising complex documents and reporting on research finding	✹ reading scientific journals, case studies, experiment reports ✹ tabulating data and plotting findings on graphs and charts

physics

other skills

In addition to the specific skills you will develop whilst studying Physics at Advanced level, you may also develop a number of other skills which will be extremely important, whether you go on to higher education or into employment.

>Improving own learning and performance:

- dealing with complex subjects
- checking understanding of work set and seeking clarification if unsur
- agreeing and setting targets and planning action
- following a plan to meet targets and making revisions to the plan as necessary
- checking progress with an appropriate person
- identifying any support needed and using it effectively

>Working with others:

- planning activities with others
- identifying and agreeing targets with others and checking understanding
- identifying and confirming responsibilities within the group
- agreeing working arrangements with those involved

>Working with Information Technology:

- deciding what, when and whether to use information technology
- selecting and using appropriate technological hardware and software to process data, prepare and present information
- identifying support needed and using it effectively

⊗Ways in which you might use

- dealing with accounts, budgets, financial statements, etc
- measuring the performance of components
- creating mathematical models to explore phenomena such as black holes
- measuring atmospheric behaviour, like weather forecasting, and calculating long term effects, like global warming

- investigating and developing new products such as power generated via alternative energy sources, new technical equipment and computer hardware, fibre optics, solar cells, etc.
- working in long term research and scientific investigations such as space exploration, atomic energy, etc.

- producing written and illustrated results from experiments
- writing scientific reports and technical information

- working as part of a team
- giving talks or presentations

- using logic, scientific thinking and a knowledge of the physical world to analyse and solve problems in industry, information technology and communications, medicine or space

Physics

C A R E E R c-o-n-n-e-c-t-i-o-n-s

There are a number of careers where having an Advanced level qualification in Physics, and all the skills that you develop through studying it, will be very useful. Manufacturing everyday goods involves electricity, energy, forces and robotics, all major areas of Physics. You can find out more about these careers by looking up information in your careers library under the Connexions Resources Classification Index (CRCI) codes listed here.

CRCI code	Title
TD	Scientific Research and Laboratory
TD	Astronomy and Astrophysics
JE	Medical Physics and Technology
G	Engineering
GE	Electronics Engineer
GE	Recording Engineer
GD	Energy Engineering
GE	Nuclear Engineering
TB	Geophysics and Geology
TD	Metallurgy and Materials Technology
PA	Radio/TV technical work
WA	Pilots and Aircrew

Although it is possible to enter some of these jobs after Advanced level studies, many of these areas recruit people with higher qualifications so you may need to seriously consider going on to higher education.

6 ways to check it out

Yes No

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Remember: Advanced level course grades can be converted into UCAS points which count towards admission to university so it is important to choose subjects which reflect your interests and abilities

A = 120 points
B = 100 points
C = 80 points
D = 60 points
E = 40 points

Thinking of doing a degree?

Degree level programmes normally require a minimum of 2 A2 levels, or the equivalent, plus supporting GCSE passes. There are a wide variety of courses where Advanced level Physics will be of direct relevance.

Degree programmes in Physics

A wide range of courses exist in universities and colleges. Courses range from single honours degrees through to multi-subject degrees where Physics can be studied alongside anything from Anthropology to Philosophy.

Physics related courses include

- Physics
- Physical Science
- Applied Physics
- Theoretical Physics
- Computational Physics
- Chemical Physics
- Astrophysics
- Mathematical Physics
- Particle Physics & Cosmology
- Engineering Physics
- Quantum Science and Lasers
- Optoelectronics
- Electronics
- Engineering Instrumentation
- Medical Physics Technology
- Radiation Oncology Science
- Architecture
- Building & Surveying
- Building Renovation & Design
- Clinical Technology
- Laser Physics and Optoelectronics
- Computer Systems Engineering
- Engineering
- Metallurgy
- Medicine
- Dentistry
- Pharmacology
- Veterinary Science
- Astronomy
- Digital Music
- Telecommunications & Internet Engineering
- Creative Music Technology

There are many degrees where having an Advanced level qualification in Physics may not be of direct relevance but will be useful, however, so you need not be restricted by this list.

Details of all the degrees available in these areas, and more, can be found on the University Central Admissions System website at www.ucas.com

Physics FACTFILE

Opportunities for Graduates

Recent statistics show the following trends for graduates from Physics degrees:

- just over 40% of graduates entered full-time employment within six months of completing their degree
- graduates entered a wide range of jobs including scientific research and development (5.6%), and commercial, industrial and public sector managers (8%)
- only 4% entered teacher training despite the demand and incentives for science graduates
- Over 30% entered a full-time course of further study – the vast majority going on to higher degrees in related subjects.

...jobs

These are some of the jobs that Physics graduates have gone into in recent years ...

- Nucleur Safety Engineer
- Research Scientist
- Trainee Clinical Scientist
- IT Support Engineer
- IT Consultant
- Trainee Production Manager
- Technical Administrator
- Armed Forces Office
- Inland Revenue Trainee
- Finance Clerk

need to find out more?

You might find these publications useful. Check to see if your Careers Library or local library have copies.

> GET: Science & IT 2007
published by Trotman

> Getting into Engineering
published by Trotman

> Questions and Answers - Science
published by Trotman

> Questions and Answers - Engineering
published by Trotman

> Degree Course Guide Engineering
published by Trotman

> Degree Course Guide Physics & Chemistry
published by Trotman

Free information is available from the following organisations. If writing please send a stamped addressed envelope to cover postage:

▷ British Astronomical Association
Burlington House
Piccadilly
London W1J ODU
0207 734 4145
Email: office@britastro.org
www.britastro.org

▷ British Helicopter Advisory Board (includes Careers Information)
Graham Suite
West Entrance
Fairoaks Airport
Chobham
Woking
Surrey GU24 8HX
01276 856100
Email: info@bhab.org
www.bhab.org

▷ Engineering Council
246 High Holborn
London WC1V 7EX
020 3206 0500
www.engc.org.uk

▷ Institute of Physics
76 Portland Place
London W1B 1NT
020 7470 4800
Email: physics@iop.org
www.iop.org

▷ Institute of Science Technology
Kingfisher House
90 Rockingham Street
Sheffield SE1 4EB
0114 276 3197
Email: office@istonline.org.uk
www.istonline.org.uk

▷ Institution of Engineering & Technology
Savoy Place
London WC2R 0BL
020 7240 1871
Email: postmaster@theiet.org
www.theiet.org

▷ Natural Environment Research Council
Polaris House
North Star Avenue
Swindon SN2 1EU
01793 411500
www.nerc.ac.uk