To get any job you have to stand out from the crowd. Physics will help to give you that edge; people are always impressed by a qualification in physics.

If you don’t know what you want to do, think about the Highers that will keep the most options open. Top universities recommend that you take at least two of the subjects shown on the opposite page. For most science and engineering courses both Higher physics and maths are required.

It is important to remember that although many jobs outside science do not require you to have studied a specific subject, studying a recommended Higher (such as physics) can give you an advantage.

“...you have to stand out from the crowd. Physics will help to give you that edge; people are always impressed by a qualification in physics.”

Which subjects should I choose?

STEH
TV WEATHER FORECASTER
Recommended Highers

Top universities* recommend that you study at least two from:

Physics
Mathematics
English
Chemistry
Biology
Geography
History
A language

*ru{}sellgroup.ac.uk/informed-choices

What will I learn in Higher physics?

You will already be familiar with many of the topics that you will study, including forces, waves, radioactivity, electricity and magnetism. At Higher, you’ll look at these areas in more detail and find out how they are interconnected. You will also learn how to apply maths to real-world problems and explore new areas such as particle physics and cosmology.

Perhaps more importantly, you will develop skills that can be transferred to just about any other area of work, from setting up a business to saving the planet. Even if you don’t go on to become a physicist, learning to think like one will help you get to the root of any problem and draw connections that aren’t obvious to others. Physics won’t give you all the answers, but it will teach you how to ask the right questions.

“It’s a bit of a jump from National 5 to Higher, but I’m glad I did. You study things in much greater depth and start seeing how the different areas of physics link together”

MOHAMMAD
HIGHER PHYSICS STUDENT
The UK space industry is one of the fastest growing sectors in the UK. There are lots of opportunities for young people who want to design satellites or space telescopes, or build and operate spacecraft to investigate our solar system.

What can I do with a Higher in physics?

Although only a lucky few get the chance to become an astronaut, studying physics can help you land a job in space. You could become a cosmologist and investigate the evolution of the universe, a planet-hunter who searches for habitable planets around other stars or an astrophysicist who searches for dark matter and black holes. If you prefer something more hands-on, there are also lots of UK jobs in space engineering.

“I use NASA’s famous Hubble Telescope as well as several ground-based telescopes in Chile and La Palma to study the most extreme explosions in the universe. These are created when stars much bigger than our sun die. By studying them we can learn more about the massive blue stars that create them.”

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Whether you want to be a surgeon or a clinical scientist, understanding physics is important if you want to work in modern medicine. Physics has revolutionised the diagnosis and treatment of illness. Surgery is now routinely carried out using lasers; cancer is treated using radiation, and new ways of using physics to see inside our bodies are being developed every year.

“After studying physics at university I decided to specialise in radiotherapy. I now work on delivering the best possible treatment for cancer patients using advanced computer systems and sophisticated particle accelerators. I love the mixture of working with different people and using cutting edge physics in my job.”

Declan, Surgeon

“I’m glad I took physics before studying medicine at university. Now that I am a surgeon, understanding how sound is produced has helped me understand how the human voice works. I also use lasers most weeks and having knowledge of how they work helps.”

Leila, Medical Physicist
“Engineering is a great way to use maths and physics to do something practical. My favourite part is being able to point at a cool building like the Shard and say, ‘I designed that!’

ROMA
STRUCTURAL ENGINEER

Architects and civil engineers design all sorts of buildings, from schools to skyscrapers, as well as other vital structures like bridges, dams and tunnels. Higher physics could be your first step towards a career in building a better world.

I didn’t fully appreciate how useful physics would be when I chose it in my fifth and sixth years. It helped me understand architecture lectures at University, and the principals I learnt at school have been carried through to working life: the more you push the boundaries to come up with unique and eye catching designs the more you realise the impact that physics has on architecture.

ALASTAIR
ARCHITECT

Build a Better World

Find out more about engineering at www.tomorrowsengineers.org.uk
“In visual effects you need to understand the laws of physics so that you can replicate them. We work in a computer-generated, virtual world, where buildings topple, tidal waves crash and things explode, and we can make this happen by understanding the underlying physics and using it in our animation. If we don’t get it right, the audience would never believe it.”

“All modern games need the physics to be programmed in to them. Without it you just can’t create games like Grand Theft Auto or Star Wars. If you are interested in becoming a computer games designer, one of the most important pieces of advice I could give you is to take physics and maths.”

To make realistic visual effects for films and TV, or design computer games you’ll need physics, maths and computing.
People with a background in physics are needed more than ever to monitor climate change and find sustainable ways of generating electricity. We also need more engineers to work out how to save water, improve the world’s food supply, make travel more environmentally friendly and recycle waste on a large scale.

**What can I do with a Higher in physics?**

“I create better places for people and wildlife, and support sustainable development. For me and my colleagues our physics training is an intrinsic part of what we do. We need it to develop our monitoring equipment for wildlife, predict the flow conditions in rivers in order to manage flooding and also to protect ecosystems by understanding the basic principles that govern the environment we live in.”

**MATT, ENVIRONMENTAL TECHNICAL ADVISOR**

“When I was deciding on what to do after my degree green energy really appealed to me. Saving the world was something I definitely had in mind. I now work on improving the efficiency of solar cells so that they can be used on a bigger scale so that we reduce our reliance on fossil fuels.”

**JESS, SOLAR ENERGY PHYSICIST**
Whether you want to set up your own business or help run a large multinational company, studying physics can offer you a great return.

### Set up a business

**Leon, Restaurant Franchise Owner**

“After university I decided to set up a restaurant business. Working for yourself can be hard, and this is where my physics helps. As well as a good understanding of numbers, physics gives you a robust, logical, sceptical mind, which is ideal for any business pursuit.”

**Gemma, Investment Expert**

“I help businesses invest billions of pounds. A background in physics has got me to where I am today. The ability to solve problems and the confidence to deal with complicated issues has proved invaluable. Moreover, a questioning scientific mind gives you a fresh perspective and allows you to think outside the box – perfect if you want to stay ahead of the game.”
To report on news, politics and the latest scientific discoveries you need to know a little bit of everything. If you are thinking of specialising in reporting science, then a Higher in physics becomes even more important.

"Reporting on new areas of science can be daunting if you have no foothold whatsoever. Even knowing a completely different bit of science increases your confidence when tackling a new bit."

"Writing for magazines and newspapers comes down to finding things out and then telling people about them – much like physics. And the comfort with numbers and logical thinking developed by studying physics have been a great help to me when planning, researching, and, finally, writing stories on topics ranging from traditions in naming football stadiums, through RAF Bomber Command during WW2, to the finer points of environmental law."

"Reporting on new areas of science can be daunting if you have no foothold whatsoever. Even knowing a completely different bit of science increases your confidence when tackling a new bit."

ALOK, SCIENCE EDITOR

CHRIS, FREELANCE JOURNALIST
Our world is full of gadgets. The number is only going to grow. So if you love gadgets and apps then why not get a job developing them?

"I develop technology to help high-level athletes and non-athletes alike. Recently I’ve worked on goal-line technology for the Premier League and also an app that allows you to measure how fast you can kick a football and share it with your mates. Being a sports fan, its great being able to use my engineering skills for something I love.”

HEATHER, SPORTS ENGINEER

"I work with graphene, a new form of carbon that is only one atom thick! This substance is very light, yet incredibly strong and could soon be used to develop lots of new devices, such as a flexible smartphone that you can wrap around your wrist.”

REBECCA, GRAPHENE RESEARCHER
The skills that I developed by studying physics have provided a perfect grounding for a career in law. It has helped me to think critically and creatively. Drafting contracts and negotiating with other lawyers really isn’t so different to writing physics reports and debating theories.”

Although the link between law and physics may not be obvious, the skills you need for both have a lot of overlap. Both require you to identify the key principles that apply from a wide range of possibilities, and use your skills to solve a specific problem.

“If you want to specialise in protecting new inventions you definitely need to study science or engineering at university. Intellectual property law requires a detailed understanding of the underlying science so you can argue your case from a strong knowledge base.”

Edward, Banking Law Solicitor

Caroline, Patent Attorney
If you want to know answers to questions like how big the universe is, what everything is made of and whether time-travel is possible, then perhaps a career in physics research is for you. Although physicists have made huge progress in answering many questions, there still plenty to find out.

“I’m developing new mathematical methods to test theories that try to combine gravity with quantum mechanics. If some of these theories prove to be correct, we may actually live in a universe with at least 10 dimensions. Many more than the three we normally experience.”

“I work on improving laser systems to detect gravitational waves. These ripples in space time have recently been discovered from two colliding black holes. Better detectors will be needed to learn more about other exotic phenomena in our universe.”
Poker is all about making complex decisions and understanding variables – skills that I learned studying physics. That’s the beauty of the subject – you can apply the skills you learn to so many areas. Many of them, like poker, are not so obvious until you try them.

LIV, PROFESSIONAL POKER PLAYER

Studying Higher physics doesn’t restrict your options, it expands them. As well as being needed for many careers in science and engineering the skills and knowledge that you can develop by studying physics keeps the door open to doing just about everything else.

DO SOMETHING COMPLETELY DIFFERENT

“You’d be surprised how useful physics can be. In fact, it got me my first job at a major UK music retailer. They needed someone with computing and radio experience to help start a radio station. Since I used to DJ on student radio and had done lots of programming as part of my degree, I really fitted the bill.”

MARTIN, RADIO AND CLUB DJ

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LIV, PROFESSIONAL POKER PLAYER
Graduate jobs: prospects.ac.uk
Apprenticeships: apprenticeships.org.uk
England: nationalcareersservice.direct.gov.uk
Scotland: myworldofwork.co.uk
Wales: careerswales.com

Research requirements for university
All degrees: search.ucas.com
Russell Group universities: russellgroup.ac.uk/informed-choices
Physics degrees: myPhysicscourse.org