

# Working in: Science



## Working in: Biochemistry

Biochemists study the chemical and physical principles of living things, analysing complex actions such as metabolism, reproduction and growth. They can be found working in genetics, microbiology, forensics, plant science, pharmacology, immunology, oceanography, toxicology, food science, environmental sciences, nutrition and more.

### Also look up:

Bioengineer, Biophysicist, Biotechnologist, Microbiologist

### What does the job involve?

- Studying the chemical and physical properties of living things
- Looking at the chemical aspects of the formation of antibodies
- Carrying out research, writing scientific articles and presenting at conferences

## Working in: Food Science

Food scientists study all properties of food, ingredients and processes within manufacturing companies, or as part of a research laboratory. They also look at how consumers behave. Food scientists can move from industry into research or vice versa, into consultancy, or even working for themselves developing food products.

### Also look up:

Food Technology, Product Development, Dietetics

### What does the job involve?

- Testing products for safety, quality and nutritional value
- Studying flavour, texture, colour
- Analysing levels of vitamins, fat, sugar and protein

## Working in: Environmental Science

Environmental scientists study the impact of human activity on the environment, using subjects such as chemistry and biology. They develop strategy and technology to prevent or control pollution in the environment. They can work as a field scientist, lab manager, project manager, consultant or environmental engineer.

### Also look up:

Ecologist, Water Quality Scientist, Environmental Consultant

### What does the job involve?

- Carrying out research to address the challenge of climate change
- Conducting lab tests on water, air and soil
- Building conceptual models to identify potential contamination sources

# Working in: Technology



## Working in: App Development

Demand for mobile phone applications (apps) has never been higher, but the skilled developers who can design them are in short supply. Developers write computer programmes using various programming languages such as Objective-C, C++ or Java. As smartphones and tablets continue to evolve, developers must adapt rapidly and think creatively!

### Also look up:

Software Engineer, Computer Programmer, Computer Scientist, Information Technology (IT) Manager

### What does the job involve?

- Fluency in programming languages like Java, Objective-C and C++
- Coding, testing and debugging apps
- Knowledge of Android/iOS operating systems

## Working in: Game Development/ Animation

Game developers design and programme games for a variety of formats, such as consoles, the internet and mobile phones. Most specialise in a particular area such as design, programming, audio, editing or production. Animators are artists who use old and new technologies to produce animated films for a variety of industries.

### Also look up:

Game Environment Designer, Game Development Designer, Digital Painter

### What does the job involve?

- Creating new games, and ideas for gameplay
- Developing user interface concepts
- Working with directors and other animators to translate storyboards into animated films

## Working in: Biotechnology/MedTech

Biotechnology involves the manipulation of biological processes for industrial and other purposes, e.g., the genetic manipulation of microorganisms for the production of antibiotics. Medical technologists design and create technologies to manufacture products like artificial hearts, cardiovascular stents, contact lenses and medical software.

### Also look up:

Biomedical Engineer, Regulatory Affairs, Process Engineer, Diagnostics

### What does the job involve?

- Using biological organisms to create and improve products and processes
- Working to develop better diagnostic technology and devices
- Developing new research procedures and prototyping new technologies

# Working in: Engineering



## Working in: Mechanical Engineering

Mechanical engineers use their problem-solving skills to design machines and technologies to improve our world. They create machines and devices, from jet engines to robots to medical devices to mobile phones. Mechanical engineers often work at the leading edge of innovation.

### Also look up:

Biomedical Engineer, Aeronautical Engineer, Mechatronic Engineer, Electromechanical Engineer

### What does the job involve?

- Designing and developing new power-producing systems
- Inventing robotics for use in industry, space and healthcare
- Making production and manufacturing more efficient

## Working in: Civil Engineering

Civil engineers improve and protect the world around us, through planning, designing and building the facilities we use every day, from houses to factories to transport systems. Structural engineering is a division of civil engineering, where the focus is on large structures such as bridges, office blocks, roads, railways, airports and canals.

### Also look up:

Building Services Engineering, Energy Engineering

### What does the job involve?

- Designing, planning and constructing new buildings and structures
- Designing new transport infrastructure and improving existing systems
- Devising innovative solutions for harnessing renewable energy

## Working in: Chemical Engineering

Chemical engineers develop the industrial processes used to make everyday products such as food, drink, drugs, cosmetics, plastics and electronics. A chemical engineer can be involved in all kinds of industrial processes, from the manufacture of medicines to the design of water treatment plants to researching new compounds for cosmetics.

### Also look up:

Process Engineering, Petrochemical Engineering, Chemical Technologist

### What does the job involve?

- Developing new, efficient manufacturing methods
- Researching new methods for the safe and efficient mass production of medicines
- Managing the safe processing of foodstuffs

### Did you know?

Ireland is ranked second in the world for research in immunology, nanotechnology, animal science and dairy science

### Did you know?

The value of Irish food and drink exports exceeded €11bn for the first time in 2016

### Did you know?

The EU's commitment to drastically reduce greenhouse emissions by 2050 has seen Ireland become a hotbed for energy efficiency development

### What skills are needed?

- Critical thinking
- Communication skills
- Attention to detail
- Problem-solving abilities

### Typical employers

- Government and environmental organisations, universities, research institutes
- Food and drink sectors
- Pharmaceutical and medical devices sectors
- Companies providing specialist services in any of the above areas

### Typical qualifications

- General science certificate or diploma
- Common entry science and specialise later
- A bachelor's degree
- Post-graduate research degrees (Masters or PhDs)

[www.sfi.ie](http://www.sfi.ie)



Check out more career examples at [www.smartfutures.ie](http://www.smartfutures.ie)

### Did you know?

World leaders in cloud computing, such as EMC, Citrix and Dropbox are located in Ireland

### Did you know?

Nine of the top 10 global software companies are located in Ireland, including Microsoft, Google, Apple and Facebook

### Did you know?

84% of third-level STEM students are extremely positive they will get a job they enjoy after college

### What skills are needed?

- Computer languages and coding
- Maths and technology skills
  - A flair for design
  - Problem-solving abilities
  - Excellent attention to detail
  - Creativity
  - Artistic skills

### Typical employers

- Android and iOS app development companies
- Software and financial services companies
- Self-employment/start-ups
- Airlines and retailers
- Game development companies
- Animation studios

### Typical qualifications

- Certificate or diploma in general computing/IT/technology
- Degree in computer science, software engineering, IT, physics/maths/applied science, game development/animation
- Conversion course in coding from any of the above

[www.sfi.ie](http://www.sfi.ie)



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### Did you know?

In 1881, Irish man John Philip Holland was the first person to successfully launch a submarine

### Did you know?

In a US survey of the top 500 companies on the stock market, 33% of CEOs had an engineering degree

### Did you know?

Around 120 international pharmaceutical companies have bases in Ireland, including nine of the top 10 global pharma companies

### What skills are needed?

- Problem-solving abilities
- Communication skills
- Analytical and creative thinking
- Team work

### Typical employers

- Industry
- Consultancies
- Government bodies/local authorities
- Research institutes

### Typical qualifications

- Certificate or diploma in engineering or a related discipline
- Bachelor's degree in engineering
- Master's degree in engineering (to become a Chartered Engineer)

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# Working in: Mathematics



## Working in: Data Analytics

Data analysis is all about collecting, organising, and understanding statistical information to make it useful. The analysing of raw data helps companies or their clients make important decisions by identifying various facts and trends.

### Also look up:

Data Science, Data Visualisation, Quantitative Research, Statistics

### What does the job involve?

- Using data to make predictions on future trends or behaviours like population growth or climate change
- Assisting companies to remove corrupt data or errors in their databases
- Analysing big data to understand human behaviour

## Working in: Finance

A financial controller ensures that the accounts of a business are correct and meet regulatory and tax requirements. They are involved in the day-to-day financial activities of the business. A financial controller is responsible for setting and monitoring the performance of company departments to ensure they meet goals.

### Also look up:

Credit Controller, Financial Analyst, Management or Chartered Accountant

### What does the job involve?

- Financial modelling and analysis
- Cash management and preparing budgets and forecasts
- Providing solutions to financial challenges in business

## Working in: Computer Science/ IT Security

Computer scientists are scientists and mathematicians who develop new ways to process, understand, store, communicate and secure data online. They design software and work on the physical components of large computer systems. IT security specialists work to protect computers and networks from intrusions and criminal attacks.

### Also look up:

Computer Engineer, Information Scientist, Software Scientist, IT Security Specialist

### What does the job involve?

- Solving computing problems and challenges to protect people
- Researching/developing new products and designing hardware
- Implementing cyber security in software systems, networks and data centres

# Exploring careers in STEM



Smart Futures is a government–industry programme providing secondary school students in Ireland with FREE access to role models working in STEM. Keeping up to date on the many career paths available in STEM isn't easy. It's a fast-moving area, with multiple routes to entry and a high demand for graduates. From designing video games or medical devices, to improving food science and sport, and even saving lives through cancer research, students need real insights into the many exciting and diverse STEM career opportunities in Ireland. Visit [www.smartfutures.ie](http://www.smartfutures.ie) to read any one of more than 100 STEM career stories, watch videos, and download posters and career infographics. Filter your choices based on your interest. You might be surprised which careers will interest you.

### Access free talks and events

Smart Futures works with partner organisations that offer free career talks and events to all secondary schools in Ireland to give students the chance to ask practical questions about working in STEM and encouraging them to look beyond stereotypes. Teachers, guidance counsellors, TY coordinators and parents can access details on the 'Volunteer Partners' section of [www.smartfutures.ie](http://www.smartfutures.ie) and find out what events are taking place throughout the year. Many partner organisations run talks in schools. These talks typically last for 40 minutes, taking place in your classroom. They are great for inspiring

students to think differently about how they choose their school subjects, life after school and preparing for jobs of the future!

### Next steps?

So now you've read some examples of STEM careers, there are so many more still to explore! From nanotechnology to games development, robotics, artificial intelligence and even space exploration, STEM offers a number of fulfilling career opportunities, to help improve lives and the world we live in.

Thinking about #STEMcareers? Follow your passion and #DoWhatYouLove!

### Who can I talk to?

Before choosing your school subjects, CAO options or PLC course, check out [www.smartfutures.ie](http://www.smartfutures.ie). Ask your teacher, guidance counsellor or TY coordinator to log on to explore free career events nationwide.

**Irish STEM industry facts**

- 250 medical technology companies employ 25,000 people in Ireland
- 9 of the top 10 global pharmaceutical companies are located in Ireland
- The top 10 multinational technology companies are in Ireland
- Laboratory technicians are needed in the biopharma, food and medical devices sectors

These talks and events are a great opportunity to meet people working in STEM and to get the answers to the questions that you really want to ask about your future.

### How can I get involved?

There are hundreds of free STEM-related events and activities going on around the country every year. Here are just a few:

- [ScienceWeek.ie](http://ScienceWeek.ie)
- [MathsWeek.ie](http://MathsWeek.ie)
- [EngineersWeek.ie](http://EngineersWeek.ie)
- [TechWeek.ie](http://TechWeek.ie)
- [SpaceWeek.ie](http://SpaceWeek.ie)
- [CoderDojo.com](http://CoderDojo.com)
- [SciFest.ie](http://SciFest.ie)
- [Collegeaware.ie](http://Collegeaware.ie)
- [iwish.ie](http://iwish.ie)

### Further resources?

Visit [smartfutures.ie](http://smartfutures.ie) first and then for further information on PLCs, apprenticeships, course points or subject requirements? Visit: [www.CareersPortal.ie](http://www.CareersPortal.ie), [www.GradIreland.ie](http://www.GradIreland.ie), [www.CareersNews.ie](http://www.CareersNews.ie), [www.plccourses.ie](http://www.plccourses.ie), [www.Qualifax.ie](http://www.Qualifax.ie), [http://FIT.ie](http://http://FIT.ie), [www.Collegeaware.ie](http://www.Collegeaware.ie), [www.STEPS.ie](http://www.STEPS.ie)

Log on to [www.smartfutures.ie](http://www.smartfutures.ie) for more information.



Science | Technology | Engineering | Mathematics

Explore your future in STEM

Find a career to make a difference

STEM graduates are in big demand



[www.smartfutures.ie](http://www.smartfutures.ie)

Smart Futures provides access to STEM careers information and role models to students, parents and teachers. It is managed by Science Foundation Ireland.



**Did you know?** Financial giants like Citigroup, Mastercard and State Street all have research and development innovation labs in Ireland

**Did you know?** Fintech, or financial technology, refers to technology used to make banking and financial services more efficient

**Did you know?** The online payments company Stripe, founded by two Limerick brothers, Patrick and John Collison, has been valued at €4.5 billion

### What skills are needed?

- Excellent maths and computer skills
- Ability to organise large amounts of information
- Logical and analytical thinking
- Problem-solving abilities

### Typical employers

- Government agencies
- Financial service providers
- Social media companies

### Typical qualifications

- A certificate or diploma in maths or accounting
- Under or postgraduate degrees in maths or accounting
- A professional accounting accreditation



Contact Smart Futures on (01) 607 3028 or [smartfutures@sfi.ie](mailto:smartfutures@sfi.ie)  
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