



# Scottish Sisters in STEM

Where studying  
STEM can lead you

Ages  
13-15

**CGI**

# Hi!

If you are reading this then you are between the ages of 13 and 15, and, we hope, thinking about your National 5 options. We have put this booklet together to give you an idea of what options are out there, and what careers these could lead you into.

The reason we have created this booklet is because STEM careers are some of the most male-dominated careers out there. This means that, not only are women not accessing the higher salaries that STEM careers often offer, but these industries are missing the female input. Therefore, new technologies, vehicles, safety equipment and software are being designed with less than 50% of the population in mind.

To combat this, and bring the female insight into STEM, we need more girls like you to study STEM subjects in school. So, we decided to put together this booklet to show you what options are out there and how to tailor your learning to get into a STEM career that is right for you.

We hope that by the end of this booklet you will have discovered new options you did not know existed or had never considered and that we will have convinced you to pursue a career in STEM.



# Meet the sisters



Hi, I'm Stella.

**I am 10 years old, and I really like STEM.** You may have met me already. I was in some booklets for girls in primary school, and now I am back, with my older sister, Sol, to help you choose your National 5 options.

Hi, I'm Sol.

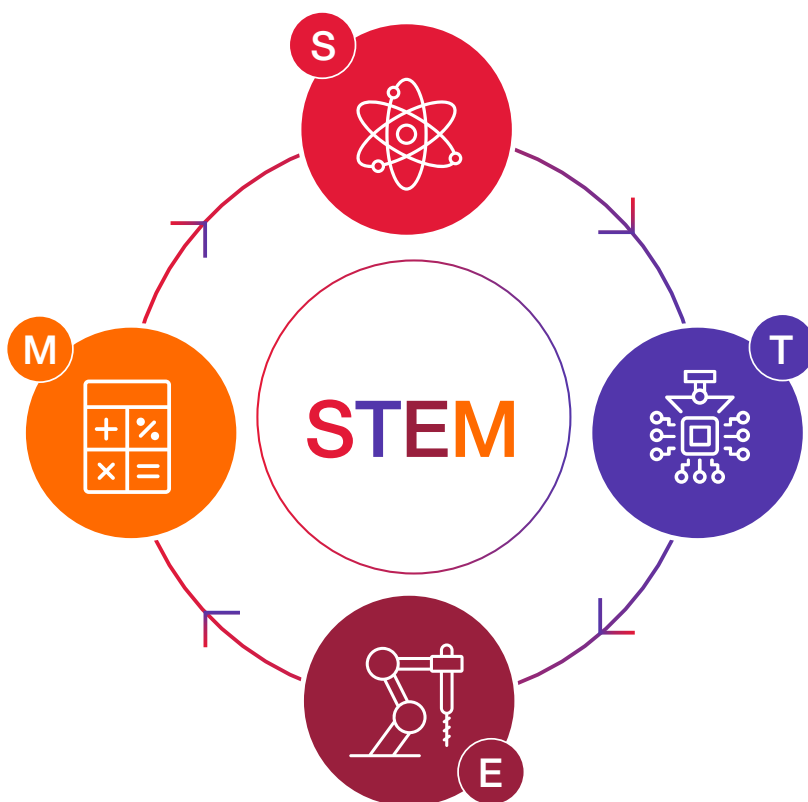
**I'm the older sister, and like my little sister Stella, I really like STEM.** I am choosing my National 5 options and I really wanted more information to help me decide what to choose. So, Stella and I decided that if I needed help then maybe others do too, so we decided to create a booklet, so everyone else can benefit from what we found out.



# The cycle of STEM

No career is an island, instead, they overlap and incorporate aspects of other topics. In STEM, no individual component would be where it is today without the others.

For instance, our advancements in science have only been possible due to those in engineering, which has only happened due to the progress made in maths, which have been facilitated by the evolution of technology, which has only developed because of science. So, you see, they all help each other. An advancement for one, is an advancement for all.



**S**

Science has advanced by better engineering, allowing us to make more exact measurements, and perform experiments on scales impossible to see with the human eye.

**T**

The advancement of science has allowed us to create incredible new technologies such as computers the size of credit cards (and smaller!).

**E**

As maths is able to take on more complicated equations, the types of engineering we can accomplish have such subtle differences to the point where we can now create machines capable of splitting atoms!

**M**

Through the progress in technology, we are now able to perform incredibly complicated mathematical equations in a matter of seconds, allowing us to tackle more and more complicated problems.



# STEM salaries

Research conducted by London Economics for the Department of Education shows that achieving 2 or more Highers in STEM subjects adds 7.8% to a man's earnings, and 33.1% for a woman's, compared to just gaining National 5 level qualifications.

Another study showed that median salary for working-age graduates was £10,000 more than their non-graduate counterparts. Take a look at some roles you can do and their salaries.



## Average Salary

**Astronomer: £50,565**

Science, Technology, Engineering and Mathematics

**Data Scientist: £41,114**

Technology and Mathematics

**Electrical Engineer: £33,497**

Technology, Engineering and Mathematics

**Accountant: £29,955**

Mathematics



www.payscale.com



Female graduates in the UK that achieve two or more STEM subjects at Higher level, add 33.1% to their earnings compared to just achieving STEM subjects at National 5 level.

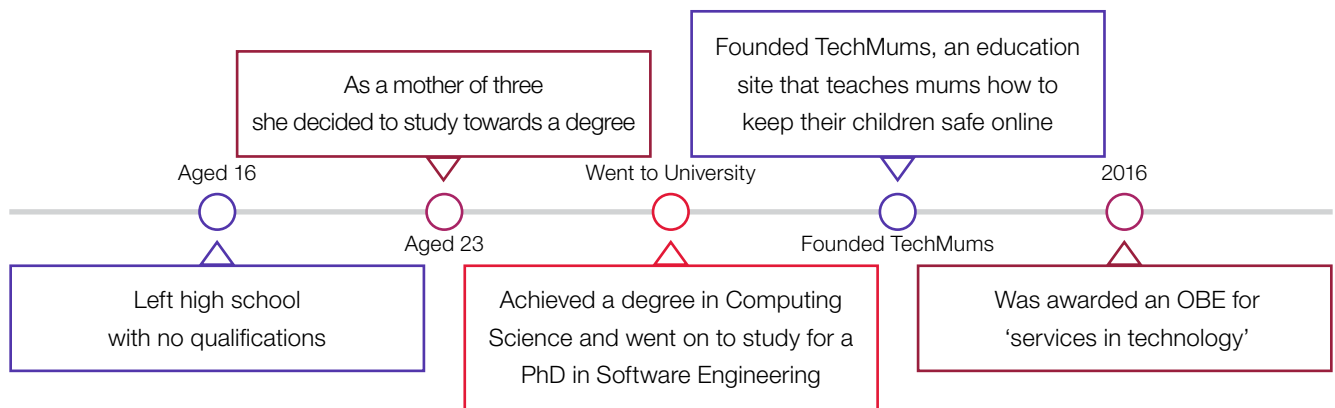


References: **London Economics** (<https://www.gov.uk/government/news/science-and-maths-send-girls-future-wages-soaring>, <https://educationhub.blog.gov.uk/2021/02/09/more-young-people-are-taking-stem-subjects-than-ever-before/>). **Median Salary** (<https://www.gov.uk/government/news/science-and-maths-send-girls-future-wages-soaring>)

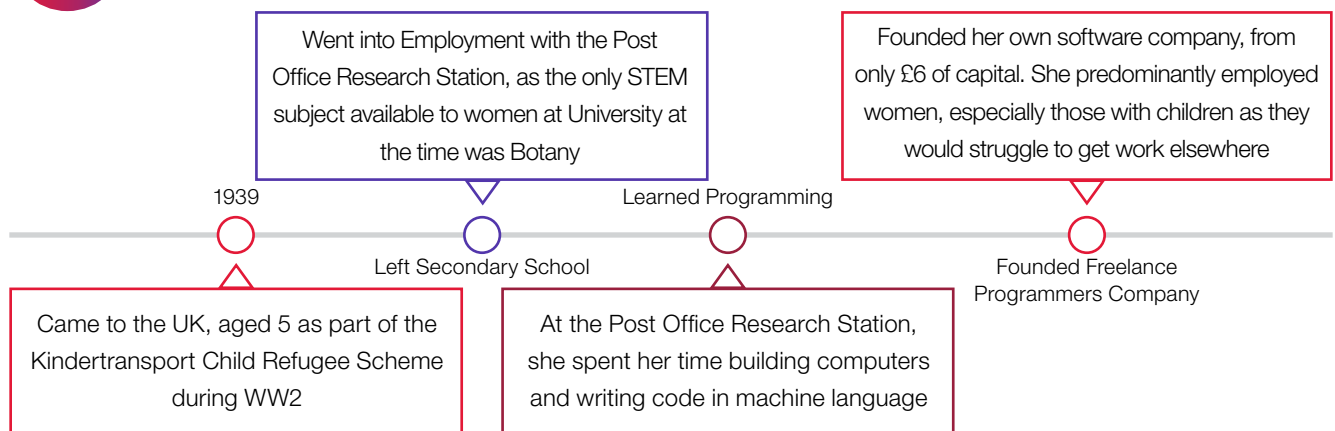
# Many paths to the same destination



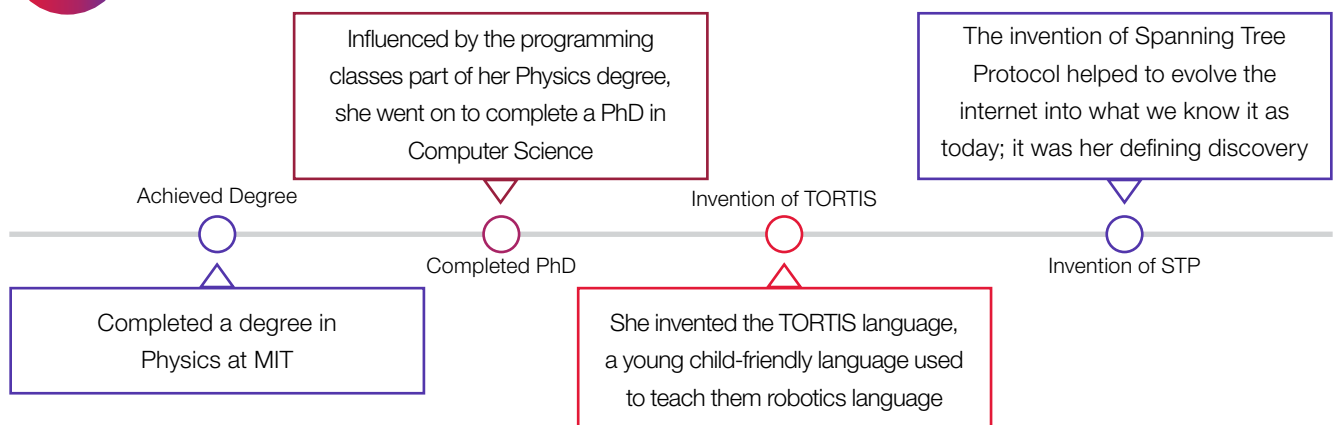
## Sue Black



## Dame Stephanie Temple



## Radia Perlman



# National 5 options

## What to do, when you don't know what to do

At this point in your life no one expects you to know what you want to do with the rest of your life. The fact you are thinking about it at all is enough for now. Right now you should only be exploring your options, finding out what things you enjoy, and what you are good at, because very soon you are going to have to start making choices, and you need to be sure you are choosing based on what you want to do, and not what your friends are doing.

Right now you might be thinking everyone else has it all figured out and you're the only one without a clue what to do next. I guarantee you that is not true. At your age, most of the people you know who are adamant they know what career they want to go into will have changed their minds at least twice before they finish their education.



Take your time. Don't rush, think it through – oh, and it's OK to change your mind. Over the rest of your life you are going to change your mind a lot, everybody does, it's human nature.



# How to choose your options...



Deciding what subject you are going to take is a big decision, and I am sure you will have loads of people telling you what subjects you should and should not take, from teachers, to parents, to friends.

But, at the end of the day, the decision is yours, and it needs to be what will make you happy. You need to balance out your SSFs (Serious, Skilled and Fun), so you want something serious, something you are skilled at, and something you find fun. Make sure you have something for every box, although, these don't have to be different. You may find that the thing you are really good at is also something serious, like maths or physics – and you may think these are fun too. You will probably find, more often than not, that the thing you are really good at is something you find fun too, because it is only human to enjoy what we are good at.

## Something serious

This really depends on what you think you might like to do with your life. For instance, if you think you might take a job abroad then learning a foreign language would be a good choice. If you think you will travel a lot then Geography will probably come in handy. If you know, with all your heart, that you are going to be carpenter, then you probably want to take woodwork. You see, 'something serious' does not mean boring, it simply means something that you are serious about. If you don't know what you want to do yet, and that is completely normal, then anything STEM is always a safe choice.

## Something you're good at

Is there a subject that you regularly get good marks in, or receive compliments on for your work? Are you a budding Katie Bouman, or a secret Greta Thunberg, or the next Melinda Gates? If you have a hidden talent for something, be it drama or science, sport or woodwork, now is the time to let it out. School is a great place to try a new skill.

## Something fun

This one is down to you I'm afraid, we can't tell you what you enjoy. It could be Geography, or Food and Nutrition, P.E., or Maths. Whatever it is, put it on your list and see where it takes you. While Universities will care what subjects you choose, they will care more about why you chose them, and believe me 'I thought it would look good on my application' is not a great line for your entrance interview! They want to see passion and thought.



In this section we are going to cover a number of subjects that you may have to choose between for your National 5 options. Your school may not offer all these options, or may offer some that are not included here.



# Science

Why choose it?

What STEM jobs can I use it for?

What STEM subjects would this go well with?

**Are you curious?** Have you ever wondered what makes bread dough rise? What makes the sea blue? Why can't we breathe underwater? Or what stops our bodies from crumpling into a heap? Science at its root is finding answers to questions that interest you.

Science is incredibly important, and broad, containing endless opportunities, no matter what your interests are. In Scotland the Science subjects you can take are Biology, Chemistry and Physics.

You can use science for everything from being a research scientist to a pastry chef. Science is an incredibly diverse and varied subject, and no matter what your interests, science will be involved in some way. Just a few jobs you could use science for include:

- Maths

Maths goes hand in hand with science, as it allows scientists to accurately describe relationships and results objectively.

Astronaut



Chef



Sound engineer



Car mechanic



# Art/Fashion and Textiles/Graphic Communications



## Why choose it?

Art/Fashion and Textiles/Graphic Communications is an incredibly useful skill and is used in all the STEM subjects, from creating accurate anatomical diagrams in Biology, to engineering designs for a working car, to drawing accurate maps of an area.

You would be amazed how useful an eye for detail, and the ability to draw accurately, is in today's world.

## What STEM jobs can I use it for?

- Biologist
- Cartographer
- Engineer



The National Society of Professional Engineers wrote an article about how creating art can make you a more effective engineer. In fact, one of the greatest engineers in history, Leonardo da Vinci, was also an acclaimed artist.



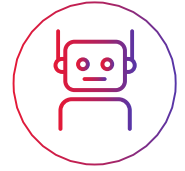
## What STEM subjects would this go well with?

- Biology
- Maths





# Engineering Science



## Why choose it?

Engineering has a far-reaching impact on our society and environment. The study of engineering science allows you to understand the relationship between Engineering, Mathematics and Science. Engineering allows you to apply the knowledge from these subject to analyse and design solutions to real world engineering problems.

## What STEM jobs can I use it for?

- Circuit Designer
- Engineer
- Electrician

## What STEM subjects would this go well with?

- Maths
- Physics



# Foreign Language



## Why choose it?

Learning another language is an incredibly useful skill, that will not only make you more employable, but also help improve memory and concentration, as well as reducing the risk of developing dementia and Alzheimer's later in life.

## What STEM jobs can I use it for?

This might not directly link to a STEM job, however some STEM job roles will see you conduct business at a global level, where being bi-lingual is a huge asset!

## What STEM subjects would this go well with?

Any of them! Although some careers are more likely to involve interaction with foreign countries than others, the brain development from learning a foreign language will help you to learn new skills.



# Health and Food Technology



## Why choose it?

Food is a huge part of our daily lives, but we really don't give it enough credit. For instance, did you know a lack of iron in our diet will cause anaemia, a lack of vitamin C causes scurvy, and a lack of calcium causes osteoporosis?



The human body requires iron to make red blood cells, which then carry oxygen around the body. Vitamin C lowers your risk of heart disease and boosts immunity, and calcium and vitamin D strengthen your bones.



## What STEM jobs can I use it for?

- Baker/Chef
- Dietician
- Food Scientist

## What STEM subjects would this go well with?

- Biology
- Chemistry

What we eat has a huge effect on our bodies. Too much of some foods will hurt, or even kill us, while not enough of others will do the same – this is Biology in action. Also, whether you are cooking, baking, or even freezing, you are using chemistry – you are mixing different substances together and changing their temperature to cause a reaction.





# Geography



## Why choose it?

Geography is so much more than just learning where places are in the world. It is also about how people interact with their environment, the causes and effects of phenomena, like earthquakes, tsunamis and volcanic eruptions. It also involves the study of why natural things are the way they are, i.e. why do some cliffs erode faster than others? Or why is one end of the beach higher than the other?

## What STEM jobs can I use it for?

- Archaeologist
- Cartographer
- Geologist

## What STEM subjects would this go well with?

- Physics
- Chemistry

Geography has more in common with the various sciences than you might think. The formation of stalagmites and stalactites are due to physics, the way some coast lines erode more than others is due to chemistry, even the formation of fossils is a science.



# History



## Why choose it?

History is important as it develops the skill of critical thinking and the ability to articulate a logical argument. These skills will serve you well in any job role you do in the future.

History will also give you an understanding of the significant developments that have been made in each of the STEM areas.

## What STEM jobs can I use it for?

While History does not directly link to a particular STEM job role, it will help to widen your understanding of your STEM area and develop vital skills.

## What STEM subjects would this go well with?

Any of them. All advancements in Science, Technology, Engineering and Maths are part of history. By better understanding the past, we are more equipped to face the future.



# I.T. and Computer Science



## Why choose it?

Computers have become integrated into our everyday lives to the point where we don't even realise how dependent on them we are. And with a world dependent on computers, understanding how they work and being able to program them to do whatever you want means you will never be out of a job.

## What STEM jobs can I use it for?

- App Designer
- Database Engineer
- Games Programmer
- Software Developer

## What STEM subjects would this go well with?

- Maths

Because Computer Science is so wide an area, and computers are used in pretty much every other discipline, you could apply your knowledge in Computer Science to anything. However, Maths and Computer Science go hand in hand, as computing relies heavily upon it.





# Design and Manufacture



## Why choose it?

Design and Manufacture is a form of engineering, and has many practical uses. This is an excellent choice if you like making things and getting creative. Also, if you've ever wondered 'what situation would possibly require you to know trigonometry?' or to know how to calculate the circumference of a circle, this is it. Design and Manufacture is an excellent example of the practical applications of maths.

## What STEM jobs can I use it for?

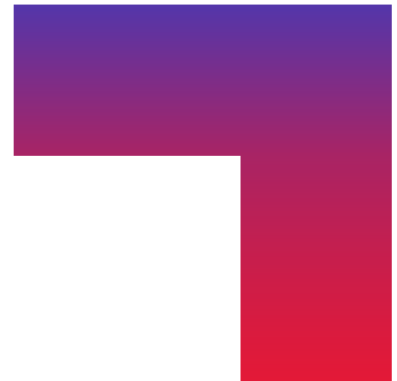
- Architect
- Carpenter
- Engineer



## What STEM subjects would this go well with?

- Mathematics

Design and Manufacture is a very practical, hands on subject, but you cannot deny its need for mathematics.



# National 5s

## What should I study?

Do my options really matter?

Yes... and no.

What National 5s you choose are important. If you have an idea of what you want to do at university then you should check the entry requirements, as they may want you to choose certain options at Higher, so it makes sense to pick these at National 5 too.

However, your choices are not the be-all and end-all. If you don't know what you want to do yet, don't worry. Choose subjects you enjoy, because if you like a subject, you are far more likely to do well in it.

If you need some help choosing your options you can have a look at the following page, where there are some potential trios you could choose that would help lead you into a STEM career, but feel free to mix and match to better suit your tastes.



Remember: There is no 'one path' for any career, nor will what you choose now set your future in stone. Over your lifetime, your goals will change. Sometimes making money will be what's most important to you, other times it might be having more time for your family, or simply doing something you love. You are going to change your mind, probably many times over, and that is OK. Life isn't about your end destination, it's about the path you travel to get there.



# What National 5s should I take?



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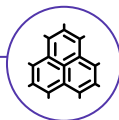
Here I have created some potential subject trios, and possible careers these could lead you into. These aren't set in stone, for instance, to be a chemist, obviously you don't need to take P.E., but hopefully it will give you some inspiration.

”



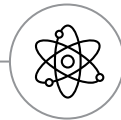
## Engineer

Maths  
Physics  
Engineering Science



## Chemist

Chemistry  
Maths  
P.E.



## Theoretical Physicist

Maths  
Physics  
Computing



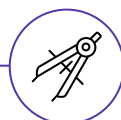
## Food Scientist

Food and Nutrition  
Chemistry  
P.E.



## Marine Biologist

Biology  
Art  
Geography



## Cartographer

Computer Science/I.T.  
Geography/History  
Foreign Language

# Scottish STEM Timeline

Scotland has a long legacy of prominent figures and contributions to Science, Technology, Engineering and Mathematics. Journey through this timeline to see just some of the amazing people and contributions!

## Medical/Botanist, Elizabeth Blackwell, 1730



'A Curious Herbal' was written; it was a significant book for medicine, outlining medicinal plants, written by **Elizabeth Blackwell**.

## Modern Economics, Adam Smith, 1776



**Adam Smith** released a paper that linked the distribution of wealth to political and social factors; this paper was the first of its kind.

## First Woman Elected to the Royal Astronomical Society, Mary Sommerville, 1835



**Mary Somerville** made significant contributions to science through her own published work, and the translation and interpretation of the works of others.

## Pneumatic Tyre, Robert William Thomson, 1847



Modern rubber tires filled with air were invented by **Robert William Thomson**.

## Logarithms, John Napier, 1614



**John Napier** releases a paper containing 57 pages explaining natural Logarithms.

## Flush Toilets, Alexander Cumming, 1755



The S-trap device invented by **Alexander Cumming** is still in use today.

## Statistical Graphs, William Playfair, 1786



**William Playfair** was the founder of graphical methods of statistics, such as pie charts. He devised them as part of his role on spying on the French Army.

## Electric Clock, Alexander Bain, 1840



The first mechanical clock powered by an electric current was invented by **Alexander Bain**.

# Scottish STEM Timeline

## Protozoologist, Muriel Robertson, 1909



The majority of **Muriel Robertson's** research concerned the lifecycle of *Trypanosoma Gambiense* – the cause of Africa sleeping sickness. However, during both world wars, she investigated the cause behind gas-gangrene.

## Penicillin, Alexander Fleming, 1928



**Alexander Fleming** discovered Penicillin, the first broadly effective antibiotic substance for which he was awarded a Nobel Prize.

## Marine Biology, Isabell Gordon, 1961



**Isabella Gordon** was an expert who specialised in carcinology (study of crustaceans); she worked in the Natural History Museum and received an OBE for her work.

## Telephone, Alexander Graham Bell, 1875



**Alexander Graham Bell** is recognised for patenting the first telephone. He also co-founded the American Telephone and Telegraph Company (AT&T) which still operates today.

## Television, John Logie Baird, 1923



**John Logie Baird** demonstrated the first working television, subsequently going on to invent the colour television.

## Geology, Maria Gordon, 1932



**Maria Gordon** produced comprehensive work on the geology of the Dolomites, which earned him the Lyell Medal and professional acclaim.

## Dangers of Radiation, Charlotte Auerbach, 1967



**Charlotte (Lotte) Auerbach** was a geneticist who carried out a substantial volume of work on mutagenesis – the process by which genetics are changed by a mutation.



# Scottish STEM Timeline

## Beta Blockers, Sir James Black, 1988



**James Black** was co-awarded the Nobel Prize for his work that led to the creation of Beta Blockers, which are widely used to treat angina and anxiety.

## Falkirk Wheel, Tony Kettle, 2002



**Tony Kettle** is an architect responsible for the Design of the Falkirk Wheel, the world's first and only rotating boat lift that connects two canals.

## Tractor Beam, St Andrews Uni, 2013



**Scientists at the University of St Andrews** were successful in creating the first functioning tractor beam able to pull an object on a microscopic level.



# Sisters in STEM: The hall of fame

Will you be in here one day?





# Professor Dame Jocelyn Bell Burnell

**Subject:**  
Astrophysics



**Professor Dame Jocelyn Bell Burnell is an astrophysicist from Northern Ireland. She is known for discovering the first radio pulsars. Radio pulsars very dense stars that spin really fast and emit radio waves in regular intervals, called pulses.**

After completing her bachelor's degree at University of Glasgow, Bell Burnell pursued a PhD at the University of Cambridge. During this time she operated a radio telescope – a normal telescope detects visual light waves, whereas a radio telescope detects radio waves. One day she noticed some interference in the data – this was especially surprising since it would appear every three seconds. Her supervisor brushed this off as man-made interference but Bell Burnell investigated further.

After a lot of research Bell Burnell concluded that these 'pulses' were coming from stars. She and her supervisor wrote up her findings and published them in a scientific journal. As this was a huge scientific discovery, it garnered a lot of media attention and as a result, a Nobel Prize was awarded. However, despite her instrumental role in their discovery, it was Bell Burnell's supervisor and a male co-worker who took home the Nobel Prize in 1974 and she was not acknowledged.

Since then however, Bell Burnell has made a name for herself as a world-renowned astrophysicist. She has held positions at the Royal Observatory in Edinburgh, Princeton University, Oxford University and many more. She was even the President of the Royal Astronomical Society for two years. Bell Burnell has since been recognised for her contributions to science, however she still does not have a Nobel Prize.

# Professor Dame Anne Glover

**Subject:**  
Biology



**Professor Dame Anne Glover is a Scottish biologist and academic. She is known for serving as the Chief Scientific Adviser to the President of the European Commission.**

Glover is originally from Dundee but went to the University of Edinburgh for her undergraduate degree in biochemistry. After this, she went on to do a masters and PhD at the University of Cambridge.

Glover started her career as a professor of molecular and cell biology at the University of Aberdeen. However, in 2006 she was named the first ever Chief Scientific Advisor for Scotland. This is a really important role as Scottish government relied on her expert scientific opinion to make informed decisions about important matters, such as health, technology and climate change.

After her success as the Scientific Advisor for Scotland, Glover took an even more impressive position within the European Commission. As Chief Scientific Adviser to the President of the European Commission she would supply scientific insight for the use of the European Parliament.

This is not the only prestigious role that Glover has held, she was also elected President of the Royal Society of Edinburgh between 2018 and 2021. The Royal Society of Edinburgh is an organisation that brings together highly accomplished experts from different fields to promote learning, research and innovation in Scotland. The group organises events, publishes academic works and provides advice to the government when needed. It is very difficult to be selected to join the Royal Society at all, but to be elected president is a very significant achievement.

Glover is passionate about using science to make a difference in the world, which is why she excelled at her advisory roles both for the Scottish government and the European Commission.

# Dame Muffy Calder

**Subject:**  
Computer Science



**Dame Muffy Calder is a Canadian born British Computer Scientist, who served as a Chief Scientific Advisor to the Scottish government during 2012 to 2015. Calder is now the Vice-Principal and Head of the College of Science and Engineering at Glasgow University.**

She came over to Scotland to study, completing her bachelor's degree of Computing Science at the University of Stirling and went on to complete a PhD at the University of St Andrews in Computational Science. While working as the Chief Scientific Advisor to the Scottish government she set up the Scottish Science Advisory Council (SSAC) which is Scotland's highest level science advisory body. It provides independent advice and recommendations on science strategy, policy and priorities to the Scottish government.

Calder's current research focuses on modelling and reasoning around complex sensor-based systems by constructing computational models, which are then used to test the behaviour of the system under different circumstances. Her work throughout her career has gained her much recognition; she currently holds fellowships with various institutions including the Royal Society of Edinburgh and the British Computer Society. Her most prestigious accolade was when she was appointed an Order of the British Empire (OBE) in 2011 for her services to Computer Science.



“I wanted to be a scientist for as long as I can remember, and I went to university to study Mathematics and Physics. I didn't know about computing then and indeed a teacher at school had told me that I wouldn't like computing, but I took a course in programming at university and just loved it! I found it was my calling.”

# Dame Raffaella Ocone

**Subject:**  
Chemistry



**Dame Raffaella Ocone is the first woman to be a professor of Chemical Engineering in Scotland; the second in the UK. Ocone is currently a Professor at Heriot Watt University and a Fellow of the Royal Academy of Engineering.**

She was born and studied in Italy, graduating from the University of Naples Federico II with a degree in Chemical Engineering. Following that, she went on to complete a masters and PhD in Chemical Engineering at the Ivy League University, Princeton. Her career has seen her travel amongst various universities in both American and Europe before she settled at Heriot Watt, where she has been a professor since 1999.

Ocone's work focuses on the development of technologies that aid sustainable and clean energy generation at large scale. This involves looking at technical challenges that might hinder these conversion processes from being efficient. She has started to use Artificial Intelligence to assist with the analysis of the huge amount of data generated from these processes in industry.

Ocone is a leader in her industry, co-authoring the Royal Academy of Engineering report on the Biofuel Industry funded by the UK government. Her work has not only gained her respect and recognition, but she was also elected a Fellow of the Royal Academy of Engineering in 2013 and received an Order of the British Empire for services to engineering in 2019.

**"Diversity is the most important aspect of my work and I really hope I can inspire our younger generation – especially young women – to study engineering."**





# Greta Thunberg

**Subject:**  
Environmental Science



**Greta Thunberg has become a household name worldwide, well known as an environmental activist, primarily for her challenge to world leaders to take immediate action against climate change.**

She is also autistic, but she has more than proved that being autistic does not have to be a detriment. When Greta was 15 she became a rather unusual truant from school. While most 15 year olds skipping class would be going shopping, or hanging out with friends, she ditched her lessons to hang outside the Swedish Parliament brandishing a sign declaring Skolstrejk för klimatet ('School Strike for Climate').

Climate Change has strong roots in science, as it was scientists who proved its existence, and its seriousness. Also, it is only our scientific advancements that can allow us to escape global devastation, making Greta not only an environmental activist, but also earning her a place with our Sisters in STEM.

Greta has given speeches at a number of global events, including the UN Climate Event of 2019 where she told world leaders, "You have stolen my dreams and my childhood with your empty words". Her influence has become so renowned that it is known as the 'Greta Effect' and she has inspired school strikes all around the world. She has even written a book called 'No One Is Too Small to Make a Difference', which is a collection of her speeches.



# Professor Sarah Gilbert

**Subject:**  
Vaccinology



**Professor Sarah Gilbert led a team of researchers in designing the genetic code for the AstraZeneca vaccine which has been used to help immunise the UK population against COVID-19.**

Sarah almost left the field of Science altogether when she grew irritated by the ‘tunnel like focus’ expected of those in her field at the University of East Anglia while she was studying for her PhD.

She had been inspired into her studies by the wide array of experience available in the department of Biological Sciences, finding the breadth of topics and avenues to explore truly exciting. However, the expectations on her to reduce her focus to a fraction of what was out there caused her to almost abandon science altogether. It was the practicalities of life, such as the need for an income, that caused her to give her scientific career ‘one more go’, and we are all the better for it.

After completing her PhD, Sarah got a job in the research of manipulating brewing yeast (which is what is used in creating beer). In 1990, she got a job at a biopharmaceutical company manufacturing drugs. She gave birth to triplets in 1998 after which her partner gave up their career to be the primary carer, allowing Sarah to continue her career, and continue it she did. By 2010, she was a professor at the Jenner Institute and started her work designing, and then creating, a novel influenza vaccine.





Dr. Stephanie  
Boyle

**Subject:**  
Computer Science



**Dr. Stephanie Boyle is a Scottish data analyst. Data analysts collect and analyse data. They then use this new information to make decisions based on the data. A lot of different organisations have data scientists on their teams as they help managers make informed decisions based on data evidence.**

Boyle studied Psychology at the University of Glasgow including one year studying abroad at the University of California, Berkeley. After this, Boyle returned to Glasgow to complete her PhD in Cognitive Neuroscience.

Neuroscience is the study of the nervous system, including the brain. Neuroscientists study the structure, function and development of the brain. This information is then used to describe behaviour and other cognitive functions.

While completing her PhD, Boyle undertook some teaching positions within the university. She even designed and taught her own course called 'Introduction to Psychology', which focused on the basics of brain science and practical data science topics relevant to research students.

Boyle began working as a data scientist in 2017, the year she finished her PhD. She worked her way up through multiple companies trying out lots of different things. Boyle even taught coding at not-for-profit CodeClan bootcamps. CodeClan is a Scottish digital skills academy which aims to help people find careers in tech. They even run a SQA accredited Youth Academy Bootcamp, which teaches young people how to code.

Dr. Stephanie Boyle still works as a data scientist but now with Komoot, which is an app for navigation and route planning.

# Professor Monica Grady, MBE

**Subject:**  
Space



**Professor Monica Grady came from a large family, being the oldest of eight children, but she didn't let that hold her back. She has flown from strength to strength.**

Her work in meteoritics has made her a leading British Scientist, as well as giving her international recognition, and earning her a Commander of the British Empire award. And, if that is not cool enough for you, she also has an asteroid officially named after her; asteroid 4731 has been called Monicagrady in her honour.

Like many great scientists before her, Monica is religious, proving all those people who say science and religion don't mix wrong. As a practising catholic she is yet another example that science and religion do not have to be at odds with one another.

On Desert Island Discs, Monica said she was in no way naturally intelligent, but instead had to work hard for her position in class, but work hard she did and it paid off. She is now Professor of Planetary Science at the Open University, and Chancellor of Liverpool Hope University. She has published various papers on an array of meteorite-related topics.



# Mary Sommerville

## **Subjects:**

Mathematics  
and Astronomy



**Mary Sommerville was elected as one of the first female Honorary Members of the Royal Astronomical Society. However, she was a polymath with an interest in various subjects, especially Mathematics and Astronomy.**

Sommerville was very accomplished in her lifetime, being held in very high esteem; she was chosen to appear on the Scottish polymer £10 notes launched in 2017.

Her early years education was minimal, she was taught to read but not write by her mother. Eventually she was sent to a boarding school for girls aged 10, where she was taught how to write French and English. Somerville was eager to continue to learn when she returned home, therefore spent most of her time in the family library. Her education then continued with a series of different schools in Edinburgh and private tutors, which expanded her knowledge in a wide area of subjects.

She married a distant cousin; an admiral of the Russian navy, with whom she had two children before he died. He did not think highly of women with intellectual ambitions, however the inheritance she received from his death allowed her the freedom to pursue her intellectual interests. She was encouraged to continue her studies, eventually crossing paths with William Wallace, a Scottish mathematician and astronomer with whom she would discuss mathematical problems.

Her first notoriety came in 1811 when she won a silver medal for solving a Diophantine problem. She went on to publish volumes of her own work as well as translations and adaptations of other popular works. Most notable was 'The Mechanism of the Heavens' which was a translation of 'Mecanique Celeste' by Pierre-Simon Laplace; this immediately made her famous and was used as a textbook for undergraduates at the University of Cambridge until the 1880s.

# Natalia Pasternak Taschner

**Subjects:**  
Microbiology



**Natalia Pasternak Taschner is a microbiologist whose press columns, radio and TV appearances have brought life-saving scientific information to the masses in Brazil during the COVID-19 pandemic.**

She is also the founder and current president of the non-profit organisation Instituto Questão de Ciência (Question of Scientific Institute), which is dedicated to promoting and defending scientific evidence in public policies. This is not the first initiative she has been part of to spread scientific understanding. She founded a science café blog, Café na Bancada (Coffee on the Lab Bench), with the aim of spreading scientific understanding over coffee.

She later became the director of Pint of Science where she coordinated science lectures in bars. Natalia also organised São Paulo's first ever specialised course in public communication of science in early 2020, with the aim of training journalists in how to spread scientific information widely. Also in 2020, she was made a fellow of the Committee of Sceptical Inquiry.

**“As a granddaughter of the Holocaust, I know what authoritarian governments can do to people. Speaking up for science in Brazil during the pandemic was my contribution to keep the ‘Never Forget’ alive.”**



# Helen Sharman

**Subjects:**  
Astronaut



**Helen Sharman has covered a range of careers over her life, from astronaut, to author, to radio presenter, to chemist. She even featured on an episode of Hollyoaks.**

Helen was the very first western woman, and also the very first British person, to go into space! Helen was just 27 years old when she went into space in 1991 for Project Juno, putting her in the top ten youngest people in space.

While in space, Helen conducted a range of both medical and agricultural tests, as well as photographing the British Isles from space and participating in an amateur radio hookup to communicate with British schoolchildren. Her home city recognised her with a star on the 'Sheffield Walk of Fame' for her accomplishments on the space mission.

Two years after returning to Earth, Helen published her autobiography, 'Seize the moment', and in 1997 she published a children's book called 'The Space Place'. She has presented both radio and television shows for BBC Schools and in 2015, she became the Operations Manager for the Department of Chemistry at Imperial College London.

**"Aliens exist, there's no two ways about it but it's possible [...] we simply can't see them."**





Every woman's success should be an inspiration to another. We're strongest when we cheer each other on.

Serena Williams

Extremists have shown what frightens them most... a girl with a book.

Malala Yousafzai

Be the woman who fixes another woman's crown without ever telling the world it was crooked.

Anamika Singh

A girl should be two things: Who and what she wants.

Coco Chanel

If the game doesn't allow you to be yourself, change the game.

Rebekah Coleman

There is no limit to what a woman can accomplish.

Michelle Obama



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