

# Materials Scientist

## Introduction

Materials Scientists study the qualities, characteristics and uses of materials. They research and develop new materials and improve the use of existing ones. They test how materials react to conditions such as temperature, pressure and stress, and tackle problems such as corrosion and metal fatigue.



## Work Activities

As a Materials Scientist, you will use your knowledge and expertise to research and develop new materials, and to improve the use of existing ones. You will also select the best materials to suit particular tasks. Your role will include researching, testing and developing new products in a wide variety of industries, including metals, polymers, plastics, natural and synthetic fibres, ceramics, glass and sand.

You will play an important part in the design and development of engineered products and structures, including aircraft, oil refineries, nuclear power plants, civil engineering projects, sports equipment, and medical technology, such as artificial limbs.

Some Materials Scientists specialise in one type of material. For example, there are:

- Glass Technologists
- Ceramics Technologists
- Plastics Technologists
- Metallurgists (who specialise in metals)

You might be working on low carbon material technologies - helping to develop new materials which are less harmful to the environment. Materials Scientists search for ways to recycle materials, and to reduce waste and energy consumption - you could play an important role in protecting the future of the planet.

You could use a variety of techniques to investigate materials' physical structures and to assess their behaviour under conditions such as temperature, pressure and stress.

For example, you could use an electron microscope or X-ray to examine internal structures. This can reveal how materials are changed, for example, by extreme temperatures. You'll use specialist software to test and evaluate materials. This could involve creating digital models of a particular materials' internal structure and reaction to various experiments.

As a Materials Scientist, you will usually work in a laboratory and you might need to wear protective clothing such as a hard hat, boots and gloves.

Being able to read, write and speak Welsh may be an advantage when you're looking for work in Wales.

## Personal Qualities and Skills

To become a Materials Scientist, you'll need:

- problem-solving skills
- an interest in the practical use of science (especially maths, physics and chemistry)
- an interest in engineering, industry and manufacturing
- a patient, methodical and investigative approach to research and development
- accuracy and attention to detail
- the ability to explain your findings clearly and concisely, including in written reports
- teamwork skills

- the ability to use technology, including computers
- willingness to learn and develop new knowledge, and keep up to date with scientific advances throughout the world

## Pay and Opportunities

### Pay

The pay rates given below are approximate.

- Starting: £30,000 - £34,000
- With experience: £37,000 - £45,500
- Senior Materials Scientists earn £49,500 - £54,000

### Hours of work

You will usually work 37 hours a week, Monday to Friday, with occasional late finishes, and shifts are common in production work.

### Where could I work?

Employers are producers of:

- metals
- plastics
- polymers
- synthetic rubbers
- natural and man-made fibres
- ceramics
- glass

Other employers are firms that use materials, for example, engineering industries, telecommunications, gas, electricity, chemical, oil and nuclear power companies.

Research opportunities are in private industry, university laboratories, industrial research associations, contract research laboratories and government laboratories, such as the Defence Science and Technology Laboratory (Dstl), the National Physical Laboratory and the BRE (known in the past as the Building Research Establishment).

Opportunities occur in towns and cities throughout the UK. There are also opportunities for Materials Scientists to work in other countries.

This career could involve working for an agency.

### Self-employment

Some Materials Scientists work as self-employed consultants.

### Where are vacancies advertised?

Vacancies are advertised on the website of the Institute of Materials, Minerals and Mining. They appear in scientific magazines and journals such as New Scientist (which also posts jobs on its website).

Vacancies are also advertised in local/national newspapers, on recruitment and employers' websites, and on Find a Job ([www.gov.uk/jobsearch](http://www.gov.uk/jobsearch)).

Social media websites, such as LinkedIn, Twitter or Facebook, are a great way to network, find vacancies and get in contact with possible employers. Make sure that your profile presents you in a professional manner that will appeal to potential employers.

Take a look at our General Information Article 'Finding Work Online'.

## Entry Routes and Training

### Entry routes

To become a Materials Scientist, you'll need a relevant degree. Entry can also be possible with a relevant foundation degree or HND/HNC, although this is more likely to lead into a Technician-level post.

Specialist degrees in materials science are available. Universities usually offer materials science in combination with engineering or, sometimes, science subjects such as chemistry.

It's also possible to enter after completing a degree in a related subject, such as physics, chemistry or engineering. You might want, or employers might expect you to have, a postgraduate qualification in materials science.

A great way to get into this career is through an internship. Take a look at our information article 'Internships', for more details.

Some universities offer degree courses with a foundation year. This is an extra year for students who don't have the specified science A levels for entry.

You might be able to go get into this career by taking an Intermediate or Advanced Level Apprenticeship, and working your way up.

### Training

Training might be on-the-job, for example, in particular lab techniques or specialist equipment. Continuing professional development could involve going on short courses, teaching others, and going to conferences, seminars and workshops.

### Work Experience

Previous experience working as technicians in relevant industries, for example, polymers, plastics or ceramics would be really useful for this career.

## Qualifications

For entry to a degree in materials science/technology, the usual minimum requirement is:

- 2/3 A levels, including at least one from maths, physics and chemistry. Design and technology is also a useful subject.
- GCSEs at grade C/4 and above in your A level subjects
- a further 2/3 GCSEs at grade C/4 and above, including English and maths

Alternatives to A levels include:

- BTEC level 3 qualifications
- the International Baccalaureate Diploma

However, course requirements vary, so please check college/university websites very carefully.

Some universities accept the Welsh Baccalaureate as equivalent to 1 A level.

## Adult Opportunities

### Age limits

It is illegal for any organisation to set age limits for entry to employment, education or training, unless they can show

there is a real need to have these limits.

### **Skills/experience**

Some entrants have gained skills by working as technicians in relevant industries, for example, polymers, plastics or ceramics. Other entrants have gained skills on industrial work placements.

### **Courses**

If you don't have the qualifications needed to enter a degree, foundation degree or HND course, you might be able to start one after completing an Access course, for example, Access to Science. You don't usually need any qualifications to enter an Access course, although you should check this with the course providers.

A foundation year before the start of a science degree or HND is available at some universities and higher education colleges for students who don't have the science A levels usually needed for entry to the course.

### **Funding**

Funding for study of materials science/metallurgy is available from the Worshipful Company of Founders. Sponsorship for higher education study is available from some industrial organisations and manufacturing companies.

Funding for postgraduate study and research is available, through universities, from the Engineering and Physical Sciences Research Council (EPSRC).

## **Further Information**

### **Contacts**

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- **Engineering and Physical Sciences Research Council (EPSRC)**  
Address: Polaris House, North Star Avenue, Swindon SN2 1ET  
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Website: [www.epsrc.ac.uk](http://www.epsrc.ac.uk)
- **Institute of Materials, Minerals and Mining (IOM3)**  
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- **Worshipful Company of Founders**  
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Website: [www.foundersco.org.uk](http://www.foundersco.org.uk)
- **People Exchange Cymru (PEC)**  
Public sector recruitment portal for Wales  
Email: [peopleexchangeymru@gov.wales](mailto:peopleexchangeymru@gov.wales)  
Website: [www.peopleexchangeymru.org.uk/home](http://www.peopleexchangeymru.org.uk/home)

## Related Careers

- Biochemist
- Biomedical Scientist
- Astronomer
- Biotechnologist
- Botanist
- Analytical Scientist
- Analytical Chemist
- Colour Technologist
- Ecologist
- Forensic Scientist
- Biology Laboratory Technician
- Chemistry Laboratory Technician
- Physics Laboratory Technician
- Marine Biologist
- Microbiologist
- Acoustician
- Zoological Scientist
- Toxicologist
- Clinical Research Associate
- Process Development Technologist
- Soil Scientist
- Laboratory Technician
- Scientist
- Biologist
- Physicist