

What is geology?

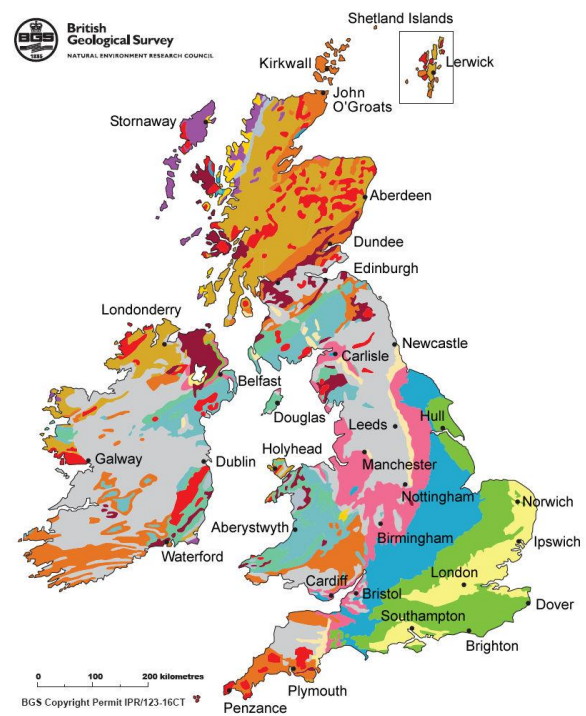
Geology is the study of the Earth's structure and 4.567 billion years of natural history. A science subject, geology underpins the provision of resources to the UK's population and industry, delivers a wide range of essential services, and helps us understand how we can live more sustainably on our planet. More information on geology as a science can be found here: www.geolsoc.org.uk/geology-for-society

In schools, geology can be taught as a GCSE and an A level. Currently, OCR and EDUQAS both offer a geology A level qualification.

Benefits of A level Geology

Studying A level Geology encourages students to think as a scientist, requiring a questioning approach to a modern science. It provides them with the opportunity to view ideas holistically, developing problem-solving skills ready for university.

One of the main positives of the course is the focus on practical skills and fieldwork. Taking students outside to see exposures of rock 'in the field' gives them the chance to apply scientific hypotheses to real situations. Michael Bolton, Director of Communications for the Field Studies Council has said that: ***"Field studies enable students to work in three dimensions in the real world, visualizing and manipulating data and building their skills as problem solving geologists. Fieldwork also provides students with the opportunity to develop their work-based skills, such as communication, observation and team work.*** The practical endorsement for A level Geology requires a minimum of six days of fieldwork: two at AS and four at A2. Students are then tested on their knowledge of practical fieldwork methods, making fieldwork applicable to all.



A Geological Map of the UK and Ireland.

IPR/123-16CT British Geological Survey © NERC. All rights reserved.

Geology as a science subject

The Geology A level is now one of OFQUAL's six science subjects. The subject content states that, 'AS and A level geology specifications must build on the skills, knowledge and understanding set out in the GCSE content for science and mathematics'.

This scientific approach to geology is carried through to the examination boards. For OCR, geology is now placed firmly alongside physics, chemistry and biology as its fourth science subject. The method of examination for all four subjects is similar for each, ensuring the same level of scientific training across the board.

This has been achieved by focusing on the application of scientific knowledge, rather than simply recalling definitions. Examinations also now give a greater weighting to the 32 mathematical skills included in the subject content, necessitating a better understanding of mathematics and statistics from students. This shift reflects the work of professional geologists in industry more realistically.

Left: students search for copper in a desk activity at the Geological Society.

Fieldwork case study

Some schools take their students to local fieldwork sites in Year 12 and go further afield in Year 13. This is how one school in East Anglia chose to fulfil their practical endorsement:

Year 12 - One day of fieldwork at Highwood Quarry, an aggregate quarry in the local area. Here, the students learn how to describe sedimentary rocks in the field, undertake a graphic log, study unconformities and interpret sedimentary environments. The visit also introduces aspects of economic geology. A second day involves studying coastal exposures at Walton on Naze, Essex. Here, contrasting sedimentary environments are studied, allowing development of field sketching skills, identification and description of fossils in situ, more graphic logs and again an opportunity to decipher ancient environments.



Year 12 students learning field skills at Highwood Quarry

Year 13 - For the four days required fieldwork, students travel to the Lochranza Field Centre on Arran, Scotland. This independent Field Centre offers taught geology field courses, tailored to either examination board. At Lochranza, students learn how to: describe and identify a wide range of igneous, sedimentary and metamorphic rocks; interpret geological structures and cross-cutting relationships; construct simple geological maps based on field measurements and recognise Arran's place in the geological history of the UK. More information on the Lochranza Field Centre can be found on our blog post: blog.geolsoc.org.uk/2017/04/11/the-lochranza-field-studies-centre/

Changes to the subject content

The subject content for all A level qualifications changed in 2016. For geology, these changes were welcome as the content had not been revisited in nine years and contained some outdated information. Examples of where the subject content has been modernised are:

- The Richter scale has been replaced by the Moment Magnitude scale for earthquake measurement.
- The focus on coal has been removed, now that it plays a much smaller part in the UK's energy mix.
- The use of IT has been updated to include Global Positioning Systems and Geographic Information Systems.

These changes to the A level specification not only modernise the subject matter but are also a better preparation for students planning to study geology, or other sciences at degree level. Having been written in partnership with 29 key stakeholders, including universities and industry experts, the new course provides transferable scientific skills applicable to a wide range of university courses.

Higher Education and beyond

Geology is a more popular subject at university than most people realise, with 1455 geoscience places open to students in 2017 (UCAS). Research conducted by OCR shows that students who have studied the Geology A level are 19 times more likely to study geology at university than those without, revealing just how inspiring the Geology A level is.

Career prospects are also strong among geology graduates. Geology is a hugely relevant sector of the UK economy, contributing 16% of total UK GVA through production and first use industries in 2013 (Confederation of British Industry Minerals Group). Even with this strong economic dependence, geologists are in short supply, with geologists, geochemists, geophysicists and hydrogeologists all featuring on the Home Office shortage occupation list.

Geology teaching

Many geology teachers initially specialise in geography or science teaching. In 2017, almost 10% of the Royal Geographical Society's teaching bursaries went to Earth science graduates. Currently, there are two geology CPD courses available for teachers, the Geology Summer School at Keele University and the Geoscience Education Academy at the Geological Society.