THE GEOLOGICAL SOCIETY

SUBMISSION TO DEPARTMENT FOR EDUCATION CALL FOR EVIDENCE: CURRICULUM AND ASSESSMENT REVIEW Improving the curriculum and assessment system - GOV.UK

Section 1: About you

The Geological Society is the UK's learned and professional body for geoscientists and a major international publisher with around 12,000 Fellows (members) worldwide. The membership encompasses those working in industry, academia, regulatory agencies, and government with a broad range of expertise on policy-relevant Earth sciences. The Society is a leading communicator of the geosciences to government bodies, those in education, and other non-technical audiences.

As the national forum for the debate and development of cutting edge geoscience, the Geological Society has a special responsibility to communicate this science and its importance to society, the Government, the media, other scientific communities and the general public. We engage with Parliament, Government, industry and academia to fulfil this purpose.

We have responded to questions in this Call for Evidence as and where they relate to geoscience and The Geological Society's strategy, mission and values[1].

Please contact us at policy@geolsoc.org.uk with queries.

Geology in the national curriculum

Geology is the study of the Earth's structure, history, natural environment and evolution. It underpins the provision of resources, delivers a wide range of essential services, and helps us understand how we can live more sustainably on our planet.

Key Stage 1-2, Age 5-11

Geology is not taught within the national curriculum as a standalone subject below GCSE level. However, students are introduced to geoscience subjects in Key Stage 1 as part of Science and Geography. In KS1 Geography, students are introduced to continents and oceans, learning about environmental features such as coasts, mountains, and rivers as well as weather and seasons. KS1 Science students learn about everyday materials including rocks and their properties and uses in day to day life. By Key Stage 2 geoscience topics become more prevalent in Science where students are introduced to fossils, rocks, soils, and evolution. At KS2 students also cover Earth and space, specifically learning about planetary movement. In KS2 Geography students learn about climate, landscapes, the water cycle and natural resources.

[1] The Geological Society

Key Stage 3, Age 11-14

In KS3 Science, students learn about the rock cycle including the composition and structure of the Earth, the atmosphere and interactions between carbon dioxide and climate, and Earth's magnetism. In KS3 Geography, students learn about plate tectonics, weathering, and glaciation – building their knowledge of Earth's creation and evolution. They also begin to learn about the interplay between environmental and anthropological influence on our planet. In KS3 Physics students are exposed to a number of topics with links to Earth and planetary geoscience such as sound waves, magnetism and space physics.

Key Stage 4, Age 14-16 (GSCE)

By Key Stage 4, students can study Geology as a standalone GCSE or continue to engage where it overlaps with other subjects. All students can take a GCSE in Core Science at Key Stage 4. Most then take extra science either as 'Additional Science', 'Applied Science', or through individual science subjects leading to GCSE awards in Physics, Chemistry and Biology.

At Key Stage 4, for students who cannot take a GCSE specifically in Geology, geoscience content is present in the GCSE Geography and Science courses. Geoscience topics common within general science subjects at this stage include the composition of Earth's atmosphere and evidence for climate change, atmospheric pollutants, water resources, energy sources (renewable and non-renewable) and radioactive materials.

Some GSCE specifications contain geoscience topics such as the introduction of P and S waves, Earthquakes, and seismographic traces in GSCE Physics or Earth and atmospheric science in GCSE Chemistry. Geography is not a compulsory subject at KS4 and thus there is no specific national curriculum statements and geoscience topics are decided by individual examination boards for their GCSE specifications. Some geoscience topics that appear in AQA GCSE geography content includes natural hazards, earthquakes, plate tectonics, climate change evidence in the environmental record, fluvial and glacial processes and landforms.

The Eduqas/WJEC exam board offers GCSE Geology and the syllabus is administered by the WJEC. The addition of Geology GSCE at Key Stage 4 extends the availability of geoscience content well beyond that offered by Key Stage 1-3. In addition, there are plans to offer a Natural History GSCE by 2025[2] which will "enable young people to explore the world by learning about organisms and environments, environmental and sustainability issues, and gain a deeper knowledge of the natural world around them". The Natural History GSCE is a welcome and valuable addition to the national curriculum – offering students an opportunity to "learn more about the natural world around them than ever before and understand how they can play a part in making sure future generations can enjoy a cleaner, safer, greener world." However, as with other subjects where geoscience topics are included within the specification, clearly signalling to students which elements are geoscience

[2] The new Natural History GCSE and how we're leading the way in climate and sustainability education – your questions answered – The Education Hub

would be beneficial for building awareness and fostering a connection with higher education and employment options.

Key Stage 5, A-Level (Age 16-18)

At Key Stage 5, students can elect to study Geology at A Level with courses offered by OCR and Eduqas/WJEC. A Level Geology students focus on developing a scientific understanding of the Earth, its evolution and the role of geology in society. Students develop critical practical skills through 4 days of fieldwork in their final year e.g., observing, collecting and analysing geo-located field data and developing mathematical problem-solving skills. This enhances their understanding of central geological paradigms e.g., uniformitarianism and the idea that "the present is the key to the past", alongside topics of geological time, plate tectonics and Earth's spheres (lithosphere, hydrosphere, biosphere, atmosphere).

If students are unable to take Geology at A Level, they may continue to explore geoscience themes through A Level Geography, where they are introduced to themes of plate tectonics and natural hazards e.g., volcanoes and earthquakes. In Geography, Physics and Chemistry A Level geoscience topics such as the carbon cycle, electric, magnetic and gravitational fields, Earth materials, isotopes and hydrocarbons are covered.

Data held by the Earth Science Teachers Association indicates that in 2024, 27 education centres in England and Wales offered GSCE Geology and 96 centres offered A Level[3]. The uptake of these courses in the same year was at 1100 students for A Level and 564 for GSCE. Since the 2014 curriculum review the uptake of formal Geology qualifications has been in decline until recently[4].

Higher education and employment: Geoscience for the future

Geology incorporates a wide spectrum of science subjects in order to build up a detailed and accurate picture of the conditions that existed at a particular point in Earth's history.

An undergraduate degree is beneficial for those aiming to become professional geologists, and is offered by university departments of *geology*, *geoscience*, or *Earth and environmental science*. About 40 UK Universities offer degrees in Geology, Geoscience or Earth and environmental science.

In recent years, geologists have been in huge demand across the UK, with geologists, geochemists, geophysicists and hydrogeologists all featuring on the UK Government's Shortage Occupation List.

Geoscientists will be crucial in meeting society's future challenges, be that through the United Nations Sustainable Development Goals, the Paris Agreement to avoid dangerous climate change,

[3] UK centres offering GCSE or A Level Geology | Earth Science Teachers' Association
[4] JCQ / ESTA, 2024

or through other important policies to protect the environment and ensure the availability of vital resources for all.

Geoscientists will be critical in:

- Ensuring access to clean and sustainable water supplies
- Sourcing and extracting critical minerals needed for green technologies like solar and wind power
- Understanding the subsurface to harness geothermal energy, enable safe infrastructure development, and carbon capture and storage technologies
- Mitigating climate change and influencing governmental policy through understanding past climates, modelling potential future outcomes and understanding climate impacts on the environment, livelihoods and natural hazards

In addition, many trained geoscientists are employed in geoscience-adjacent or non-geoscience sectors. This demonstrates the value of geoscience training and experience to society, and that the transferable analytical and problem-solving skills provided by a geoscience degree are widely recognised by employers. Examples of the sectors in which many geologists are employed include:

- Banking
- Insurance
- Regulation
- Environmental / Sustainability Consultancy
- Teaching
- Trading
- Law

Section 2: General views on curriculum, assessment and qualifications pathways

10. What aspects of the current a) curriculum, b) assessment system and c) qualification pathways are **working well** to support and recognise educational progress for children and young people?

We have answered this question as it relates to curriculum only.

- The breadth of the current curriculum allows teachers and students to draw from a wide range of topics – increasing the likelihood of capturing and maintaining students interest in subjects that inspire and engage.
- The geoscience content within the KS1, KS2 and KS3 curriculum contains good progression between levels and sensible learning objectives commensurate with pupils age and developmental stage.
- Most, but not all, students have opportunity to explore geoscience subject matter as subtopics within other subjects.

- Students who do have the chance to study for a formal Geology qualification at KS4 and KS5 have good exposure to the topic through the current curriculum.
- A survey conducted by the British Geophysical Association in 2023 suggested that most university level geophysics students felt that the Maths and Physics they studied at school prepared them adequately for their university degrees (Jenkins et al., 2024[5]).

11. What aspects of the current a) curriculum, b) assessment system and c) qualification pathways **should be targeted for improvements** to better support and recognise educational progress for children and young people?

a) curriculum

- **Signposting and subject clarity**

  The lack of signposting and identification of geoscience topics within the existing national curriculum leads to a lack of awareness and understanding among pupils of the subject – reducing students' interest and confidence in taking formal qualifications at GSCE and A-Level. Students that do have the opportunity to study geoscience topics rarely learn that they are studying geoscience and therefore miss the opportunity to develop an appreciation or understanding of the scope of the subject.

  In 2024, a wide range of geoscience and geoscience-adjacent careers were listed on the UK Government's Shortage Occupation List[6];

  - 2111 Chemical scientists in the nuclear industry
  - 2112 Biological scientists and biochemists
  - 2113 Physical scientists in the construction-related ground engineering industry, limited to
    - engineering geologist
    - hydrogeologist
    - geophysicist
  - 2113 Physical scientists in the oil and gas industry, limited to
    - geophysicist
    - geoscientist
    - geologist
    - geochemist

[5] https://academic.oup.com/astrogeo/article/65/5/5.28/7794768
[6] Skilled Worker visa: eligible occupations and codes - GOV.UK

    - technical services manager in the decommissioning and waste areas of the nuclear industry
    - senior resource geologist and staff geologist in the mining sector
- 2114 Social and humanities scientists, limited to archaeologists
- 2121 Civil engineers
- 2126 Design and development engineers
- 2127 Production and process engineers
- 2129 Engineering professionals not elsewhere classified
- 2461 Quality control and planning engineers

A recent survey conducted by the British Geophysical Association[7] illustrated that a lack of awareness of the subject was the most common reason given by current university students and graduates, for the low numbers being recruited to geophysics programmes. This evidence demonstrates the importance of signposting and clear identification of the topics and specialisms being taught within broader subjects in schools.

- **Teacher training and expertise**

The Earth Science Teachers Association[8] (the professional association for Earth science education) note that where geoscience is taught within other subjects such as Physics, Chemistry, or Geography it is rarely taught by specialists. Unless a PGCE student is able to partner with a school where Geology is taught there is no training available to Geology teachers other than through an industry sponsored CPD course run by the Earth Science Teacher's Assocation and the European Geosciences Union. This is currently the only formal training available to prepare teachers to support the 96 centres who currently offer Geology A Level and the 27 centres who offer GCSE. The Geological Society has supported teachers through the annual Geoscience Education Academy; a free two-day teacher training course for secondary school teachers and teacher trainees that aims to boost teachers' Earth science subject knowledge while providing innovative teaching ideas and activities that can be delivered in the classroom. More recently we have launched the Earth Science Ambassador scheme which places trained university students in schools to support teachers and demonstrate Earth sciences through engaging and exciting demonstrations.

In addition, Science and Geography teachers we have worked with through teacher training and CPD programs report feeling underprepared or underconfident to teach geoscience topics, leading to them being overlooked or excluded from lessons. This bias leads to inequity of access to pupils between schools and results in geoscience exposure being largely contingent on teacher experience or enthusiasm. Continuous training and

[7] https://academic.oup.com/astrogeo/article/65/5/5.28/7794768
[8] ESTA | Earth Science Teachers' Association

professional development would help Science and Geography teachers feel confident, enthusiastic and capable of teaching geoscience topics. Scrutiny of the status of teaching abilities, support, and connectivity for geoscience subject areas is likely to evidence the need for accessible training to be provided to school teachers.

- **Ubiquity of access**

  Not all schools teach or mirror the National Curriculum and in such institutions geoscience content is easily left out – resulting in opportunities to study geoscience being inequal among schools.

- **Secondary accountability measures**

  Within the Progress 8 and Attainment 8 Framework for assessing academic performance of secondary schools, Geology is categorised as an 'other' subject in Bucket 3, resulting in it being less valued by students and schools in comparison to science subjects. Since its introduction in 2014, there has been a decline in the number of students taking formal Geology qualifications nationally, implying that such accountability measures impact student's choices and prioritisation. Reconsidering the categorisation of Geology in this framework and placing it alongside Science and Geography in Bucket 2 would likely result in greater uptake of the subject by both students and schools.

- **Diverse and engaging learning experiences**
  Geoscience is an applied science which is inherently linked to real world case studies, fieldwork, and experiential learning opportunities that can be inspirational and engaging in comparison with desk-based learning. These experiences can build confidence and capacity in pupils at all educational levels, however the barrier of administration borne by schools to enable these experiences is often prohibitive, reducing students' exposure and access to opportunities. Since launching our Earth Science Ambassador program in 2023, we have experienced such high demand for ambassador workshops that we have been unable to fulfil all requests. Companies with outreach progammes report that there are significant barriers for teachers in relation to time and space within the curriculum to engage with their offerings. Creating space in the curriculum for more diverse and engaging learning experiences, supported by organisations primed to deliver outreach, would enhance students learning across the curriculum.

- **Opportunities for curriculum improvement through geology**
  i. **Exposure to problem solving and building transferrable skills** - Teachers reported that the national curriculum would benefit from being more centred on problem solving and transferrable skills rather than the current focus on knowledge and recall. Building students capacity for problem solving by using information and observations to develop, test, and then refine theories would better equip them for life. Geology offers

students the opportunity to learn skills of observation, analysis and interpretation as well as exposure to real world and practical examples. By focusing on the application of scientific knowledge, rather than memorisation of facts, Geology strongly reflects the work of professional scientists – giving students a taste of a scientific career.

ii. **Keeping pace with digital -** A curriculum that was able to evolve and keep pace with digital and technological advancements would better prepare students for the level of digital skills required in higher education and employment. Respondents to a 2023 survey by the British Geophysical Association reported an exposure to coding topics at school would have been beneficial to their geophysics degrees. As our world becomes increasingly interconnected and data-driven, integrating digital tools and technologies are revolutionising how we study and understand our planet. Through geology, students can learn about the use and application of digital tools and solutions in relation to the societal and environmental challenges of the 21st century.

iii. **Blended learning -** blending and combining subjects can help prepare students for the interdisciplinarity expected in post 19 education and employment. Due to its applied nature, geology pairs particularly well with other non-science subjects such as economics, international relations, human geography, anthropology and social science.

b) assessment

- **Breadth of subject choice and the loss of AS Levels**
- The loss of public examinations at the end of Year 12 (AS Level exams) and the reprioritization of terminal exams at the end of Year 13 (A Level exams) has reportedly had negative impact on many students. The reduction in choice to three rather than four subjects in Year 12 has reduced the breadth of study, and the lack of a public examination at the end of Year 12 has in some cases resulted in a lack of focus at this crucial stage in their education. Students who do not finish the two years of KS5 leave with no certificates. Additionally, this change has had significant impact on the number of students studying Geology at A Level (alongside other minority subjects).
- The changes to AS Levels following the 2014 curriculum and assessment review was followed by a sharp decline in the student uptake of Geology, from ~3,500 in 2014 to ~250 in 2019 (Jones & Loader, 2024[9]). Since AS Levels no longer count towards students' progression toward A Level, their appeal and popularity has declined, reducing students access to a broad and balanced range of learning themes at a critical time when students are making choices about future study and employment.
- During consultation, high school teachers told us that although high stakes terminal exams at the end of KS5 test a student's resilience and stamina, many students who are bright, knowledgeable and enthusiastic are being let down by the rigidity of the current system.

[9] P. Loader and B. Jones (2024, September). Geology exam statistics update. The Earth Science Teachers Assocation Annual Conference 2024, Liverpool University, United Kingdom.

They suggested that modular exams may be better for accessibility and balancing out opportunity among students with varying learning styles and participation needs.

c) qualification pathways

- In post-16 education, students can continue in full-time education, undertake an apprenticeship, or engage in part-time work and employment to complement their studies. Careers in the geosciences are served well by the practical and vocational experience students gain from apprenticeships and employment and having multiple pathways into the field supports a diverse workforce and ensures entry is accessible.
- The recently approved Geoscience Degree Apprenticeship (GDA) aims to provide an alternative pathway to a geoscience career, offering students the ability to earn a degree while gaining practical work experience. The process of developing a degree apprenticeship is led by industry, with support from academic advisors who work collectively as a 'trailblazer' group with support from the Institute for Apprenticeships and Technical Education (soon to be Skills England). The resulting input to the apprenticeship comes from a large and diverse group of employers that operate in the geoscience field and employ geoscientists, ensuring the course content is current, relevant and fit for the world of work.
- By offering the GDA industry is able to secure suitably trained employees via a pipeline of graduates who they work with throughout their degree. As apprentices, students complete their degree with no debts, have a paid job in the geoscience sector while earning their degree, and receive an excellent learning opportunity that combines on-the-job training with a higher education.
- Launching in 2025, the GDA is an example of the value of technical or vocational training in preparing for a geoscience career. By blending study with hands-on experience, university students have the chance to develop skills for the world of work while cementing their theoretical training through lived and practiced examples. By encouraging students in post-16 education to engage with varied qualification pathways, the curriculum serves the individuality of each student better than if options are more limited.
- Importantly, qualification pathways should support students with varying routes into employment that encourage their interests and the development of a wide range of skills and capabilities. It is also imperative that they support students to obtain skilled, well-paid and fulfilling employment and lay the foundation for a stable and successful career.
- More flexibility or the option to carry out extracurricular activities that are recognised by universities, to fill this shortfall once choices have been made, could solve this problem. A geoscience course requires a range of skills ranging from digital computing skills, fieldwork, analysis and lab skills as well as creativity. Having space in the curriculum to allow extra-curricular activities that encourage creativity, getting outdoors as well as developing digital skills would be beneficial for students' preparedness for post education employment.
- A vocational (BTEC style) geoscience qualification would offer another accessible route into geoscience.

- One expert in the field of space and planetary geoscience with experience in equity and inclusion in education reflected that "The majority of higher/further education institutions are not capitalising on schools' introductory learning to unlock potential through follow-on provisions for advanced education/training routes. This shortcoming results in missed opportunity to further the UK's abilities in innovation, scientific discovery and more to inspire and serve the public good, attract investments and mutually beneficial long-term partnerships. The necessary acceleration of home-grown talent for the UK's geoscience sector can only be achieved through improved and purposefully planned connected education and training pathways."

Section 3: Social justice and inclusion

13. In the current curriculum, assessment system and qualification pathways are there any barriers to improving attainment, progress, access or participation which may disproportionately impact pupils based on other characteristics (e.g. disability, sexual orientation, gender, race, religion or belief etc.)

- Research recently published in the Journal of Earth Systems, Science and Society has shown that interventions such as mentoring can have a positive impact on equity and participation among university students within the geosciences (Dowey et al. 2024[10]).
- The study set out to increase participation and retention of UK-domiciled Black, Asian and minority ethnic students at university level through facilitating network-building, improving awareness of research careers, enhancing confidence in continuing in research, and strengthening a sense of belonging.
- The evaluation process showed unequivocally that the ring-fenced, discipline-specific, fully funded nature of the interventions was a critical factor in participant involvement. Similar approaches deployed for school students should be considered to reduce barriers to participation faced by students with a range of protected characteristics.
- Recommendations from the project for increasing student participation include:
    a. Funding is critical to participation in mentoring programs, especially as "marginalised groups who may otherwise be unable to take part due to financial considerations, caring commitments, or a sense of isolation".
    b. Co-creation with marginalised groups who are to be the target of any intervention is essential "to understand barriers and improve inclusion".
    c. It is essential that planning and preparation consider accessibility needs and the scheduling of offerings to accommodate certain religious calendars.
    d. Longevity and due care is critical to the long-term success of interventions to improve participation as well as critical evaluation of the impacts.

[10] Earth Science, Systems and Society | The Equator Project Research School and Mentoring Network: Evaluated Interventions to Improve Equity in Geoscience Research

- In addition, research published in the same journal has examined the approach of "confronting racism and colonialism in the geosciences" with a view to teaching equity through a critical historical lens and enhancing student's learning (Diaz-Vallejo et al., 2024[11]).
- In this study, students assessed 1) biases in the processes and forms of knowledge production, legitimisation, and exclusion; 2) the source of inequities in representation in the discipline; and 3) how societal benefits and harms of scientific practices are felt disproportionately demographically and geographically.
- Approaches of this nature, while nascent in their existence, provide a blended and contextual learning of geoscience, incorporating social science and humanities analysis to better understand ethics and historical context resulting in science that is more accessible and relevant to current society.

Section 5: Curriculum and qualification content

22. Are there particular curriculum or qualifications subjects where: a. there is too much content; not enough content, or content is missing; b. the content is out-of-date; c. the content is unhelpfully sequenced (for example to support good curriculum design or pedagogy); d. there is a need for greater flexibility (for example to provide the space for teachers to develop and adapt content)?

- Geoscience is not taught as standalone science the KS1-3 national curriculum, yet it is fundamental to many pressing global issues. There is potential to teach students about climate change, the environment, resources, hazards and how the earth works through geoscience topics. Building a connection with the Earth in early education sets a strong foundation for responsible environmental stewardship throughout the rest of life.
- There are a number of elements of the existing KS4 national curriculum that could be evolved in order to encourage and promote exposure to geoscience topics within other science disciplines.
- In the 2014 curriculum review, the topic of plate tectonics was removed from the KS4 Science national curriculum. Therefore, only GCSE Geography students have the opportunity to study the theory of plate tectonics at school. Reinstating the topic of plate tectonics into the national curriculum in GSCE Science would provide students with an important opportunity to engage with one of the geosciences most fundamental recent concepts. Most logically it could be placed in the Physics section of the national curriculum where links can be made to include the distinction between asthenosphere/lithosphere, the forces that drive plate tectonics and the geophysical evidence for plate tectonics.

[11] Earth Science, Systems and Society | Critical Engaged Pedagogy to Confront Racism and Colonialism in (Geo) Science Education Through a Historical Lens

- In the current KS4 Science national curriculum there is an opportunity to add societal context to the existing requirement to cover ‘radioactive materials, half-life, irradiation, contamination and their associated hazardous effects, waste disposal’. By amending this part of the curriculum to include ‘geological requirements for waste disposal’ students would have the opportunity to learn about the applied nature and social importance of geoscience in the context of the UK’s policy to construct a Geological Disposal Facility for its radioactive waste.
- Evolution, inheritance and variation forms a major part of the KS4 Biology national curriculum content. However, there is no mention of extinction, or more specifically mass extinctions, which are fundamental to our understanding of the origin and evolution of species on Earth. Incorporating this into the KS4 Biology national curriculum would ensure all students learn about the evidence for mass extinctions, impacts of past change on species evolution and consider the evidence for a 6th mass extinction. With the ongoing importance and relevance of biodiversity decline and climate change to our understanding of the planet and our relationship with it, this would be an engaging and topical way to increase students' exposure to geoscience topics within other science disciplines.
- Earth and atmospheric science form a major part of the Chemistry KS4 national curriculum content. Within this, the statement ‘potential effects of, and mitigation of, increased levels of carbon dioxide and methane on the Earth’s climate’ could be amended to explicitly include the geological opportunity for carbon capture and storage.
- Additionally, with the global drive for an energy transition and more pressure than ever on developing renewable energy sources, an inclusion of the importance of materials and minerals for sustainable energy could be a valuable addition to the KS4 and KS5 curriculum.

25. In which ways does the current primary curriculum support pupils to have the skills and knowledge they need for life and further study, and what could we change to better support this?

- The geoscience topics 'rocks, fossils and soils' taught KS2 Science amount to around 6 hours teaching in half a school term. There is an opportunity to increase the volume of KS2 students' exposure to geoscience topics through the Science curriculum and encourage their interest in and exposure to the geosciences.
- While topics such as volcanoes and earthquakes are introduced in KS2 Geography they are taught largely from a social science perspective – missing an opportunity to inspire and engage students about the science of natural hazards and Earth systems.
- Further topics such as weather, climate and the environment are similarly not covered within the science curriculum.

26. In which ways do the current secondary curriculum and qualification pathways support pupils to have the skills and knowledge they need for future study, life and work, and what could we change to better support this?

- The 2021 Net Zero Strategy saw the UK commit to Net Zero by 2050, with the Government announcing an additional target of an 81% cut in its emissions by 2035 during the recent COP29. Alongside additional targets related to renewable energy and carbon capture, if achieved, this will place the UK as a global leader in the energy transition.
- This ambition is not reflected with equivalent emphasis in the topics prioritised within the national curriculum. To maintain its status on the Net Zero world stage and to ensure the next generation of geoscientists are primed to contribute to ambitious climate and environment goals, the UK curriculum must showcase the importance of relevant subjects to current students.
- Instilling knowledge related to Earth and environmental processes would encourage students to consider geoscience as a career, preparing them to join the UK's future skilled workforce and to deliver on Government's climate and environment commitments.

Section 6: A broad and balanced curriculum

Our analysis of curriculum subject trends over time (published alongside the main consultation document) has shown that while many subject areas are thriving and take-up is growing, take-up of some subjects has declined over time. Of course, this is not necessarily a problem: these changes may reflect policy directions or other social trends, or they may reflect changes in policy and accountability measures over time.

32. Do you have any explanations for the trends outlined in the analysis and/or suggestions to address any that might be of concern?

While Geology is not specifically cited in this analysis, enrolment in formal Geology qualifications at GSCE and A Level have been in decline until recently. In 2023 the uptake of Geology A-level had dropped from a peak of 2,240 in 2015 to 1,100 in 2024. The number of students taking Geology GSCE in 2015 was ~1000 compared with 594 in 2024.

UK universities have seen a decrease in admissions onto geoscience-related programmes since 2015 (Higher Education Statistics Agency), which can be partially explained by a demographic dip in the number of 18-year olds at the time (Office for National Statistics) and an increase in tuition fees (N. Stephen et al., 2023[12]).

[12] The Anning Project from the Geological Society of London: investigating the slump in geoscience recruitment & inspiring the next generation of geoscientists

Suspected influencing factors vary, with lack of awareness linked to reduced school offerings often cited as a primary barrier to university enrolment. In addition, social or familial pressures may influence students away from geoscience, and historical links with industries with a reputation for poor ESG records reflect poorly on the industry as a whole. An assumption that geoscience is only for those who enjoy being outdoors limits participation and contributed to an exclusionary environment. Additionally, responses to a recent survey on the declining trends in undergraduate geophysics students highlighted the following reasons for students not considering geophysics at university:

- Lack of awareness of the subject
- Not having a teacher who had an interest in the subject
- Lack of awareness of future careers related to the subject

In addition to the adjustments to curriculum content and signposting discussed in previous sections of this consultation response – some ideas for encouraging engagement and participation in geosciences within schools are (N.Stephen et al., 2024[13]):

- **Supplementary outreach and engagement programs in schools –** The Geological Society's education team work to improve awareness of, and access to, engaging and inspiring geoscience education in schools. However, our outreach program is not equitably offered nationwide, and not all schools are able to take advantage of opportunities due to financial constraints or pressure on resources. Support to expand the availability of and readiness for schools to engage with these programs would be a positive addition to the current student experience.
- **Supporting teachers with training and high quality teaching resources** – The Geological Society creates peer reviewed, curriculum linked teaching resources on a range of topics to help teachers confidently and engagingly teach geoscience in the classroom at all levels. More could be done to support existing and new teachers to confidently and capably teach geoscience topics within the existing curriculum. Continuous investment in teacher capabilities and confidence would have wider benefits for students and schools – such as reducing anxiety or pressure.
- **Work experience opportunities or placements –** The Geological Society has a membership of over 12,000 professional geologists working across the sector and with some support would be well placed to support students with making connections required to secure valuable work experience.
- **High quality, relatable career information for schools, students and parents** – The Geological Society's central hub of career information is a widely accessed and valued resource. Work is underway to update and modernise this to ensure it is fit for the 21st century, however, more could be done to ensure that this resource is accessible and known in all schools. Professional bodies and learned society's memberships hold a

[13] This is Geoscience: Embedding Geoscience within Education K-12 – and within the Public Consciousness - to Promote Geoscience Uptake at University

wealth of career and education information that could be useful to schools if a central careers hub was to be developed and shared to support students' choices.