GEOSCIENCE IN THE SCOTTISH CURRICULUM

Natural Resources

I can explain how the distribution and control of important natural resources affects the international power and influences of states. SOC 4-11b

I can discuss the sustainability of key natural resources and analyse the possible implications for human activity. SOC 4-08a

I have carried out research into novel materials and can begin to explain the scientific basis of their properties and discuss the possible impacts they may have on society. SCN 4-16a

I can participate in practical activities to extract useful substances from natural resources. SCN 3-17b

Geohazards

I can describe the physical processes of a natural disaster and discuss its impact on people and the landscape. SOC 2-07b

I can explain how the interaction of physical systems shaped and continue to shape the Earth's surface by assessing their impact on contrasting landscape types. SOC 4-07a

Engineering Geology

I can solve problems through the application of engineering principles and can discuss the impact engineering has on the world around me. TCH 4-12a

I can extend my use of manual and digital graphic techniques to realise ideas, concepts and products and recognise the importance of real world standards. TCH 4-11a

Landscapes

Having explored the substances that make up Earth's surface, I can compare some of their characteristics and uses. SCN 2-17a

Through evaluation of a range of data, I can describe the formation, characteristics and uses of soils, minerals and basic types of rocks. SCN 3-17a

I can evaluate the changes which have taken place in an industry in Scotland's past and can debate their impact. SOC 4-05b

I can describe the major characteristic features of Scotland's landscape and explain how these were formed. SOC 2-07a

Having investigated processes which form and shape landscapes, I can explain their impact on selected landscapes in Scotland, Europe and beyond. SOC 3-07a

Climate Change

I can explain some of the processes which contribute to climate change and discuss the possible impact of atmospheric change on the survival of living things. SCN 3-05b

I can analyse products taking into consideration sustainability, scientific and technological developments. TCH 4-05a

I can identify threats facing the main climate zones, including climate change, and analyse how these threats impact on the way of life. SOC 4-12a

By exploring climate zones around the world, I can compare and describe how climate affects living things. SOC 1-12b

Water

I can apply my knowledge of how water changes state to help me understand the processes involved in the water cycle in nature over time. SCN 2-05a

I have investigated different water samples from the environment and explored methods that can be used to clean and conserve water and I am aware of the properties and uses of water. SCN 2-18a

Energy

I can investigate the use and development of renewable and sustainable energy to gain an awareness of their growing importance in Scotland or beyond. TCH 2-02b

I have explored how different materials can be derived from crude oil and their uses. I can explain the importance of carbon compounds in our lives. SCN 4-17a

Through exploring nonrenewable energy sources, I can describe how they are used in Scotland today and express an informed view on the implications for their future use. SCN 2-04b

By investigating renewable energy sources and taking part in practical activities to harness them, I can discuss their benefits and potential problems. SCN 3-04b

Having studied an economic activity, I can explain its development and assess the impact of change within its locality and beyond. SOC 4-10c

By contributing to an investigation on different ways of meeting society's energy needs, I can express an informed view on the risks and benefits of different energy sources, including those produced from plants. SCN 4-04a

Through investigation, I can explain the formation and use of fossil fuels and contribute to discussions on the responsible use and conservation of finite resources. SCN 4-04b

Science Communication

I can select and use digital technologies to access, select relevant information and solve real world problems. TCH 4-01a

I can report and comment on current scientific news items to develop my knowledge and understanding of topical science. SCN 2-20b

Having selected scientific themes of topical interest, I can critically analyse the issues, and use relevant information to develop an informed argument. SCN 4-20b

I have researched new developments in science and can explain how their current or future applications might impact on modern life. SCN 4-20a

I can consider the advantages and disadvantages of a proposed land use development and discuss the impact this may have on the community. SOC 2-08b

I can use specialised maps and geographical information systems to identify patterns of human activity and physical processes. SOC 4-14a

I can explain why a group I have identified might experience inequality and can suggest ways in which this inequality might be addressed. SOC 3-16a

I can discuss the extent to which my choices and decisions are influenced by the ways in which I am informed. SOC 3-17b

Environmental Management

Through exploring the carbon cycle, I can describe the processes involved in maintaining the balance of gases in the air, considering causes and implications of changes in the balance. SCN 4-05b

Throughout all my learning, I take appropriate action to ensure conservation of materials and resources, considering the impact of my actions on the environment. TCH 1-02a

I can monitor the environment by collecting and analysing samples. I can interpret the results to inform others about levels of pollution and express a considered opinion on how science can help to protect our environment. SCN 4-18a

I can analyse how lifestyles can impact on the environment and Earth's resources and can make suggestions about how to live in a more sustainable way. TCH 2-06a

I can make suggestions as to how individuals and organisations may use technologies to support sustainability and reduce the impact on our environment. TCH 2-07a

I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally responsible way. SOC 2-08a

I can identify the possible consequences of an environmental issue and make informed suggestions about ways to manage the impact. SOC 3-08a

I can investigate the climate, physical features and living things of a natural environment different from my own and explain their interrelationship. SOC 3-10a

I can develop my understanding of the interaction between humans and the environment by describing and assessing the impact of human activity on an area. SOC 4-10a

Notes

The Scottish curriculum is called Curriculum for Excellence.

It is formed around a series of statements which pupils should have experience of during their nursery, primary school and lower secondary school education.

Each statement on the previous slide is followed by a code - the letters refer to the area of the curriculum and the first number to the level.

- SCN - Science
- TCH - Technologies
- SOC - Social Studies

- 1 (First Level) - for most, covered in primary 2-4
- 2 (Second Level) - for most, covered in primary 5-7
- 3 or 4 (Third or Fourth Level)- for most, covered in secondary 1-3

In primary school, one teacher will cover all/most experiences and outcomes. In secondary school, different subjects tackle different experiences and outcomes.

What now?

Claim it: many of these will be taught and referred to in the curriculum without the word geoscience coming up. Are we shouting about the diversity of geoscience in Scotland and claiming each of these statements as important to the geoscience community?

Celebrate it: are we encouraging pupils to love geoscience? Are we giving them opportunities to learn deeply and see what they are learning being applied in the real-world?

Support it: you now have the tools to speak to teachers about where you can support them with resources or teaching. Can we upskill teachers at all levels to deliver these with confidence? Can we have a presence in schools, via resources or in person, to improve the teaching and therefore make it more engaging and up-to-date?

Who am I?

My name's Emma Smith and I am a Geography, Geology and Environmental Science teacher based in Gairloch High School. After studying a BSc (Hons) in Geology at the University of St Andrews I went on to gain a PGDE (Secondary) in Geography at the University of Edinburgh. I am a member of the Scottish Association of Geography Teachers, the Earth Science Teachers' Association and have completed additional training at Keele University, the GeolSoc and EGU.

Please feel free to get in touch:

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GEOSCIENCE IN THE SCOTTISH CURRICULUM

National 5 & Higher Environmental Science

- Pollution of air, land and water
- Environmental Assessment & Monitoring
- Use & interpretation of hydrographs in environmental monitoring
- Implementation of government policy leading to legislation and initiatives
- Earth's internal heat - sources & heat flow
- Mechanisms of plate boundaries & the resources they produce
- Formation & environmental impact of Bauxite deposits
- Sources, production & assessment of geothermal energy
- Surface & subterranean hydrological cycle
- Oceanic circulation
- Soil compositions, structure and uses
- Biofuels
- Atmospheric composition & circulation
- Natural causes of both long- and short-term climate change
- Demand for and security of access to global resources - energy, food & water
- Sustainable management of water resources
- Water quality improvements and monitoring
- Energy - sources, production and evaluation of shale gas, hydrogen and nuclear energy
- Waste management - including quantifying and monitoring environmental impacts
- Anthropogenic climate change

National 5 & Higher Geography

- Atmospheric composition & circulation
- Oceanic circulation
- Impacts of changing climate patterns on communities
- Natural & anthropogenic climate change - causes, impacts & development of responses
- Surface & subterranean hydrological cycle
- Basin characteristics
- Monitoring & mitigating land use impacts on hydrological cycles
- Soil compositions, structure and uses
- Development and mapping of glacial landscapes
- Development and mapping of coastal landscapes
- Development and mapping of fluvial landscapes
- Development and mapping of karst landscapes
- Land Management issues caused by conflicting use of Scotland's landscapes
- Impacts of population growth on demand for natural resources, water and energy
- Land degradation (focussing on soil erosion)
- Causes, impacts & monitoring of earthquakes
- Causes, impacts & monitoring of volcanic hazards
- Causes, impacts & monitoring of tropical storms

Notes

Curriculum for Excellence extends into S4-6 with a variety of courses offered at different levels.

Each of these courses includes a course specification, outlining what is to be covered and what may be examined.

Geography at National 5 and Higher levels is offered in nearly every school, whilst Environmental Science is offered at some schools.

A Higher in Geology was offered until 2015.

What now?

These courses are taught by specialists, usually with a background in Geography, Biology, Chemistry or Geoscience.

Claim it - are we highlighting to pupils and teachers that all of these areas of study are part of geoscience? If they are, are they going on to study geosciences at university?

Celebrate it - are pupils aware of the number of careers within these areas?

Support it - although they're taught by specialists, support in terms of training, upskilling or resources are still needed. Can you help establish Environmental Science at your local school? Can we work as a group to target the SQA exam board to ensure geosciences stay in the curriculum.