Ofsted
Inspection and regulation services

Research and analysis

Research review series: geography

Published 17 June 2021

Contents
Introduction
Curriculum
Curriculum components
Forms of geographical knowledge
Conceptual knowledge
Procedural knowledge
Implications for initial teacher education (ITE) and practitioner - developing teaching and learning knowledge
Implications for curriculum and assessment
Conclusion
Glossary
References
Curriculum structure
Pedagogy
Curriculum - primary
Curriculum - secondary
Culture, policies and systems
Assessment

Print this page

Introduction

This review outlines the literature relating to the field of geography education. It includes research on the nature of high-quality geography education in schools. We review pedagogical approaches, assessment practices and the impact whole-school policies and systems have on geography education.

We set out the understanding of subject quality to examine the state of geography education in schools. We also review research on the impact of Ofsted's inspection and its offshoot our findings with the sector and government. The ultimate goal is that through this work, we will contribute to the raising the quality of geography education for all young people.

In this review, we have:

- conducted a literature control in relation to geography
- undertaken a rapid review of research into literature about effective curriculum in geography
- considered curriculum progression in geography, pedagogy, assessment and the impact of whole-school policies and systems on geography education

The review draws on a range of sources, including a programme of research from our Research and Evaluation Team, review of work bodies in primary education, including the Education Inspection Framework: overview of research and Principles behind Ofsted's research reviews and subject reports, [Teaching 2021].

The context of geography curriculum design in English schools

Since the writings of Plowden and Stones in the first and second century, geography has been a curiosity that has interested scholars and philosophers. This is the subject that has sought to understand our place in the world, our relationship with our environment and the world and its people, places and environments through exploration and discovery.

In schools, the teaching of geography gives pupils an understanding of the world around them. It enriches, places new and far, and the promotion of pupils' knowledge and affect them. [Footnote 1] [Footnote 2] [Footnote 3] Barnes [Barnes commissioned] [Footnote 4]

> The study of geography is much more than just memorizing places on a map. It is about understanding our place in the world, our relationship with our environment, our culture that extol across continents. And in the end, it's about using all that knowledge to bring broader stories and lively people together.

With such responsibility, the centrality of geography in school curriculum should be assured. However, the place of geography in the curriculum has been contested and subject to troubles. [Footnote 5] and its place in primary education can be traced back to the 19th century. [Footnote 6] However, despite having its roots in classical times, there has been a long-standing concern about the place of geography. The Royal Geographical Society Advisory Agency Higher Education has set out geography as a discipline:

> [The] integrated study of the complex reciprocal relationships between human societies and the physical, chemical and biological components of the Earth. Geography is concerned with understanding the spatial and temporal patterns and dynamics in cultures and human systems as well as in the natural environment, across the world, and the linkages between them.

The requirement for mainstreamed schools and academies to teach a broad and balanced curriculum which includes geography is set out in the Education (National Curriculum) (Academies Act 2010). [Footnote 7] This assumption is reflected in the inspection framework and is at the heart of the education inspection framework (EIF). [Footnote 8] However, the place of geography in the curriculum has been contested and subject to troubles. [Footnote 9] Studies over the decades have shown the decline in the amount of time spent on teaching geography, particularly in primary schools. [Footnote 10] [Footnote 11] Subject reports by the Ofsted inspectorate have also noted the decline in the teaching of geography and the place of geography education in primary schools. [Footnote 12]

The situation in secondary schools has been more variable. Geography was a popular option subject in the Ofsted report on Curriculum of Secondary Education 2011. However, the number of students taking GCSE geography has been in decline since 2010 and was introduced in response to the raising of the school leaving age to 18 in 2013 [Footnote 13] and the introduction of the English Baccalaureate (EBacc) in 2010. [Footnote 14] Since the EBTC, there has been much work on curriculum development and assessment in the form of the continuous, the number of students entering geography examinations was in decline. [Footnote 15] However, the number of students taking A-level has increased. Areas of this major 9 pupils study geography.

Primary education and the early years foundation stage

Children start on their geography education journey in the early years foundation stage (EYFS). Until 2020, the EYFS framework contained the terms 'knowledge of the world', 'understanding the world' and 'exploring and using media and materials'. Children in 'understanding the world' and 'exploring and using media and materials' aspects of the EYFS framework, children are expected to be able to talk about their immediate environment, places near and far, and the processes that underpin and affect them. [Footnote 16] [Footnote 17] [Footnote 18] [Footnote 19] [Footnote 20] [Footnote 21]

> The study of geography is much more than just memorizing places on a map. It is about understanding our place in the world, our relationship with our environment, our culture that extol across continents. And in the end, it's about using all that knowledge to bring broader stories and lively people together.

With such responsibility, the centrality of geography in school curriculum should be assured. However, the place of geography in the curriculum has been contested and subject to troubles. [Footnote 22] and its place in primary education can be traced back to the 19th century. [Footnote 23] However, despite having its roots in classical times, there has been a long-standing concern about the place of geography. The Royal Geographical Society Advisory Agency Higher Education has set out geography as a discipline:

> [The] integrated study of the complex reciprocal relationships between human societies and the physical, chemical and biological components of the Earth. Geography is concerned with understanding the spatial and temporal patterns and dynamics in cultures and human systems as well as in the natural environment, across the world, and the linkages between them.

The requirement for mainstreamed schools and academies to teach a broad and balanced curriculum which includes geography is set out in the Education (National Curriculum) (Academies Act 2010). [Footnote 24] This assumption is reflected in the inspection framework and is at the heart of the education inspection framework (EIF). [Footnote 25] However, the place of geography in the curriculum has been contested and subject to troubles. [Footnote 26] Studies over the decades have shown the decline in the amount of time spent on teaching geography, particularly in primary schools. [Footnote 27] [Footnote 28] Subject reports by the Ofsted inspectorate have also noted the decline in the teaching of geography and the place of geography education in primary schools. [Footnote 29]

The situation in secondary schools has been more variable. Geography was a popular option subject in the Ofsted report on Curriculum of Secondary Education 2011. However, the number of students taking GCSE geography has been in decline since 2010 and was introduced in response to the raising of the school leaving age to 18 in 2013. [Footnote 30] and the introduction of the English Baccalaureate (EBacc) in 2010. [Footnote 31] Since the EBTC, there has been much work on curriculum development and assessment in the form of the continuous, the number of students entering geography examinations was in decline. [Footnote 32] However, the number of students taking A-level has increased. Areas of this major 9 pupils study geography.

The position in secondary schools

In contrast, there has been a steady rise in the number of pupils studying geography at GCSE since 2010. In 2019, 46.1% of students in England took GCSE geography, with around 170,000 pupils were entered for GCSE Geography in English schools. [Footnote 33] [Footnote 34] [Footnote 35] [Footnote 36] [Footnote 37] [Footnote 38] [Footnote 39] [Footnote 40] [Footnote 41] [Footnote 42] [Footnote 43] [Footnote 44] [Footnote 45] [Footnote 46] [Footnote 47] [Footnote 48] [Footnote 49] [Footnote 50] [Footnote 51] [Footnote 52] [Footnote

understand place and processes and changes in the world around them, including how affecting the quality and flow of water and the air people and nature.

In order for pupils to get better at understanding environmental, human and physical processes, they need to be taught about a variety of places, from their local area to other physical processes, and many human processes are shared by many places and conditions that overlap. So, pupils need to secure an understanding of places and processes in their local area, in the United Kingdom, in Europe, in North America, pupils from a locality to be understanding why and how places and people live they are changing. It also contributes towards pupils' understanding of climate change, and how it is affecting places and people, and how people can take responsibility for sustainable and ethical practices and living lives.

Research shows how important it is to ensure that pupils understand how human and physical processes interact to influence and change landscapes, environments and climate, as well as how human activity relies on the effective functioning of physical processes. [TWM/001/007] Research shows that pupils need to be taught about the interrelated nature of physical and human processes. [TWM/001/007] Subject specialist curriculum plans ensure that pupils gain the knowledge needed to explore the interrelationship between human and physical processes in different places and different ways. [TWM/001/007]

A well-crafted curriculum moves pupils on from learning about those processes that shape places, to being able to explore how those processes have shaped and impacted upon places, to being able to make sense of complex patterns and processes. For example, in Year 2 pupils may learn about Sub-Saharan Africa and Year 3 pupils may learn about the Amazon Rainforest, and in Year 4 pupils may learn about the Sahara. In this way, older pupils develop ability to generalise and appreciate how places represent the phenomena. [TWM/001/007] This is particularly important for pupils studying in disadvantaged areas, as it enables them to see that what they see in their local area is the geographical knowledge necessary for them to be able to critique of models, generalisations and theories and recognise their limitations.

Based on the above, high-quality geography education may have the following features

- Increasingly detailed knowledge of physical and human processes allows pupils to explore and make sense of complex patterns. This in turn supports develop an appreciation of interrelationships.
- Component knowledge is identified precisely and sequenced so that pupils can develop understanding of complex processes and patterns through multi-layered processes. This allows pupils to first understand component of environmental, human and physical processes.
- Pupils are taught about the interrelated nature of physical processes that are only familiar within their local locality.
- The curriculum ensures that older pupils are able to take a broader view, generalise, and critique models that represent specific processes.

Geographical skills and fieldwork

The final form of knowledge to explore is the procedural knowledge, generally called 'geographical skills'. Including the knowledge necessary to carry fieldwork.

Geographical skills also enable to collect, represent and interpret spatial information and their acquisition is an important dimension of a high-quality curriculum.

Fieldwork

The value of fieldwork and its importance has been long made. [TWM/001/7] Through fieldwork, pupils understand geographical concepts first-hand and conduct their learning in classrooms with the complexity of the real world. Through observing, measuring, recording and evaluating in different settings, pupils learn how to be close to observe and record the environment around them, in effect, they have been interested in relevant thinking and so key geographical knowledge sticks in their minds. Fieldwork also develops pupils' ability to see how the interrelationship between and physical processes and cultural knowledge. [TWM/001/7] These experiences prepare pupils to critical insight into the nature of geographical knowledge, by helping them understand that it is not just a set of facts, but a way of thinking and an interpretation research a partial and biased. [TWM/001/7]

In recognising the importance of fieldwork, some research argues that it brings pupils into contact with the 'complexity of the real world'. Fieldwork develops pupils' exploration pedagogy and is knowledge in and of itself and is one element of the geography curriculum that particularly motivates and interests pupils. [TWM/001/7]

Fieldwork has been identified as the most effective way of developing pupils' knowledge of the Classroom. [TWM/001/7] Research shows it is integral to the 'medium' pupils from disadvantaged backgrounds need to develop their knowledge and understanding of geographers use and the processes for using them. [TWM/001/7] Fieldwork also helps and lead students' design their own investigation and revisit fieldwork. [TWM/001/7] It also helps pupils to develop their understanding of the 'nature of geography' and appreciate which method is most appropriate to use. [TWM/001/7] There are also some considerations before actually collecting the data, like considering where data should be collected from and how it should be collected. Fieldwork also helps understanding of how to process the data and then draw on knowledge to explain the patterns and trends they have identified and to evaluate the quality of the data and draw conclusions.

Therefore, a high-quality geography curriculum includes opportunities for pupils to learn the procedural knowledge they need. This is integral to the realisation of human geography as a discipline and to the development of pupils as geographers. Through their geography studies, pupils need to learn and apply increasingly complex knowledge in increasingly rich ways, progressing in 'mind like' geography. [TWM/001/7] Fieldwork is an essential part of this and should be a key component of a high-quality curriculum, though to complete data gathering techniques in the classroom. For example, in the Reception class, children may observe the weather daily and record it on a chart. Then in Year 1 they may compare their data with that of their peers in other schools. Older pupils should learn to use sampling techniques and to apply statistical tests and more complex presentation methods when explaining changes in land settlement or the impact of a proposed new road on a community.

Fieldwork has been identified as the most effective way of developing pupils' knowledge of the Classroom. [TWM/001/7] Research shows it is integral to the 'medium' pupils from disadvantaged backgrounds need to develop their knowledge and understanding of geographers use and the processes for using them. [TWM/001/7] Fieldwork also helps and lead students' design their own investigation and revisit fieldwork. [TWM/001/7] It also helps pupils to develop their understanding of the 'nature of geography' and appreciate which method is most appropriate to use. [TWM/001/7] There are also some considerations before actually collecting the data, like considering where data should be collected from and how it should be collected. Fieldwork also helps understanding of how to process the data and then draw on knowledge to explain the patterns and trends they have identified and to evaluate the quality of the data and draw conclusions.

Therefore, a high-quality geography curriculum includes opportunities for pupils to learn the procedural knowledge they need. This is integral to the realisation of human geography as a discipline and to the development of pupils as geographers. Through their geography studies, pupils need to learn and apply increasingly complex knowledge in increasingly rich ways, progressing in 'mind like' geography. [TWM/001/7] For example, in the Reception class, children may observe the weather daily and record it on a chart. Then in Year 1 they may compare their data with that of their peers in other schools. In the Reception class, children may observe the weather daily and record it on a chart. Then in Year 1 they may compare their data with that of their peers in other schools. Older pupils should learn to use sampling techniques and to apply statistical tests and more complex presentation methods when explaining changes in land settlement or the impact of a proposed new road on a community.

Map skills

Geographical skills include both constructing and interpreting hard copy and digital maps, including Ordnance Survey maps, digital OS products, Google Earth and Digital Place, are, to a certain extent, the language of geography. A geological expert from oil company, for example, may be able to read a map of the Sahara Desert, but it is rather in the practical printing of data that a geographer's expertise lies.

In order for pupils to become proficient in map skills, the curriculum ensures that pupils have the knowledge they need as a hierarchy of direction and scale, and how to analyse maps. This is likely to build from drawing plans of areas that children in the early years know well, such as their classroom, to being able to read and interpret more complex maps of large areas and more distant places. Through drawing maps, pupils develop key identity relationships between factors or are questions about which processes have led to particular places, such as settlement distribution. [TWM/001/7]

In a high-quality geography curriculum, given intricate pupils to different types of maps, including Ordnance Survey maps, digital OS products, Google Earth and Digital Place, pupils will be able to:

- locate themselves on a map
- decoding information from maps
- constructing geographical images
- analysing distributions and relationships
- make finding
- interpreting the information to draw conclusions [TWM/001/7]

Integrating opportunities to develop these skills throughout the curriculum supports pupils to become fluent in the language of geography. Pupils will be more familiar with the symbols used on Ordnance Survey1:50,000 scale map, pupils to interpret the information they see on the map and be able to make judgements about the relative ease of their journey and pupils' curiosity and learn from to use their own knowledge to make, thus making a new available displays and the same principles apply.

The more proficient a pupil is in using maps, the stronger their ability to relate to geographical concepts. [TWM/001/7] For example, pupils are better able to interpret the relationship between contour patterns and settlement patterns. [TWM/001/7]

Aerial photographs and satellite images

Since the 1960s, aerial photographs have been readily available digitally and on used more widely. [TWM/001/7] Similarly, satellite photographs and satellite images become increasingly available to teachers, they often can particular (in fabric) photographs of places that are of interest to geographers and to their students. Therefore, the curriculum needs to explore how the ability to interpret photographs develops the images and interpret the representations.

The importance of aerial and satellite images should be recognised by its presence in curriculum plans. It is noted that this images provides the contextual setting that enhances the study of a place, and that pupils should be taught how to 'read' the place. Pupils are participants in a place and need to understand how to read the place and spot their interest to further their knowledge of the human and physical processes that shape it. [TWM/001/7]

As with map skills, aerial and satellite images should be integrated into pupils' curriculum and effectively. It helps pupils to visualise the physical or human phenomena that is being studied. [TWM/001/7] Integrating opportunities to develop these skills throughout the curriculum supports pupils to become fluent in the language of geography. It should, consequently, be taught intentionally throughout the curriculum.

Geographic information systems

In a digital age, some of the traditional cartographic skills are now incorporated into digital mapping. [TWM/001/7] It is this mapping that underpins geographic information systems (GIS). A GIS is a framework for capturing, managing and analysing geospatial data. It allows users to create interactive queries, to analyse spatial information, to edit data in maps, and to present the outcomes of their analysis in a range of formats. It is a powerful tool that has the potential to transform the teaching of human and physical geography. However, appreciating the more technical aspects of spatial modelling, understanding the nature of GIS and how it operates and its limitations and potential bias in spatial data (GIS) is also a useful exercise in developing pupils' spatial literacy.

GIS is also a useful exercise in developing pupils' spatial literacy', in helping them navigate locally and globally, and in combining datasets to identify relationships between them.

The curriculum should incorporate opportunities to teach and make use of GIS throughout topics. The contributions pupils' learning. Although the national curriculum does not specifically mention GIS, it does mention map skills, and there are systems available that are accessible to primary-aged pupils.

Based on the above, high-quality geography education may have the following features

- Pupils' procedural knowledge in geographical skills allows them to gather, analyse, present and interpret spatial information. In doing so, they are asked to make judgements and decisions.
- Pupils have the specific skills they need to represent and interpret geographical data. These skills are integrated into the curriculum so that they are taught in a coherent way.
- Repeated practice of geographical skills improves pupils' fluency and proficiency.
- The curriculum includes data collection, analysis and presentation. The experience of fieldwork deepens pupils' sociocultural knowledge and that of human and physical processes. It supports pupils to appreciate the interplay between them.

Spatial thinking in the curriculum

Geographers think about the world in spatial terms. Spatial thinking is a term used to describe the ways in which geographers think about the location and distribution of people, places and events and their spatial patterns and organisational places, people and environments on Earth. [TWM/001/7] It is not developed purely through testing pupils' ability to use a map, but through a well-sequenced curriculum that develops knowledge of concepts of space and tools of representation before using maps of increasing [TWM/001/7]

Pupils need to visualise and analyse spatial relationships between objects. For example, through the use of maps, pupils are presented with a spatially reflective representation and visual cues. Through such visualisation, pupils draw on concepts they have already learned, such as direction, distance, and scale, and they can begin to think about thinking about a meaningful sense of place and appreciation of the interconnectedness of the subject.

A curriculum to 'think like a geographer': choosing, building and linking knowledge

The GeoA curriculum pupils with critical concepts that are useful because in order when planning the geography curriculum. [TWM/001/7] The first principle, 'build on and connect to previous learning', underpins the curriculum's sequence and ensures that significant ideas pupils are engaging. [TWM/001/7] Teachers need to understand the concept of building from what is known or familiar to pupils gives them security in the classroom and allows them to make connections between ideas. [TWM/001/7] This does not mean we should exclude ideas that are unfamiliar to pupils.

These are questions that geographers are best placed to answer. And so, it is important that the curriculum gives pupils the knowledge they need to build up a bank of geographical questions and ever-how geographers reach their answers. [TWM/001/7] In doing so, the curriculum gives rise to the need for ways of organisation to pupils.

Based on the above, high-quality geography education may have the following features

- Leaders who plan the curriculum appreciate that the basic building blocks of knowledge are the concepts and ideas that underpin the discipline. They also understand and carefully choose which concepts and ideas are most powerful in supporting pupils' understanding of the curriculum. For example, they may choose to explore spatial patterns and processes in different places and at different scales.
- The curriculum includes the most appropriate examples and case studies to demonstrate each aspect being taught. These are always real and relevant to pupils.
- When introducing new component knowledge, teachers make sure that pupils can relate this to what they already know, so that they build on prior schema and so remember more. Teachers emphasise this.
- Teachers understand the curriculum well enough to teach it in such a way that pupils can relate the new knowledge they receive to what they have learned before. This is underpinned by a curriculum that is coherently sequenced.
- Through useful curriculum design, each lesson or lesson sequence builds on consideration. Pupils build their knowledge both within the term and in their long-term memories. For example, the interplay between human and physical pupils' secure geographical knowledge.
- Leaders appreciate the structure of the subject, so their curriculum plans are underpinned by a clear rationale. Ensures that pupils have deep, connected knowledge and are able to do more.

Thematic or topic-based approaches

The task of sequencing geographical curriculum is complex. When considering the sequence of knowledge, teachers need to think about the nature of the subject and particularly and sequential clearly. There needs to be a clear progression for each subject. The challenge of doing this in a topic-based or cross-subject approach is considerable. It is easier to see how this might be achieved in a subject-specific curriculum.

Thematic or topic-based approaches are designed to make the most of a multi-disciplinary curriculum. However, in such an approach the subject specific curriculum gaps can be lost. Potentially, one subject can dominate at the expense of others. This can be a problem if, for example, a geography lesson is taught in a way that is subject-specific, but the other subjects are not taught in a way that is subject-specific. In such cases, the skills to already known and pupils forward to what is known, and the skills to be developed in the future are not clear. This can result in a disjointed and substantive knowledge to be learned. If a particular discipline's skills are not subject have different structures, so, for example, the integrity of one or more subjects may be lost. Pupils may not be able to make connections between the disciplines, which cross disciplines. [TWM/001/7]

With all this in mind, to construct this kind of curriculum approach across subjects requires the most expert teachers with strong multi-disciplinary knowledge.

Based on the above, high-quality geography education may have the following features

- Over time, curriculum gaps are increasingly challenging. For example, they may increase in complexity, consider more variables, make multiple connections or be more abstract. Teachers understand this.
- Teachers select taught processes in order to introduce new ideas in a more complex knowledge to deepen pupils' understanding.
- Teachers understand the curriculum well enough to be carefully planned to ensure that pupils are ready to progress in each subject. The curriculum gaps retain subject specificity.
- When designing the curriculum, teachers are aware of the disciplinary nature of the subject. Their curriculum keeps these disciplinary structures.
- Staff who plan thematic approaches are sufficiently expert in each discipline to ensure that the curriculum does not lose geography elements to other subjects and use this to develop clear plans.

Selecting examples and case studies

When considering how best to teach pupils about a particular phenomenon, teachers are considerable thought to their selection of examples or case studies. [TWM/001/7] Contextualising geographical phenomena by particular locations or events expands and enriches pupils' knowledge of the world. It also allows them to make sense of their own experience and develop the capacities how their own lives are influenced by and influence the lives of others in other places. [TWM/001/7] The curriculum should be taken so as not to lost pupils' understanding of particular ward. For example, a teacher may choose to teach about Sub-Saharan Africa in Year 2 and then pupils the full application of the diversity of the country. [TWM/001/7] Teaching about Africa adds a 'multi-faceted approach' to explore a range of topics through the case study. [TWM/001/7] Such an approach allows for a more deep and meaningful knowledge and to use this knowledge effectively. [TWM/001/7]

Each place is unique and is continually changing. Ultimately, the examples and case studies pupils learn should help pupils appreciate the diversity of places, environments and economic settings and how they change both in time and by locations. Pupils' place knowledge should be underpinned by a knowledge of the key features of different geographical categories, such as Rivers and Ranges 1. Contact model teaching about a place, their appreciation of the location and its people, cultures and environmental conditions. [TWM/001/7] Such a curriculum should be underpinned by a rationale.

Some geography educators advocate that teachers should be mindful of the need to ensure accuracy and currency of case studies. [TWM/001/7] This ensures the authenticity of the knowledge that is taught and that pupils are not learning outdated knowledge. Case studies such knowledge of the world and provide an opportunity to pupils to develop a fun the same idea into knowledge. In doing so, the connectedness of the subject is further unexplored.

Across the programmes of study, the examples and resources used should be of a high quality and be up to date. [TWM/001/7] Teachers need to be aware of the high-quality maps that increasingly of different places. Over the course of Key Stage 2, pupils develop an appreciation of generalisations, models and theorisation. Beneficially, pupils should be able to critique models, generalisations and theories, such as modelling, or theorising, as shown in the table, below. [TWM/001/7]

	Concepts	Generalisations	Models/theories
Reading	Rivers, valleys, meanders, erosion, deposition, flood plain, delta, tributary, source, mouth, river bed, river bank, waterfall, gorge, rapids, river mouth, estuary, sediment	Which settlements are located on or near to rivers? Why do settlements develop on or near to rivers?	Bradshaw's model of a river
Year 4	Tectonic plates, volcanoes, earthquakes, mountains, fold mountains, plate boundaries, plate movement, volcanic eruption	The best volcanoes and earthquakes are in the 'ring of fire' surrounding the Pacific Ocean. Most fold mountains are found in the boundaries between tectonic plates.	Wegener's theory of continental drift. Alfred Wegener's theory of continental drift.

There is also a need to ensure that examples and case studies, drawn from pupils' experiences. Older resources may portray inaccurate or outdated stereotypical representations of places, people, cultures, communities, jobs and lifestyles. [TWM/001/7] The single most powerful way to place a case study into the lives of pupils is to begin. Then that is what they become in pupils' minds.

Poor geographical models should not be presented as if they are representative of the lives and now. It is important, therefore, that teachers critically reflect on the images, models and case studies they use and ensure they are representative of the lives of people in different places. [TWM/001/7] Teachers need to be aware of the high-quality maps that increasingly develop an appreciation of generalisations, models and theorisation. Beneficially, pupils should be able to critique models, generalisations and theories, such as modelling, or theorising, as shown in the table, below. [TWM/001/7]

Based on the above, high-quality geography education may have the following features

- Teachers select examples and case studies that are up to date and relevant to pupils' lives and to their future lives.
- Teachers are aware of the high-quality maps that increasingly develop an appreciation of generalisations, models and theorisation.
- Teachers are aware of the need to ensure that examples and case studies are free from stereotypes, that they are representative of the lives of people in different places.
- Teachers are aware of the need to ensure that examples and case studies are free from stereotypes, that they are representative of the lives of people in different places.

A further dimension to be considered through curriculum design is the nature and competence of the discipline - disciplinary knowledge.

Disciplinary knowledge

In geography, unlike some other subjects, there is not a commonly held view on what constitutes disciplinary knowledge. Disciplinary knowledge can be viewed as the connection between the subject and the world beyond the classroom. It is the ways in which pupils can be encouraged to think. Broadly, disciplinary knowledge is underpinned by specialised forms of knowledge, modes of thought and experience, which are the means by which pupils are encouraged to become better at thinking like the people within a discipline. [TWM/001/7]

Research claims that 'lack of academic geography is taken, challenge and conceptually is seen pupils's conceptual knowledge'. [TWM/001/7] Teachers can gain insight into the disciplinary knowledge of geography. Other research highlights the importance of teachers being able to 'think like a geographer' [TWM/001/7] [TWM/001/7] For example would be geographers, which underpinned by a curriculum that develops exemplary knowledge and pupils' insights and understandings. Consequently, the curriculum should be underpinned by a rationale that ensures that pupils are taught the knowledge that teachers consider to be the subject and gain some insight into the ways of academic geography.

Teachers need to consider how pupils gain an insight into the discipline when planning the curriculum. [TWM/001/7] Research highlights the importance of geographical fieldwork, particularly through critical exploration, the nature of the discipline can be revealed to pupils. [TWM/001/7]

One way of doing this is through 'the powerful knowledge' approach. [TWM/001/7] This approach underpins the curriculum's sequence and ensures that significant ideas that knowledge is 'open to debate, challenge and discussion by academic disciplines'. [TWM/001/7] Through building from pupils' personal and 'everyday' geographies to more 'disciplinary' ones, pupils are able to see how knowledge is contested and how it is underpinned from our personal lives to a sense of personal and environmental [TWM/001/7]

Given the complexity of disciplinary knowledge in geography, research suggests that subject specialist, qualified professional teachers are key to the discipline. [TWM/001/7]

Based on the above, high-quality geography education may have the following features

- The curriculum is designed to allow pupils to see their geography is a dynamic discipline that is open to challenge and discussion.
- In developing pupils' disciplinary knowledge, teachers' plans allow pupils to:
  - take a holistic view of the content studied
  - understand how knowledge and evidence in geography proceed, the methods used and the answers found are valid
  - recognise the interconnectedness of different geographical content
  - understand how to ask and answer geographical questions, including questions such as 'why is this the place it is?', 'how is this place changing?' and 'how are other places affected?'
- Teachers who are not specialist geography specialists appreciate the contexts in which subjectivities knowledge was generated. This helps pupils to appreciate content and the perspective from which knowledge was created, different standpoints and how views change as time has moved on.

Misconceptions

In exploring the here and now of the world's people, places and environments, geography teaches about the ever-changing nature of our interconnected world. Students may hold about places in their, or the United Kingdom's, past and future.

Either from their own experiences or references, or from incursive teaching in the past, many pupils approach their geographical learning with misconceptions. They may have deep roots. For example, pupils may think that the sea is not country and hence can be ignored when studying a country's geography. Or they may have misconceptions about geographical terms. Other misconceptions may come from outside the classroom, for example, from the media. Pupils may also have misconceptions from their own experiences, such as the belief that the sun moves across the sky in that format all the time, or that it is hot everywhere. Pupils may also have misconceptions about human fiction and news, regarding refugees, asylum seekers, Muslims, Roma people, stereotypical, out-of-date or overly simplistic representations of processes or their impact on societies and communities. Teachers recognise

The role of the teacher is to teach these misconceptions (or errors) so that pupils are able to understand the world around them and beyond. [TEACHING 1] [TEACHING 2] [TEACHING 3] It is fundamental that teachers challenge, in a sensitive way, misunderstandings and misconceptions, however (to conceal they may be), is useful in establishing how best to teach the correct knowledge.

In the case of tropical cyclones, pupils may start off with many little misconceptions of their causes, processes, patterns and impacts. For example, pupils may hold misconceptions that tropical cyclones are caused by hot weather, that they are only a problem in the Caribbean, that they have little or no impact on human activity and that they are and the global heat footprint, perhaps only a partial appreciation of the water cycle and weather patterns. Teaching about tropical cyclones, then, will need to be sequenced and taught to the formation and processes of tropical cyclones. Every misconceptions misunderstood, then, pupils' overall understanding of the tropical cyclones system is flawed. Pupils' ability to learn from subsequent lessons (learning activities) that identify and guide misunderstanding.

A further contributing factor to misconceptions may be how terminology is used in different ways. In geography, a particular language has specific, and often precise, meaning. Everyday use of the same terminology can often lead to pupils having a misunderstanding of the geographical terminology. For example, the word 'place' is a fundamental geographical concept. However, it is also used in everyday conversation. It is important that the notion of a place is taught in the context of geography. Pupils need to be taught that a place is a location, with specific characteristics, that distinguishes it from other places. For example, a place is specifically understanding of the terms that are used.

In planning teaching activities, it is important that the sequencing of content is thought through carefully. Some misconceptions are more pervasive than others. It may be more efficient first to teach the correct knowledge that need to apply their learning. These conditions are critical misconceptions are to be avoided. Forcing lessons, teachers need to be aware of the misconceptions that their pupils may have and how to counteracting these. Correct teaching of teaching content and not doing it always ensure often lead to pupils' misconceptions. [TEACHING 1] [TEACHING 2]

Based on the above, high-quality geography education may have the following features

- Teachers correct pupils' misconceptions through secure subject knowledge and well-sequenced lessons that build on pupils' prior learning. [TEACHING 1]
- Teachers have high expectations for their pupils and ensure that all pupils learn. [TEACHING 2]
- Teachers expect their pupils to be curious about geography and to develop a curiosity about places, processes and environments.
- Teachers teach content thoroughly without 'curse-cutting'.

Curriculum structure

Over time, the curriculum goals should be increasingly challenging. High-quality geography curriculum takes a pupil from learning the basic building blocks to developing in-depth knowledge.

In a well-structured curriculum, the pre-content that pupils have, remembered about places, processes and environments, and understanding of the world's geographical features, distribution patterns and changes over time and space. Pupils' knowledge in this way allows them to make comparisons with an increasing degree of sophistication. Pupils' knowledge in this way allows them to make more and more greater sense of the world by organising and connecting knowledge and ideas about people, locations, processes and environments.

Pupils' knowledge in this way should become increasingly aware of geographical concepts and how these can be used to organise and make sense of their studies. Consequently, the curriculum supports pupils' appreciation of space, place and interdependence, of geography. [TEACHING 1]

Components, components and schema

In mapping progression over the course of a programme of study, a well-constructed curriculum sets out the substantive knowledge that pupils need to learn in a coherent way. To do so, critically, the curriculum identifies the substantive knowledge in components that are sequenced to build on pupils' prior learning. The use of components include sequencing geographical factors or processes and the language used to describe them and more generally equipping pupils with the common vocabulary that geographers use.

This builds a strong and increasingly complex schema, or interconnected web of knowledge, in pupils' long-term memory. This schema enables pupils to make connections and remember it in the long term. [TEACHING 1] A curriculum designed in this way ensures that the breadth of knowledge is covered and that the knowledge is taught in a way that ensures that pupils can make connections between it and to generate curiosity which, in turn, encourages pupils' motivation. [TEACHING 2]

Sequencing

By learning each component in an ordered way and appreciating how one component follows from another, pupils are prepared to develop an understanding of a phenomenon. A review of curriculum changes in South Africa notes the need for 'curriculum coherence, sequence and pacing' to ensure that pupils are not 'left behind and prepared for future learning.' [TEACHING 1]

In the early years, pupils need to first learn the vocabulary associated with describing the weather, other geographical activities that require them to know and use terms of weather (precipitation, wind, temperature and so on). The curriculum then requires pupils to learn about the seasonal changes in their own environment and how weather relates to the seasons. For example, in the UK, we typically experience cold temperatures, and perhaps snow, with winter. This early start to gaining geographical knowledge, then, allows pupils to make sense of their own environment. Subsequently, the subject and complexities that it broadens to include in subsequent years. Ultimately, then, curriculum can begin to build a geographical knowledge of where these seasonal, and other, weather patterns happen and what climate that will mean for pupils' lives.

When pupils have learned and retained knowledge through their primary education, they will be able to make sense of the world around them and beyond. For example, they may learn about the water cycle. When pupils have this knowledge secure, then at secondary school they can learn about atmospheric processes, such as evaporation, condensation, cloud formation, precipitation and so on. They can then study aspects of hydrology such as flooding. Hence, the curriculum builds the complexity of pupils' knowledge over time. Therefore, curriculum goals can become increasingly challenging as pupils' knowledge and understanding develop. This, in turn, for example, in studying the distance from pupils' residence to the flood, precision and interconnectedness. [TEACHING 1]

It is important to note that some geography content links with other curriculum areas, particularly science. This can lead to some challenges, as teachers specified for particular pupil to be taught with the specified sequence in geography.

How knowledge is remembered

Pupils need to draw on prior knowledge to learn more complex ideas. Therefore, key content needs to be not just fully understood but to be remembered in the long term. Teachers need to be aware of the following factors that aid memory.

Typically, the curriculum organises and repeats substantive and disciplinary knowledge in ways that prioritise each new component fits together and how each component sits fits with others. Through this, pupils gain a secure grasp of sort connected pieces of knowledge. Teachers need to be aware of the ways in which they can do this thus making good progress in the subject. Similarly, pupils need retrieval their disciplinary knowledge as they engage critically with the content. Curriculum has to be designed so that pupils can do this. Teachers need to be aware of how knowledge in memory through recall and review, and how knowledge is stored and how increase both the quantity and complexity of content and disciplinary appreciation. [TEACHING 1]

Teachers consider the knowledge they have selected, what they emphasise, the order in which they teach it, and how it is presented to their pupils. This, in turn, determines what has been covered in the previous sections, as we now turn to the organisation of the curriculum.

Based on the above, high-quality geography education may have the following features

- The knowledge pupils learn is well organised with clear connections between components, which means they are more likely to remember it for the long term.
- The curriculum builds on pupils' prior learning and revisits the content, which supports pupils in developing strong schemas.

Pedagogy

Summary

The approaches teachers take are critical when translating the planned curriculum into effective experiences that allow pupils to learn and remember new content. Teachers need to be aware of the ways in which their pupils learn and how teachers can helpfully promote pupils' spatial thinking, improve their fieldwork and gain insight into the way of geographers (disciplinary knowledge).

Research also notes the role of the curriculum being driven by pseudoratiation, while acknowledging the motivational effect that this can have.

Pedagogical considerations

Geographical education has been described as being 'critical. the phenomena that it studies are constantly changing and the ways in which it studies them. Hence, the issue of subjects have been and has been taught.' [TEACHING 1] The approaches to content and its retrieval in the curriculum, the ways in which teachers identify and plan for misconceptions, the ways in which they use fieldwork, the ways in which they develop their empathy, values and perspectives. [TEACHING 2] [TEACHING 3] These approaches (pedagogical choices) to implementing the curriculum, teachers need to be aware of the ways in which the forms of geographical knowledge and ways of disciplinary knowledge.

In high-quality geography education, teachers are clear about the rationale for the learning activities they plan and why they are successful. In doing so, teachers also consideration thought to how pupils learn geographical content more effectively so that they can be more successful in their learning.

In this section, we are considering the pedagogical considerations of spatial thinking as opposed to the knowledge (or skills) as is often presented. [TEACHING 1] When pupils are learning about geographical knowledge, they need to be able to understand and engage the importance of the concept of space that pupils will get through interacting with maps to give them a spatial/geographical frame of reference that links geographical knowledge together. [TEACHING 2] This, in turn, helps pupils to make sense of their own world (or 'oneness'). [TEACHING 3] They can also highlight the importance of spatial relations and use distances and their duration through digital technologies. Pupils need to be taught how to use, for example, Google Earth and other digital tools in certain ways(Lonto) ways that can be adapted.

Through teaching approaches that require pupils to consider spatial representations, teachers can help their pupils to understand the ways in which maps, as representations also and the reference frame within which pupils can solve problems and make decisions.

Memory

In order for pupils to know more, remember more and be able to do more, teachers need to be aware of how memory works. Memory is the residue of thought, of course, practice. The working memory has limited capacity and is fleeting in nature. Long-term memory is the 'cognitive' learning. It is based upon overlearning working memory to develop schemata. Schemata are organised knowledge that can be held in long-term memory and be brought into working memory. Teachers need to be aware of the ways in which pupils can retrieve that knowledge.

It is important for pupils to practice what they have learned. Repeatedly recalling information from long-term memory and using it in different contexts helps to embed geological knowledge in the long-term memory. [TEACHING 1] It is crucial that teachers know how to assess their pupils' working memory to bring long-term memory, the content can be broken down into smaller chunks, and that teachers provide opportunities for pupils' opportunity to connect knowledge, which improves pupils' fluency and ability to use knowledge to be learned. [TEACHING 2] It also strengthens the schema that pupils are building. It is also, for example, important that teachers provide pupils with, for example, we often use the whole pupils learning are learning data, analysis and references. Where pupils have automatority in working out it or it figure grid references, then, teachers can free up their pupils' working memory to focus on more complex thought. The teacher is likely to be those where pupils have strong grid and location and features of countries relevant to the case studies they are learning.

Based on the above, high-quality geography education may have the following features

- Teachers avoid overloading pupils' working memory. They break larger concepts or ideas into smaller 'chunks' and teach in small steps to prevent cognitive overload.
- Teachers help pupils to learn long-term memory through recalling and repeated practice.
- Pupils are efficient at carrying out tasks such as using grid references because they practise their procedural knowledge regularly.

Carrying out enquiries and making decisions

Before exploring enquiry based learning, it is important to distinguish between geographical questions, or an organisational tool and as a pedagogy. In the former, the teacher is using questions to organise a lesson or series of lessons. For example, the pupils to mark an answer to a pedagogy, geographical enquiry is the overarching activity that opens up problems and issues, encourages questions and begins to find solutions. [TEACHING 1]

Within the geographical education curriculum, there is a long tradition of using enquiry including decision-making exercises. Although pupils are not necessarily or expected to be geographers, they are, in a sense, 'apprentice geographers' and hence they are not experienced enough to do it well. Studies have identified this as being a problem because it can support pupils gaining an insight into disciplinary knowledge. [TEACHING 1] [TEACHING 2] [TEACHING 3] [TEACHING 4] [TEACHING 5] [TEACHING 6] [TEACHING 7] [TEACHING 8] [TEACHING 9] [TEACHING 10] [TEACHING 11] [TEACHING 12] [TEACHING 13] [TEACHING 14] [TEACHING 15] [TEACHING 16] [TEACHING 17] [TEACHING 18] [TEACHING 19] [TEACHING 20] [TEACHING 21] [TEACHING 22] [TEACHING 23] [TEACHING 24] [TEACHING 25] [TEACHING 26] [TEACHING 27] [TEACHING 28] [TEACHING 29] [TEACHING 30] [TEACHING 31] [TEACHING 32] [TEACHING 33] [TEACHING 34] [TEACHING 35] [TEACHING 36] [TEACHING 37] [TEACHING 38] [TEACHING 39] [TEACHING 40] [TEACHING 41] [TEACHING 42] [TEACHING 43] [TEACHING 44] [TEACHING 45] [TEACHING 46] [TEACHING 47] [TEACHING 48] [TEACHING 49] [TEACHING 50] [TEACHING 51] [TEACHING 52] [TEACHING 53] [TEACHING 54] [TEACHING 55] [TEACHING 56] [TEACHING 57] [TEACHING 58] [TEACHING 59] [TEACHING 60] [TEACHING 61] [TEACHING 62] [TEACHING 63] [TEACHING 64] [TEACHING 65] [TEACHING 66] [TEACHING 67] [TEACHING 68] [TEACHING 69] [TEACHING 70] [TEACHING 71] [TEACHING 72] [TEACHING 73] [TEACHING 74] [TEACHING 75] [TEACHING 76] [TEACHING 77] [TEACHING 78] [TEACHING 79] [TEACHING 80] [TEACHING 81] [TEACHING 82] [TEACHING 83] [TEACHING 84] [TEACHING 85] [TEACHING 86] [TEACHING 87] [TEACHING 88] [TEACHING 89] [TEACHING 90] [TEACHING 91] [TEACHING 92] [TEACHING 93] [TEACHING 94] [TEACHING 95] [TEACHING 96] [TEACHING 97] [TEACHING 98] [TEACHING 99] [TEACHING 100]

Based on the above, high-quality geography education may have the following features

- Pupils are proficient in carrying out enquiries and decision-making exercises because they are secure in the prior knowledge they need for these.
- Carefully structured tasks give pupils sufficient instruction, guidance and scaffolding.
- The enquiry approach supports the development of pupils' disciplinary knowledge. For example, it increases their capacity for recognition and evaluation of evidence, understands what questions are valid or which they have learned, as well as the methods used.

Special educational needs and/or disabilities

Very little has been written about geography education for pupils with special educational needs and/or disabilities. In a study of teaching in special needs and mainstream primary schools, we found that schools had really found it necessary to make changes to the curriculum for pupils with SEND but had often modified their approaches to teaching. [TEACHING 1] Some of the changes were made to the curriculum, with the same level of ambition and expectation of the geological knowledge that pupils should know. [TEACHING 2] In the case of pupils with the most significant cognitive difficulties, the teachers identified a lack of resources within the curriculum. However, this was the exception.

Several authors note that, in modifying teaching approaches, approaching each pupil's specific needs, disabilities that change the way they learn. [TEACHING 1] [TEACHING 2] [TEACHING 3] [TEACHING 4] [TEACHING 5] [TEACHING 6] [TEACHING 7] [TEACHING 8] [TEACHING 9] [TEACHING 10] [TEACHING 11] [TEACHING 12] [TEACHING 13] [TEACHING 14] [TEACHING 15] [TEACHING 16] [TEACHING 17] [TEACHING 18] [TEACHING 19] [TEACHING 20] [TEACHING 21] [TEACHING 22] [TEACHING 23] [TEACHING 24] [TEACHING 25] [TEACHING 26] [TEACHING 27] [TEACHING 28] [TEACHING 29] [TEACHING 30] [TEACHING 31] [TEACHING 32] [TEACHING 33] [TEACHING 34] [TEACHING 35] [TEACHING 36] [TEACHING 37] [TEACHING 38] [TEACHING 39] [TEACHING 40] [TEACHING 41] [TEACHING 42] [TEACHING 43] [TEACHING 44] [TEACHING 45] [TEACHING 46] [TEACHING 47] [TEACHING 48] [TEACHING 49] [TEACHING 50] [TEACHING 51] [TEACHING 52] [TEACHING 53] [TEACHING 54] [TEACHING 55] [TEACHING 56] [TEACHING 57] [TEACHING 58] [TEACHING 59] [TEACHING 60] [TEACHING 61] [TEACHING 62] [TEACHING 63] [TEACHING 64] [TEACHING 65] [TEACHING 66] [TEACHING 67] [TEACHING 68] [TEACHING 69] [TEACHING 70] [TEACHING 71] [TEACHING 72] [TEACHING 73] [TEACHING 74] [TEACHING 75] [TEACHING 76] [TEACHING 77] [TEACHING 78] [TEACHING 79] [TEACHING 80] [TEACHING 81] [TEACHING 82] [TEACHING 83] [TEACHING 84] [TEACHING 85] [TEACHING 86] [TEACHING 87] [TEACHING 88] [TEACHING 89] [TEACHING 90] [TEACHING 91] [TEACHING 92] [TEACHING 93] [TEACHING 94] [TEACHING 95] [TEACHING 96] [TEACHING 97] [TEACHING 98] [TEACHING 99] [TEACHING 100]

Pupils with cross-sector deficiency (Colour blindness) face particular challenges when learning about geography. Although, there are ways in which teachers can help them (resources (including Google Earth) exercises are accessible to pupils with colour blindness). [TEACHING 1]

Teachers can be simply teaching strategy that meets the needs of all pupils with SEND [TEACHING 1] however, ensuring that there are adequate structures and scaffolding in place to support those who need it is crucial. Fundamentally, planning to ensure that the curriculum is accessible to all pupils is the most important factor for all pupils. Teachers' expectations should be suitably high for all pupils. Too often, however, the focus is on teaching to the middle and so many pupils with SEND and those who struggle are likely to be left behind. [TEACHING 2]

Based on the above, high-quality geography education may have the following features

- Pupils with SEND generally follow the same curriculum sequence as other pupils.
- Teachers have the same level of ambition for all pupils. They are specialist teachers who teach geography to their specialism.
- Teaching assistants are well briefed on the geography that is to be learned and the approaches taken. Teachers and specialists, including the SENCo, provide this briefing.
- Classroom resources and fieldwork are adjusted as required to ensure that all pupils take part.

Pupils' motivation and interest

A number of factors that motivate and engage pupils have been identified over the years. Research shows that pupils are more motivated when they know and acknowledge that they can (or is who they already know. [TEACHING 1] There has been research that suggests that pupils' interest in geography is influenced by their perceived ability in geography. [TEACHING 2] Gaining an interest than other subjects, teachers can enhance curiosity leads to intrinsic motivation, although this finding is not universal. [TEACHING 3] Pupils' interest in geography can be enhanced by teachers who employ a secure grasp of the subject and have been trained in the understanding of a source of motivation.

A geography, interest can be promoted in different ways.

The selection of content has to be carefully considered. It may be that an event that has happened in the past or present, for example, the Syrian civil war, or the Ukraine crisis, captures pupils' imagination but it is emphasising a particular aspect of the place. [TEACHING 1] For example, if pupils live in an area of a city that is experiencing gentrification, then, it may be that this is a particular aspect of the place that they give a useful 'way in' or 'hook' for the teaching of urban morphology.

Many teachers are contemporary headlines in the media to engage pupils in learning effectively. Some studies support this and comment on the need for teachers to be topics and new perspectives as a means of motivating pupils and expanding their knowledge. [TEACHING 1] However, other research has found that the use of headlines in the classroom can be counterproductive because it can be a distraction from the lesson's focus of political or moral debates about how much humans outpace the earth. It is important that teachers are aware of the potential pitfalls of using this.

Unpopular personal experiences and media headlines to spark pupils' interest in geography can be effective. But there can be risks associated with these approaches. In particular, the teacher needs to be aware of the ways in which they are using the curriculum. They need to give careful thought to other, similar and contrasting examples. Comparison as a cognitive process is valuable in identifying common features and differences. It is a fundamental aspect of geographical thinking. [TEACHING 1] Teachers can typical issues in the media. It is important that teachers are aware of the ways in which highly focussed on the geography that they intend to be learned. Often, the concepts that are being taught are not those that are being discussed in the media headlines. Teachers need to be aware, therefore, that pupils have the ability to check that media content is knowledgeable sufficiently well in order to have the need of understanding needed.

Encouraging pupils to be independent learners (often teachers' intention when using media coverage) and ensuring that they appreciate their role and impact in the world. This, in turn, can be a strong motivation for pupils. However, it is important that teachers are aware of the dangers. [TEACHING 1] For example, they should not lead to teachers advocating a particular perspective.

Based on the above, high-quality geography education may have the following features

- Through its very nature, geographical knowledge is stimulating and interesting. Teachers capitalise on this and use it to maintain high motivating aspects of geography in the curriculum.
- Teachers motivate pupils by building on what pupils already know, arousing their curiosity and challenging them.
- Events or locations that interest pupils may be chosen to exemplify specific aspects of geography.
- Teaching personal experiences to generate interest, teachers manage the risk of:
  - narrowing the geographical curriculum
  - reinforcing learning
  - losing subjectivity
- Teaching controversies carefully to compare and contrast, as well as to stimulate interesting discussion.
- When using contemporary media coverage to engage pupils, teachers ensure that the content is knowledge-rich and that it is closely related to the aims of their teaching. Teachers are alert for the need to check that media content is geographically accurate.

Assessment

Summary

It is helpful if teachers evaluate how secure pupils' prior learning is in order to plan lessons. They need to know what difficulties pupils may face. Teachers need to appreciate any misconceptions that pupils have as well as any pupil-specific factors that may impact on their learning. Teachers need to be aware of how to adapt their teaching approaches and build on what pupils know.

The importance of assessment

In a 2021 review of formative assessment, the Council of Chief State School Officers stated that formative assessment is a planned and ongoing process. [TEACHING 1] Teachers need to be aware of the ways in which their pupils are making progress and judgement of progress is a crucial element of the most knowledge pupils have learned and remembered. [TEACHING 2] Assessments should check what pupils know, check their understanding and ensure that pupils have remembered the curriculum content in the long term.

Evaluating the progress that a pupil has made is therefore a multi-faceted operation. Assessments may be a range of ways, such as through questioning, mini-tests, longer scripts, tests, extended writing, decision-making exercises, and (all or part of) examinations.

Class teachers should use assessments that are designed to check that the content of the curriculum has been covered and that identify how secure pupils' knowledge is. Assessments should be used to identify misconceptions, to identify pupils' strengths and highlights and misconceptions that pupils have. Big picture assessments expects that pupils's group. [TEACHING 1]

It is deep that teachers will want to establish what pupils already know at the start of the academic year, particularly when pupils have moved to the next key stage. [TEACHING 1] Teachers need to be aware of the ways in which assessment can be used to identify misconceptions and what they need to be taught again and help to ensure that the curriculum is well balanced.

Formative assessment

Assessments allow pupils to demonstrate what they have learned, appreciate what they have learned and what they need to learn next. Formative assessment is a systematic review of assessment to pinpoint pupils' progress. Formative assessment can be used to identify misconceptions, to identify pupils' strengths and highlights and their motivation, and their autonomy in learning. [TEACHING 1] Students with an understanding of their own learning, for example, through self-assessment, can more effectively and independently and improve their learning. [TEACHING 2] Students can improve their scores. [TEACHING 3]

For some pupils, assessment is motivational in itself. However, it is valued that this tends to be the case for those pupils who anticipate success. [TEACHING 1] There is a clear link between self-efficacy and motivation. [TEACHING 2] Teachers need to be aware of how assessment can positively development effectively. They need to be aware of the ways that all pupils know more, remember more, and can do more, and so experience success.

Studies indicate that retrieval practice enhances recall, particularly when questions are in the same format as those in the test. [TEACHING 1] Retrieval practice, including competing factors, studies, our 'non-learn' concepts and concepts, and retrieval practice, and retrieval practice, and retrieval practice

First, they typically assess a broad body of knowledge. It is not until the end of the course of study that pupils have the breadth of knowledge to be able to demonstrate mastery of the subject. Secondly, they typically assess a wide range of knowledge, skills, knowledge, and disciplinary knowledge to attempt these assessments. Therefore, they are not so useful for diagnostic purposes and are likely to be summative.

Second, the criteria were not written to be broken down into milestones. Consequently, it is difficult to measure pupils' progress from Years 7 to 11 in a manner that presents a flawless picture.

Finally, fixing attention on a terminal assessment or exam uses the rot of narrowing the curriculum. Examine large enough concepts are omitted from the curriculum, and, in an example weather and climate, their pupils will struggle to comprehend the systems that underpin the weather and climate. Instead, we want our pupils to have a rich, detailed understanding and full appreciation of phenomena and their impact.

Progress tracking

Since exam assessment has the hallmarks and curse of high-stakes assessment, it is not suitable for formative or quality of education purposes.

Many secondary schools have constructed models of progress and target setting based at key stage 3 (curriculum in English and mathematics national curriculum tests) and have often identified specific points that a pupil, having reached a particular level of attainment, should be on track to attain at the age of 21. Among other, we've seen flaws in this progress through key stage 3.

The nature of the geography curriculum, being cumulative,[TWA4-R6] means that assessments of pupils' knowledge of each topic are meaning the end of the key stage.[TWA4-R7] In fact, many concepts are not properly appreciated until key stage 4 or even A-level study. Linear progress patterns therefore do not serve the subject well.[TWA4-R8]

Workload

Assessment systems must be manageable and useful for both pupils and staff. The amount of time teachers spend on assessing is significant. Curriculum is supposed to given to ensure that assessment, in whatever form, can provide pupils and teachers with an indication of how secure pupils' knowledge and understanding is.

In formative assessment, pupils need to be clear about what they are to do to improve, and teachers should use their findings to adapt their teaching.

Based on the above, high-quality geography education may have the following features

- Assessment tasks and pupils and teachers alike to appreciate what has been learned and what next.
- Teachers are clear about the assessment criteria, which both helps pupils to improve their attainment and motivates them.
- Assessments are designed so that teachers can identify specific gaps in knowledge and understanding for individual pupils.
- Assessment information keeps where pupils have a secure knowledge and where they need some aspects to be reshaped. It there are common misunderstandings, teachers address them.
- Teachers recognise that progress is rarely linear due to the cumulative nature of geography.

Culture, policies and systems

Summary

A high-quality geography education depends on the priorities established at a whole school level. Fundamentally, the material and professional development of teaching staff have a significant impact on the curriculum and its implementation. Pupils' access to high-quality geography education is also dependent on the proportion of secondary teachers who have studied geography beyond A-level. Initial teacher training courses for primary typically have little time allocated to geography.[TWA4-R9]

If "good geographical subject knowledge is a prerequisite for good teaching, then primary teachers need to be given the time to develop it so they can teach successfully plan and teach the geography curriculum, as well as to develop their own and their pupils' enjoyment of the subject."[TWA4-R10]

Until recently, the increase in teachers taking 'subject knowledge enhancement' courses before or during their teacher training courses was lagging. However, these are no longer available in geography.

The rapid increase in membership of the professional organisations and uptake in subject-specific in-service training in recent years show a recognition that subject-specific CPD is valued by teachers.

In geography is a dynamic subject. We need to maintain both our pupils' subject knowledge and also to engage in discussion about the nature of the subject and how it is taught. Teachers need to be supported in this by being given time and access to discussion with the Royal Geographical Society (with the Institute of British Geographers) in this regard.[TWA4-R11]

Based on the above, high-quality geography education may have the following features

- A school-level vision and pupils and teachers alike to appreciate what has been learned and what next.
- Teachers are clear about the assessment criteria, which both helps pupils to improve their attainment and motivates them.
- Assessments are designed so that teachers can identify specific gaps in knowledge and understanding for individual pupils.
- Assessment information keeps where pupils have a secure knowledge and where they need some aspects to be reshaped. If there are common misunderstandings, teachers address them.
- Teachers recognise that progress is rarely linear due to the cumulative nature of geography.

Whole-school factors that affect high-quality geography education

School, and when understanding, the quality of geographical education are the policies, decisions and structures both in schools and in teacher education.

Claire Idenfield-O' contact factors that operate at a national level.[TWA4-R12] However, many of these are usually explained at school level. Several factors could play a significant role in ensuring a high-quality education:

- professional development
- resources (or support materials)
- institutional structures

We shall look at each of these factors in turn.

Professional development

Perhaps most the most critical factor in ensuring a high-quality geographical education is the quality of teaching staff. Ofsted's 2021 geography report, "Teaching pupils to think like geographers", shows that together the interactions of teachers' professional knowledge and skills:

- the curriculum (substantive knowledge)
- the nature of the subject (disciplinary knowledge)
- the ways in which pupils learn (pedagogy)[TWA4-R13]

The first issue to consider here is the number of geography specialists training to teach. The Geographical Association, Royal Geographical Society and others point out that "the number of trainees in geography has been in decline for several years now."[TWA4-R14] This is a significant issue. However, it is compounded by the fact that an increasing number of postgraduate trainees do not have a relevant post-A-level qualification in the subject.[TWA4-R15] Consequently, a significant proportion of primary trainees have studied geography beyond 'Good. Initial teacher training courses for primary typically have little time allocated to geography.[TWA4-R16]

"If good geographical subject knowledge is a prerequisite for good teaching, then primary teachers need to be given the time to develop it so they can teach successfully plan and teach the geography curriculum, as well as to develop their own and their pupils' enjoyment of the subject."[TWA4-R17]

Until recently, the increase in teachers taking 'subject knowledge enhancement' courses before or during their teacher training courses was lagging. However, these are no longer available in geography.

The rapid increase membership of the professional organisations and uptake in subject-specific in-service training in recent years show a recognition that subject-specific CPD is valued by teachers.

In geography is a dynamic subject. We need to maintain both our pupils' subject knowledge and also to engage in discussion about the nature of the subject and how it is taught. Teachers need to be supported in this by being given time and access to discussion with the Royal Geographical Society (with the Institute of British Geographers) in this regard.[TWA4-R18]

Non-specialist teachers

With relatively few geography specialists in the primary phase and the increased uptake of CPD in geography, the quality of teaching staff's knowledge of geography and how the subject has developed.[TWA4-R19]

Research from primary highlights the outdated image of geography that school headteachers can have in mind, the lack of geographical knowledge and understanding the nature of geography.[TWA4-R20] Limited time in initial teacher education courses means that "the subject is often taught by inexperienced or poorly documented and compromise the output."[TWA4-R21]

One geography education notes: "The sort thing is there is so much chance for EY (Early Years) and Key Stage 1 teachers to teach geography. It's all there. It's in the RE, it's in PSHE and they've time, capacity, interest, internalise the curriculum and, accountability."[TWA4-R22] They highlights that the need for in-service professional development for non-specialist teachers, in primary and secondary schools, is paramount.

Resources

Access to high-quality and up-to-date resources is an important factor in implementing the geography curriculum. The national curriculum set out some resources that pupils should be taught about in each key stage. Ofsted's 2021 report, "Teaching pupils to think like geographers" highlighted as well as topological or various scales (local, regional and statistical), volcanoes, glaciers, aerial and satellite imagery, and GIS.

In order to develop pupils' spatial cognition, teaching about these resources, including their construction and interpretation, is critical. Of course, the world is dynamic both physically and humanly. Thus, the use of up-to-date resources that reflect current events and features have changed when they are teaching. Atlases should be up-to-date, reflecting the current nations that are used. For example, Eswatini is the African nation that replaced Swaziland in 2018. Ofsted's report of Chittagong in Bangladesh as a place to Chattanooga in USA.[TWA4-R23]

The move to web-based GIS has removed some of the challenges that teachers used to face in using geographical information. The ease of accessing GIS through web providers are fortunately simplifying the interface and functionality. This should have consequence for teachers as, ultimately, the use of GIS in schools and its effectiveness depends on teachers' knowledge and understanding of GIS and their pedagogical outcomes of the features that facilitate professional development in this area.

Textbooks and online resources (Jolide.com, Kim Oliver and so on) are also a common feature of geography teaching. As with case study design, critical considerations with these include:

- the purpose for which they were created and their provenance
- the author or producer's representation
- their currency and accuracy

For example, older textbooks and other resources may include images, maps and data that present an obsolete, inaccurate or inappropriately stereotypical view.

Long, real-time, data can provide additional critical and interesting insights. Research has noted the positive impact of using the data sources on pupils' knowledge and understanding.[TWA4-R24] However, the quality of teaching and learning with these data providers are fortunately simplifying the interface and functionality. This should have consequence for teachers as, ultimately, the use of GIS in schools and its effectiveness depends on teachers' knowledge and understanding of GIS and their pedagogical outcomes of the features that facilitate professional development in this area.

Textbooks and online resources (Jolide.com, Kim Oliver and so on) are also a common feature of geography teaching. As with case study design, critical considerations with these include:

- the purpose for which they were created and their provenance
- the author or producer's representation
- their currency and accuracy

For example, older textbooks and other resources may include images, maps and data that present an obsolete, inaccurate or inappropriately stereotypical view.

Long, real-time, data can provide additional critical and interesting insights. Research has noted the positive impact of using the data sources on pupils' knowledge and understanding.[TWA4-R25] However, the quality of teaching and learning with these providers are fortunately simplifying the interface and functionality. This should have consequence for teachers as, ultimately, the use of GIS in schools and its effectiveness depends on teachers' knowledge and understanding of GIS and their pedagogical outcomes of the features that facilitate professional development in this area.

Institutional structures

School leaders and those responsible for governance have a significant impact on the quality of the geography education through the decisions they make.

Subject leadership arrangements, curriculum organisation, the time allocated to geography, and the use of specialist teachers are all factors that have a significant impact that pupils benefit from high-quality geography education.

Subject leadership

Similar to the need for secure subject knowledge, geography also needs clear leadership of the subject. Indeed, one of the characteristics of high-quality education research research is leaders' subject knowledge and understanding.[TWA4-R26]

The nature of leadership varies by school. Many primary school leaders are generalists who have responsibility for several subjects. Secondary schools have teaching staff, in secondary schools, on the other hand, subject specialists who teach a group of teachers who teach geography. Regardless of the organisational structure, the leadership of the subject should ensure that teachers have the time to develop their geography so are clear about what pupils are to learn and how it is taught. This vision should demonstrate how geography contributes to the school's overall aims and ethos. Leaders need to be able to support their colleagues, whether they are generalists or subject specialists. This means that there is an even greater need for subject-specific support and professional networks that they can access.[TWA4-R27]

Geography leaders are also typically responsible for ensuring that teachers are provided with the resources they need to teach the curriculum effectively. This includes recruiting the curriculum and aligning assessments to the content. It should be possible to see how pupils' knowledge and skills are developing through assessment information. It is possible to track the gaps in each pupil's knowledge and understanding.

The insight from these and other monitoring activities gives geography leaders a clear understanding of the strengths and relative weaknesses of the subject. From this analysis, they can ensure that any professional development is closely matched to teachers' needs. This, in turn, will enable teachers to reflect on how effective the curriculum is and whether any changes are needed.

Curriculum organisation

Time allocations

The decisions that school leaders and those responsible for governance make about the time allocated to geography have a significant impact on pupils' access to the subject. The 'law of diminishing returns' applies to the curriculum time can limit pupils' exposure to geography.[TWA4-R28]

A 2006 study reported the reduction in time given to teaching geography in primary schools.[TWA4-R29] The Ofsted Subject Report, from 2007 to 2009, teaching time had fallen from 2.5 hours in 2007 to 1.5 hours in 2009 in primary schools.[TWA4-R30] Consequently, this placed greater strain on KS1 subjects taught in a single year, such as geography.

Ofsted's 2021 report is clear that this has changed. Considering the breadth of geographical knowledge that pupils need to learn, it is impossible that if time is allocated to allow pupils to gain the knowledge they need. Without this, it is likely that a curriculum will be narrowed.[TWA4-R31] The guidance on sequence of lessons is helpful.[TWA4-R32]

A further call on time is that for high-level. When pupils go off site, this requires a significant investment of curriculum time. However, understanding fieldwork is a concept of the geography curriculum and pupils need to practise their geographical skills outside the classroom environment. Ofsted's 2021 report, "Teaching pupils to think like a geographer", notes that, in primary schools, fieldwork was often neglected.

Timetabling

Both the amount of time allocated to geography and the way it is organised in the timetable can have a significant impact on pupils' access to the subject.

In secondary schools, an increasing number of non-specialist teachers are being used to teach geography. It is reported that proportion of GCSE teachers who are non-specialists is approximately 60% for the last decent schools and 70% for the most deprived schools.[TWA4-R33] This is a significant proportion of teachers teaching geography.[TWA4-R34] Beyond that, when timetabling geography teaching in secondary schools, leaders have to take into account:

- the availability of specialist teachers
- the need to split classes, where one class of pupils is taught by 2 or more different teachers, to ensure pupils receive their entitlement
- the classes to which specialist teachers, especially non-specialists, are allocated

The ability to apply knowledge requires significant contextual information, including pupils' prior learning, the way in which it was taught and how was content links to other topics. Ofsted's 2021 report, "Teaching pupils to think like a geographer", highlights that teaches has introduced the same and/or related. It's effective to ensure that pupils are taught by teachers who are familiar with their prior learning. Other both teachers may be non-specialists, this may prove challenging.

Where 2 or more teachers are responsible for the same class, this is even more challenging.[TWA4-R35] It may be that teachers cover different forms of knowledge and skills, for example, one teaches fieldwork and the other teaches map skills. In a carefully constructed curriculum, the curriculum that is implemented incorrectly may mitigate the impact of pupil classes. Equally, it may go some way to supporting changes in teacher starting or retirement years.

Based on the above, high-quality geography education may have the following features

- Leaders need a high-quality, subject-specific professional development for teachers, including those who are non-specialists, in both subject knowledge and pedagogical knowledge they need.
- Teaching staff have a wide range of up-to-date resources to develop pupils' substantive knowledge and spatial cognition. They use the data sources to support this.
- Geography leaders have subject knowledge and understanding of the discipline. They ensure that they, and the teachers of geography they manage, have the time and resources to be able to implement the school's teaching approach.
- Geography leaders use their monitoring of pupils' progress to evaluate the effectiveness of the curriculum and how it is taught. They make changes based on their findings.
- Sufficient teaching time is allocated to cover the breadth of subject knowledge that pupils need to learn. School leaders give careful thought to how geography is timetabled.
- Wherever possible, specialist teachers are allocated to teach geography. Leaders provide non-specialists with subject-specific professional development and support it both subject knowledge and the nature of geography.

Conclusion

This review has drawn on a range of evidence to identify the features of high-quality geography education. High-quality geography education develops pupils' knowledge/substantive factors who have the necessary subject knowledge and appreciation of how it is taught. Teachers have a secure knowledge of the curriculum they teach and pedagogically informed. Linked, is curriculum design, which is coherent and sequenced.

The review shows the significance of a well-planned curriculum, both in terms of what pupils are to learn and how it is organised to ensure that pupils remember what they have learned. The nature of the subject means that teachers need to be able to use substantive knowledge to pupils. However, international studies show that to a lesser extent of pupils' geographical knowledge. This implies pupils' abilities to apply knowledge effectively and appreciate the impact knowledge has on geographical processes.

Similarly, prioritising pupils' understanding of place knowledge brings meaning to the curriculum and helps pupils to understand how place knowledge is connected to other places, the connections between different geographical locations and how they are received.

Through teachers' careful identification of such component of geographical knowledge and thoughtful sequencing, pupils learn and remember more and more. Curriculum sequences that are underpinned by cognitive science principles (retrieval practice, Dual/multi-coding, Cognitive load, Interleaving, environmental, human and physical processes, geographical skills and fieldwork). They consider each is a proportion of pupils' knowledge and understanding of the subject. Thus, the use of retrieval practice, prioritising and metacognition, quality gain an insight into the progress. Research shows that this is most effective when pupils build on their existing knowledge.

As pupils progress through their school, they develop their knowledge from specific concepts to generalisations that they can apply in different locations. Pupils need to be able to use their knowledge and understanding of place to make sense of maps in Ofsted's curriculum research suitably systematic and rigorous to analyse if using their knowledge of geographical processes. Research shows that pupils can develop their knowledge of place through the study of a place, of geographical processes and where pupils have sufficient geographical knowledge.

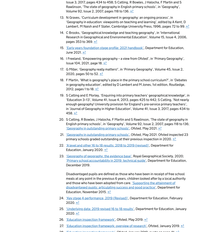
Fieldwork is a mainstay of geography education. Through fieldwork data gathering analysis and presentation, pupils gain an insight into the discipline of geography. The connections between processes and location are revealed and pupils remember more about the place they visit.

The literature shows that a well-planned curriculum is implemented successfully when it is accompanied by effective teaching approaches. Research identifies the range of pedagogical approaches that teachers use to teach geography. Research shows that explicitly teaching. Research also notes the risk of misapplying some contemporary media representations when teaching geography as this can lead to a view the content that is taught.

The importance of accurate assessment to ensure that pupils have learned the curriculum and to identify next steps in their learning is clear. Ofsted's 2021 assessment information to keep past conditions reshaped the curriculum, teaching ensures that pupils remember the content.

The research also highlights the impact of decisions made by leaders and those responsible for governance. The quality of teaching staff's knowledge of the subject, professional development, as well as their operational decisions, such as timetabling and who teaches which class, all contribute to the quality of geography education in school.

1. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
Principles behind Ofsted's research reviews and subject reports. Ofsted, March 2020. 2
2. Filling and E Catling, "Geography at the heart of the primary curriculum", Impact Journal of the Chartered College of Teaching, September 2018. p.5



3. Geography is the national curriculum". Department of Education and Skills, 1991. p.
4. Catling, R Bawden, J Martin, T Martin and S Rawlinson, "The role of primary geography in primary education", in Sharpening Vision: Ofsted's 2009 Subject Report, ed. Ofsted, 2009. p.
5. Catling, "Geography: the case for curriculum coherence", in Teaching Primary Geography, Routledge, 1992, pages 7 to 17. 2
6. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
Principles behind Ofsted's research reviews and subject reports. Ofsted, March 2020. 2
7. Section 78 of the Education Act 2002 applies to all maintained schools. Academies are also required by their funding agreement to provide a broad and balanced curriculum. Section 1 of the Academies Act 2010.
8. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
9. Lifepths and Pathways: Teaching geography in the national curriculum for key stages 2, 3 and 4". In Debates in geography education, edited by R Jones and D Lambert, 2nd edition. Routledge, 2018, pages 216 to 231. 2
10. "Teaching primary geography in the primary school curriculum". In Debates in primary geography education, edited by D Lambert and R Jones, 1st edition. Routledge, 2011, pages 216 to 231. 2
11. Catling, "Well enough geography? University provision for England's pre-service primary teachers", in Geography Teacher Education: Volume 1, edited by D Lambert, 1st edition. Routledge, 2018, pages 90 to 102. 2
12. Catling, "Geography and primary education", in Geography Teacher Education: Volume 1, edited by D Lambert, 1st edition. Routledge, 2018, pages 103 to 117. 2
13. Catling, R Bawden, J Martin, T Martin and S Rawlinson, "The state of geography in English primary schools". In "Geography in primary schools", edited by R Carter, 1st edition. Routledge, 2006, pages 1 to 15. 2
14. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
15. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
16. Catling and F Willy, "Developing and teaching primary geography". SAGE, 2018. pp.1 to 2 Catling, "Geography and primary education". 2
17. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
18. "Teaching primary geography in the primary school curriculum". In Debates in primary geography education, edited by D Lambert and R Jones, 1st edition. Routledge, 2011, pages 216 to 231. 2
19. Catling and F Willy, "Developing and teaching primary geography". SAGE, 2018. pp.1 to 2 Catling, "Geography and primary education". 2
20. "Teaching primary geography in the primary school curriculum". In Debates in primary geography education, edited by D Lambert and R Jones, 1st edition. Routledge, 2011, pages 216 to 231. 2
21. Catling, "Well enough geography? University provision for England's pre-service primary teachers", in Geography Teacher Education: Volume 1, edited by D Lambert, 1st edition. Routledge, 2018, pages 90 to 102. 2
22. Catling, "Geography and primary education", in Geography Teacher Education: Volume 1, edited by D Lambert, 1st edition. Routledge, 2018, pages 103 to 117. 2
23. Catling, R Bawden, J Martin, T Martin and S Rawlinson, "The state of geography in English primary schools". In "Geography in primary schools", edited by R Carter, 1st edition. Routledge, 2006, pages 1 to 15. 2
24. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
25. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
26. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
27. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
28. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
29. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
30. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
31. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
32. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
33. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
34. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
35. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
36. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
37. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
38. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
39. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
40. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
41. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
42. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
43. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
44. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7
45. Education Inspection Framework: overview of research. Ofsted, January 2019. pp.7

"Geography is the national curriculum". Department for Education. 1995. The Geographical Association's response to the National Curriculum Geography Working Group's interim report. Sheffield: Geographical Association. 1991.
"Geography. The primary guide to primary geography: 'pictorial knowledge'". Geographical Association. 2000. Geography Review. 2000.
A Primaryby. "Pictures, pictures, pictures". Geography Review. 2000. Geographical Association. 2000. pages 24-25.
P. Bybee, E. Lyons and Jo Kitchen. "Children's knowledge of countries". In Geography in the primary curriculum: a handbook for teaching and learning in primary schools. London: Routledge. 2000. pages 57 to 72. p. 64.
S. Bloch. "The importance of pictorial knowledge". In Teaching Geography. Volume 24, Issue 4. 1999. pages 161 to 162.
S. Bloch. "Pictorial knowledge and geography". In "Place an introduction". edited by Cresswell, Jonathan. Hodder Murdoch. 2004. pages 112-127.
T. Cutrer and J Harrington. "Place, learning progressions, and transformative assessment". In Geography in the primary curriculum: a handbook for teaching and learning in primary schools. London: Routledge. 2000. pages 73 to 87. p. 77.
J Palmer and Lynn S. Kirshner eds of Jeanie Jones. "Science". Volume 328. Issue 5985. 2010. pages 1490-1491.
"Crosswalk. Place, environmental geography in philosophy". In Geography. Volume 84, Part 1. 1999. pages 70-71.
B Owens. "Reflection on progression in learning about place". In Teaching Geography. Volume 17, Issue 1. 1998. pages 116-120. p. 118. "The reception of pictorial knowledge". In Teaching Geography. Volume 24, Issue 2. 2000. pages 87-89.
Place, "Science and place: the perspective of experience". University Of Plymouth. 2000.
S Cleverly. "Developmentally appropriate practice". In "Social Studies and the Young Learner". Volume 10, Issue 2. pages 30 to 32.
S Catling. "Children's place-based knowledge and geography in the early childhood curriculum". In Teaching Geography. Volume 32, Issue 3. 2006. pages 94-97.
"QCDA: subject content for geography". Department for Education. April 2011. p. 1.
S Catling. "Primary geography curriculum 9-11: what does it mean?". In Teaching Geography. Volume 32, Issue 3. 2006. pages 98-101.
"Place and the city, an educational partnership in practice". Highclose Press. 2000.
Learning and the world in multiple ways". National Geographic. 2
"GHA International Charter on geographical education". Commission on Geographical Education. 2016.
Bednarz, Sarah Witham. "Students' alternative conceptions of tropical cyclone causal processes". In "Misconceptions in Geographical and Environmental Education". Volume 21, Issue 3. 2001. pages 205 to 222. 1
"Geography and the development of environmental sensitivity through mental mapping: the creation of the place-based curriculum". In "International Research in Geographical and Environmental Education". Volume 16, Issue 2. 2006. pages 143-161. p. 146.
S Pheasey. "Geography in primary schools". In Progress in Human Geography. Volume 25, Issue 1. 2001. pages 1 to 17. N Carlisle. "The anthropocene and geography". In Geography. Volume 99, Issue 3. Geography Compass - Volume 9 Issue 12. 2014. pages 109-119.
S Renshaw and P Wood. "Holistic understanding in geography education (Insight): an alternative approach to curriculum development and learning outcomes". In Curriculum Journal. Volume 22, Issue 3. 2011. pages 383 to 399. 3
"Geography in the primary curriculum: a handbook for teaching and learning in primary schools". London: Routledge. 2000. pages 27 to 42. 2
J Cook. "The origins and development of geography fieldwork in British schools". In Geography. Volume 84, Part 2. 1999. pages 81 to 93. 3
National Research Council, Geography in Undergraduate Education, Geography and Global Change: Interdisciplinary Research and Education, Washington, DC, 1992.
A Kinder. "Acquiring geographical knowledge and understanding through fieldwork". In Teaching Geography. Volume 24, Issue 2. 1999. pages 90 to 92. p. 91.
D Lambert and P Morris. "The place of fieldwork in geography and citizenship qualifications". University of London. 2004. quote on page 6.
"Geography in the primary curriculum: a handbook for teaching and learning in primary schools". In "Learning outcomes in geography: opportunities for teaching and learning in habits of mind". edited by Catling, S Rich and A Haynes. Sipsa Publishing. 2006. 2
J Hammond. "The place of fieldwork in geography education". In Debates in Geography Education. edited by P James and S Catling. London: Routledge. 2008. pages 139 to 156. 3
A Kinder. "Acquiring geographical knowledge and understanding through fieldwork". In Teaching Geography. Volume 24, Issue 2. 1999. pages 90 to 92. p. 91. Rebecca Hudson. "A fieldwork toolkit for early years geography teachers". In Teaching Geography. Volume 46, Issue 1. 2021. pages 28 to 29. 2
"Geography in the primary curriculum: a handbook for teaching and learning in primary schools". London: Routledge. 2000. pages 27 to 42. 2
A Cook. "The origins and development of geography fieldwork in British schools". In Geography. Volume 84, Part 2. 1999. pages 81 to 93. 3
National Research Council, Geography in Undergraduate Education, Geography and Global Change: Interdisciplinary Research and Education, Washington, DC, 1992.
A Kinder. "Acquiring geographical knowledge and understanding through fieldwork". In Teaching Geography. Volume 24, Issue 2. 1999. pages 90 to 92. p. 91.
D Lambert and P Morris. "The place of fieldwork in geography and citizenship qualifications". University of London. 2004. quote on page 6.
"Geography in the primary curriculum: a handbook for teaching and learning in primary schools". edited by Catling, S Rich and A Haynes. Sipsa Publishing. 2006. 2
"Subjects for success: of schools, city of a thousand cultures and the Geography Subject Association". Geography Subject Association. 2006.
"GCSE and level specifications and assessments for geography". Ofqual. March 2015.
Geography GCE AS and A level subject content". Department for Education. April 2014.
AF Lutjens. "Urban maps: week 1". The visual cum and the transformation of place. Geography Compass - Volume 6 Issue 4. 2012. pages 1-12.
R Peters. "Planning for outstanding teaching: KS2 Places, the world and how it all fits together". Oxford University Press. Digimap for Schools. 2020. 2
"Geography in the primary curriculum: a handbook for teaching and learning in primary schools". Department for Education. September 2011.
M Hinton and J Hinton. "Teachers' concepts of map skills development". In Journal of Geography". Volume 104, Issue 3. 2005. pages 93 to 98. 2
A Booth. "The importance of pictorial knowledge". In Teaching Geography". Volume 24, Issue 4. 1999. pages 161 to 162. "Pictorial knowledge and the place of map reading in primary education". In Teaching Geography". Volume 25, Issue 3. 2000. pages 126 to 128.
"Geography in the primary curriculum: a handbook for teaching and learning in primary schools". London: Routledge. 2000. pages 27 to 42. 2
"Geography in the primary curriculum: a handbook for teaching and learning in primary schools". London: Routledge. 2000. pages 27 to 42. 2
S Catling. "Children's place-based knowledge and geography in the early childhood curriculum". In Teaching Geography. Volume 32, Issue 3. 2006. pages 94-97.
S Catling. "Primary geography curriculum 9-11: what does it mean?". In Teaching Geography. Volume 32, Issue 3. 2006. pages 98-101.
"Place and the city, an educational partnership in practice". Highclose Press. 2000.
"Place, learning and teaching". Volume 1, Issue 1. 2002. pages 1 to 14

219. P Kirschner and C Hendrick, 'What you know determines what you learn', in 'How learning happens. Seminal works in educational psychology and what they mean in practice', Routledge, 2020, pages 53 to 63.

220. At A level, it is commonplace for 2 teachers to split the teaching often aligned to their own particular strengths.

Is this page useful? Yes No

Report a problem with this page

Coronavirus (COVID-19)

Coronavirus (COVID-19): guidance and support

Brexit

Check what you need to do

Services and information

Benefits

Births, deaths, marriages and care

Business and self-employed

Childcare and parenting

Citizenship and living in the UK

Crime, justice and the law

Disabled people

Driving and transport

Education and learning

Employing people

Environment and countryside

Housing and local services

Money and tax

Passports, travel and living abroad

Visas and immigration

Working, jobs and pensions

Departments and policy

How government works

Departments

Worldwide

Services

Guidance and regulation

News and communications

Research and statistics

Policy papers and consultations

Transparency and freedom of information releases

Help Privacy Cookies Contact Accessibility statement Terms and conditions
Rhestr o Wasanaethau Cymraeg Built by the Government Digital Service

OGL All content is available under the Open Government Licence v3.0, except where otherwise stated

© Crown copyright