Collins

Scheme of work

Geography: Key Stage 2 Years 3 and 4

Teachers Professional Development Programme

Enquiry 4: How and why is my local area changing?

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Connecting the curriculum through enquiry based learning

Key Question: How and why is my local area changing?

Learning objectives

During the enquiry pupils will have opportunities through the application and analysis of a wide range of geographical skills and resources to:

- Identify, describe and give reasons for why environments change;
- Explain with examples how some environmental change may be the result of natural events whilst other change may be the result of deliberate human activity to improve the quality of life;
- Observe, record and explain changes that have occurred in the past to the school and its grounds and its immediate environment;
- Identify, describe and explain how an aspect of life in the local area has changed over a long period of time, or how the locality has been affected by a significant national or local event or development, or the work of a significant individual;
- Demonstrate understanding of how the quality of the environment may change within the local area and make judgements to explain observations;
- Recognise how remote sensing by satellites and satellite images inform geographers of environmental change on a global scale and identify and explain

Purpose of the enquiry

The concept of change underpins the study of geography with its central paradigm of investigating the interaction of people and their environments. Pupils at Key Stage 1 can be introduced to the importance of change through their own personal geographies – of themselves and the people and places with which they engage at home, at school and within the immediate vicinity of where they live.

At Lower Key Stage 2 the concept of change can be developed and illustrated through the familiar surroundings of the pupil's school and grounds and its immediate local area. It is important to establish and build an understanding amongst the pupils of changes that occur in environments as a consequence of natural events (quite often natural disasters of one kind or another) over which people have little or no control, and changes that people choose to make as a means of improving the quality of life. In most schools there will be changes that can be charted over the years by using a wide range of digital and hardcopy resources, as well as by engaging with members of the community who may have witnessed those changes first-hand.

Similarly, spatial changes over time to the settlement in which the school is situated can be investigated through digital mapping programmes, fieldwork observation and recording using baseline maps at a variety of scales. Fieldwork in the local area provides an ideal context to introduce the idea of hypothesis generation and testing through data collection and interpretation – which is central to what geographers do. An example is given here of how teachers can engage young geographers in a carefully structured fieldwork investigation focusing on identifying and explaining variations in the quality of the environments pupils observe in the local area. This follows the enquiry process of identifying relevant data to collect, employing techniques to capture and present it and interpreting the results.

Finally this enquiry enables pupils to reflect upon the contribution that remote sensing technology used by satellites can make to understanding larger scale environmental change at a global level.

Context

This enquiry follows the established pattern of continuity and progression built in to other enquiries in the programme by beginning with the familiar and known (the pupil's school and its grounds). It then extends outwards in scale to consider the less familiar (local area) and finally a range of unknown locations at a global scale. In all three contexts pupils apply their enquiry skills to investigate a range of questions which, as they unfold, illustrate the concept of change and the different ways in which it manifests itself. Throughout the enquiries, pupils are also encouraged to reflect on some of the consequences of environmental change and to consider who or what might benefit from such changes and who in turn might be affected negatively by them.

National Curriculum coverage Geography

Pupils should be taught to:

Locational knowledge

- Locate the world's countries, using maps to focus on Europe (including the location of Russia) and North and South America, concentrating on their environmental regions, key physical and human characteristics, countries and major cities.
- Identify the position and significance of latitude, longitude, Equator, Northern Hemisphere, Southern Hemisphere, the Tropics of Cancer and Capricorn, Arctic and Antarctic Circle, the Prime/Greenwich Meridian and time zones (including day and night).

Human and physical geography

Describe and understand key aspects of:

- Physical geography, including: climate zones, biomes and vegetation belts, rivers, mountains, volcanoes and earthquakes, and the water cycle.
- Human geography, including: types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water.

specific examples of change from NASA images of locations around the world;

- Describe and explain the impact of environmental change in one threatened region of the world.

Key Subject Vocabulary

Site; Location; Cumbria; Lake District; Village; Town; Valley; Mountain; River; Lake; Mouth; Run-off; Change; Storm; Rainfall; Wind; Saturated; Natural disaster; Environment; Derelict; Borough; London; Olympics; Redevelopment; Canal; Transport; Plan; Geographical Information System (GIS); Costs and benefits; Land use; Scale; Key; Settlement; Route; Residential; Commercial; Recreation; Leisure; Public services; Classify; Pattern; Distribution; Census; Population; Demographic; World War I; Satellite; Orbit; Remote sensing; Trend; False-colour; Wireless; Hurricane; Emergency planning; City; Vegetation; Desert; Density; Lake; Irrigation; Sea; Deforestation; Criterion; Hypothesis; Fieldwork; Accessibility; Pollution; Traffic; Amenities; Scatter graph; Line of best fit; Correlation; Positive; Negative.

Geographical skills and fieldwork

- Use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied.
- Use the eight points of a compass, four and six-figure grid references, symbols and key (including the use of Ordnance Survey maps) to build their knowledge of the United Kingdom and the wider world.
- Use fieldwork to observe, measure, record and present the human and physical features in the local area using a range of methods, including sketch maps, plans and graphs, and digital technologies.

Connections to the subject content of other curriculum areas

Language and literacy

Teachers should develop pupils' spoken language, reading, writing and vocabulary as integral aspects of the teaching of every subject. English is both a subject in its own right and the medium for teaching; for pupils, understanding the language provides access to the whole curriculum. Fluency in the English language is an essential foundation for success in all subjects.

Spoken language

Pupils should be taught to speak clearly and convey ideas confidently using Standard English. They should learn to justify ideas with reasons; ask questions to check understanding; develop vocabulary and build knowledge; negotiate; evaluate and build on the ideas of others; and select the appropriate register for effective communication. They should be taught to give well-structured descriptions and explanations and develop their understanding through speculating, hypothesising and exploring ideas. This will enable them to clarify their thinking as well as organise their ideas for writing.

Reading and writing

Teachers should develop pupils' reading and writing in all subjects to support their acquisition of knowledge. Pupils should be taught to read fluently, understand extended prose (both fiction and non-fiction) and be encouraged to read for pleasure. Schools should do everything to promote wider reading. They should provide library facilities and set ambitious expectations for reading at home.

Pupils should develop the stamina and skills to write at length, with accurate spelling and punctuation. They should be taught the correct use of grammar. They should build on what they have been taught to expand the range of their writing and the variety of the grammar they use. The writing they do should include narratives, explanations, descriptions, comparisons, summaries and evaluations: such writing supports them in rehearsing, understanding and consolidating what they have heard or read.

Vocabulary development

Pupils' acquisition and command of vocabulary are key to their learning and progress across the whole curriculum. Teachers should therefore develop vocabulary actively, building systematically on pupils' current knowledge. They should increase pupils' store of words in general; simultaneously, they should also make links between known and new vocabulary and discuss the shades of meaning in similar words. In this way, pupils expand the vocabulary choices that are available to them when they write.

In addition, it is vital for pupils' comprehension that they understand the meanings of words they meet in their reading across all subjects, and older pupils should be taught the meaning of instruction verbs that they may meet in examination questions. It is particularly important to induct pupils into the language that defines each subject in its own right, such as accurate mathematical and scientific language.

Numeracy and Mathematics

Teachers should use every relevant subject to develop pupils' mathematical fluency. Confidence in numeracy and other mathematical skills is a precondition of success across the national curriculum. Teachers should develop pupils' numeracy and mathematical reasoning in all subjects so that they understand and appreciate the importance of mathematics.

Pupils should be taught to apply arithmetic fluently to problems, understand and use measures, make estimates and sense check their work.

Pupils should apply their geometric and algebraic understanding, and relate their understanding of probability to the notions of risk and uncertainty. They should also understand the cycle of collecting, presenting and analysing data. They should be taught to apply their mathematics to both routine and non-routine problems, including breaking down more complex problems into a series of simpler steps.

Science

Living things and their habitats

Pupils should be taught to:

- Recognise that environments can change and that this can sometimes pose dangers to living things.

History

A local History study

Pupils should be taught:

- A depth study linked to one of the British areas of study.
- A study over time tracing how several aspects of national history are reflected in the locality (this can go beyond 1066).
- A study of an aspect of history or a site dating from a period beyond 1066 that is significant in the locality.

Computing

Pupils should be taught to:

- Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration.
- Use search technologies effectively; appreciate how results are selected and ranked; and be discerning in evaluating digital content.
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

NOTES

Ancillary Question 1: Why do places change?

Show the pupils the photographs of Glenridding in **Resource 1** and encourage them to describe what kind of settlement it is and also its *site* (its exact position) and *location* (its immediate surroundings). Explain that the village of Glenridding is in the United Kingdom, in the county of Cumbria (see map **Resource 2**), within an area often referred to as the *Lake District*, to the north of the small town of Ambleside (see map **Resource 3**). It is a village situated in a deep valley at the mouth of a river as it flows out into a large lake called Ullswater. Its broader location is dominated by mountains with very steep slopes.

Now explain to the pupils that in December 2015 the village of Glenridding changed drastically. Are there any clues in the photographs to suggest what this change may have been and what caused it?

Now show the pupils the news reports at www.youtube.com/watch?v=rQXKaL2iYQo and www.youtube.com/watch?v=YMX1SOwHJ7k

Encourage discussion and reflection. What changes occurred in the village and what were the causes of these changes? Between 3–8 December 2015, *Storm Desmond* hit North West England and Cumbria as it passed to the west of the United Kingdom (**Resource 4**). During this time over a month's rainfall fell in the space of just 48 hours and winds reached speeds of 130 km per hour. Rainwater poured down the saturated steep-sided mountains into the rivers, which quickly burst their banks. The result was that the village was devastated by the impact.

The pupils can be encouraged to read the news reports of the floods at www.bbc.co.uk/news/uk-england-cumbria-35057763 and www.theguardian.com/uk-news/2015/dec/09/glenridding-defences-fail-as-flood-waters-rise-in-isolated-cumbria-town

Take time to discuss the events at Glenridding. Were these events and the changes that took place things that the residents of the village had any control over? What might they do in the future to help protect themselves from such an event happening again? Are these things that the residents can do alone or will they also need help from elsewhere? Where do you think this assistance will come from? The devastation was the result of a natural event (Storm Desmond) that caused a natural disaster for the people of Glenridding – change they would have preferred not to have happened.

Next show the pupils the images in **Resource 5** and ask them to describe what kind of place this is. They are all photographs of derelict land in the London Borough of Newham (see map in **Resource 6**). This was the land that was redeveloped for the Olympic sports arenas, village and parks for the London Olympic Games of 2012. This location was transformed as the time lapse films at www.youtube.com/watch?v=bB0W8xiqQ8Y and www.youtube.com/watch?v=lPpD-x_rykU show. The result was a venue for the Olympics in London which left so many wonderful sporting memories. Look at some highlights here; www.youtube.com/watch?v=TbsXUJITa40

Spend time discussing with the pupils what kind of change to the area this was? How did the change here compare with the changes that occurred at Glenridding? The difference is that people decided to make the changes in Newham of their own free will, whereas the changes for the people of Glenridding were inflicted upon them without any say in the matter. **Resource 7** shows a *Google Earth* image of the area of the Olympic Park in 1945. **Resource 8** shows the same area in 2015. Print off the 1945 black and white image and ask the pupils what occupied most of area of the Queen Elizabeth Olympic Park in 1945 (mostly railway sidings and goods yards). On the 1945 base map support the pupils to locate and label the location of the *Olympic Stadium; Aquatics Centre*; *Stratford International Rail Station*; *River Lee* and *Wetland Walks Park*. If any of these are not immediately identifiable, then all can be located by switching on the *Places* layer when viewing the 1945 image.

NOTES

Ancillary Question 2: How has my local area changed in the past?

In terms of ensuring continuity and progression, a logical place to begin this enquiry is with your own school and grounds itself. If the school has been established for several decades or more, there will almost certainly have been changes over time to its fabric and layout, and also, perhaps, to the number and origin of pupils attending.

Track down sources of information, which may have been archived either within the school records or perhaps at the County Records Office; school plans and log books often provide a wealth of information about change. In addition local community members, particularly if they attended the school in the past, can be invited to come in and discuss their experiences and how the school looked has changed since the time when they attended.

Write to parents and families appealing for old photographs, newspaper reports and school newsletters together with any other sources of evidence that might illustrate change to the school and its environs. For both long-established and recently built schools *Google Earth* provides a wealth of GIS data, which can be used to identify changes to the school and its grounds over time. Its various layers can be switched on and off to make the information more useful. For example, the present Dartington C of E Primary School in Devon didn't exist in 2006 (**Resource 9**) but by 2010 a new community school had been established in what was originally farmland on the outskirts of the village (**Resource 10**).

Only pupils in a few primary schools will be able to observe, describe and explain changes as radical as this. However, in most institutions there will be discernible changes to the structure of the school and the layout of its grounds for the pupils to be able to discuss. For example, although the structure and layout of the school buildings at Alphington Primary School in Exeter did not change a great deal between 2002 (**Resource 11**) and the present day (**Resource 12**), the school grounds did see significant change with the incorporation of former allotments adjacent to the school.

As with all aspects of change to the environment it is important to encourage discussion amongst the pupils about what they perceive to be the advantages and disadvantages of any changes they have observed. In what ways has the community (in this case the school community) benefitted from the changes and are there any costs or negative things about what has occurred over time? This develops the skill of evaluating and reflecting upon change and considering its costs and benefits, which is integral to seeing the world as young geographers. In relation to recording changes, which have occurred to the school and its immediate environment, pupils can draw plans of the school at different dates to identify, describe and explain the alterations and/or annotate a base *Google Earth* image to achieve the same thing.

Every primary school will be based in a settlement of some kind, ranging in scale from a hamlet to a city. This settlement can form the initial focus of what change has occurred in the local area. Historical maps of the area are of great value for the pupils to use as baselines against which to identify and explain any changes they can observe. The subscription service *Digimap for Schools* http://digimapforschools.edina.ac.uk/ allows teachers to access a wide range of present-day Ordnance Survey maps at a range of scales as well as historical maps dating for the 1890s. Also included are street level maps showing street names. There is a free and comprehensive user guide at http://digimapforschools.edina.ac.uk/schools/Resources/allstages/userguide.pdf

Using a copy of an 1890s base map of their local area (large-scale maps at scales of 1:10 000; 1:5000 and 1:2500 are particularly useful for young geographers studying the local area), pupils can plan a route to identify and locate changes in land use that have occurred over the past 100 years or so. They can colour code their maps by shading areas according to an agreed map key e.g. *residential; commercial; recreation and leisure; public services; transport.* Having completed this exercise it will be important to discuss with the pupils reasons for the changes they have recorded on their base maps.

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What has changed and why? Endeavour to extend and stretch the thinking of the pupils here. For example, an area of new housing might have appeared to house people moving to the local area but it is also important to discover why they are moving in – new jobs, retirement, refugees etc.

Because all schools will be located in a settlement of one kind or another, surrounding streets and houses will always provide pupils with an insight into changes that have occurred over time. For example, they can undertake a survey using a copy of a large-scale map (**Resource 13** has an example of a junior school in eastern England) to colour code areas and streets according to the age of the residential properties to be found there using the classification in **Resource 14**. As well as identifying the location of properties of each type on their base maps, the pupils can also tally total numbers, which can then form the basis of graphical representations using a range of techniques such as bar graphs and histograms. Once completed, the map of residential properties can be interpreted to identify and explain the distribution of homes of different ages in the local area. It will also allow the pupils to consider the pattern of growth that has occurred historically over time.

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Ancillary Question 3: How did my local area change as a result of World War I?

A geographical investigation of the causes and effects of spatial changes in the local area can be connected in a meaningful way to a local historical enquiry. A local historical enquiry may study how an aspect of life has changed over a long period of time, or how the locality was affected by a significant national or local event or development or the work of a significant individual.

Online census records dating back to 1841 are now searchable at www.ukcensusonline.com/census/1841.php with additional demographic data accessible at www.nationalarchives.gov.uk/records/census-records.htm

The example outlined here shows how an investigation of the impact of World War I can be used to add value to the main thread of the pupil's geographical investigations. There is detailed guidance and support for carrying out a local historical study from *The Historical Association* at www.history.org.uk/resources/resource_3863.html and the *Schools History Project* at www.schoolshistoryproject.org.uk/ResourceBase/primary/OurLocalityWW2.htm

Why do we remember William Pengilley?

This enquiry can be easily replicated with any community where there is a war memorial or a parish church with commemorations to the dead of World War I. William Pengilley's name was selected at random from all of the dead from World War I inscribed on the war memorial in Exmouth, Devon (**Resources 15** and **16**). Pupils could be divided into pairs and encouraged to choose one of the soldiers commemorated. All of the following information about William was then accessed online in a very straightforward way through mostly free archive websites (details and procedure to follow detailed below):

WILLIAM CHARLES PENGILLEY was born in 1877 in Wonford (Exeter) in Devon, the second child of Charles and Jane Pengilley. His father Charles was born in 1851 in East Budleigh, and his mother Jane was born in 1853 in Kennford/Doddiscombsleigh. They were married in 1875. The surname Pengilley is Cornish in origin.

William's elder sister was Ellen (born 1875). He had two younger sisters (Agnes and Alice) and four younger brothers (Robert, Frank, Samuel and Henry). There was another sibling who died before 1911. The family were living in South Wonford, Heavitree when William was young, and his father worked as a grocer's porter.

The family moved, sometime before 1891, to Fore Street, in the parish of Littleham in Exmouth, Devon, where William's Father worked in the Marine Stores.

William married Elizabeth Ann in 1908 and, by 1911, they too were living in Fore Street (number 97 **Resource 17***). His parents lived at 19 Fore Street. William and Elizabeth had two children, William and Annie (born in 1909 and 1910).*

The 1911 census shows William working as a carter for the urban council. William joined the 1st Battalion of the Devonshire Regiment in 1916 and his service number was 24695. By that time he was 39 years old and almost certainly conscripted into service since his job would not have been a 'protected' one. **Resource 18** *shows the Devonshire Regiment embarking for Flanders from Jersey where the regiment had been 'fitted out'.*

Sadly, William died on 4 January 1917; the records stating that he was killed in action in France and Flanders. The 1st Battalion weren't fighting on that date, so it seems likely that William was wounded during an earlier battle, and died on 4 January from his injuries.

During the three months preceding his death, the 1st Battalion of the Devonshire Regiment was attached to the 95th Brigade of the 5th Division and had fought in the final four battles of the Somme, notably the Battle of Guillemont; the Battle of Flers-Courcelette; the Battle of Morval and the Battle of Transloy.

*He was buried at Gorre British and Indian Cemeteries, in Pas de Calais in France (***Resource 19***). The grave reference is III.E.12 (***Resource 20***) His death was reported in The Western Times newspaper on Friday 19 January 1917.*

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*Nearly a hundred years on from his death William's niece, Virginia Anne, still lives in Exmouth along with her two children (**Resource 21**). She is the widow of Frank, the son of William's youngest brother Henry. On her mantelpiece is a sepia-tinted and faded photograph of a mound of earth and a makeshift cross in Flanders bearing the name of William Charles Pengilley taken immediately after his burial – his 'corner of a foreign field'.*

Many records can now be found online.

- The first site I visited was the **Commonwealth War Graves Commission** www.cwgc.org ... *Find War Dead*; then I entered W PENGILLEY, plus FIRST WORLD WAR. The site showed one William Pengilley, who was a Stoker 1st class in the Royal Navy, born in Exmouth, and died 4 April 1918, being remembered on the Plymouth Naval Memorial. It seemed unlikely that this was 'my' William as it didn't mention the Exmouth Memorial, but no other William Pengilley was listed.

  I then went on to the **Ancestry** website ancestry.co.uk (a subscription site) which has censuses up to 1911 (no later as there is a 100 year closure rule). After clicking on *Search*, then *Military*, I entered W PENGILLEY (minimum information gives more choices) and found a WILLIAM CHARLES PENGILLEY, born in Devon. This William died on 4 January 1917 in France and Flanders. I clicked on *See All Information* which showed him as a Private in the 1st Battalion Devonshire Regiment, killed in action; his number was 24695. It seemed more likely that this is the W C PENGILLEY on the Exmouth War Memorial. I clicked on *See More* and a list of other records, which might relate to William, was shown on the right-hand side of the screen (as well as records relating to the William Pengilley from Plymouth mentioned in the first bullet point). One of the records, the *International Find a Grave Index*, showed Pvt W. C. Pengilly buried in Gorre British and Indian Cemeteries.

  I then closed this screen to return to *Ancestry* and began looking at the other records available. Working backwards, I clicked first on the *1911 Census* which showed William living at 97 Fore Street, Exmouth, married, and a carter by trade. The first screen shown is a transcript of the census entry. Click on *View Image* to see the original form, with William's signature (as head of the household). The 1911 census is the only one to show the householder's signature; all earlier censuses were completed by a census enumerator.

  The census form shows that William had been married for three years to Elizabeth Ann and that they had two children: William Henry, aged 2, and Annie Elizabeth, aged 9 months. Their home had four rooms (not counting the scullery, landing, lobby, closet or bathroom). The entry also shows that Henry Foley was a boarder living with them. As this census shows William as aged 34, it was possible to calculate that he was born around 1877, (there are sometimes discrepancies in the age shown in the censuses, so it's not always accurate – it's best to check other facts as well when researching), in Wonford (Exeter) in Devon. I clicked on *Free BMD Birth Index* on the right hand list. It showed me that William's birth was registered in the December quarter 1877. If I was going to successfully order a copy of his birth certificate at this stage, I would have required other information from this page – the Registration District, volume and page number.

  With the information I now had, it was possible to follow William through the 1881, 1891 and 1901 censuses, all the time checking that the information (e.g. names of his mother, father and siblings) were the same on each entry. The spelling of his surname changed which isn't unusual – the census enumerator at the time completed the entries from verbal information given to him/her. But the rest of the information was accurate so I was reasonably confident it was the same William.

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Now I had details of William's date of death and his service number, I clicked on the *Search* tab at the top of the *Ancestry* page, and *Search All Records*. On searching using his full name and date of death, the website offered a range of records that might relate to William. One record was *British Army WW1 Medal Rolls Index Cards 1914–1920. See More* showed that it is William (number 24695) and he received a Victory medal.

Ancestry has used the 1891 census to plot where most people with the surname Pengilley lived. It shows the highest number in Devon, followed by Cornwall and Yorkshire.

- The **General Register Office** www.gro.gov.uk is the site from which to order a copy of birth/marriage/death certificates.
- **Find My Past** www.findmypast.co.uk is another subscription site, similar to *Ancestry.*
- **FamilySearch** familysearch.org is a free site, which gives a transcription of the 1881 census, showing William's household, where his mother and father were born, his siblings etc. This confirmed the information I had already obtained from *Ancestry.*
- More details about the 1st Battalion, Devonshire Regiment are available at www.longlongtrail.co.uk – where they fought etc. It contains other useful information, e.g. battles, army life, life at the front. **The photograph of dead soldiers awaiting burial would be potentially very upsetting for pupils**.
- I returned to the Commonwealth War Grave Commission site www.cwgc.org to try and discover why it had not shown me the record of William Charles Pengilley. Now I had William's service record number I entered that and found him listed as W. C. Pengilly (a different spelling again of his surname). It shows him as being buried at Gorre British and Indian Cemeteries (which the site explains is located in Pas de Calais in France, with 893 casualties being buried there), and his grave reference is III. E. 12.
- **Find a Grave** www.findagrave.com is a free site at which I also searched for William's grave.
- I subscribed to **Forces War Records** forces-war-records.co.uk which showed that William was the husband of E. A. Pengilly of 97 Fore Street, Exmouth. The site explained the Victory Medal and British War Medal and also gave a list of all the conflicts the Devonshire Regiment were involved in during World War I, during each year. William was in the 1st Battalion so it was possible to see in which battles he fought until his death.
- It was possible to purchase a photograph of William's grave from **The War Graves Photographic Project** www.twgpp.org/search.php . Searching the site is free, and when I found William's details I paid a 'donation' for a photograph of his grave which was sent to me by email within 24 hours. When I first entered William's name, even trying different spellings, nothing was offered. I then tried just entering his surname and was offered 11 choices, one of which was W. Pengilly. Better results are often obtained by putting in the minimum of information.
- I returned to the *Ancestry* site ancestry.co.uk in order to find William's parents (Charles and Jane) on the 1911 census. It showed them living at 19 Fore Street, Exmouth; that they'd had nine children, eight of whom were still living and listed Charles' occupation as a dealer in marine stores. The birthplaces of Charles and Jane were shown as well as those of the children still living at home.
- **The British Newspaper Archive** www.britishnewspaperarchive.co.uk is a subscription site on which I registered. I was able to find, and print, the page in The Western Times, dated Friday 19 January 1917, which announced the death of William Pengilley.

NOTES

Ancillary Question 4: How and why does the quality of the environment change in my local area?

In any locality where a school is surrounded by streets, pupils can be engaged in an investigation into how, in their view, the quality of the environment varies from one area to another and possible explanations for this. The suggested fieldwork-based enquiry which follows has been carried out by Key Stage 2 pupils of different ages at various schools including St Leonard's Church of England Primary School in Exeter and East-the-Water Primary School in Bideford. It is easily adaptable to any school context. It is recommended that a *Teachers TV* film of Sam Jones carrying out the full investigation with his pupils at St Leonard's is viewed before commencing the enquiry. It can be viewed and downloaded from www.creativeeducation.co.uk/video/684

The film shows the pupils undertaking each of the following stages of a hypothesis-based enquiry into how and why the quality of the environment might change between a local river and the school. This is just an example that can be adapted to other locations very easily e.g. from a new supermarket, local park or industrial estate to the school.

A 1:5000 Ordnance Survey map of the area surrounding the school or a copy of the relevant section from a local street atlas (both of which will show the names of streets) can be used as the base map for the investigation. It is possible to obtain a1:5000 OS map centred on the school covering a surrounding area of 4 sq km from various outlets at a reasonable cost e.g. www.mapstop.co.uk/product11701_A-Site-Centered-Ordnance-Survey-Landplan-Map-1-5-000---Flat.aspx or they can be printed online from *Digimap for Schools* if your school has a subscription. An alternative to both of these options is a street map generated at no cost from *Google Earth*. Simply search for the name of your school, drag the slider to zoom in and out until the school has been located as desired and then switch on *View in Google Maps* (the first icon on the right on the top tool bar). All of the local streets will be superimposed on to the satellite image, which can then be saved and printed off as required.

Having created a base map from one of these sources the next step is to agree with the pupils the criteria that will be used to evaluate the quality of the environment.

Divide the pupils into groups of four and encourage them to discuss what makes some streets attractive and others not so much. What would make their ideal street in terms of things that they would like to see? Which things would they prefer not to be present? Give them some ideas to progress their thinking e.g. what about the level of traffic, accessibility to local shops, parks and open space, the presence and quality of front gardens, noise and air pollution levels, safety concerns, litter and other pollution, satellite dishes and wires?

Support each group to identify their top 10 things (criteria) for an environmentally attractive street and then share with the rest of the class. Create a class list of the most popular criteria on the board and from this identify the top 10.

The next stage is to identify a hypothesis with the pupils. Explain that a hypothesis is just an idea or a hunch that geographers come up with about aspects of the world, which they can then test through fieldwork to see if it's true. At East-the-Water Primary School the hypothesis the pupils investigated was: *The quality of the environment improves with distance from the river to the school* – see **Resource 22**.

The 25 streets that they surveyed between the river and the school and the 10 criteria used to make an assessment of environmental quality in each one are shown in **Resource 23**.

It was agreed that the pupils would score each criteria on a scale of 1 to 10 with 1 equating to very poor and 10 to outstanding. This would mean that each street could receive a total maximum mark of 100. Some very worthwhile discussion ensued about exactly how to score each criterion to avoid confusion and to ensure consistency e.g. a pupil asked whether a lot of noise and pollution in a street would score high or low on the scale 1 to 10.

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Fieldwork then involved the pupils working in supervised groups of four and visiting each of the streets. Each group of pupils then agreed a consensus score out of 10 for each of the 10 criteria and filled in the relevant column section on **Resource 23**.

Back in class, the next stage is to complete the relevant sections of the summary sheet **Resource 24** – its total score out of 100 and it distance (from the centre of the street) to the school in metres, calculated by using the linear scale on the map. The pupils can now transfer the summary data to a scatter graph (**Resource 25**). They place one small cross for each street at the point where the score for environmental quality and distance from the river intersect (as shown by Sam in the video). Having placed 25 crosses at their correct locations, the pupils draw a dotted line around the approximate area of the crosses on the graph and finally draw a 'line of best fit' through the enclosed area at the longest diagonal.

Examples are shown for the most probable scenarios in **Resources 26**, **27** and **28**. The pattern in **Resource 26** shows a positive correlation (connection) between the two sets of data and proves the hypothesis that the quality of the environment improves with distance from the river (the line of best fit inclines upwards from lower left to top right). The pattern in **Resource 27** shows the opposite – a negative correlation or connection as the quality of the environment declines with distance from the river (the line of best fit drops from top left to bottom right of graph). **Resource 28** shows a random pattern of distribution, which means that the quality of the environment remains much the same between the river and the school, with the line of best fit being virtually level from the left to the right side of the graph.

Taking plenty of time to discuss the results of the fieldwork enquiry with the pupils is important. Having ascertained what the pattern of data shows and whether it proves or disproves the hypothesis, the next stage is to seek explanations for what has been discovered (as Sam can be seen doing with the pupils in the film).

Reasoning and speculation are important here. There may be a number of reasons for the pattern identified and synthesising these to create an explanation that the pupils can write up may require more time than anticipated. As with many things in geography there may not be a single correct answer to an enquiry. The truth may be a combination of many reasons and valuing what the pupils suggest is essential.

The final stage is for the pupils to write up their enquiry report to include the following sections:

- Hypothesis – what we set out to prove or disprove.
- Environmental quality criteria – how we decided on the things we were going to measure.
- Data collection – how we went about gathering the information we needed during fieldwork.
- Data presentation – what we did to display the data we had collected.
- Data interpretation – what the data told us.
- Explanation – possible reasons to help us understand our results.

NOTES

Ancillary Question 5: How do NASA satellite images inform us of environmental change on a global scale?

Show the pupils the image in **Resource 29** and ask them what it shows? What do they understand a *satellite* to be? With what do they associate the word e.g. satellite television?

A satellite is a man-made machine that is launched by a rocket into space and then placed in orbit around the Earth (**Resource 30**). Using specialised wireless transmitters, satellites both collect and transmit information and are particularly useful as a means of capturing images of the Earth below. Images captured by a large number of Earth-observing satellites provide unique views of the Earth. In geography, gathering and interpreting such images is known as *remote sensing*. Geographers use images taken high above the Earth to determine patterns, trends and basic characteristics of the Earth's surface. Satellites are fitted with different kinds of scanners and sensors to gather information about the Earth.

The most well-known satellites are LANDSAT and SPOT although NASA (The National Aeronautics and Space Administration), which is the United States government agency responsible for the civilian space programme, also records a huge amount of imagery from its own satellites and from the International Space Station (**Resource 31**). Satellite images detect electromagnetic radiation – x-rays, ultraviolet light, visible colours and microwave signals. This data can be processed to provide information on soils, land use, geology, pollution and weather patterns. Colours can be added to this data to help understand the images. In some cases this results in a 'false-colour' image where, for example, red areas represent growing vegetation and built-up areas show as blue/grey.

Divide the pupils into pairs and give each pair a copy of the two 'before' and 'after' images in **Resource 32** without any explanation. What kind of place is shown in the two images (e.g. natural, semi-natural, built-up or mainly rural and remote etc.)? What do the two images show – before and after what has happened? Encourage discussion and speculation. They show part of the town of Mantoloking on the coast of the state of New Jersey in the United States (**Resource 33**) before and after Hurricane Sandy (**Resource 34**) struck in October 2012. What kind of damage can the pupils identify? How has the landscape been altered? Encourage the pupils to reflect upon the potential usefulness of this pair of images to rescue services and for emergency planning in the future.

Continue to challenge the pupils to interpret the changes revealed in each of the following sets of satellite images:

- **Resource 35** – these three images show the growth of the city of Dubai (map **Resource 36**). Explain to the pupils that the red shading indicates growing vegetation and the blue/grey shows built-up areas. The sea is shown in black. The desert is tan coloured. What has happened to the number and density of roads and buildings? What are the shapes that are similar to palm trees in the water? (see images in **Resource 37**).
- **Resource 38** – these two images show the Aral Sea, which was once the world's fourth largest lake and is situated partly in Kazakhstan and Uzbekistan (see map in **Resource 39**). Today, due to the diversion of water from its feeder rivers (to irrigate the land to grow mostly cotton **Resource 40**), it is much smaller (see the effects of this in **Resource 41**) and the northern and southern halves of the sea have become virtually separated.
- **Resource 42** shows a satellite image of an area in Brazil (map **Resource 43**) where there is a lot of change happening. The image in **Resource 44** shows what this place is like on the ground and the map in **Resource 45** is the same area as that shown in the satellite image. Ask the pupils to think about what changes are taking place using the key to help. Encourage discussion, speculation and reasoning. The photograph in **Resource 46** shows the change – deforestation.

NOTES

Assessment

This enquiry presents several opportunities to evaluate at different stages how the pupils are progressing in geography through the mastery of key geographical skills and outcomes. It is not necessarily intended that all of the following learning activities should be assessed. Rather the list can be used as a general guide for selecting perhaps one or two assessment opportunities relevant to individual pupils rather than on a whole group basis.

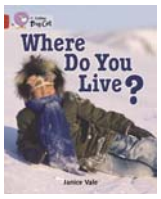
Ancillary Question	Learning Activity	Possible source of evidence of achievement
1	**Identify**, **describe** and give **reasons** for why environments change	Oral Annotated poster comparing events at Glenridding with the construction of the London Olympic Park
1	**Explain** with examples how some environmental change may be the result of natural events whilst other change may be the result of deliberate human activity to improve the quality of life	Short piece of explanatory writing
2	**Observe**, **record** and **explain** changes that have occurred in the past to the school and its grounds and its immediate environment	Land use map of local area; Map of local area shaded with key to show age and type of housing distribution Oral
3	**Identify**, **describe** and **explain** how an aspect of life in the local area has changed over a long period of time, or how the locality has been affected by a significant national or local event or development or the work of a significant individual	PowerPoint Report
4	Demonstrate **understanding** of how the quality of the environment may change within the local area and make **judgements** to **explain observations**	Fieldwork Scatter graph Enquiry write up
5	**Recognise** how remote sensing by satellites and satellite images inform geographers of environmental change on a global scale and **identify** and **explain** specific examples of change from NASA images of locations around the world	Annotated notes and bullet points
Homework	**Describe** and **explain** the impact of environmental change in one threatened region of the world	PowerPoint

Homework possibilities

To run in conjunction with their geography investigation focusing on the local area at school, the pupils could each be given a location to research where considerable environmental change is occurring globally e.g. the Amazon rainforest, the Sahel area of West Africa, the Great Barrier Reef in Australia or the Arctic ice of Greenland, Alaska or Siberia. In each case the pupils will need to locate the area with appropriate maps and images, identify the environmental change occurring, the causes of this change and its impacts – both positive and negative.

Further reading

Collins *Big Cat* has books for every child in the classroom with a wide variety of genres, top authors, relevant topics and a range of engaging formats and illustrative styles. Listed below is a selection of from the Big Cat list to support the enquiry topics in Connected Geography for KS1. Find out more at Collins *Big Cat* – www.collins.co.uk

ISBN: 978-0-00-723098-3	*Where do you live?*	Janice Vale	

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