Collins

Scheme of work

Geography: Key Stage 2 Years 5 and 6

Teachers Professional Development Programme

Enquiry 1: How do volcanoes affect the lives of people on Hiemaey?

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Connecting the curriculum through enquiry based learning

Key Question: How do volcanoes affect the lives of people on Hiemaey?

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**, **recognise** and **describe**, using appropriate subject vocabulary, where Saethor takes his dog Tiry for a walk each day;
- **Identify**, **describe** and and **compare and contrast** the countries of Europe;
- **Recognise**, **describe** and **explain** the key geographical features of the Westman Islands region of Iceland and the island of Hiemaey in particular**;**
- **Compare and contrast**, using appropriate geographical vocabulary, the physical and human geography of Vestmannaeyjar with that of the local area/region;
- **Explain** and reach a **judgement**, using appropriate and specialised subject vocabulary, why there are so few trees on Hiemaey;
- **Explain** how volcanoes form, **observe** the global pattern of volcanoes correctly and suggest plausible geographical **reasons** for this distribution;

Purpose of the enquiry

This enquiry encourages and supports pupils not only to understand some of the key physical processes that shape the Earth, but also to recognise and evaluate the interaction of people with these physical processes – the very essence of geography. All landscapes and environments offer opportunities, constraints and, sometimes, risks and hazards to the people who coexist with them. This enquiry exemplifies this in a manner that is straightforward for pupils to grasp and to evaluate. As the enquiry evolves, so pupils are able to appreciate how environments may change over time and how this might bring advantages and challenges to the people who are interconnected with them.

Context

The island of Hiemaey (pronounced *Hay – my* and meaning *Home Island*) is the largest and only inhabited (population 4500) island of the Westman Islands, Iceland (*Vestmannaeyjar* pronounced *Vestman – a, ei – jar* in Icelandic). The Westman Islands form the most southerly region of Iceland and are very active volcanically. The island of Hiemaey came to international attention in 1973 with the eruption of the Eldfell volcano, which destroyed many buildings and forced a months-long evacuation of the entire population to mainland Iceland.

Approximately one-fifth of the town was destroyed before the lava flow was halted by the application of 6.8 billion litres of cold seawater but not before it had increased the land area of Hiemaey by 20 per cent. Today the two volcanoes of Eldfell and Helgafell dominate the island and everyone lives quite literally in their shadow.

Successive eruptions from seabed volcanoes over thousands of years have created a barren, largely treeless landscape with distinctive tall and imposing cliffs and black ash beaches. A Polar climate (albeit moderated to some extent by the warming effect of the Gulf Stream, it still has an average daily temperature of 4.8 °C) brings 190 days of rain, which totals 1588 mm on average each year, and very strong winds. This, along with the harsh physical geography, makes Hiemaey a very challenging place to try and farm.

In contrast, the surrounding seas offer much greater potential for local people and fishing and fish processing is by far the most important economic activity on the island. Two volcanoes combined with global awareness of the impact of the 1973 Eldfell eruption on the island and a rich and varied bird population (including iconic puffin colonies) now bring thousands of tourists to the island using the 30-minute ferry journey from the mainland. Local people have developed many ways of earning a living from these visitors.

National Curriculum coverage Geography

Pupils should be taught to:

Locational knowledge

- The countries (including the location of Russia), major cities and key physical and human geography of Europe.
- 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.

Place knowledge

- Understand geographical similarities and differences through the study of human and physical geography of a region in a European country.

Human and physical geography

Describe and understand key aspects of:

- Physical geography including climate zones and volcanoes.
- Human geography including economic activity and trade links, and the distribution of natural resources including energy.

Geographical skills

- Use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied.

- **Understand** how and why the environment of Hiemaey has changed over time and reach **conclusions** and make **judgements** about the positive and negative impact of these changes on the ways of life of the people of Hiemaey;
- **Understand** the stages in the manufacture of an economic activity – fish processing – together with what export, import and trade entails;
- Make a **reasoned geographical judgement**, using evidence and logical argument, as to whether earthquakes are more dangerous than volcanoes.

Key Subject Vocabulary

Volcano; Continent; Island; Europe; Latitude; Equator; Longitude; Hemisphere; Weather; Climate; Trade; Economic activity; Natural resources; Environment; Landscape; Eruption; Fire; Fjord; Magma; Evacuation; Lava; Cliff; Gulf Stream; Glacier; Mountain; Relief; Earthquake; Political; City; Urban; Rural; Region; Archipelago; Geyser; Port; Geothermal; Precipitation; Climate graph; Growing season; Distribution; Pacific Ring of Crust; Mantle; Refugees; Core; Tectonic plates; Igneous; Sedimentary; Tourism; Metamorphic; Economic activity; Processing; Colony; Transport; Market.

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.

History

- The Viking and Anglo-Saxon struggle for the Kingdom of England to the time of Edward the Confessor.

Key Question: How do volcanoes affect the lives of people on Hiemaey?

Science

- Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.
- Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
- Recognise that soils are made from rocks and organic matter.
- Recognise that environments can change and that this can sometimes pose dangers to living things.
- Construct and interpret a variety of food chains, identifying producers, predators and prey.
- Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

NOTES

Ancillary Question 1: Where does Saethor take his dog Tiry for a walk every day?

Ask the pupils if they have a dog in the family or in the families of relatives and friends? Do they take the dog for a walk at any time? Where do they go? What's their favourite walk and which bits of the walk does the dog really appreciate?

Now show the pupils the photograph of Saethor out for his daily walk with his dog Tiry in **Resource 1**. Ask the pupils to describe the walk they think Saethor and Tiry do every day? Encourage speculation and reasoning based on evidence they can see. What is it that they have walked up? Possibly a hill or a mountain. What does the ground appear to be made of? To focus the thinking of pupils here, show them the photographs in **Resource 2**. This shows the view from the town in the background of the first photograph and Saethor and Tiry are standing right on top of the feature in the background of all three photographs in **Resource 2**. What is it that they have walked up? If the pupils have not mentioned a volcano at this point then the image in **Resource 3** will illicit this.

The photograph in **Resource 3** shows the same place in 1973. So, it's a volcano then. Take time here to discuss with pupils what they understand a volcano to be. What does a volcano do? How does a volcano form? Explain that a volcano is an opening in the Earth's crust that allows red hot (molten) liquid rock from beneath the crust to reach the surface. This molten rock is called *magma* when it is beneath the surface and *lava* when it erupts and flows from a volcano. Along with lava, volcanoes also release gases, ash and rock. It's a super-hot mix that can be both incredibly destructive and creative. Further background for teachers is at www.bbc.co.uk/schools/gcsebitesize/geography/natural_hazards/volcanoes_rev2.shtml and https://volcanoes.usgs.gov/about/index.php

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Ancillary Question 2: Where do Saethor and Tiry live?

What we know so far in this enquiry is that Saethor and Tiry live somewhere where there are volcanoes. There are no active volcanoes in the United Kingdom (although there were many in the past) so how close are the nearest places with active volcanoes to where we live?

Give the pupils copies of the map in **Resource 4**, which shows the distribution of earthquakes and volcanoes in the world, together with the world map of countries in **Resource 5**. Which are the closest places that have active volcanoes? Italy, Iceland and the Azores (a group of islands that form part of Portugal). In which of these three places do the pupils think that Saethor and Tiry live? The answer can be seen in **Resource 6** and **Resource 7**. Which of the three possible locations do the satellite image and map match up to? Iceland.

Using the political map of Europe (**Resource 8**) the pupils can now be supported to carry out the activities in **Resource 9**. These have been designed to encourage the pupils to become familiar with the countries and capital cities of Europe without necessarily being set the task of learning them 'off by heart'. As an extension exercise the pupils can move on to complete the more challenging tasks in **Resource 10**. These require them to analyse a range of cartographic data contained in the maps in **Resource 11** and refer back to the political map in **Resource 8** to find the answers. A final Europe-based mapwork activity is for the pupils to show graphically the data in **Resource 12**. Here the populations of the 20 largest cities in Europe are shown.

The pupils can now show this data graphically on the outline political map of Europe in **Resource 13**. The population of each city is to be shown by a proportional bar 1 cm wide and with a height drawn to the scale 1 cm or 10 mm = 1 million people (so 1 mm of height = 100 000 people). So the population of Athens will be shown by a 1 cm bar with a height of 6 cm and 3 mm or 63 mm and so on. Pupils are to position their graphs as close to the correct location of each city on the map as possible but there may need to be some juxtaposition to avoid overlap! Each of the bars should be labelled with the name of the city it represents at its base. The scale used should also be shown on the map. An example of one completed proportional bar for Istanbul is shown in **Resource 14**.

Return to the map of Iceland in **Resource 7**. Explain to the pupils that Saethor and Tiry live in a particular region or area of Iceland. Off the southern coast is a collection of islands that people in Iceland call *Vestmannaeyjar* or in English the *Westman Islands*. It is one of these islands, *Hiemaey*, that Saethor and Tiry call home.

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Ancillary Question 3: How do geographers describe the Westman Islands?

Show the pupils the map of Iceland in **Resource 15** with Vestmannaeyjar or Westman Islands highlighted in red. The islands form the most southerly part of Iceland and are part of its *southern* region. Iceland is divided into eight geographical regions.

Print off a copy of the map of the regions of Iceland in **Resource 16** and get each pupil to stick it into the centre of an A3 piece of plain paper. Now the pupils can go online at www.visiticeland.com/discovericeland/regions the official tourism information website of Iceland.

Encourage the pupils to read the geographical characteristics of each region and then *annotate* (add notes around the edge of the map and indicate with an arrow which region is being described) their map with just its key features e.g. *geysers, fishing ports, glaciers, geothermal power stations, puffin colonies, fjords* etc. If the pupils had a week to holiday on Iceland, which region would be their priority to visit first and why? This activity provides a good opportunity to exemplify the difference between *physical* and *human* geography – the difference between essential 'natural' features of the environment and those created by people.

Write the word *archipelago* on the board and encourage each pupil to pronounce it. Does anyone have an idea of what the word means? Encourage discussion. Tell the pupils that the word is connected with the following map of Vestmannaeyjar – **Resource 17**. Does this generate additional ideas?

Archipelago is a geographical term for a group, chain, cluster or collection of islands of which Vestmannaeyjar is an excellent example. In total 15 islands make up Vestmannaeyjar archipelago, many of which are quite small, as can be seen in the photographs in **Resource 18**. The continent of Europe has many other examples of island archipelagos, including the largest in the world in terms of number of islands.

Give the pupils copies of the relief map (shows the height and main physical features of the land e.g. rivers) of Europe in **Resource 19**. Divide the pupils into pairs and challenge them to identify as many archipelagos as they can. They should make a list, e.g. Balearic Islands, and then cross reference with the political (countries and main cities) map of Europe **Resource 8** to identify the country of which they are a part. Encourage discussion.

The Åland Island Archipelago in Finland (**Resource 20** and **Resource 21**) is the largest in the world in terms of the number of islands included within it. If the smallest rock pinnacles or stacks jutting out of the sea are included in the definition then the number of 'islands' here is more than 50 000.

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Ancillary Question 4: How does the physical and human geography of Hiemaey compare with the area in which I live?

Show the pupils the photograph (**Resource 22**) of Hiemaey and explain that Hiemaey is the largest of the 15 islands of Vestmannaeyjar and the only one of the archipelago on which people live – there are 4500 people there, including Saethor. Remind pupils that *physical* geography is about the natural environment of a place and *human* geography about the presence of people and how the way in which they live interacts with that natural environment e.g. they build towns and cities, create farms and fish the seas and oceans.

Firstly encourage the pupils to describe the physical landscape of Hiemaey from the evidence in the photographs in **Resource 23**. Take time to draw out subject vocabulary such as *mountain, cliff, beach, hill*, etc. and also adjectives that summarise the environment e.g. *barren, bare, exposed, treeless, wild, remote, dangerous* etc.

Next undertake a similar exercise with the photographs in **Resource 24** but this time support the pupils to identify the human geography of the island. For example, the things that people are doing to earn a living, the places in which they live (individual homes as well as settlements (groups of homes in villages and towns) and the services on which they depend, such as schools, shops and doctors etc. There is an opportunity now to undertake fieldwork in the local area to compare and contrast the physical and human geography of Hiemaey with what occurs at home. The pupils could draw a Venn diagram to show features that are the same and those that are different.

NOTES

Ancillary Question 5: Why are there so few trees on Hiemaey?

One of the most startling features of the physical geography of Hiemaey that pupils will have identified from the images, is that there are very few trees. Ask the pupils to consider why they think this? It is likely that an immediate response will be that it's too cold for trees to grow, which is an entirely sensible suggestion given Iceland's sub-Arctic position – its name would also suggest a freezing climate. If this is the case then tell the pupils that this is something that can easily be checked out by analysing the climate data for Hiemaey.

Climate refers to the average weather conditions, particularly temperature and precipitation (any form of moisture that falls to Earth from the atmosphere), experienced in a place month by month. Average climate data is based on readings taken over a period of at least 30 years. Geographers show this information on very special graphs with two vertical axes (with different variables on each axis) called a *Climate Graph*.

Distribute copies of the climate graph for Hiemaey in **Resource 25**. Now write 6 °C on the board and ask the pupils if they know why this temperature is so important to plants and trees? Encourage the pupils to speculate and give them time to reason. 6 °C is the temperature that defines the length of the *growing season* in a location. Once the temperature reaches 6 °C then plants and trees will grow. Ask the pupils to calculate, by tracing along the red average temperature line on the graph, for how many months in Hiemaey the temperature is 6 °C or more? Five months at least. So although it is chilly, it's not too cold for trees to grow for at least five months of the year. But why don't we seem them?

There is an opportunity at this stage to make a natural connection with science. That is for pupils to explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) and how they vary from plant to plant.

Tell the pupils that you are going to challenge them to solve a mystery. In a moment you are going to give them three clues which, when used together, answer the question of why there are so few trees on Hiemaey. Two of the clues are in **Resource 26** and the third is at http://icelandreview.com/news/2014/02/20/westman-islands-hit-strong-wind
Can the pupils put the three clues together? Encourage discussion and questioning. Who are the people in the boat? What is the animal and why is the newspaper story about Hiemaey being the windiest place in Iceland of significance?

The history of Iceland begins in AD 874 with the arrival and settlement by Vikings and their slaves, who had been living in Britain before then – see the map of the expeditions of the Vikings in **Resource 27**. Geographers estimate that, at that time, up to 60 per cent of Iceland, including Hiemaey, would have been covered in woodland.

The Vikings quickly settled the land. They cleared the woodland for fuel, for use as building material for homes and boats, and also to make way for pasture upon which they could graze herds of sheep. Grass, moss and small shrubs replaced the trees and large herds of sheep grazed it all leading to serious soil erosion. To this day trees do not have a chance to grow back – the soil is too thin and infertile for them to take hold and sheep eating any saplings that do manage to germinate. Added to this is the fact that Hiemaey is the windiest place in Iceland, with regular gusts easily capable of ripping up any trees that do manage to grow.

At this point this investigation is easily connected to work in the history curriculum relating to: *the Viking and Anglo-Saxon struggle for the Kingdom of England to the time of Edward the Confessor.*

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Ancillary Question 6: Why are there volcanoes on Hiemaey?

Not everywhere in the world has a volcano. In fact volcanoes and earthquakes only occur at very specific places around the globe. Revisit **Resource 4** with the pupils. Ask them to look carefully at the distribution (how something is spread over an area) of volcanoes and earthquakes. What do they notice? Encourage discussion and feedback.

On the outline map of the world (**Resource 28**) encourage the pupils to draw a single line in red joining up all the places on land and under the sea where volcanoes and earthquakes occur. In particular what do they notice about the land surrounding the Pacific Ocean? Geographers call this the *Pacific Ring of Fire* (**Resource 29**), which has a total of 452 active volcanoes – 75 per cent of the world's total. Ninety per cent of all earthquakes also occur here. All but three of the world's 25 largest volcanic eruptions of the last 12 000 years have occurred at volcanoes in the Ring of Fire.

Ask the pupils to locate Iceland on the map in **Resource 4**. Which two volcanoes are named? Ask the pupils if they (or more likely members of their families and older friends) can remember anything about what happened when the Eyjafjallajokull (pronounced A-ya-feckla-lock-ul) volcano erupted in 2010 (photograph **Resource 30**).

During the seven days between 14 and 20 April, a huge ash cloud covered a large area of northern Europe (**Resource 31**). This caused airports in 20 countries to be closed to commercial airlines. This affected 10 million passengers many of whom were forced to remain in holiday and business destinations for an extra week before they could return home – see the films at www.youtube.com/watch?v=57hUhLdyYyg and www.youtube.com/watch?v=e-TMtRh8AIs

Next give out copies of the map in **Resource 32**. This shows the tectonic plates that make up the Earth's crust. How do the boundaries of the plates in this map compare with the red lines that the pupils drew on their outline map? Plate tectonics is easily illustrated to younger pupils by showing them a jigsaw – ideally a jigsaw for toddlers with about a dozen large chunky pieces. Explain that the 'skin' or *crust* of the Earth is cracked and broken up into large pieces, which geographers call *plates*, just like the pieces that make up a jigsaw. Below the very thin crust (which ranges in thickness from a few kilometres below the oceans to 50 km under mountain ranges) is the mantle, which is 3000 km thick and made up of red-hot liquid rock called *magma*. The magma is under great pressure below the crust – rather like champagne in a bottle before the cork is removed.

Direct the pupils back to the map of plates in **Resource 32** and get them to locate Iceland. What do they notice about the plates here? Iceland sits on top of where two plates meet. Which two plates are they? What does the map show about what is happening to the edges of the two plates below Iceland – are they moving together, past each other or apart? They are moving apart. **Resource 33** shows the boundary between the two plates crossing Iceland in more detail. Geographers call this boundary the *Mid-Atlantic Ridge* – see map **Resource 34**.

What do the pupils think could happen to the magma when the plates above it move apart? It can force its way up between the plates and erupt out as lava through a volcano.

Below Iceland two plates are moving apart and magma is rising up through the gap that is created. This is summarised very well in the short film at www.youtube.com/watch?v=tXm0B_PjUOk

Before moving on there is an opportunity here to connect with the science curriculum and the requirement for pupils to be taught to: *compare and group together different kinds of rocks on the basis of their appearance and simple physical properties*. On cooling, lava solidifies to form igneous rocks such as granite and basalt, which makes up most of the island of Hiemaey. At this stage, pupils could also explore sedimentary and metamorphic rocks both in the classroom and perhaps in the local area as part of joint fieldwork

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Ancillary Question 7: How were the people of Hiemaey affected when Eldfell erupted?

Eldfell (**Resource 35**) is one of two volcanoes on Heiemaey and is *active*, which means that it has erupted within living memory and could do so again with little or no warning – the rock surface on the top of Eldfell is still warm from it last eruption. In the early hours of the morning of 23 January 1973, when almost everyone on Hiemaey was asleep, magma began rising up the crack between the Eurasian Plate and the North American Plate – the Mid-Atlantic Ridge. Over the next three months a new volcano formed – Eldfell.

At the time, Katrin Leifsdóttir was a 13-year-old schoolgirl who had lived her whole life on Hiemaey. **Resource 36** contains the entry she wrote in her personal diary for Tuesday 23 January 1973. Read through the diary entry with pupils and support them to identify the characteristic features of personal diary writing, which it illustrates. A particular thing to highlight is that it is a chronological (time order) account of events that includes both factual things, e.g. the number of fishing boats and journey times, as well as feelings and emotions. It is written in the first person, in the past tense and time connectives such as 'within a few hours', 'next', 'then', 'meanwhile', 'soon after', and 'an hour later' link the narrative. Thoughts are freely used, which makes it a reflective narrative that is likely to be confidential to the writer. The audience is not the public, nor are historians or even other members of her own family – the audience is herself. It has much more in common, say, with the diary of Anne Frank than that of Captain Scott, who deliberately left a diary on his body to be found after his death so that historians knew that he had reached the South Pole as well as giving the precise details of his journey.

From a geographical perspective discuss with pupils how Katrin's diary entry also identifies geographical aspects of the eruption e.g. what is the 'crack' she refers to? Why is the lava fountaining into the sky? What is sulfur and what has it to do with volcanic eruptions?

At www.youtube.com/watch?v=blDXgde1Tpg there is BBC film about Iceland and, in particular, the threat that its many active volcanoes present not only to the people living in Iceland but also to the UK and Europe in general. The section between 26.00 and 35.18 looks specifically at the 1972 eruption on Hiemaey and its physical and human impact on the island and its community. Show this excerpt twice – just watching on the first occasion and then, during the second viewing, supporting the pupils to make notes of all the ways the eruption changed the *physical geography* of the island, i.e. the area, height, shape and natural features and its *human geography*, i.e. its impact on the way of life of people including homes, occupations and of course their emotions and feelings.

The eruption continued for three months and the film shows the efforts to save the harbour from the encroaching lava. Why was saving the harbour so crucial? Why did people consider this to be the most valuable part of the island? What did people do to save the harbour? What do you think would have happened to the island and its people if the harbour had been buried by the lava?

Explain to the pupils that, after her evacuation, Katrin lived on the mainland in the small town of Vik for two years before returning home. When she did, she found that her beloved island had changed beyond recognition. The home that she had grown up in was buried below 25 m of solidified lava. The positions of all of the lost homes on the island were marked with wooden crosses, each one carrying an inscription of the name of the family who once lived there. These remain on the island to this day – see the images in **Resource 37**.

Finally encourage and support the pupils to imagine what Katrin might have written in her personal diary on the day she returned home. What emotions would she have felt as she got off of the ferry and walked through the town to try and locate where she used to live? What would she have felt when she finally found the cross marking the place where her home lay beneath the lava? What would she have left there? What treasured items might lie buried?

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One of the homes, which was buried by the lava on the night of 23 January 1973, has been excavated and now forms part of a museum commemorating the eruption. The pupils can look at the images of this excavated home in **Resource 38**.

The images show many personal items in rooms that were simply abandoned by residents as they ran for their lives. Once they have looked at the images the pupils can plan and draft their diary entry. The audience will once again be just themselves as author as this diary entry will be very personal to Katrin. Remind pupils of the conventions of diary writing covered earlier.

NOTES

Ancillary Question 8: Why do the people of Hiemaey go on living next to an active volcano?

A common and entirely understandable response of many pupils when learning about natural hazards and their interaction with people, is to query why they continue to live in such areas in the full knowledge that another life-threatening episode such as a volcanic eruption could occur again without warning. Spend some time exploring this with the pupils. Ask them how many have moved from one place to another already in their lives? If they haven't moved, it is likely that they will have members of their family such as older siblings, uncles, aunts or grandparents who have done so. It is important for pupils to understand that for adults to move, in most cases, they will need a job to move to or have sufficient savings and a pension to support them after retirement. People can't just move without a means of support unless they are willing to become refugees who move because their lives are at risk from war, natural disasters, disease or persecution on the grounds of religion or ethnicity.

People continue to live on Hiemaey because of attractive employment opportunities in two *economic activities* – fishing and fish processing, and tourism. Economic activity is the production of goods (e.g. a car) or a service (e.g. a cinema) that other people purchase and the objective is always to make a profit on the transaction.

Begin by asking the pupils why they think people continue to live on Hiemaey despite the obvious risks? What do you need to be able to live somewhere? Remind pupils about what the film about the 1973 eruption said about the port on Hiemaey. It is the most important in Iceland in terms of weight and value of fish caught – an incredibly important economic activity that employs, in some capacity, 70 per cent of all those who work on the island.

Divide the pupils into pairs and provide each pair with the set of images in **Resource 39**. These were all taken in and around the harbour on Hiemaey. In addition to actual fishermen who work on the boats catching the fish, how many other jobs can they see that people are involved in doing? For every fisherman on a boat catching fish there are ten people doing other really important jobs at the harbour – so most people who work at the harbour never go to sea to catch fish! Give the pupils plenty of time to analyse the images and to work out who is doing what. Encourage feedback and discussion and make a list of all the jobs that pupils have identified on the board.

Ask the pupils how many regularly eat fish? Which kinds of fish? How do they normally eat their fish – fish and chips, from a can, such as tuna or fresh, such as salmon? Try to have a collection of a range of ways in which we buy fish to show the pupils e.g. a tin of tuna, fish paté or paste, sardines and mackerel in ring-pull cans. Also show photographs of battered fish or prepared frozen or chilled meals such as fish pie etc. Encourage the pupils to consider what has been done to the fish in each of these examples before it reaches us to eat. In all cases the fish has been *processed* by someone before it reaches us as consumers. This is very important for the pupils to grasp. We don't catch our own fish and, in most cases, don't process or prepare it for eating ourselves – we rely on other people to do that for us. *On Hiemaey fish processing is the island's most important economic activity – the main way the island and its people earn money.*

Now show the pupils the photographs of Vikingur Smarason in **Resource 40**. He is the processing manager of a company called *Langa ehf*, located at the harbour on Hiemaey (**Resource 41**). This company employs 20 people (**Resource 42**) – although only 17 are shown here! But what does this company do? This is the challenge for the pupils to try and work out. The images in **Resource 43** are in the correct sequence. Show the pupils the images and encourage them to suggest what happens at Langa ehf. What do they make and sell, and to whom?

Langa ehf (www.vsv.is/en/about-us/dottur-og-hlutdeildarfelog/langa) specialises in producing dried fish pieces for sale in Nigeria – particularly fish heads, fish bones, fish tails and whole fish cutlets. The two most frequently dried fish are cod (**Resource 44**) and pollock (**Resource 45**).

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The ocean waters of the North Atlantic and South Arctic (**Resource 46**) are the richest fishing grounds for these two species anywhere in the world. Approximately 70 tonnes of already filleted fish from three other nearby companies in the harbour arrive at the factory each day, so in reality Langa ehf receives what is left – the heads, the backbone, tail and fins. From every 100 tonnes of raw material, the company produces 21.5 tonnes of processed dried fish pieces. On arrival the fish pieces are washed and, if necessary, further filleted by hand to remove any remaining internal organs and flesh. The fish pieces (mainly heads, backbones and tails) are then placed on green trays inside drying boxes. Hot air is blown through the trays of fish for two days. After being allowed to stabilise in wire boxes, the dried fish is packed into 30 kg bags and loaded into a container on the back of a lorry. Each container-load consists of 750 bags. The container is then loaded on to the ferry, which takes it off the island.

Every year Langa ehf send out 1000 containers full of dried fish, all of which is sold to traders in Nigeria, particularly in the region of Biafra (**Resource 47**), who then sell it on to market traders. The groups of pupils can now arrange the images into the correct sequence and individually produce a circular flow diagram to chart the manufacturing process from beginning to end.

Before moving on, spend some time with the pupils considering why dried fish would be particularly suitable for many people in Nigeria, especially for the poorer sections of the population. Many people here do not have refrigerators or freezers in a country where the climate is tropical with very high humidly during the wet season and temperatures greater than 40 °C in the dry season.

The second most important economic activity on Hiemaey is tourism – people travelling to the islands to stay and enjoy a holiday. Show the pupils the film produced by the local tourist board at www.youtube.com/watch?v=kYCUvypQbRs
Ask them to make a note of all the different jobs shown that will employ people on the island e.g. waiters and waitresses. If necessary, show the film several times. Encourage discussion. How many different jobs did they see local people doing?

Thousands of bird watchers visit Hiemaey every year. As well as having the largest colony of Puffin anywhere in Europe, another 80 species of birds have been seen on the island at various times. From www.visitwestmanislands.com/en/page/birdwatching-in-vestmannaeyjar-iceland each pupils can select one seabird, wader or gull to research. Their results could be presented in a PowerPoint to include a photograph and details of habitat, food, plumage, nest and eggs. A good place to begin is at www.rspb.org.uk/discoverandenjoynature/discoverandlearn/birdguide/ .

There is an opportunity here to extend the study of birds and connect with the requirements in the science curriculum for pupils to study food chains and the life cycle of birds and compare with mammals and reptiles.

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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 on an individual pupils rather than whole group basis.

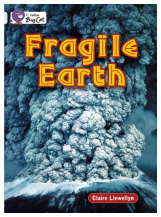
Ancillary Question	Learning Activity	Possible source of evidence of achievement
1	**Identify**, **recognise** and **describe**, using appropriate subject vocabulary, where Saethor takes his dog Tiry for a walk each day	Oral
2	**Identify**, **describe** and **compare and contrast** the countries of Europe	Annotated map
3	**Recognise, describe** and **explain** the key geographical features of the Westman Islands region of Iceland and the island of Hiemaey in particular	Photograph interpretation
4	**Compare and contrast**, using appropriate geographical vocabulary, the physical and human geography of Vestmannaeyjar with that of the local area/region	Venn diagram
5	**Explain** and reach a **judgement** using appropriate and specialised subject vocabulary why there are so few trees on Hiemaey	Explanatory writing
6	**Explain** how volcanoes form, **observe** the global pattern of volcanoes correctly and suggest plausible geographical **reasons** for this distribution	Labelled diagram, map and discussion
7	**Understand** how and why the environment of Hiemaey has changed over time and reach **conclusions** and make **judgements** about the positive and negative impact of these changes on the ways of life of the people of Hiemaey	Discursive writing
8	**Understand** the stages in the manufacture of an economic activity – fish processing - together with what export, import and trade entails	Flow diagram
Homework	Make a **reasoned geographical judgement**, using evidence and logical argument, as to whether earthquakes are more dangerous than volcanoes	PowerPoint presentation

Homework possibilities

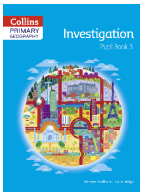
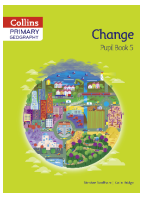
Whilst undertaking this investigation at school, pupils could carry out a mini enquiry of their own at home focusing on earthquakes and in particular answering the question: *Are earthquakes more dangerous than volcanoes?* Include describing and explaining what an earthquake is, how their magnitude is measured, where they occur and a case study of the effects of a recent earthquake with a reasoned judgement based on the evidence e.g. comparing data of deaths and injuries caused by earthquakes and volcanoes. They should present a conclusion which they consider to be the more dangerous.

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: 978-0-00-723110-2	*Fragile Earth*	Claire Llewellyn	
ISBN: 978-0-00-812786-2	*Volcanoes*	Emily Dodd	

Collins *Primary Geography* provides a progressive, skills based scheme for primary school pupils.

ISBN: 978-0-00-756359-3	*Primary Geography Pupil Book 3 Investigation*	Stephen Scoffham and Colin Bridge	
ISBN: 978-0-00-756360-9	*Primary Geography Pupil Book 4 Movement*	Stephen Scoffham and Colin Bridge	
ISBN: 978-0-00-756361-6	*Primary Geography Pupil Book 5 Change*	Stephen Scoffham and Colin Bridge	
ISBN: 978-0-00-756362-3	*Primary Geography Pupil Book 6 Issues*	Stephen Scoffham and Colin Bridge	
ISBN: 978-0-00-756369-2	*Primary Geography Interactive resources 3-6*