MapStream
for Schools

Reach for the Skye:
Extreme Environments

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Learning Resource
Key Stage 4

This is one of a series of teaching resources for use with Mapstream for Schools.
For more details about this service, visit http://mapstream.edina.ac.uk

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MapStream for Schools Learning Resources

These resources are a guide for teachers to demonstrate to the whole class or direct individual students as appropriate. Each activity has several ideas within it that you can tailor to suit your class and pupils. Some resources contain worksheets for direct distribution to pupils.

Level	Context	Location
KS4	Extreme environments are a feature of many exam specifications. They take many forms: from the heat of hot deserts, to the cold of the Poles. We do have some environments that we could call 'extreme' in the UK, although the term could be taken to be a continuum, and we are not perhaps as extreme as other places.	The Isle of Skye is an island in the Hebrides. It has a range of landscapes, and attracts many visitors who want to pit themselves against the extreme mountain landscapes. This will form the basis for the activities here.

Knowledge	Changing map scales, creating PoI's, symbolising and recording data about locations, decoding map information
Cirriculum links (England)	GCSE: AQA 'A' – Ice on the Land unit, Edexcel 'A' – Glaciated Landscapes
Scottish Curriculum for Excellence	Scottish Highers: Physical Environments – topic c) Lithosphere, and also the Geographical Methods and Techniques section

http://mapstream.edina.ac.uk
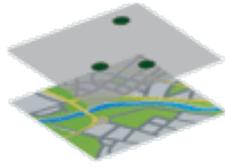
Activity

Introduction

As pupils are entering the classroom, load up MapStream for Schools, and locate the **Isle of Skye** – display the maps using a GIS client of your choice.
You may wish to have the island already displayed at the start of the lesson, perhaps oriented in an unfamiliar direction.

> A quick tutorial on to start using MapStream for Schools is available here:
> http://mapstream.edina.ac.uk/start.html

Skye is an area which is popular with visitors for many different reasons. The island has dramatic mountain scenery, notably the Cuillin Ridge.

Zoom into an area of the Cuillin Ridge on the mapping, and ask pupils to suggest some words that they would use to describe the landscape that is being shown.
See later for the link to Geograph, where images can be found.

You could also use a Flickr Slideshow.
Go to Flickr: http://www.flickr.com and enter 'Cuillin Ridge' into the search box. This will return a set of images. Scan them to make sure they are all appropriate, and nothing untoward has slipped in there, then click SLIDESHOW.

You'll see a stream of images of the **Cuillin Ridge.** Ask students to suggest words to describe the landscape they are seeing.

You could then put these into Tagxedo or Wordle or similar word cloud generators to create a useful collated word cloud of these words.

Here's one that I made earlier…

http://mapstream.edina.ac.uk
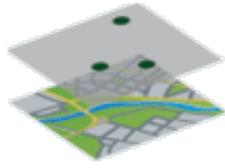
You could also use the Geograph website http://www.geograph.org.uk to explore the area and some of the landforms which are present there. You can use the search function on the website. This would make a useful case study for the human use of glaciated areas, particularly upland glaciated landscapes. This would make a powerful combination along with the Ordnance Survey mapping provided in MapStream for Schools.
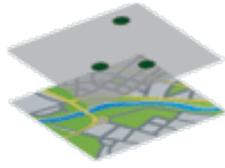
Introduction to main activity

The term 'extreme' brings to mind wind-swept polar landscapes, or sun-scorched deserts littered with the bones of dead creatures. Are there actually any extreme environments in the UK ?

We need to establish first what we mean by **extreme.** If we take the idea of 'extreme sports', for example, we will think of activities which are potentially dangerous, which require skill and are not for everyone. They may have more than a hint of danger, and require equipment to be able to participate.

The former OCR Pilot GCSE Geography in England and Wales had a unit on **Extreme Environments** which provided a range of contexts for teachers to choose from. One of them was Mountain Environments.

The meaning of the word 'extreme' that we generally use involves some of the following connections:

- beyond the usual experience
- dangerous

- challenging
- requires special equipment / training
- unusual

An environment can also be made more extreme by certain weather conditions, or a lack of preparedness on the part of the people who enter it.

'Extreme' is therefore a continuum of experience, from slight hardship to serious risk. The outcome could be exhilaration and stories to tell in the pub afterwards, or an appearance on the evening news.

An example of an extreme environment:

Discuss some of these ideas with students. What are the extreme places in the UK they have visited?

One place that can be very extreme is the **Cuillin Ridge** on the Isle of Skye. The Black Cuillins are a mountain chain, formed from a mosaic of volcanic rocks.

The value of maps to those who visit is clear, but the mountains also pose a challenge to those who may want to use traditional map and compass navigation techniques, because the rocks themselves are magnetic. The rocks contain metal particles which were oriented in particular directions when they were formed, and these can make traditional compasses unreliable.

![Ordnance Survey logo] ![EDINA logo]
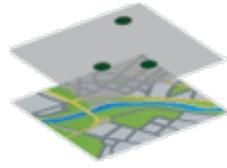
Let's go over the sea to Skye

Student Instructions

1. Create a location map for the island using MapStream for Schools – this needs to show the location of Skye relative to the mainland of Scotland and at least one major city. Using the map that you have created, along with the MapStream for Schools service, provide sample answers for the following questions.

    • Identify the different options for travelling to the Isle of Skye
    • Outline 4 options for travelling from Edinburgh to Skye.

2. Find the Cuillin Ridge
3. Use the key extract on landscape features to explore how the map represents landscapes.
4. Using QGIS, zoom to the 50 or 25k raster and assess the contours on the map. Tightly packed contour lines represent steep slopes.
5. Where is the nearest settlement, and roughly how far away is it ? What other places could you go to for help if you needed it ?
6. What activities do you think that people could do in an area like this – think of commercial activities and jobs that might be possible, before moving on to leisure activities

Plotting a route

A page from a diary has been found fluttering in the wind at the following Grid Reference: NG525214, on the slopes of Blabheinn (pronounced Blaven)

Find this Grid Reference by using the appropriate maps that have the blue National Grid lines on them for you to read, describe the location using information taken from the map.

Work out the route that was taken by the people who wrote the diary, and create two shapefiles to plot the route taken.

1. create a line shapefile to draw the route that the walkers followed.

2. create a point shapefile to add a point at the five key places mentioned. Add a DESCRIPTION attribute field to record what each point is: e.g. car parked

3. Create a shapefile, add a field for description of each point. Location, what can be seen, and key points of interest etc. Descriptions can then be used as labels when creating a map.
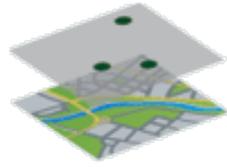
Advanced option: Alternatively create a series of points as a shapefile, and a separate line shapefile which follows the route that you have taken.

Route description on the diary page

We took the B8083 road from Broadford towards Elgol. We drove through Torrin and round the northern end of Loch Slapin.

We parked our car by the roadside in a small car park at NG545172**, just after the fish hatchery at ILLEGIBLE 1. From there we put on our walking boots and headed west. There was a footpath which we followed, which ran to the south of a series of streams called the Abhainne ILLEGIBLE 2**

After passing through some farm buildings and crossing several streams at fords, we arrived at some old ILLEGIBLE 3 – the remains of old dwellings. From here, the track headed NW and as we rounded a bend, we could see the ILLEGIBLE 4 Hills across the water to the west.

The path started to descend towards a sandy beach at a bay called ILLEGIBLE 5

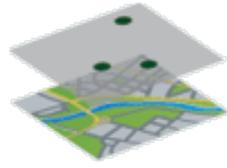Can you identify the places that are shown only be a WORD ILLEGIBLE ?

Fill them in here, or separately…

ILLEGIBLE WORDS

1	
2	
3	
4	
5	

ANSWERS

1	Kilmarie
2	Cille Mhaire
3	Shielings
4	Cuillin
5	Camasunary or Camas Fhionnairigh

Annotation tips:

Use the description attribute of the your point shapefile to create labels for the points.

Choose styling for your line, points and labels to stand out from the map.

Create a printable map or save to an image file. You could also add a text box with the full route description.

Extension activity

Map symbols

How are extreme landforms identified on a map key ?

Find out a little more about these landscape features

- Crags
- Contour patterns and gradients
- Screes

Websites and further tools

http://www.skye.co.uk/ - the official website for the Island - available as an app
http://www.theskyeguide.com/ - an independent guide to the island, which shows a range of activities and tourist destinations which could also attract visitors
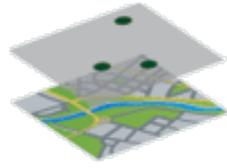
Apps

It's worth noting that some smartphone apps can also export files showing the path that people have taken. These can be imported into Google Earth or software such as QGIS if they are in GPX format. It may be that you could use a local route to test the students' route description abilities.

You will need to choose to export your route in GPX format from the app if you wish to use it in this way.

Mountain Rescue Team and Route Cards

With the Digimap for Schools resources (http://digimapforschools.edina.ac.uk/cosmo/home?page=resources) that were previously written, there was a focus in some activities on the work of mountain rescue teams.

These people risk their lives to help people who have got into difficulty. Unfortunately, some people don't take Ordnance Survey maps and compass onto the hills, or are unable to use it accurately. When people visit remote areas, they often leave a route card in case of problems. There is some debate over whether this is a good idea or not.

The Mountaineering Council of Scotland's advice on route cards can be viewed here:
http://www.mcofs.org.uk/route-cards.asp

When going into the hills for a day's walk (or overnight) a **route card** can be filled in and left with a person who can raise the alarm. There are various formats for these cards.
For example they can be downloaded from several websites:
http://www.livefortheoutdoors.com/News-Landing/Search-Results/Features/Where-can-I-get-a-routecard-from/

They are available in two versions: Basic and Advanced

The **Skye Mountain Rescue team**, like all rescue teams, is made up of volunteers, who give up time to train in first aid and rescue techniques. The website provides a useful summary of their activities in and around the Cuillin Hills: http://www.skyemrt.org/

If you explore the website you will see a report on previous years' activity.
The report shows the details of the callouts they have had, and the locations, and also the circumstances which led to the callout.

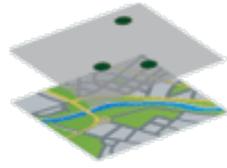Students could be asked to create a map for the report of a year of your choice
There are details for the last few years e.g. 2011 can be viewed here:
http://www.skyemrt.org/callouts11.html

A point shapefile should be produced which contains attributes about callouts as well as the location where it happened.

e.g.
This report:

Incident: Injured Walker
Location: The Great Stone Shoot, Sgurr Alasdair
Date: 28 February 2011 Time: 2000
No of Team Members Involved: 19 Total Team Hours: 38

A party of 5 had climbed Sgurr Alasdair from Glenbrittle. On the descent of the Stone Shoot a female member of the party started suffering pain from her hip. She was given Diclofenic (pain relief) by another member of the party who was a doctor but, was still only moving very slowly. When they failed to return to Glenbrittle by 2000 the alarm was raised.

As the team arrived at Glenbrittle a head torch was spotted descending the Eas Mor path. This turned out to be a member of the party who had run ahead to advise that the injured walker and the remainder were on their way down. The team stood by until all members of the party were safely off the hill.

Could result in these attributes being generated.

Grid Reference (find location and use maps to identify)	NG 4421
Team Members involved	19
Team Hours used	38
No. of injured people	1
Nature of injury	Slight
Helicopter involved ?	No
Hospitalisation of casualty involved	No

As a series of points are added to a map, students should appreciate that this data (which we can also call **metadata or attribute data** is searchable using a GIS if a **QUERY** is generated.
This can be added to the **attribute table** for the points that are created.

Extension
If using QGIS, you may wish to create a custom icon, or choose a suitable icon to represent a call out or problem.