**GCSE (9-1)**

***GEOGRAPHY B (GEOGRAPHY FOR ENQUIRING MINDS)***

**Extreme Weather Teaching and Learning Resources**

The following mapping document outlines a selection of teaching and learning activities related to extreme weather. These activities are mapped against the specification topic content as well as highlighting the relevant geographical skills which can be delivered. The activities have been produced by the Royal Meteorological Society (RMetS) in Collaboration with OCR. The activity resources are written for students to access and there are answer sheets available for teachers. All of the resources for teachers and the activity sheets are available on the RMetS website: [https://www.metlink.org/secondary/key-stage-4/ocr-gcse-geography/](https://protect-eu.mimecast.com/s/n8pcCPZmmu5zvjGFzuu9M?domain=metlink.org)

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| ***Specification content*** | ***Teaching and Learning*** | ***Geographical Skills*** |
| **1.1 How can weather be hazardous?**   1. **Why do we have weather extremes?**  * The extremes in weather conditions associated with wind, temperature and precipitation in contrasting countries. | *(A) Classroom Activities: Extreme weather*  These activities help students develop their data skills as they are required to interpret tables and do some simple calculations.  The students will need the worksheet (including resource sheets 1-6) and the excel data sheet to complete the activities:  Section A - calculating range and interpreting climate data  Section B – using evidence to explain weather extremes  Section C – do averages hide extremes?  Section D – Working with graphs (lines of best fit and annotations)  There is an [answer sheet available for teachers](https://www.metlink.org/wp-content/uploads/2019/06/A_Extreme-Weather-Classroom-activity-answers.pdf) | *9.1 With respect to* ***cartographic*** *skills, learners should be able to:*   * Describe, interpret and analyse geo-spatial data presented in a GIS framework.   *9.2 With respect to* ***graphical*** *skills, learners should be able to:*   * Extract, interpret, analyse and evaluate information.   Graph included:   * Climate graphs   *9.3 With respect to* ***numerical*** *and* ***statistical*** *skills, learners should be able to:*   * Understand and correctly use range * Interpret tables of data. * Draw estimated lines of best fit. * Extrapolate trends from data. |

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| **1.1 How can weather be hazardous?**   1. **Why do we have weather extremes?**  * The extremes in weather conditions associated with wind, temperature and precipitation in contrasting countries. | *(B) Excel Exercises*  If students have not used Excel before or they need a refresher please ask them to work through: ‘Activities to develop basic Excel skills: Excel basics’  The students need to download the following two documents to develop their Excel abilities and introduce graphing data:   * Exploring extreme weather graphs in Excel – students worksheet (B2a) * Exploring extreme weather graphs in Excel – Excel sheet (B2a)   These activities support students to construct line, radial and climate graphs as well as the opportunities to calculate the data using Excel.  Tasks 1 (B2b) and 2 (B2c) ask students to paste their graphs onto the worksheet, a selection of questions are provided. Students can extract and interpret their graphs as well as critically reflect.  *Exploring Extreme Weather*  The students need to download the following two documents to explore climate data and activities for Keswick and Eastbourne:   * Exploring extreme weather – making a climate graph student worksheet (B3) * Exploring extreme weather – making a climate graph – Excel sheet (B3)     These activities guide students through temperature and rainfall data to support them with producing a climate graph for Keswick. The final task asks students to create a climate graph for Eastbourne, why not pick the geographical area closest to the school?  There are [completed climate graphs](https://www.metlink.org/wp-content/uploads/2019/06/B3_Interpreting-Climate-graphs.pdf) for teachers to access and share with their students (PDF and Excel)  There is an information sheet (B2d) available for teachers called ‘Choosing the right graph’ in Excel. | *9.2 With respect to* ***graphical*** *skills, learners should be able to:*   * Select and construct appropriate graphs and charts, using appropriate scales and annotations to present information. * Effectively present and communicate data through graphs and charts.   Graphs included:  Line, radial and climate graphs |

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| **1.1 How can weather be hazardous?**   1. **Why do we have weather extremes?**  * The extremes in weather conditions associated with wind, temperature and precipitation in contrasting countries. | *Measures of data dispersion*  The activities and questions enable students to understand and use measures of central tendency e.g. Interquartile range and there is a stretch and challenge activity to interpret Standard Deviation.  *N.B Standard Deviation is NOT a geographical skill required at GCSE and this WILL NOT be examined.*  Download the student information and worksheets:   * Exploring extreme weather – measures of dispersion [– student worksheet](https://www.metlink.org/wp-content/uploads/2019/06/B4_Exploring-extreme-weather-Measures-of-dispersion-pupil-activities.pdf) * Exploring extreme weather – measures of dispersion – background information (B4) * Exploring extreme weather – measures of dispersion – Excel activity (B4)   Work through the activities, which encourage students to investigate and interpret the rainfall and temperature data.  *(C) Homework activities*  Supporting resources for these activities include:   * Extreme weather – homework activity – student worksheet (C) * Extreme weather – homework activity – Resource sheet (C)   The homework activities ask students to extract information from the resources, introduce the term anomaly as well as asking them to describe and explain patterns.  There is a ‘[solutions for teachers](https://www.metlink.org/wp-content/uploads/2019/06/C_Extreme-weather-RMetS-homework-activity-answers.pdf)’ answer sheet available for support. | *9.3 With respect to* ***numerical*** *and* ***statistical*** *skills, learners should be able to:*   * Understand and correctly use appropriate measures of central tendency, spread and cumulative frequency including, inter-quartile range. * Interpret tables of data. * Make predictions; interpolate and extrapolate trends from data.   9.1*With respect to* ***cartographic*** *skills, learners should be able to:*   * Extract, interpret, analyse and evaluate information * Describe, interpret and analyse geo-spatial data presented in a GIS framework   Map included:   * Choropleth maps |
| *Isotherm mapping activity*  *Isoline mapping Exercise*  These activities gives students the opportunity to explore Isoline maps in terms of the data they show, patterns and how to interpret them.  The key activity is for students to draw their own isotherms (a type of isoline map). This activity is differentiated as it has three levels of difficulty from basic to challenging.  Download the instruction sheet: ‘Isotherm – Notes for Teachers’. | 9.1*With respect to* ***cartographic*** *skills, learners should be able to:*   * Select and construct maps, using appropriate scales and annotations, to present information.   Use and understand gradient, contour and spot height (on OS and other isoline maps). |
| **1.1 How can weather be hazardous?**  b. When does extreme weather become a hazard?  • **Case studies** of **two** contrasting natural weather hazard events arising from extreme weather conditions. The case studies must include a natural weather hazard from each bullet point below: flash flooding or tropical storms heat wave or drought. There must be one UK based and one non-UK based natural weather hazard event.  • For each chosen hazard event, study the place specific causes (including the extreme weather conditions which led to the event), consequences of and responses to the hazard. | *2003 Heatwave Case Study*  Download the ‘Heatwave case study’ sheet which outlines the causes and responses to this weather hazard event in 2003. There are a variety of sources available within the document for students to access as they research.  The final page provides a template for students to use when researching this case study.  As the students work through the resources e.g. newspaper articles, satellite imagery and some interesting response information from the government, NHS and charities (Red Cross and Age UK) they can interpret, analyse and evaluate the sources. | 9.4 With respect to **formulating enquiry and argument**, learners should be able to:   * Deconstruct, interpret, analyse and evaluate visual images including photographs, cartoons, pictures and diagrams. * Analyse written articles from a variety of sources for understanding, interpretation and recognition of bias. |

**Other recommended resources to support teaching weather and climate**

[https://www.metlink.org/secondary/key-stage-4/ocr-gcse-geography/](https://protect-eu.mimecast.com/s/n8pcCPZmmu5zvjGFzuu9M?domain=metlink.org)

There are a wide variety of resources available on the Royal Meteorological Society website to support the teaching of weather and climate. This includes hyperlinks to lots of teaching and learning materials, examples and case studies. Throughout the resources there are diagrams, images, data sources and maps so there are lots of opportunities to embed geographical skills. Please click on the link right at the bottom of the page e.g. *OCR GCSE Geography B*.