

A case study of a depression weather system, Klaus 2009.

This series of lessons covers the formation of, weather associated with, and the impacts of a depression. It uses depression Klaus in 2009 as a case study. It is assumed that students already have a basic grasp of the concepts inherent within the weather and climate topic, particularly air masses and the interpretation of weather symbols.

Syllabus links

GCSE Syllabus	Area
WJEC A	2.1 What are these weather hazards associated with high and low air pressure systems over the British Isles and with tropical storms? 2.2 How do weather hazards affect people, the economy and the environment.
WJEC B	1.1 What causes contrasting types of pressure systems in different parts of the world? 1.2 How does contrasting pressure in the atmosphere lead to variations in weather and climate? 1.3 To what extent are people's activities and quality of life influenced
CCEA	ii) demonstrate (with reference to places for illustration purposes only) knowledge and understanding of: – the weather patterns and sequence of change associated with a frontal depression as it moves across the British Isles (weather at the warm front, in the warm sector and at the cold front); and – the weather patterns associated with anticyclones in the British Isles during winter and summer. (iii) interpret synoptic charts and satellite images and understand the limitations of forecasting (range and accuracy); (iv) evaluate the effects (positive and negative) of depressions and anticyclones on the economy and people (with reference to places for illustration purposes only);
AQA A	The sequence of weather associated with the passage of a depression and the reasons for it.

Further information relating to the concepts introduced in these lessons may be found in the YouTube lectures by **Pete Inness** at

http://www.youtube.com/user/royalmetsoc#p/u/1/2Wxoq_4K2IE



Lesson.1 Formation of a depression.

Learning Outcomes	Teaching and Learning Activities	Resources/Additional activities/Comments
<p>Be able to describe the formation of a depression weather system.</p> <p>Be able to describe the air movement within a depression weather system.</p> <p>Be able to identify the features of a depression upon a satellite image.</p> <p>Be able to identify the features of a depression upon a synoptic weather chart.</p>	<p>Main activity</p> <p>Share the learning objectives with students.</p> <p>Use the PowerPoint presentation to illustrate the formation of a depression.</p> <p>There is plenty of opportunity here for students to come to the front and annotate specific points.</p> <p>Students can annotate their worksheet.</p> <p>Plenary</p> <p>Ask students to complete the associated slide related to characteristics that identify a depression. Students can justify their choices.</p>	<p>PowerPoint: Formation</p> <p>Worksheet: Formation</p> <p><i>*These will be need to be printed beforehand.</i></p> <p>Coloured pencils and pens.</p> <p><i>*There is an opportunity to differentiate by removing the annotation prompts for more able students.</i></p>

Lesson.2: Identifying the growth and passage of depression Klaus from satellite and temperature charts.

Learning Outcomes	Teaching and Learning Activities	Resources/Additional activities/Comments
<p>Be able to describe the passage of depression Klaus over the 23rd and 24th of January.</p> <p>Identify the different stages in the development of depression Klaus using satellite and temperature maps.</p> <p>Be able to offer reasons for why depression Klaus was particularly intense compared to other storms.</p>	<p>Starter:</p> <p>Students can complete the Question of Sport activity; this can be completed whole class in two teams, or by inviting individuals to the board.</p> <p><i>* Open the presentation and view. The front squares slide will be shown. When a square is clicked, using a mouse or an IWB, it will move to a question. When a student has answered the question click on the back button, this will return you to the squares slide and the previous clicked square will disappear. Continue the process till all squares have been removed.</i></p> <p>Main activity</p> <p>Share the learning objectives with students.</p> <p>Using the PowerPoint, illustrate the birth and passage of depression Klaus.</p> <p>There is an opportunity here for students to come and label/highlight the different features under the direction of the teacher.</p> <p>Students should then complete the sequencing task. Students need to match the correct satellite image, temperature map and description.</p> <p>Go over the task with students, these can then be stuck into their book and the satellite/temperature images appropriately labelled.</p> <p>Plenary Activity.</p> <p>Ask students to identify the different features found upon the satellite image.</p>	<p>PowerPoint- Question of Sport starter activity.</p> <p>PowerPoint- Passage of a depression.</p> <p>Worksheet- passage sequence</p> <p><i>* please note the cards are in the correct order and will need to be prepared beforehand. For example, they could be cut up and placed into separate envelopes. You may even consider laminating for long-term use.</i></p> <p><i>*There is an opportunity to differentiate here by removing the descriptions and asking more able students to write their own.</i></p> <p>Scissors/Glue</p>

Lesson.3: Weather associated with the passing of a depression.

Learning Outcomes	Teaching and Learning Activities	Resources/Additional activities/Comments
<p>Be able to describe and explain the type of weather associated with the different fronts in a depression.</p> <p>Be able to describe how the weather changes with the passage of a depression.</p> <p>Be able to reproduce a diagram of the cross-section of a depression.</p>	<p>Starter</p> <p>Ask students to identify the three areas shown on the satellite image associated with depression Klaus.</p> <p>Main Activity</p> <p>Share the learning objectives with students.</p> <p>Use the PowerPoint to illustrate how a depression looks like in cross-section.</p> <p>Explain the weather associated with both the warm and cold fronts.</p> <p>Ask students, using the help sheet provided, to produce a story describing the passage of a depression as if they were in field monitoring the weather system.</p> <p>Students could peer assess each other's work and provide suggestions. Work could be typed/written up.</p> <p>Plenary</p> <p>This is an activity based upon repetition; students fold their A3 page into four. They copy everything displayed on the presentation into one of the boxes. When requested students swop their A3 paper with another- the process continues again, but this time at a faster pace. After the fourth time, students should draw the cross-section from memory.</p>	<p>PowerPoint presentation- cross-section.</p> <p>Worksheet- passing of a depression.</p> <p><i>*Please note that these will need to be printed beforehand.</i></p> <p>PowerPoint- cross-section revision.</p> <p>A3 paper</p> <p>Pencils.</p> <p><i>* With the cross-section writing task there is the opportunity to differentiate; more able students could produce a story just from a provided copy of the cross section. The cross-section could be drawn as a storyboard, each cartoon showing the changing weather and clothing worn by a character.</i></p> <p><i>*The cross-section revision PowerPoint is timed. Additional music/sound effects could be added, i.e. rain, thunderstorms!</i></p>

Lesson.4: The impact of depression Klaus.

Learning Outcomes	Teaching and Learning Activities	Resources/Additional activities/Comments
<p>Students will be able to describe the impacts of a depression, illustrated by Klaus in 2009.</p>	<p>Starter</p> <p>Ask students to explain what is happening on the two fronts labelled on the PowerPoint presentation slide. Students could write brief descriptions with a partner and share these with the class.</p> <p>Main Activity.</p> <p>Share the learning objectives with students.</p> <p>Recap the factors that contributed to the intensity of the depression.</p> <p>Show the silent footage of the impact of Klaus linked to on the PowerPoint presentation.</p> <p>Ask students to classify the statements according to the categories.</p> <p>Debrief the statements with students.</p> <p>Follow-up task.</p> <p>Ask students to produce a news report about the impact of Klaus, this could take a number of media, i.e. article, radio/tv news report. Students could work as individuals or as peers.</p>	<p>PowerPoint presentation on the impact of Klaus.</p> <p>Classification statements.</p> <p><i>*Please note that these will need to be prepared beforehand. Statements should be printed, cut up and placed within envelopes for students. You may consider laminating cards for long-term use.</i></p> <p>Scissors and glue, A3 paper for statements.</p> <p>Access to ICT resources.</p> <p>Note</p> <p><i>* Alternatively students could produce an annotated map of the impacts of the depression. Statements could be colour-coded to show the different types of impact.</i></p>