

About the lessons

This sequence of three lessons centres on a visit to The Hereford Waterworks Museum. The lessons are aimed at Key Stage 3 and the National Curriculum area of: understanding, through the use of detailed place-based exemplars at a variety of scales, the key processes in hydrology, and how human activity relies on the effective functioning of natural systems.

- The first lesson is about the processes involved in river flooding, including some work on local knowledge of Herefordshire.
- The second lesson is the visit to The Hereford Waterworks Museum, which is anticipated as a half-day visit or, possibly, extended to a day if fieldwork opportunities are followed up.
- The third lesson is based on an assessment of flooding in Hereford.

Lesson Plan 1 Why do rivers flood?			
Time: 1 hr	Date:	Class:	Subject: Geography
Lesson focus: River flooding		Lesson title:	
Lesson Objectives: <ul style="list-style-type: none"> • To locate some places that have flooded before in Herefordshire. • To understand some reasons why rivers flood. • To share understanding about reasons for river flooding. 		Literacy focus: Key terms: relief, saturated, deforestation, intense rainfall, urbanisation, compacted	Numeracy focus: Measuring flooding
Resources required: <ul style="list-style-type: none"> • Photos of flooding in Herefordshire, 2007 (source from BBC website) • Maps of The City of Hereford and Herefordshire County • An ordnance Survey map google maps to locate places in the photographs • Textbooks/websites for research into factors contributing to river flooding • PowerPoint 		SMSC opportunities: Impacts of flooding	Assessment of learning objectives: <ul style="list-style-type: none"> - -Group work -Class discussion
Homework set and due: N/A		Homework to collect: N/A	
Meeting individual's needs: Ideas for differentiation have been incorporated into the lesson resources.			
Class room support: N/A			
Health and safety/risk assessment: <ul style="list-style-type: none"> - Bags under table to avoid any tripping hazards - Pupils seated properly to avoid tripping over chairs or falling off - Knowledge of any wires from IT equipment – trip hazard - Knowledge of nearest fire exit in case of an emergency 			

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Time (estimate)	Teacher activity	LO	Learner activity	AfL and differentiation
20 mins	<p>The BBC has an archive of photos taken during the 2007 floods in Herefordshire.</p> <p>Print out photos showing different flooded locations around the City of Hereford and County of Herefordshire. One set per group (of two or three). Also provide a map of the City of Hereford and County of Herefordshire for each group.</p> <p>Google maps / ordnance survey maps can also be used</p>	LO1	<p>Groups locate the photos and choose which of the two maps to display them on.</p> <p>You may choose to model one or two first.</p>	<p>If you have access to Digimap or a similar product, students could locate the photos using Digimap. Some students could then be challenged to use map skills to explain local features contributing to flood risk/</p>
20 mins	<p>Allocate three factors from the list provided on the PowerPoint to student groups and use resources (textbooks, websites) for independent research into why these factors contribute to river flooding.</p>	LO2	<p>Students should continue to work in groups of two or three, each student researching one factor.</p>	<p>Independent learning.</p> <p>Some groups could be allocated fewer factors or simpler factors such as rain and melting snow.</p>
20 mins	<p>Share reasons for river flooding as a class.</p> <p>Link these reasons to the final PowerPoint screen about the River Wye.</p>	LO3	<p>Selected groups could present their findings back to the rest of the class.</p>	<p>Students could make notes on new factors, and improve their own work with any new information or ideas</p>

Teaching and Learning project PGCE

The Waterworks Museum in Hereford

Why do rivers flood?



Learning objectives

- To locate some places that have flooded before in Herefordshire.
- To understand some reasons why rivers flood.
- To share understanding about reasons for river flooding.



Starter – the 2007 floods

In 2007 very heavy rain caused terrible flooding in Herefordshire, Gloucestershire and Worcestershire.

Working in groups, find out where (the location) of each of the photographs were taken in Herefordshire.

Use the City of Hereford map and the County of Herefordshire map to decide where each photograph is located and place it around one of the maps.

Draw a line using a ruler to link the location to the photograph.





Holmer school flooded. Pic: Paul Stevens



Merton Meadow car park flooded. Pic: Paul Stevens



Widemarsh Street. Hereford. Pic: Paul Stevens



Bodenham by Frankie Devereux



Rescue teams gathering outside the Moon Inn at Mordiford, following the evacuation of Hampton Bishop. Picture by Kerry Fortey.



Edgar Street in Hereford by Chris Barn



2007 floods in Herefordshire



Ledbury by Martin Perry



Leominster in flood by Allan Williams



Leominster in flood by David Oliver



Little Hereford by Brian Wojtczak



Mordiford in flood by Garry Thomas

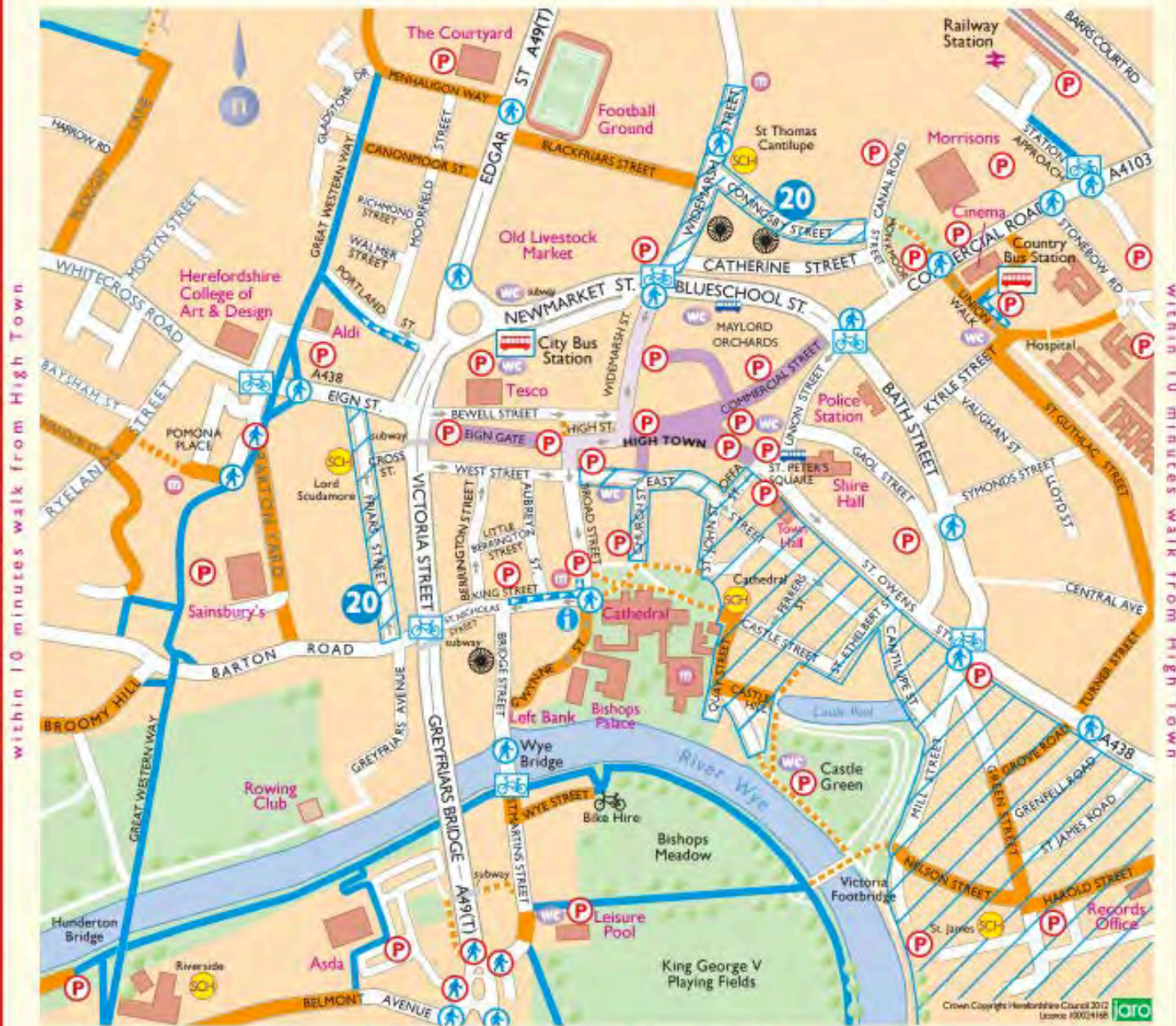


M50 - photo by David Watkins



2007 floods in Herefordshire

within 10 minutes walk from High Town



within 10 minutes walk from High Town





Resources to help you...

Which are physical and which are human causes?

Why do rivers flood?

- A river floods when the water normally flowing in the **channel** overflows its **banks** and spreads out onto the surrounding land.
- Pick **three** of these reasons for flooding and work out how they cause river flooding:

Heavy, intense rainfall

Rain over a long period of time

Melting snow

Steep slopes

Saturated soil

Urbanisation

Deforestation

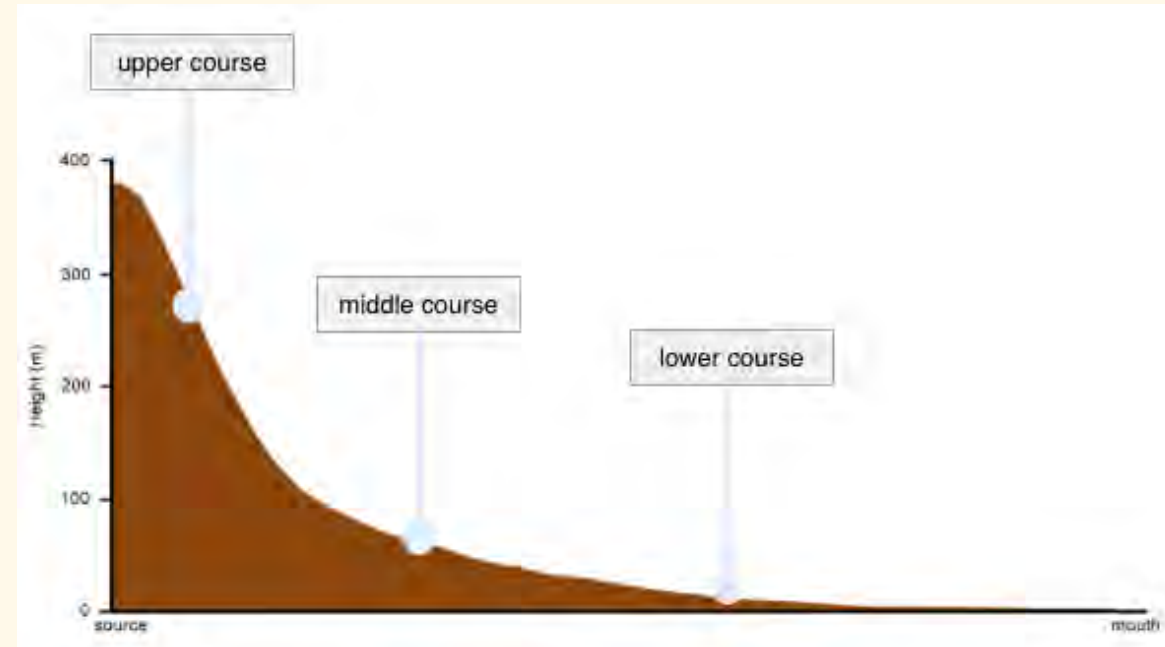
Impermeable rock

Compacted soil

The River Wye

Upland parts of the catchments are steep, mountainous, impermeable and fast responding. The profile flattens out downstream to become wide lowland floodplains with gentler meanders.

River flooding in the upper catchments of the Wye and Usk tends to occur rapidly due to the characteristic narrow, steep valleys. Lower down the catchments, the areas of flooding are more extensive.



Wye and Usk Catchment Flood Management Plan

Summary Report January 2010

Activity

Explain the key words impermeable and catchment in your own words.

Summarise the reasons why the River Wye Catchment can flood in your own words.

Lesson Plan 2 – Fieldwork Opportunities at The Hereford Waterworks Museum			
Time:	Date:	Class:	Subject: Geography
Resources required: Worksheet for fieldwork around the museum. Clipboards		SMSC opportunities: Working in groups	Assessment of learning objectives: - Observations - Fieldwork data collection
Meeting individual's needs: Differentiation will be provided through group selection and assignment of tasks to different groups with support staff / allocated teachers to aid task completion.			
Health and safety/risk assessment: <ul style="list-style-type: none"> - Pupils need to be aware of: roads, river safety, dogs, members of the public and strangers as we will be working in a public area. - The ground surface will be uneven and pupils should be aware of trip and slip hazards. - If students are working in water, there may be unseen hazards below the water surface. The site should be inspected before the field trip. - Students should be aware of their surroundings and location to avoid getting lost. Observers should be visible to all. - Students should be aware of weather hazards and be prepared with, for e.g., strong sun, heavy rain, strong wind. - As there is the possibility of infection by water-born bacteria, anti-bacterial handwash should be provided. - As there is the possibility of insect bites when working near water sources, antihistamine medicine should be available. - Students should work in groups; individual work should be avoided. <p>See also Health and Safety guidance provided by the Hereford Waterworks Museum</p>			

Time (estimate)	Teacher activity	LO	Learners activity	AfL and differentiation
	<p>Connection:</p> <p>Pupils are introduced to the site by the volunteers. They are provided with a background to the site.</p>			

	<p>Pupils complete a field sketch of the area, focusing on the river and its floodplain.</p> <p>The Hereford Waterworks Museum's Education area makes it possible to complete a field sketch from inside the premises if the weather is bad.</p>		<p>Pupils can complete their field sketch on the worksheet provided with this pack.</p> <p>Pupils then annotate their field sketch.</p>	<p>The annotations can be used as stretch and challenge if combined with other sources within the Waterworks Museum.</p>
	<p>Fieldwork opportunities at the site could include using drainage to the river to:</p> <ul style="list-style-type: none"> - measure flow rate - measure width of channel - flow rate of the river <p><u>Guidance on river fieldwork</u></p>		<p>Pupils can use the worksheet to record their findings.</p>	
	<p>There are two additional questions on the worksheet for students to complete as extension opportunities.</p>			

River Fieldwork @ The Waterworks Museum

Name:.....

Date:.....



1. Describe some of the main features within your field sketch.
2. Flow rate of the tributary =
3. Width of the tributary =
4. Flow rate of the river =
5. Explain why this area is likely to flood
6. Suggest why this original site was chosen for the waterworks

Teaching and Learning project PGCE

The Waterworks Museum in Hereford

Why do rivers flood? Assessment



Learning objectives

- To use information from the Hereford Waterworks Museum visit to explain some causes for flooding in Herefordshire.
- To use an Environment Agency flood map to explain flood risk in Hereford.
- To complete your own research into ways in which the City of Hereford could be protected from river flooding.



FLOOD warnings have been in place in Herefordshire today while motorists have been advised to be aware of water on roads.

The Environment Agency has issued flood warnings for the River Wye in Hereford and between [Hay](#)-on-Wye and Hereford.

The A438 between Willersley and Letton is currently impassable due to flooding and Herefordshire fire crews are out this morning to help those who might be affected.

At 8am, the level at the Old Wye Bridge gauge was 4.43 metres and rising and is expected to reach a peak level of between 4.7 and 5.1 metres this afternoon and into the evening.



Enter a postcode or place name:

Go

Other topics for this area...

Flood Warning Areas

Flood Map for Planning (Rivers and Sea)

Map legend

Flood Map for Planning (Rivers and Sea) [i](#)

Flood Zone 3

Flood Zone 2

Flood defences (Not all may be shown*)

Areas benefiting from flood defences (Not all may be shown*)

Main River [i](#)

Main River

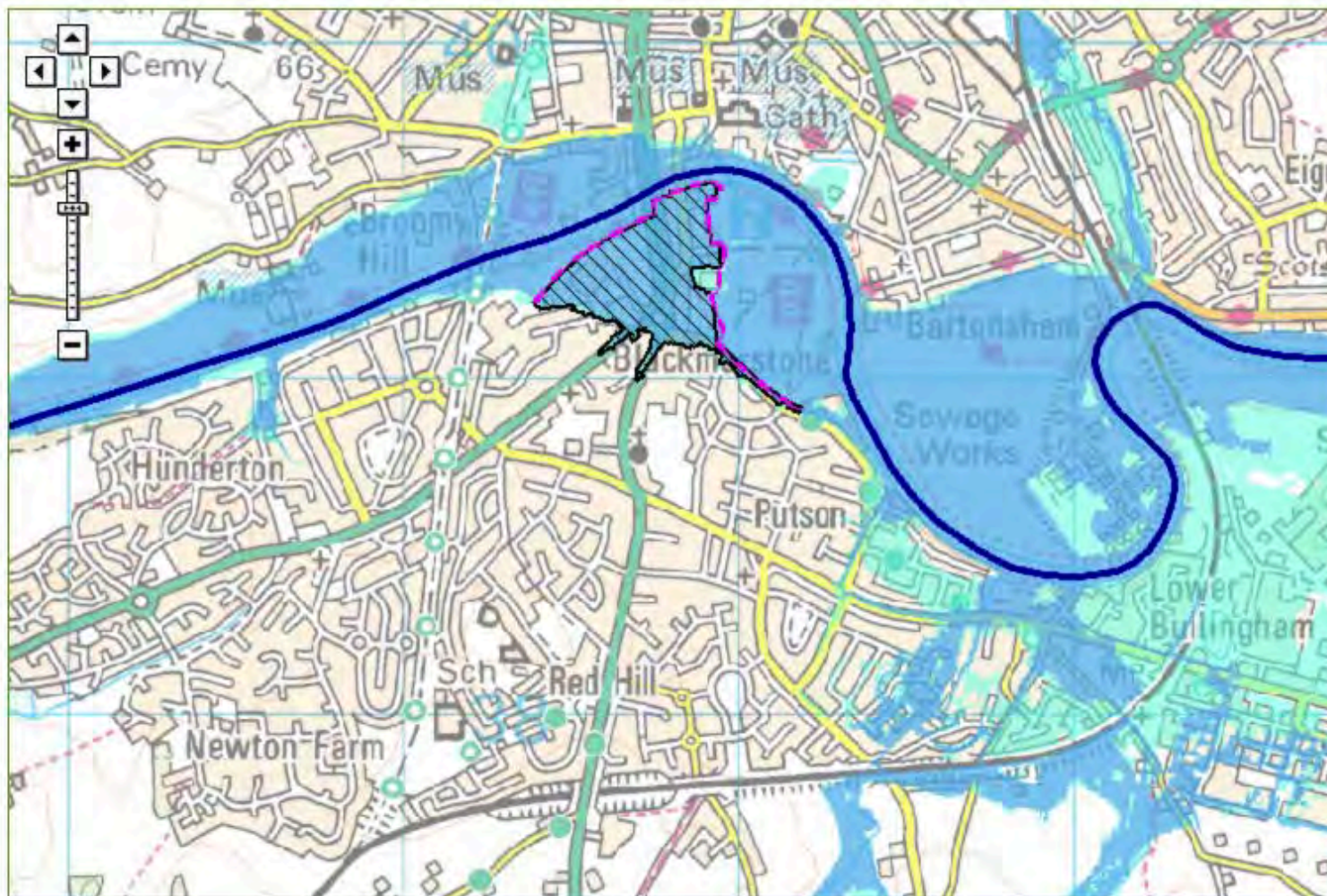
Other national environmental organisations [i](#)

Natural Resources Wales Area of responsibility

Scottish Environment Protection Agency Area of responsibility

X: 350,817;Y: 238,768 at scale 1:20,000

[Other maps](#) [Data search](#) [Text only version](#)



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Assessment instructions

- Complete the Hereford Times article by:
- Outline the factors that might have caused the flood risk in Hereford (include the information you gathered at the Waterworks Museum).
- Using the Environment Agency map, explain which areas of the City of Hereford are most at risk of flooding.
- Using your own research, justify how the City of Hereford could be protected from river flooding.

