

## River Basin Landscape Case Study: The River Severn

### Student Activities

#### [a] Locating the drainage basin

*Use the resources to locate the drainage basin of the River Severn, remember to include the location of the source and mouth and to label the major settlements (towns) it flows through onto your own version of the map.*

#### [b] Landforms along the Severn

*Add the diagram from Section B to your book, annotating it to show where the landforms, listed below are found.*

*Check your notes to make sure you have explanations of how each of those landforms are created. If not, add them now!*

#### [c] How are these landforms influenced by geology and climate?

*Use the resources from Section C to help you to complete this summary table*

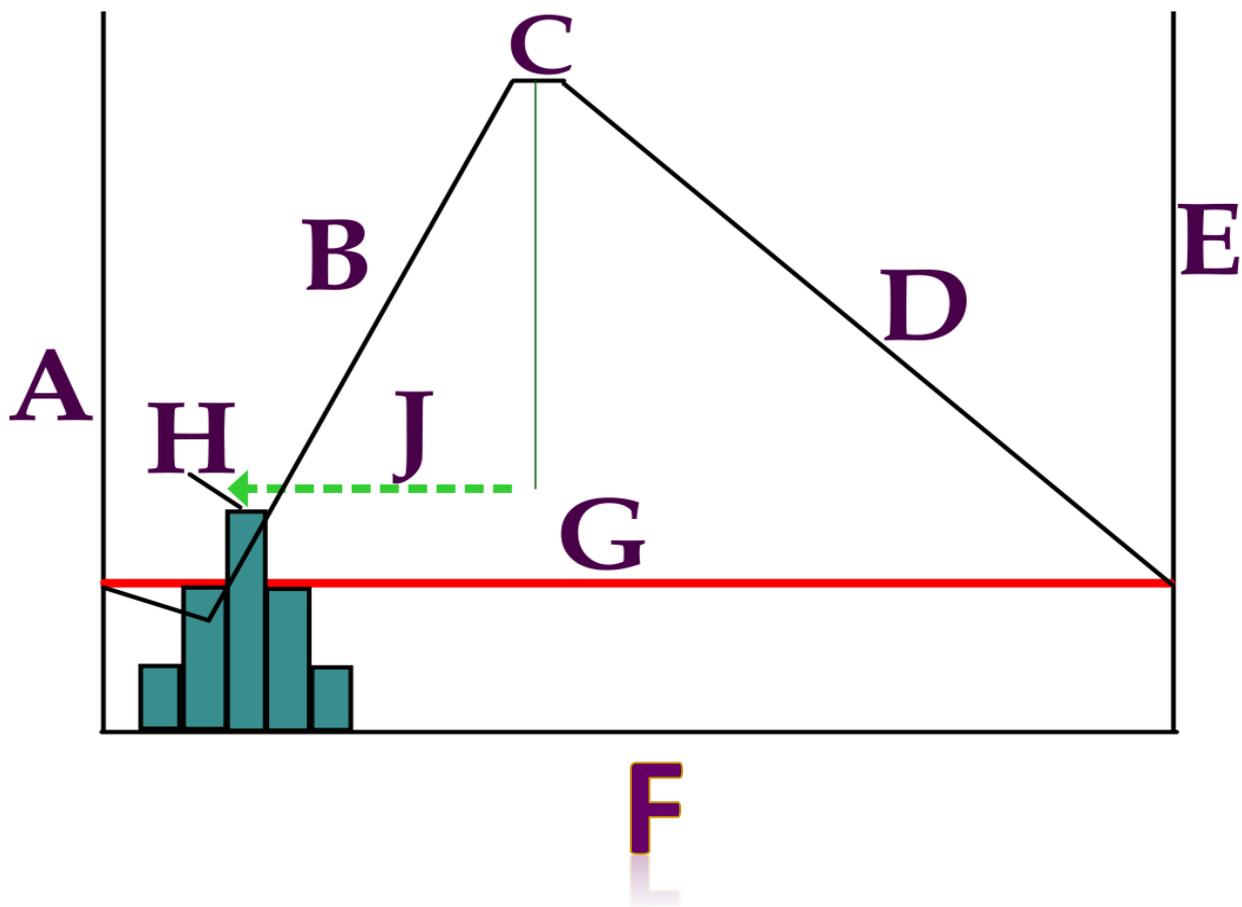
Course	Altitude	Precipitation	Geology	River characteristics	Geomorphic processes
<b>Upper</b>	Height above sea level	Amount of rainfall in mm per year	Rock types (names); hard or soft; permeability	Width Depth Velocity Sediment size/shape	Weathering Erosion (lateral or vertical) Mass movement Soil creep Transportation Deposition
<b>Middle</b>					
<b>Lower</b>					

#### [d] How does the drainage basin respond to rainfall?

*Use the resources from Section D to help you to complete the following*

1. What 'h' is used to show how the water level (discharge) changes in a river?

2. Label your own version of a hydrograph



The shape of the hydrograph (flashy or flat) is affected by a range of human factors and physical (natural) factors.

3. Draw a two-columned table in your book then unscramble the following and add to the table, once you have decided whether they are human or physical (natural)

<b>Precipitation amount</b>	<b>Soil conditions –</b>	<b>Precipitation intensity</b>	<b>Soil type</b>
<b>Urban or rural</b>	<b>Antecedent conditions</b>	<b>Afforestation vs deforestation</b>	<b>Drainage basin shape</b>
<b>Relief</b>	<b>Geology</b>	<b>Soil depth</b>	<b>Vegetation</b>

4. Choose either 'flashy' or 'flat' – now select 'ingredients' from the menu on the following page that would result in that shape of hydrograph

<b>Precipitation amount</b> – lots vs little	<b>Soil conditions</b> – eg frozen; saturated; dry	<b>Precipitation intensity</b> – short shower vs heavy rainstorm	<b>Soil type</b> eg clay or sand
<b>Urban or rural</b> (affects amount of roads and buildings and impermeable surfaces)	<b>Antecedent conditions</b> – has there been any rainfall in the run up to this period of rain	<b>Afforestation vs deforestation</b>	<b>Drainage basin shape</b> – in circular basins it takes longer for water to reach the channel
<b>Relief</b> – steep slopes vs gentle slopes or flat land	<b>Geology</b> – permeable or impermeable	<b>Soil depth</b> – deep vs shallow	<b>Vegetation</b> – very little/none vs lots of

5. Choose three of your ingredients then explain them, like this.

Eg An **urban area** (chosen ingredient) has lots of impermeable surfaces [POINT] this means that the rainfall cannot infiltrate as it would if it had been soil and instead has to flow over the surface (overland flow) [DEVDP]. Overland flow reaches the river far more quickly, consequently the river level rises more rapidly, the lag time is shorter and the flood risk is higher, leading to a flashier hydrograph. [FULLY DEVDP].

**[e] How do physical and human processes interact to cause flooding?**

*Use the resources from Section E to help you to complete the following*

- Why do so many people live in close proximity to the River Severn?
- The 2014 floods were a 'one-off' event? Explain your thinking!
- What caused the 2014 floods? [remember to include physical (natural) AND human causes]

**[f] How does flooding affect Shrewsbury? [river affects human activity]**

*Use the resources from Section F to help you to complete the following*

- How else could the data in Data Rep 1 have been presented?

b) Shrewsbury has been carefully planned so that the flood risk can be managed quite easily.

>To what extent do you agree with this statement? You must include facts from Source F, Data Rep 1 to evidence your thinking

**[g] What is being done by humans to minimise the risk of flooding in Shrewsbury?**

*Use the resources from Section G, Data Rep 3 and the 'Humans Managing flooding' photograph sheet to help you to complete the following*

- a) What are the two types of river/flood management strategy?
- b) How are they different?
- c) Which is Shrewsbury using most of? Why might that be?

*Use the resources from Section G, Data Rep 4 to help you to answer the following*

'Small scale river management just moves the problem from one location to another'

>To what extent do you agree with this statement? You should include facts from Source G, Data Rep 4 to evidence your thinking.

**Research:** Check this out ..... is the bigger picture a better idea?

