

# Dunfermline High School

## Geography Department

Name



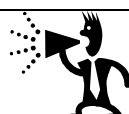


\_\_\_\_\_

Teacher

\_\_\_\_\_



## River Landscapes

Key to using this booklet:	
	A reading task
	A writing task
	Work together in a pair or group
	Think about or memorize something
	More difficult N5 level extension work

Learning Outcomes for the Rivers Unit				
	I get it	I'm not sure	I'm lost	I was absent
The Hydrological Cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drainage basins and basic river features	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Processes of transportation, erosion and deposition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The river's long profile	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Weather and climate affecting river environments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical features of river landscapes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
River landscape map work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reasons for flooding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## The Hydrological Cycle

(LO: The Hydrological Cycle)



### Task 1:

The Hydrological cycle is the continuous recycling of water from stores such as the sea to the atmosphere and back again as precipitation. This recycling of water has always happened. There is the same amount of water on earth today as there was when the dinosaurs walked the earth. No new water is ever created or lost – it is merely recycled continuously.



### Task 2:

Watch a clip on the hydrological cycle and then discuss in your groups the importance of the hydrological cycle to life on earth.



### Task 3:

Complete a diagram of the hydrological cycle in the space below:



### Task 4:

Have a go at the smartboard task on the hydrological cycle.



### Task 5:

Match up the terms to the correct definitions.

Evaporation		The release of moisture from plant and animal life
Advection		A change in state from liquid to vapor
Condensation		The movement of vapour by wind
Precipitation		The movement of water over the land's surface
Surface run-off		A change in state from vapor back to liquid
Evapotranspiration		Droplets become too heavy and fall as rain.



Task 6:  
Complete this word search.  
Can you find the mystery words?

Word search:  
Evaporation  
Condensation  
Transpirate  
Surface run-off,  
Advection,  
Cloud  
Vapour  
??????  
?????

V	A	P	O	U	R	D	S	C	V	E	N
R	E	C	Y	C	L	E	C	O	L	V	M
W	A	T	E	R	C	B	J	N	K	A	K
E	A	T	G	S	D	N	H	D	J	P	L
V	D	E	B	U	F	M	G	E	H	O	O
G	E	T	A	R	I	P	S	N	A	R	T
M	C	O	F	F	U	I	F	S	G	A	P
C	T	D	B	A	G	N	D	A	F	T	U
L	I	S	V	C	H	Y	S	T	D	I	Y
O	O	A	C	E	J	T	S	I	S	O	T
U	N	W	X	C	Y	R	A	O	A	N	R
D	Y	E	Z	E	K	F	A	N	Q	W	E



Task 7:  
Complete your own definition of these terms in the spaces below.

Evaporation: \_\_\_\_\_  
\_\_\_\_\_

Condensation: \_\_\_\_\_  
\_\_\_\_\_

Advection: \_\_\_\_\_  
\_\_\_\_\_

Surface run-off: \_\_\_\_\_  
\_\_\_\_\_

Precipitation: \_\_\_\_\_  
\_\_\_\_\_

Task 8:

Make up a pop-quiz question with one of today's keywords as its answer to revise what you have learned.



Task 9:

Answer the following exam question:

Describe the movement of water through the hydrological cycle. (6)

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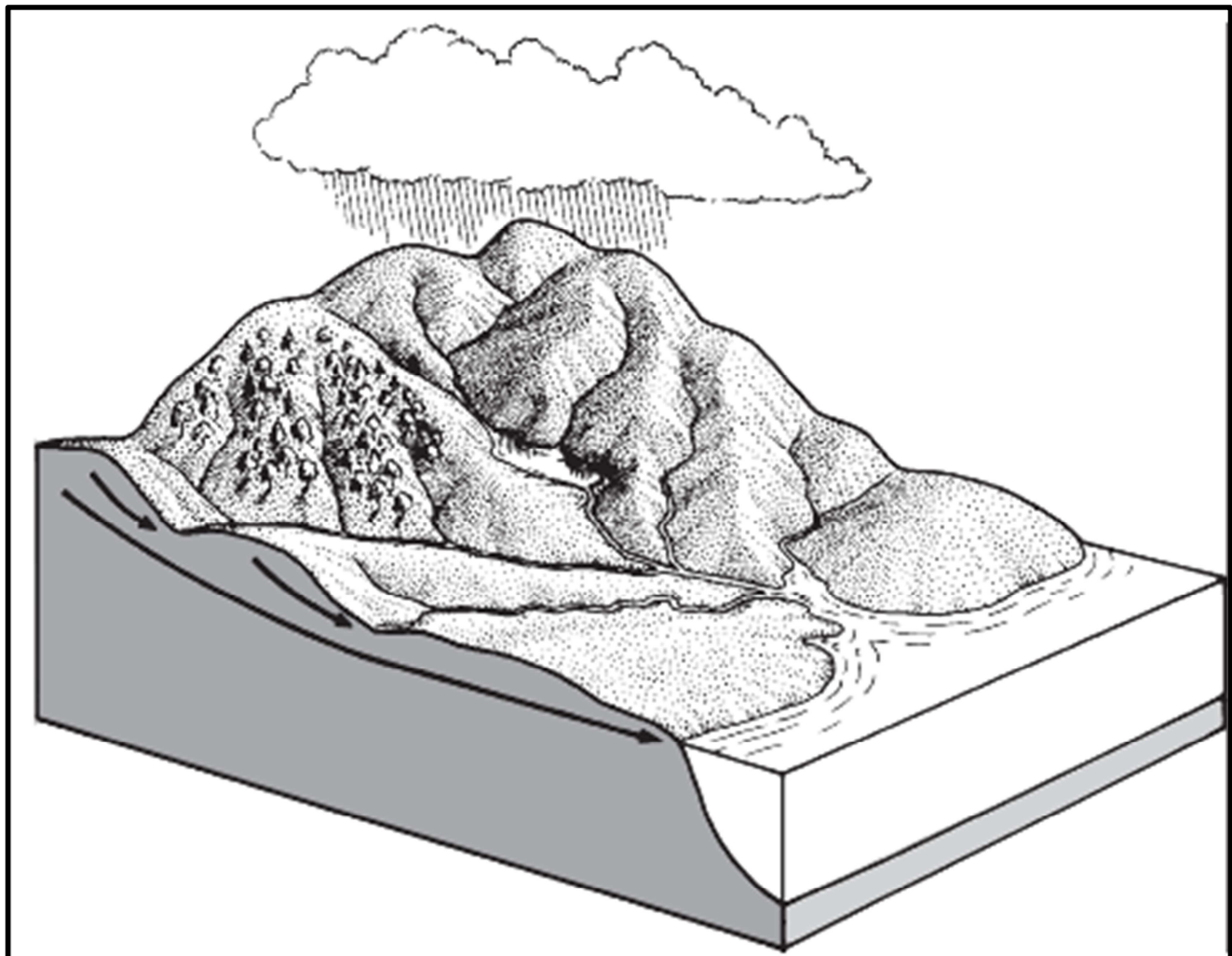
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Task 10:

Colour and label this diagram to show the features of the hydrological cycle



## The Drainage basin

(LO: Drainage basins and basic river features)



### Task 1:

A drainage basin is the area that is drained by a river. The edge of this area is known as the water shed which is the area of high land that separated one basin from its neighbour.



### Task 2:

Watch the video clips on drainage basins and water cycle and take notes to further understand the **difference** between the hydrological cycle and a drainage basin.



### Task 3:

Using the template provided by your teacher, make your own pop-up drainage basin. Make sure you label all of the features.



### Task 4:

Use this space to draw an exam standard diagram of the passage of water through a drainage basin



### Task 5:

Place the terms from your diagram into the correct columns

Inputs	Stores	Transfers	Outputs



## Task 6:

Use the table from task 5 to answer this exam question:

Describe the movement of water through a drainage basin. (6)

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## Task 7:

Match the correct term to its definition.

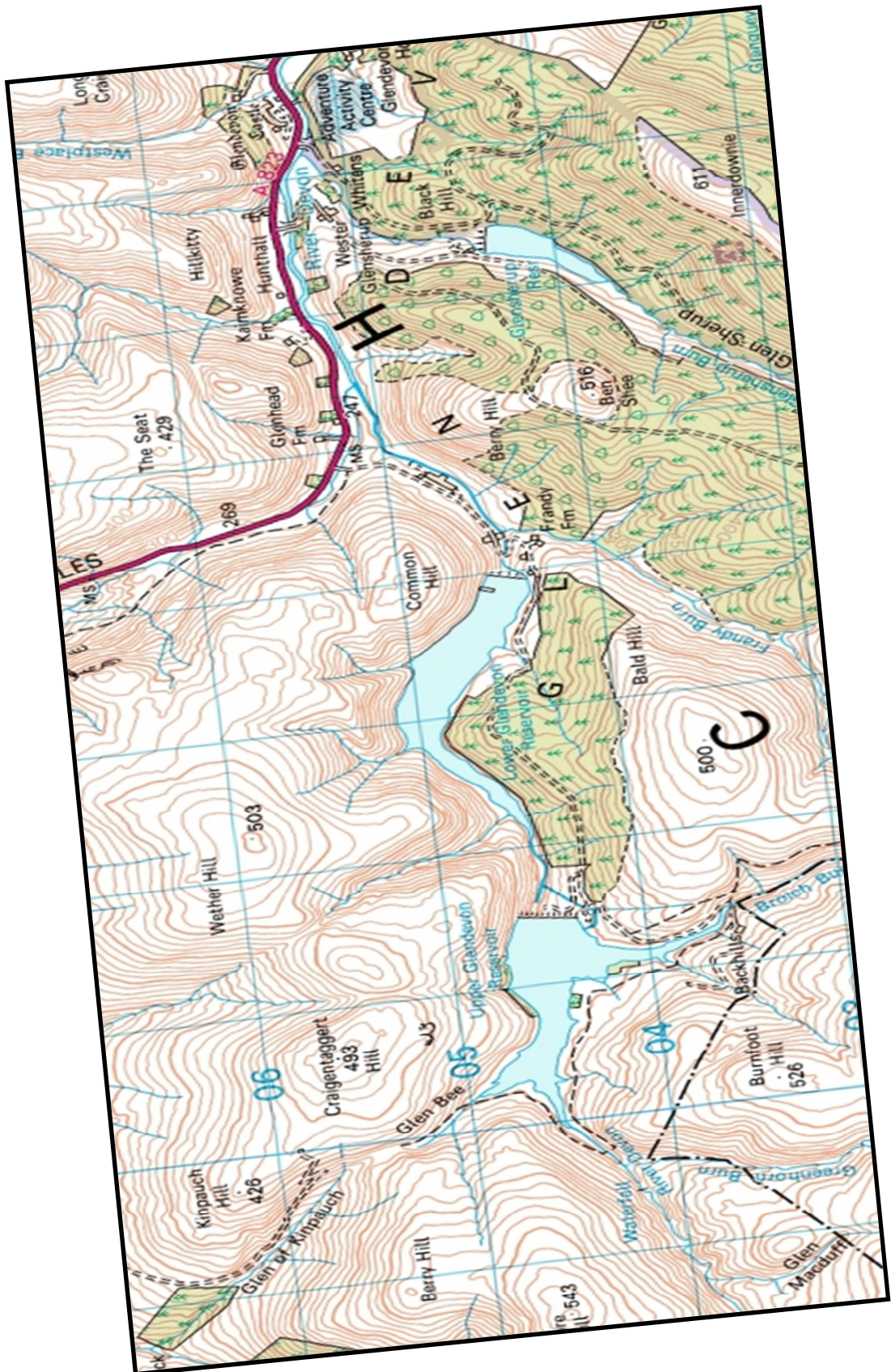
Confluence point		The edge of a drainage basin
Tributary		The point at which a smaller river meets a larger one
Estuary/river mouth		A smaller river that leads onto a larger river
Drainage basin		The point at which a river meets the sea
Water shed		Where the river begins
Source		The area drained by a river



## Task 8:

Examine the definitions shown below and label them correctly on the map on the next page. Access a digital copy to see it in clearer colour detail.

- **River Source:** Starting point of a river on highest ground.
- **Confluence:** Where two rivers meet and join to form one larger river.
- **Drainage Basin:** The area of land drained by a river and its tributaries.
- **Mouth:** The end of the river, where it meets the sea, or a lake.
- **Tributaries:** Small rivers running into the main one which form part of the same drainage basin system.





The Processes of a River

(LO: Processes of transportation, erosion and deposition)



Task 1:

Complete a diagram that explains how rivers transport their load.



Task 2:

Your teacher will explain how rivers erode the landscape. Explain each process below.

Abrasion/Corrasion:

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Hydraulic action:

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Corrosion/solution:

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## The Rivers Long Profile

(LO: The river's long profile and LO: Land use in River Landscapes)



### Task 1:

A river can be divided up into three sections in what we call the 'long profile'. These stages, upper, middle and lower, have different qualities that influence the landscape and land use along the river's course.



### Task 2:

Watch a video to see how a river's features change as we journey from the source to the mouth. Take notes under the following headings:

Physical Features and climate	Processes	Land use



### Task 3:

Now label a diagram of the three stages of the river to show how the river changes in character as you travel down its length from source to mouth.

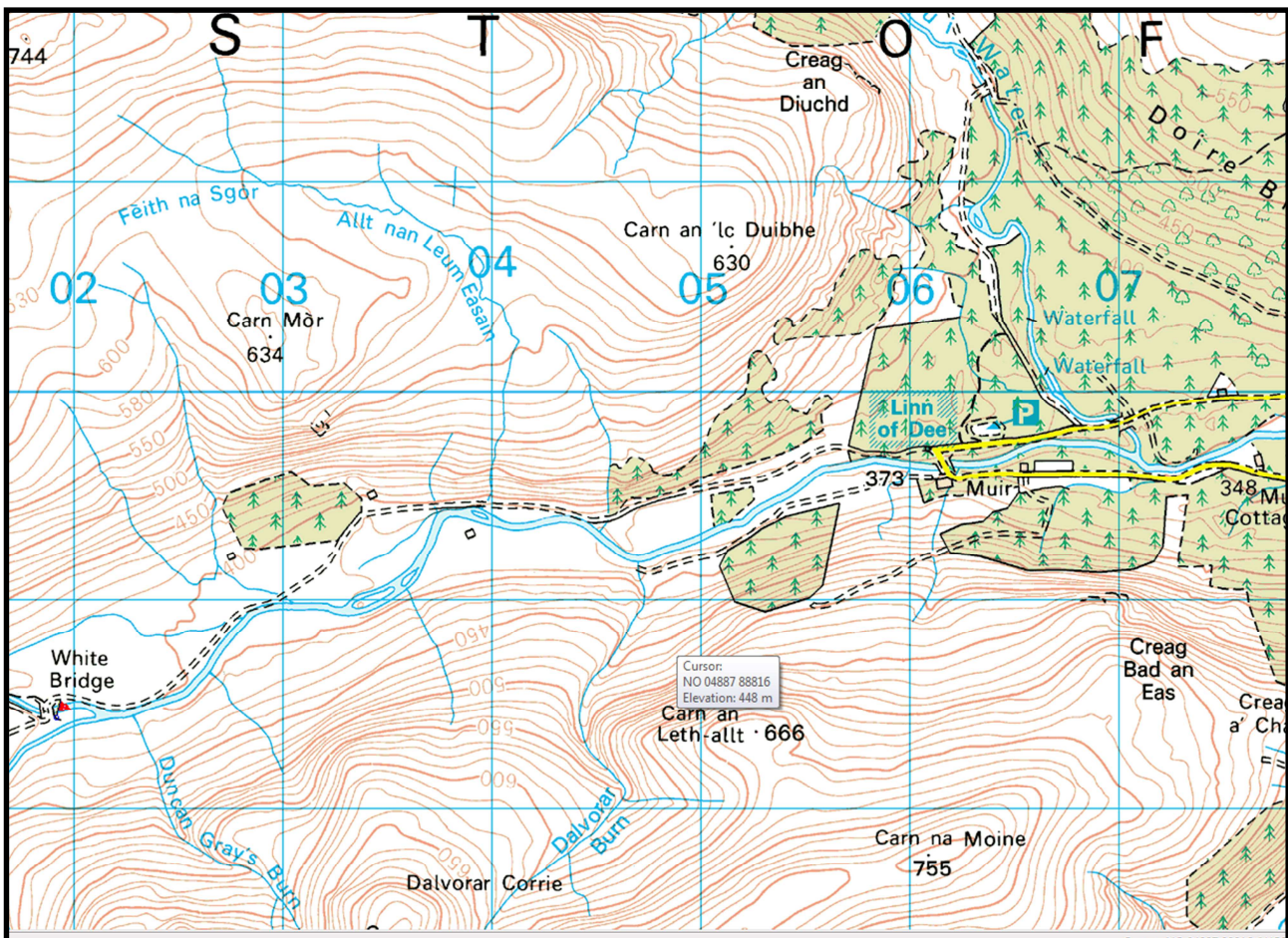



Task 4:  
Match the term to its definition in the table below:

Gradient		Dropping of material carried by river
Velocity		Material carried along by the river
Bed load		Material worn away by the river
Erosion		The speed of the river
Deposition		The material carried by the river
Transportation		The steepness of the river's course



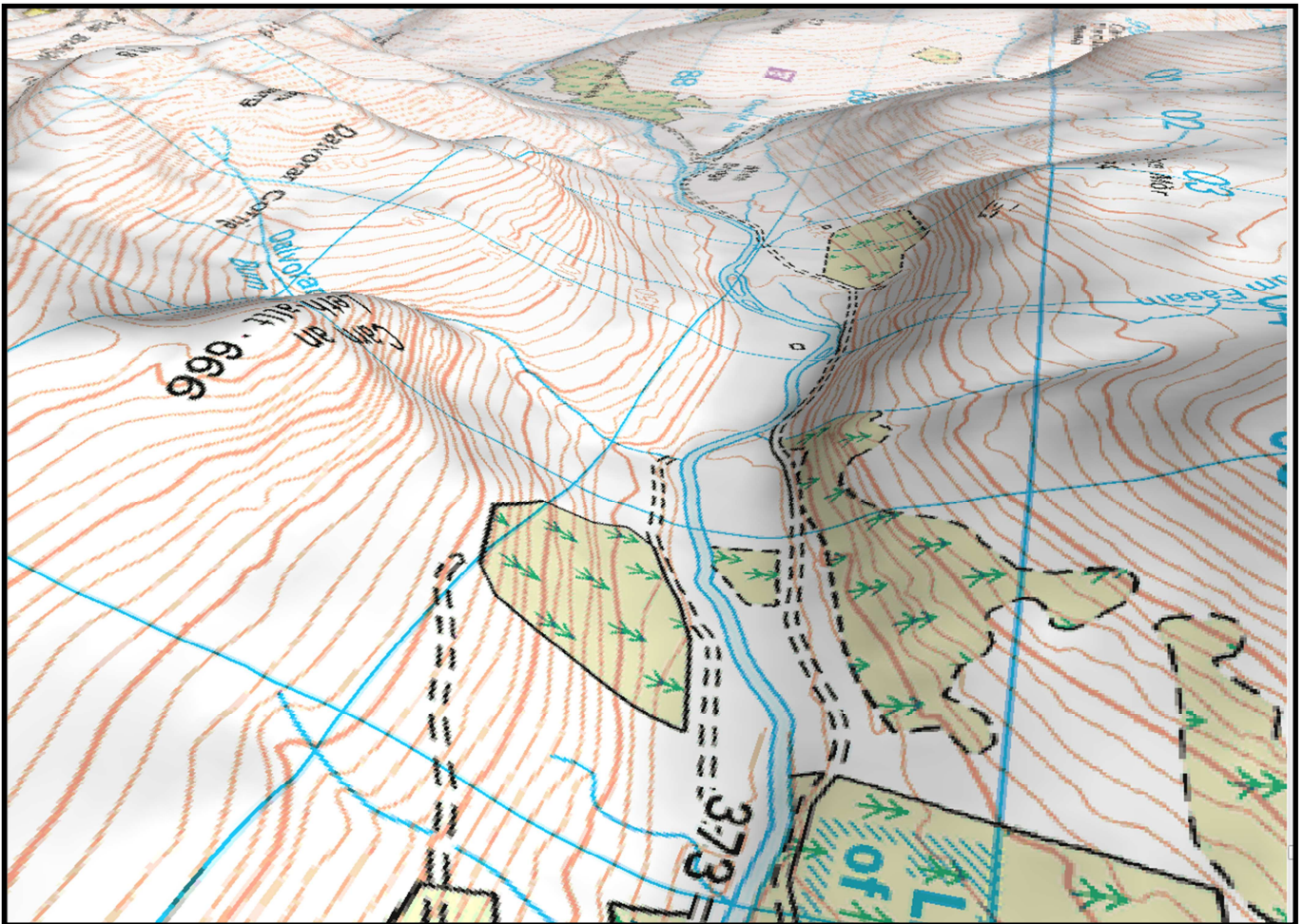
Task 5:  
Look at this map of a river landscape. Label the following features (use neat writing as you will add to this map in task 3).



v-shaped valley, tributary, confluence, wide flat valley bottom, steeper valley sides, upper course stream, middle/lower course river.

## Task 6:

Your teacher will take you through how to colour and label the two maps to show you how the 2D map translates into a 3D environment.



## Task 7:

Now study the land use powerpoints. Research the necessary factors for each land use and make a powerpoint, verbal presentation or movie explaining why each land use must be located where it is.



There are eight land uses to choose from – work in groups to **teach the class** why your land use is located where it is.



## Task 8:

Go back to your map from task 5 and select an appropriate location for three of the land uses you have learned about. Label them clearly A, B and C and then justify your decisions below.

A

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B

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C

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## Task 9:

Complete the sentences using the correct terms from the word box below. Use a Geographical Dictionary if you are not sure of a term.

A river starts in the \_\_\_\_\_ course; this is known as the \_\_\_\_\_. Here boggy ground forms many small rivulets and \_\_\_\_\_ which gradually join up to form larger more powerful streams. The steep \_\_\_\_\_ increases the water's \_\_\_\_\_ and this causes its erosive power to be \_\_\_\_\_. The bed load will be \_\_\_\_\_ and large and most of it carried by \_\_\_\_\_.

As we move through the middle course the river becomes \_\_\_\_\_ with slower velocity. Erosive power \_\_\_\_\_ and some \_\_\_\_\_ takes place. The bed load is more rounded and \_\_\_\_\_ has reduced its size. \_\_\_\_\_ and traction will be the main methods of transportation.

As we enter the lower course the velocity slows further, bed load becomes increasingly \_\_\_\_\_ or sand like and much more material is carried by \_\_\_\_\_. The river has slowed down and much more deposition of \_\_\_\_\_ takes place.

Key words:

Paragraph 1: streams, gradient, upper, source, velocity, traction, increased, angular

Paragraph 2: wider, saltation, deposition, decreases, attrition

Paragraph 3: gravel, sediment, suspension



## Task 10:

Work together to make a connected river course diagram that shows how the features you have discovered in task 1 -6 change along the river's course.



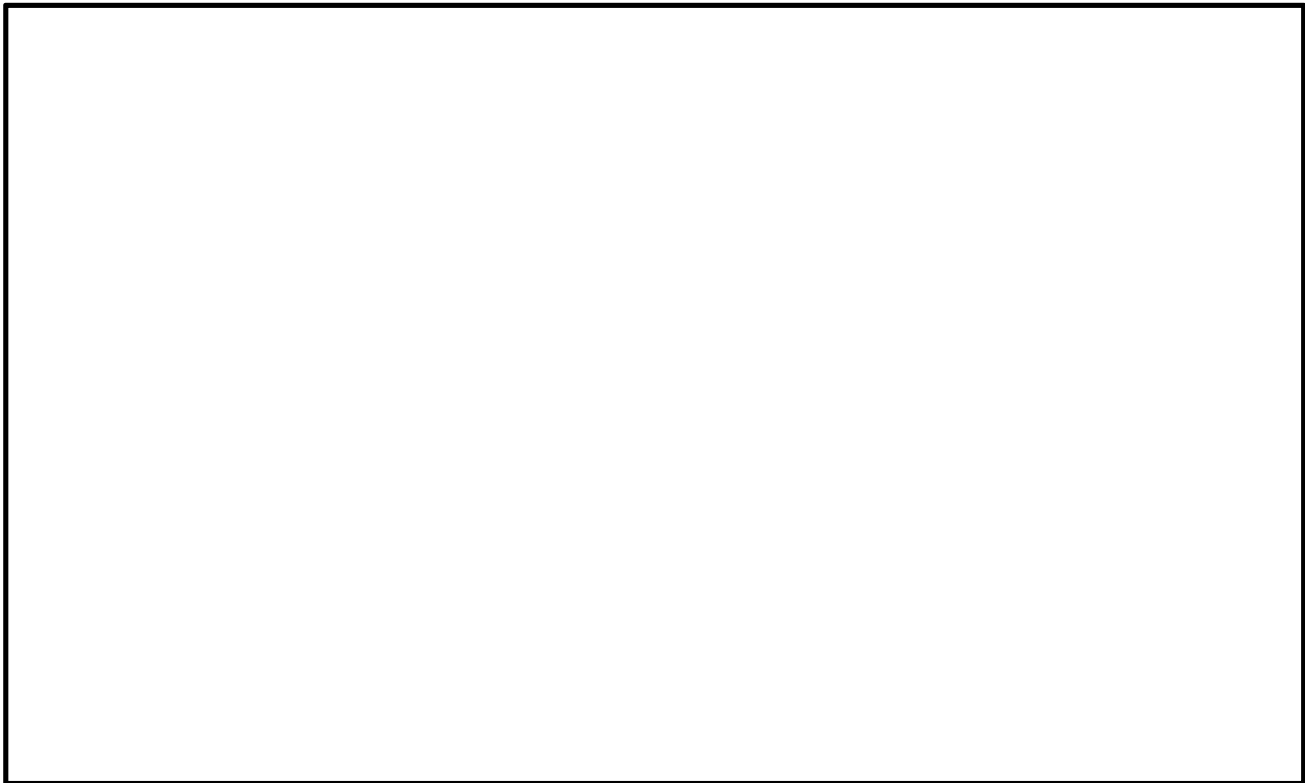
## Physical Features of Rivers Landscapes

(LO: Physical features of river landscapes and LO: River landscape map work)



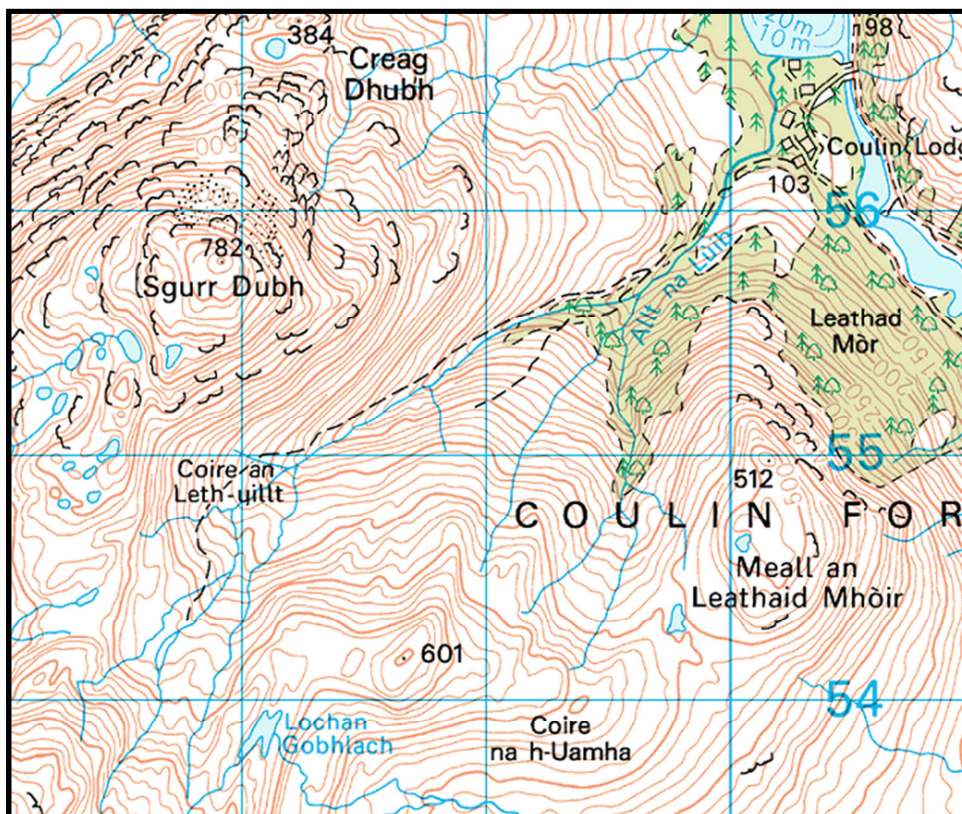
### Task 1:

Formation of a V-shaped valley in the upper course



### Task 2:

Identify the v-shaped valley on this map by layer shading the contours at 50m intervals. Access this image digitally to see it clearer colour detail.





Task 3:  
Formation of a Waterfall in the middle to upper course



Task 4:  
Formation of a meander in the middle to lower course



Task 5:  
Formation of an ox-bow lake in the lower course



Task 6:  
Formation of a flood plain





Task 7:  
Formation of a delta

Task 8:  
Describe the features of the river and valley between two grid references your teacher gives you. (6)

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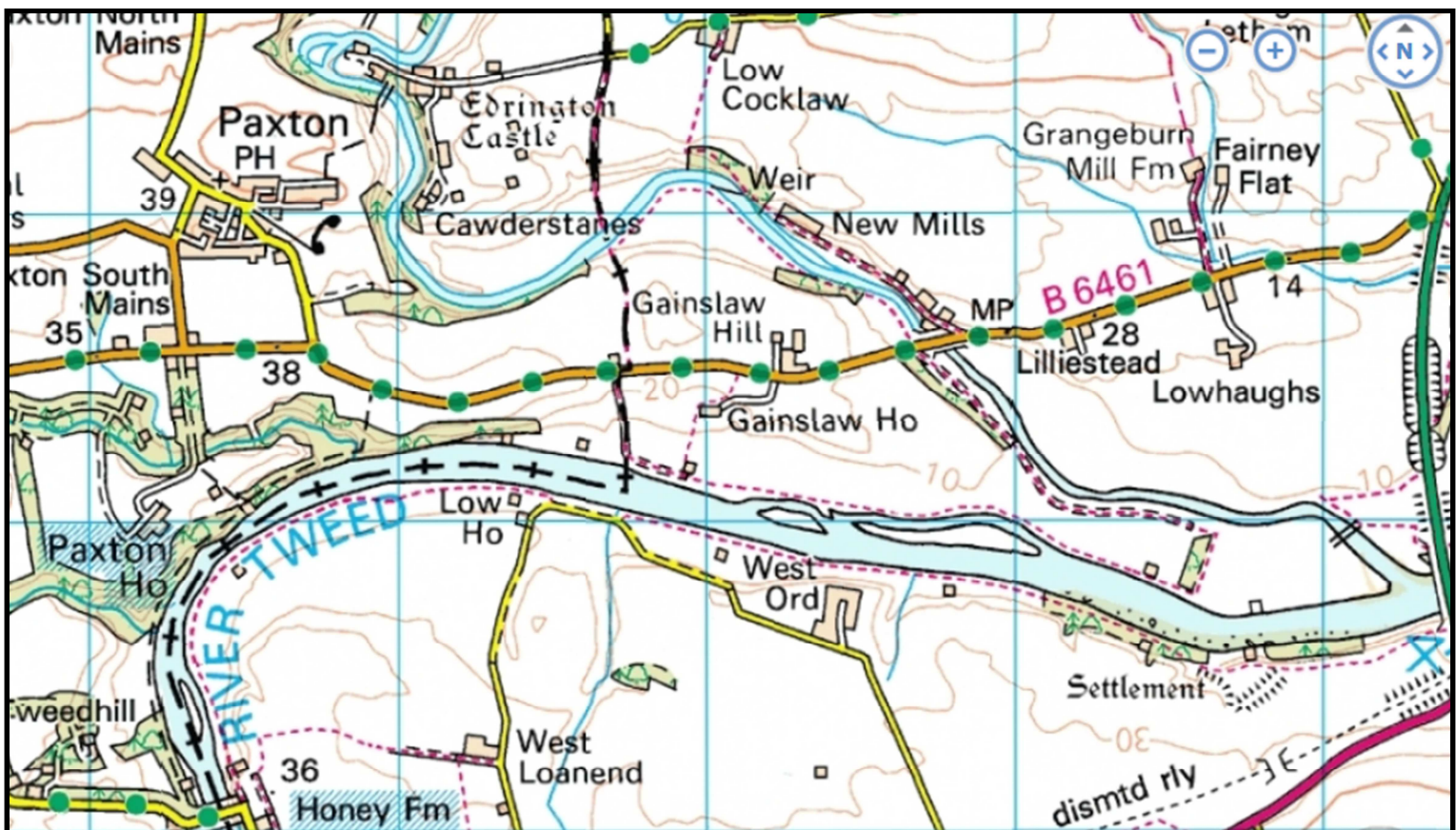
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Task 9:

Identify as many river features and valley features as you can on these maps.



## Floods

(LO: Reasons for flooding)

### Task1:

Watch a video on flooding and write a diary entry for that day, giving reasons why the flooding was so bad.

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### Task 2:

In this space, mind map as many reasons why flooding takes place as possible.

### Task 3:

Complete this table listing the human and physical reasons for flooding taking place.

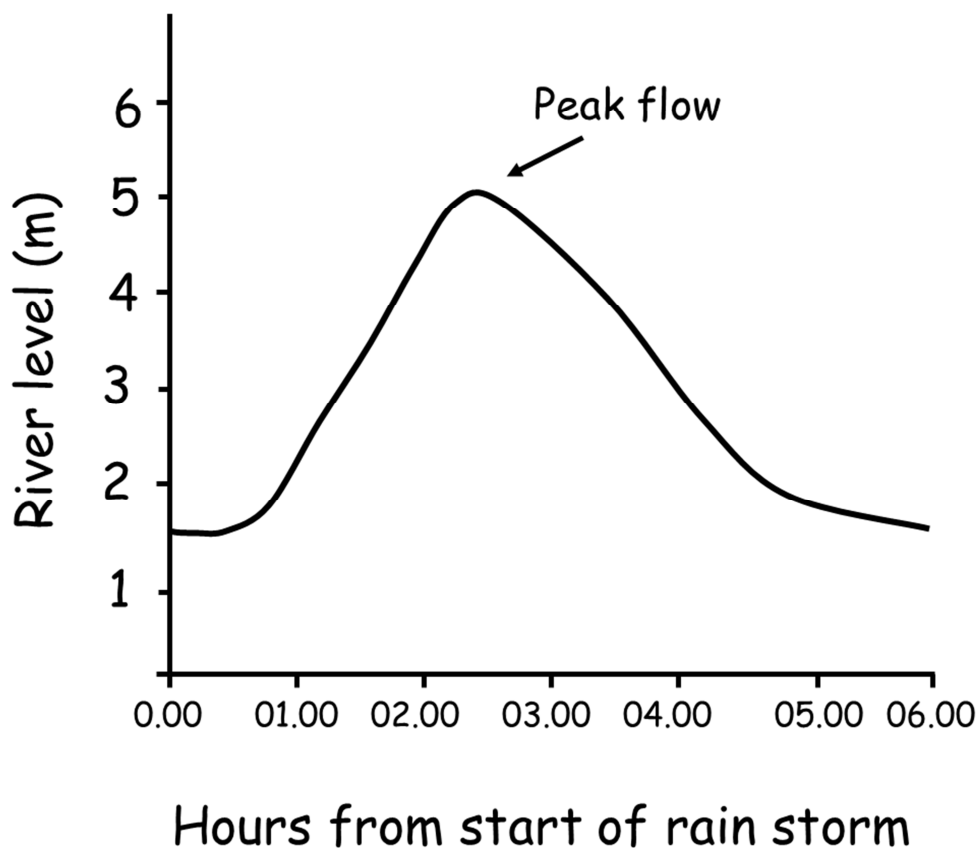
<b>Human</b>	<b>Physical</b>

Added Value Challenge #1 – ‘Environment Agency Action Plan’**Task:**

Your challenge is to produce a poster that shows the area covered by the flooding of the river shown in the Hydrograph shown below. You are to include information on causes, impacts and solutions to this disaster.

Your teacher will give you a blank map. The contour lines show the height of the land. The graph below shows you the height the river grew to after a rain storm. You need to:

- 1) Use colours shade in the areas affected by the flood. Use a different colour to show how high the water reached as each hour passed.
- 2) Watch the clips on the Boscastle and Cockermouth floods. Take some notes and use them to label the causes of the flooding.
- 3) Use colours to identify which areas you would:
  - a. You may barricade 4 places with a 4cm diameter ring of sand bags.
  - b. Evacuate immediately – justify your choice.
  - c. You may bulldoze 5 embankments of 5 cm in length to provide permanent defense for the city.
- 4) Having watched the clips, take notes on the impacts on people and the environment.
- 5) What solutions can you think of? Try and think of 5 ways to prevent the causes you have discovered taking place. Can you label them onto your map?

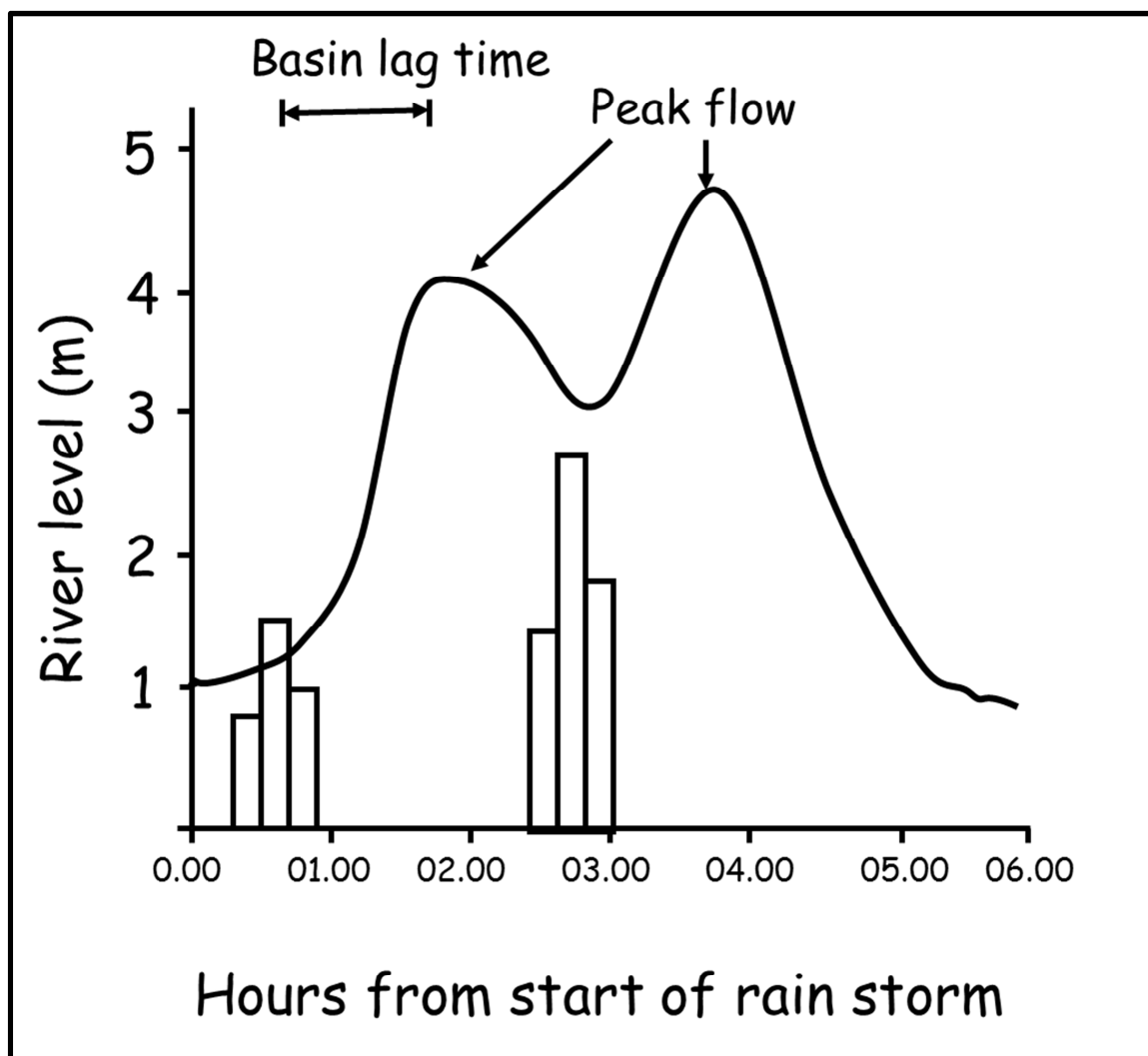


Added Value Challenge #2 – ‘Predict the Weather’

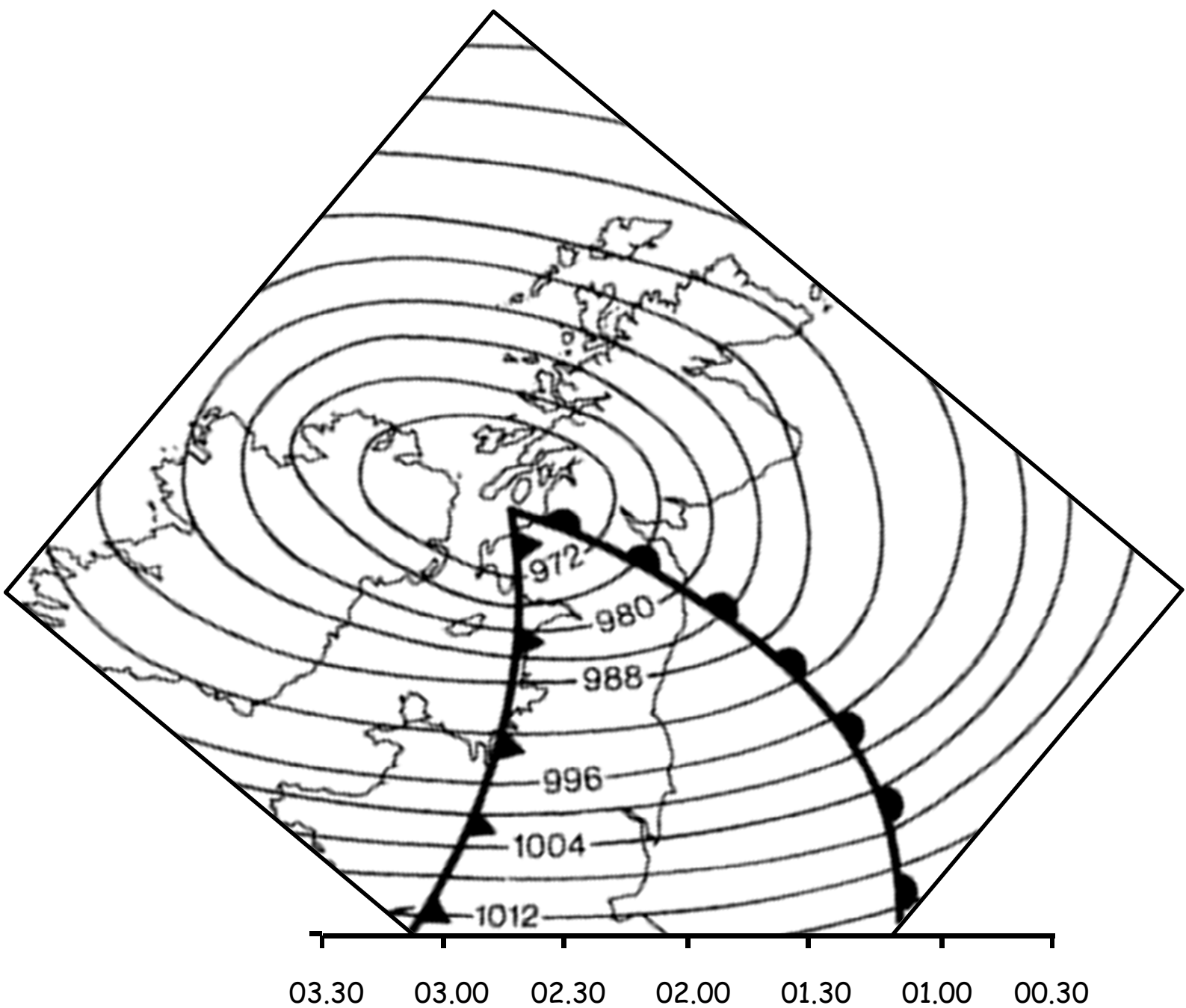
Task:

Your challenge is to combine the data from the synoptic chart below with the hydrograph also shown below. You will produce a presentation that shows:

- 1) Choose a lower or upper course location on the river Severn. Print this off and attach it to your poster.
- 2) Suggest a suitable land use for the area giving reasons for the physical geography supporting your choice.
- 3) Explain how your chosen land use will be affected by the local climate conditions indicated by your station symbols.
- 4) Using the timeline on the synoptic chart, can you give reasons for the double peak in river level at the location you have chosen?
- 5) Now produce three station symbols that would be reasonable for:
  - a. The warm front passing over your chosen location.
  - b. The warm sector passing over your chosen location.
  - c. The cold front passing over your chosen location.
  - d. Give each station symbol a ‘time of day’ that relates to the time line on the synoptic chart.
- 6) Can you research reasons why the river level does not rise immediately – but several hours after the rain has fallen



As well as the usual data, this synoptic chart has a **timeline** that shows you when the fronts passed overhead at your chosen location.



### Added Value Challenge #3 – Flooding: the International Story

Task: Your challenge is to produce a news report on flooding in Bangladesh. Each person in your group will take responsibility for one of the following sections:

1. The **news anchor** will give an introduction to the area. Use a map to explain where Bangladesh is and some key facts about the country.
2. An interview with a **local person** – what are their feelings and emotions at having been involved in a flood?
3. An interview with a **rescuer** – what have they done to help? What more can be done?
4. An interview with a **geographer** to explain how a flood happens.
5. A **co-anchor** to round up the report.

Use digital resources, your workbooks, jotters and atlases to help you:

1. Write out a script.
2. Prepare any props you want to use.
3. Review any of the audio/visual images available.

Your teacher will keep you aware of the time as you will need to work together quickly to be fully prepared in time to deliver your presentation! Each person will speak for **a maximum of 1 minute**.

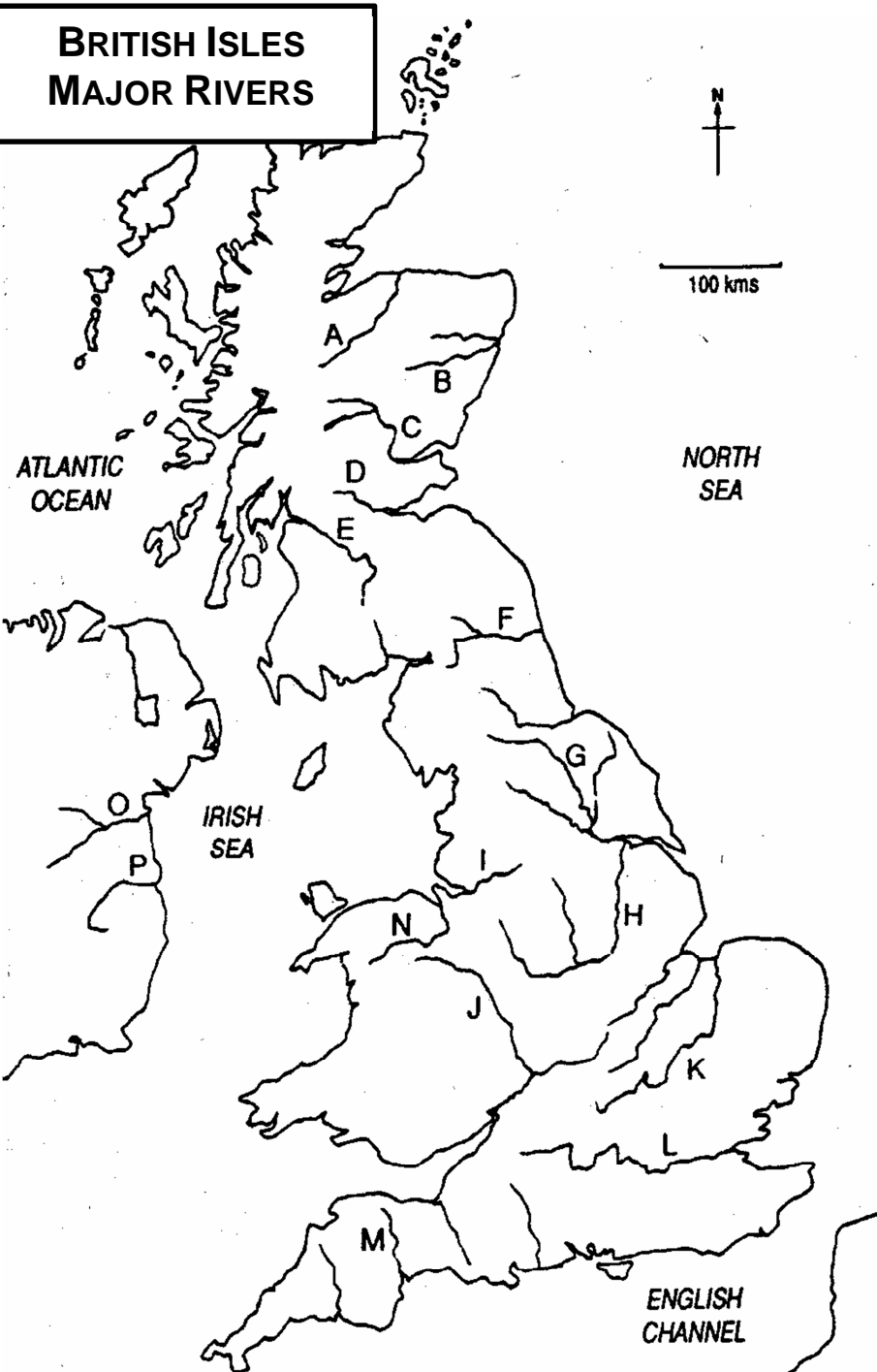


Rivers of UK

Task 1:

Use an atlas to find the names of all of the rivers in Britain.

**BRITISH ISLES  
MAJOR RIVERS**



The map shows the British Isles with major rivers labeled A through P. A scale bar indicates 100 kms. A north arrow is present. Labels for the Atlantic Ocean, North Sea, Irish Sea, and English Channel are included.

Name of River
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

<b>Rivers Vocabulary</b>	
<b>Condensation:</b>	The cooling of a gas so that it changes into a liquid, for instance as water vapour cools, it condenses to become water droplets, which, when heavy enough, fall as rain.
<b>Confluence:</b>	Where two rivers meet and join to form one larger river.
<b>Delta:</b>	A build up of sediment at the point where a river meets a sea or lake, due to the water velocity slowing and the river having less energy to carry the sediment. See later section for details.
<b>Drainage Basin:</b>	The area of land drained by a river and its tributaries.
	The drainage basin acts as an open system, with a number of inputs, outputs, stores and transfers.
	The main input into the system is precipitation, mainly as rainfall, but also as things such as snow, sleet and hail.
	This water is then transferred through the system by the processes of infiltration, percolation, overland flow and throughflow.
	During the course of its movement between the sky and the river, water can also be stored in a number of places within the system. Vegetation may intercept the falling precipitation and store it, water may be stored on the ground in lakes, it may be stored within the soil, or it may be stored as groundwater.
	Finally the water will reach the river, which is the primary output to the system. However water will also have already been lost due to the processes of evaporation, transpiration and evapo-transpiration.
<b>Estuary:</b>	The point at which a river begins to meet the sea. The river will be tidal, meaning that it will have both salt water and fresh water in it.
<b>Evaporation:</b>	Water that is warmed, usually by the sun, so that it changes into a gas (water vapour).
<b>Evapo-transpiration:</b>	The combination of evaporation and transpiration.
<b>Fluvial:</b>	relating to a river, from the Latin for water.
<b>Groundwater:</b>	see Percolation
<b>Hydrology:</b>	The study of water
<b>Infiltration:</b>	The downward movement of water that seeps into the soil or a porous rock.
<b>Mouth:</b>	The end of the river, where it meets the sea, or a lake.
<b>Overland Flow:</b>	When water flows over the surface of the ground. This occurs for a number of reasons: the soil may be saturated and therefore be unable to absorb any more water; the underlying rock may be impermeable or the ground may be frozen.
<b>Percolation:</b>	The movement of water through the soil or underlying porous rock. This water collects as groundwater.
<b>Precipitation:</b>	Water falling to Earth in any form: e.g. rain, sleet, hail, snow, and dew, all are encompassed by the term precipitation
<b>Surface Run-off:</b>	see Overland Flow
<b>Throughflow:</b>	the movement of water within the soil sideways, towards the river.
<b>Transpiration:</b>	The water loss from vegetation into the atmosphere.
<b>Tributaries:</b>	Small rivers running into the main one, that form part of the same drainage basin system.
<b>Velocity:</b>	The speed of the flow of the river
<b>Watershed:</b>	The imaginary dividing line between neighbouring drainage basins.