River Drainage Basins

**L.O.** To understand the meaning of ‘the river basin’, name its features and complete a labelled diagram

**Drainage Basin:** an area of land drained by one river and its tributaries.

**Drainage Basin System**

**ACTIVITY 1:** Match the keywords to the correct definition

<table>
<thead>
<tr>
<th>KEYWORDS</th>
<th>DEFINITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage</td>
<td>Water entering the system/area</td>
</tr>
<tr>
<td>Output</td>
<td>A place where water is held and does not move for a period of time.</td>
</tr>
<tr>
<td>Flow</td>
<td>A movement of water from one place to another.</td>
</tr>
<tr>
<td>Input</td>
<td>Water leaving the system/area</td>
</tr>
</tbody>
</table>

The diagram below shows the movement of water through a drainage basin system.

**ACTIVITY 2:** Read the keywords below and add them to the correct place on the diagram.

<table>
<thead>
<tr>
<th>KEYWORD</th>
<th>DEFINITION</th>
<th>KEYWORD</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Precipitation</td>
<td>The transfer of water from the air to the land. Water can fall to the Earth as rain, hail, sleet or snow</td>
<td>8. Interception</td>
<td>Where some precipitation is temporarily caught by plant leaves before reaching the ground by dripping or stem flow.</td>
</tr>
<tr>
<td>2. Stem flow</td>
<td>Water running down a plant stem or the trunk of a tree.</td>
<td>9. Infiltration</td>
<td>A process by which surface water enters the soil by filtering it through soil pores / small openings</td>
</tr>
<tr>
<td>3. Soil moisture</td>
<td>Water stored in the soil.</td>
<td>10. Groundwater flow</td>
<td>The downslope movement of water through underlying rocks</td>
</tr>
<tr>
<td>4. Transpiration</td>
<td>A process by which plants return moisture to the atmosphere, having taken it through their roots.</td>
<td>11. Surface runoff</td>
<td>The transfer of water over the ground surface. It is easiest to see where it forms rivers.</td>
</tr>
<tr>
<td>5. Evaporation</td>
<td>The transfer and change of water from the ground into water vapour in the air. This is caused by the heat from the sun.</td>
<td>12. Percolation</td>
<td>The downwards flow of water through cracks and joints in underlying rock</td>
</tr>
<tr>
<td>6. Groundwater</td>
<td>A store of water held below the surface in the ground zone above the base rock.</td>
<td>13. Groundwater flow</td>
<td>The downhill transfer of water through pores and small cavities in the soil</td>
</tr>
<tr>
<td>7. Surface storage</td>
<td>Water held on the surface in lakes, ponds and puddles.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A Drainage Basin System- The movement of water

**ACTIVITY 3:** Colour the boxes in the diagram above to show the inputs, stores, flows and outputs. Don’t forget to colour in the key.

**ACTIVITY 4:** Read the keywords below and add them to the correct place on the diagram below.

<table>
<thead>
<tr>
<th>KEYWORD</th>
<th>DEFINITION</th>
<th>KEYWORD</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Source</td>
<td>A place on higher land where the river begins.</td>
<td>4. Confluence</td>
<td>The point at which two rivers join.</td>
</tr>
<tr>
<td>2. Mouth</td>
<td>The end of the river, where it meets the sea.</td>
<td>5. Watershed</td>
<td>A boundary between drainage basins. Usually along highland and ridges.</td>
</tr>
<tr>
<td>3. Tributary</td>
<td>A smaller river that joins a larger river.</td>
<td>6. Catchment area</td>
<td>The area within a drainage basin.</td>
</tr>
</tbody>
</table>

**ACTIVITY 5:** Study an OS map and identify as many of the features above.

**ACTIVITY 6:** Complete, Yorkshire rivers worksheet
Yorkshire rivers

1. Using the diagram of drainage basins, complete the following:
   The start of a river is its _____________.
   As it flows it is joined by smaller rivers called ______________.
   They meet at a _________________.
   The place where a river enters the sea is its ________________ which may be an ________________ or a _________________. The area which is drained by a river and its tributaries is its ________________ whose boundary is called a ________________.

2. Match up the beginnings and endings below to write six correct statements about Yorkshire rivers.
   a) The source of the River Swale
   b) The River Calder
   c) The confluence of the River Don and the River Rother
   d) The mouth of the River Esk
   e) The Yorkshire rivers
   f) The River Humber

   ____________ is an estuary.
   ____________ is in the Pennines.
   ____________ flow into the North Sea.
   ____________ is at Whitby.
   ____________ is a tributary of the River Aire.
   ____________ is at Rotherham.
RIVER PROCESSES

L.O: To name and describe the 3 river processes of **Erosion**, **Transportation** and **Deposition**

S - Watch the video clip 1, 'sticky does river processes'

Video 1: https://www.youtube.com/watch?v=3BSYRPeHfME

Video 2: https://www.youtube.com/watch?v=SNJF4AfElVs for more detail

**EROSION** - Is the **wearing away** of the land e.g. the river bed and banks.

There are four types of erosion:

**Hydraulic Action** = ...........................................................................................................................

**Abrasion** = ........................................................................................................................................

**Solution** = ...........................................................................................................................................

**Attrition** = ...........................................................................................................................................

Erosion creates river features such as ; -

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TRANSPORTATION - The removal of the eroded material.

Rivers need energy to transport material and the levels of energy change as the river moves from source to mouth. When energy levels are high, large rocks and boulders can be transported easily.

Energy levels are high when:

- Velocity/speed is high
- River levels are high or deep water/large Volume
- After heavy rain or rapid snow melt
- Rock type is soft, easily eroded

Annotate (label) the diagram below describing the 4 types of transportation

![Diagram of transportation types](image)

DEPOSITION - the laying/dropping of down of eroded material.

Deposition occurs when the river's energy drops because:

- Velocity/Speed reduces
- Water is shallow
- Lots of load (becomes too large/heavy)

It creates the river features of .................................................................

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5 - Name 5 river upper course features  
4 - Give the names of 4 types of river erosion  
3 - Name the 3 courses of a river long profile  
2 - Name 2 upper-course features  
1 - Name 1 feature of deposition
A River Meander

L.O. To describe the characteristics of a river meander and explain how it is formed.

**A Cross Section of a Meander Bend**

**ACTIVITY 1:** Watch the video clip then add the following labels to the diagram below.

https://www.youtube.com/watch?v=t6XK6-BpCUw OR https://www.youtube.com/watch?v=9nRpQZFxVs

**Word Bank**

- Fastest flow
- Erosion
- undercutting
- *outside bend
- *deposition
- *inside bend
- *river cliff
- *Lateral erosion
- *vertical erosion
- *deep water
- *shallow water
- *slip-off slope

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**ACTIVITY 1:** Complete the paragraph below which describes the formation of a meander bend. Use the words in the word bank to fill in the missing spaces.

_________ course of a river__________ has many bends in it. These are called meanders. The **fastest flow** of water is on the outside of the bend ________ erosion takes place and the channel is worn away to _______ deep water and a bank ________ a river cliff. The water flows _______ slowly round the inside of the bend. This _______ deposition, shallow water and a gentle bank called a slip off slope. _______ the river overflows its banks it deposits material called alluvium on to the flat, wide floodplain.

**Word Bank:** The, more, When, make, where, usually, called, causes
1 Look at the diagram above. It shows a river winding its way down a valley.
   a) Colour the diagram lightly in pencil to make it clearer and easier to understand. Use blue for the river, green for the valley floor and brown for the valley sides.
   b) Label the floodplain, a meander and alluvium.
   c) Add arrows and labels to show:
      • a place where there may be deep water in the river,
      • a place where there may be deposition on the river bank,
      • a place where there may be erosion,
      • a place where there may be shallow water.
   d) Carefully draw an arrow in the river to show the line of fastest flow. Give the arrow a label.

2 Complete the following paragraph by filling in the spaces with information from your completed diagram.

The course of a river usually has many bends in it. These are called __________. The ______________ of water is on the outside of the bend where __________. ________ takes place and the channel is worn away to make ______________.
The water flows more slowly round the inside of the bend. This causes __________ and __________. When the river overflows its banks it deposits material called __________.
A group of geography students have been out on a field visit in Derbyshire. They have been studying the River Noe and have collected information about one of the bends in the river. They now have to draw a cross-section across the river to show its main features.

Your task is to complete their drawing using the information that they collected. You can get help with this by looking at pages 12 and 13 in the pupil book.

1 Complete the shape of the river channel by marking dots at the correct depth and distance.
Join the dots with a smooth curved line. The first three and the last three have been done for you.

2 Mark in the areas of erosion and deposition.

3 The fastest flow is at distance 1.5 metres and a depth of 1.2 metres. Mark this with the symbol from the key.

4 Add arrows and labels to show the outside of the bend and the inside of the bend.

5 Colour your diagram lightly in pencil to make it clearer and easier to understand. Remember to colour the key.

6 Briefly describe and explain the shape of the river channel.