

Name: _____



Geography

Homework Booklet



Year 8

Term 5: Rivers and Flooding

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|------------|----------------------------|-----------|------------|
| Homework 1 | Learn keywords | Due date: | Completed? |
| Homework 2 | Guided Reading Activity | Due date: | Completed? |
| Homework 3 | Prepare for knowledge test | Due date: | Completed? |

Geography Homework Tasks Term 5

Homework 1 - Learn the keywords below for a mini test at the start of next lesson. You could read through the words, write them out, create a match up activity or get someone to test you.

| Keyword | Definition |
|-------------------------|---|
| Drainage Basin | The land that is drained by a river and its tributaries. |
| Discharge | The amount of water passing a specific point at a given time. |
| Abrasion | The pebbles being transported wear away the bed and banks of the river channel. |
| Attrition | The particles in the river are knocked about as they are transported, and they gradually become more rounded and reduced in size. |
| Bedload | The material carried by a river by being bounced or rolled along its bed. |
| Gradient | The slope of the river profile |
| Hydraulic Action | Hydraulic action is when the force of fast-flowing water hits the bed and banks and forces water and air into cracks in the bedrock |
| Meander | A bend in a river. The outside of the meander has the fastest flow and deepest water. |
| Oxbow lake | A meander which has been cut off from the main river channel and abandoned. |

Homework 2 — Complete the guided reading activity below.

You may wish to write your answers out on paper, so you have more space.

Homework 3 — Revise the information on the knowledge organiser for a mini test in class. You could highlight the key information, create revision cue cards or get somebody to test you.

5 Where is the source of the Ribble? And the mouth?

6 What part of the river system does Settle mark the beginning of?

10 Explain the formation of Stainforth Force.

1 Where is the River Ribble located?

2 What is the primary land use of land in the Ribble watershed?

3 Why do you think the Romans chose Ribchester as a site for a fort?

4 What efforts are being made to protect the Ribble's environment?

River Ribble

The River Ribble rises 246m above sea level in the Yorkshire Dales, close to Ribblesdale Viaduct and flows SW for 75 miles to the Irish Sea at Lytham. Human activity is evident along the entire course of the Ribble, including Ribblesdale Viaduct on the Settle-Carlisle Railway. This area is largely sheep farming, moving into the middle course the land is given over to cattle farming, becoming urban at Preston before ending between the arable farms of Tarleton and the tourist resort of Lytham, on the Fylde coast.

The medieval market town of Settle, is the first along the Ribble, and marks the change in features from upper to middle course. Sinuous, looping meanders can be found in Rathmell Bottoms to the SW of Settle, along with meander scars and ox-bow lakes created by meander migration across this wide valley floor. The area is undeveloped, due to regular winter flooding, leading to the formation of extensive natural levees along the river.

At Ribchester, the Ribble is large, powerful and historically strategically important for the Romans, who established the fort of Bremetennacum here. The Ribble winds across the valley floor in a sinuous, sweeping pattern towards the M6. Here the Ribble sweeps around the edge of Brockholes Nature Reserve, where the visitor centre sits on floating pontoons to protect the buildings during flooding.

The River Douglas, the last tributary of the Ribble, joins just before Hesketh Marsh, the site of a canal lock between the Leeds-Liverpool canal and the Ribble estuary. This opens out into the Irish Sea, to the south of the coastal seaside resort of Lytham. Sedimentation in the area led to land reclamation, especially on the southern banks of the Ribble, where the fertile alluviums are turned over to arable farming.

Close to the source on Gayle Fell, the Ribble winds around the interlocking spurs of the Dales, through the area known as Ribblesdale. At the edge of the dale, sits Stainforth Force, the Ribble's only significant waterfall has formed because softer sandstone beneath the limestone has been eroded away.

Widening into the middle course at Sawley Abbey, the flood plains, and river meandering mean much of the area is pastoral, with industrial efforts focused on a limestone quarry at Clitheroe. Great Mitton, SW of Clitheroe marks the Ribble's major confluences with the Hodder and Calder respectively.

Fishwick Bottoms mark the beginning of the tidal Ribble. The river meanders along the southern edge of Preston to Penwortham, where the river been heavily managed. Levees along the channel, which shows evidence of straightening to give access to Preston Docks. The wide flat flood plains of the lower Ribble were utilized as a WW2 aerodrome at Warton, still in use today by BAE Systems.

11 What middle course features are found in Rathmell Bottoms? Why are they found here?

12 What industries can be found here? Why are they important?

9 Where does tidal River Ribble begin?

7 Which man-made water feature joins the Ribble estuary? Why does this link exist?

8 Why is the management of the lower Ribble important?

Knowledge Organiser: Rivers

Overview of topic

What is the water cycle?
 How does a river change from start to finish?
 How can rivers change the landscape?
 What landforms are made by rivers?
 How was Niagara falls made?
 What is the River Tees like?
 What are the causes of flooding?
 What are the effects of flooding?
 What happened in Bangladesh 2004?

Keywords

Discharge - The amount of water that flows past a point on a river per second.
 This is measured in M³/s (also called cumecs)

Erosion - The breaking down and moving of rock

Floodplain - Flat land either side of a river, often very fertile and suitable for farming.

Impermeable rock - Does not allow water to pass through (E.g. granite, clay, concrete)

Precipitation - Moisture that falls from the Earth's atmosphere towards the surface
 (rain, snow, hail, sleet, fog)

Surface run-off - The flow of water over a surface, without a channel.
 The ground is *impermeable* so water cannot *infiltrate* into the soil.

Tributary - A stream or river that flows into a larger river. Tributaries do not flow directly into the sea. There are more of these in the *upper course* of a river.

Key concept #1

How does a river change from source to mouth?

Rivers start life as a small stream, often appearing as a spring, lake or hollow. This is the highest point of the drainage basin. Water flows downhill due to gravity, it is joined by other smaller streams called tributaries. The river is steepest in the upper course and flattest in the lower course. As the river starts getting flatter, it starts to make meanders and floodplains. Near the mouth, the river is at its widest and fastest, this is where it meets the sea as either an Estuary or Delta.

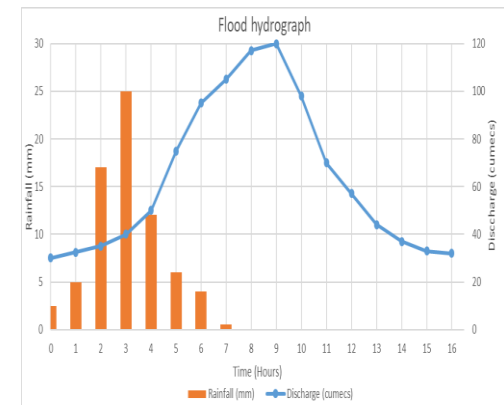
Question #2

What is erosion?

Erosion means *breaking down and moving of rock*. Hydraulic Action, Attrition, Abrasion and Solution are the main types of erosion. Each is slightly different to the rest, but over time, this is what shapes our whole river landscapes. When a river starts to lose energy sediment is dropped. This makes for fertile soil, which is full of *nutrients*, making it great for crops to grow.

Geographical skill - To interpret a flood hydrograph

This graph shows a river in flood. The difference between rain and peak discharge is 6 hours. This is called *lag time*. A lag time means that water is absorbed by ground, so the flood is lower.

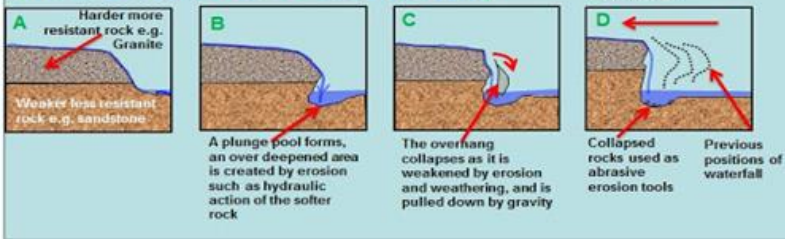


river
 peak
 This longer more the risk is

Waterfall formation diagram

Key concept # 3 How can we prevent future flooding?

The formation of a waterfall



Hard Engineering

Dam
Embankments
Channel straightening
Channel widening
Portable flood barriers
Flood shelters

Soft Engineering

Floodplain zoning - put parks and playing fields next to rivers.
Tighter laws on where houses can be built.
Re-naturalising the river
Planting more trees & vegetation

Case study #1 Bangladesh 2007

75% of the country is less than 10m above sea level, meaning that the country is very flat. 2 major rivers flow through Bangladesh, before reaching the Bay of Bengal. These rivers drain the Southern side of the Himalaya mountain range, so snow melt in spring often raises river levels, Between 4th -11th June up to 500mm of rain fell in just one week. This resulted in an estimated 10.5 million people who were displaced and led to 1,100 deaths. These were mostly from building collapse and landslides (due to saturated soil). \$290 million of rice crops were destroyed and the water was contaminated with sewage. This meant that lots of people contracted diarrhoea and dysentery because the water quality was so poor.

To stop this happening again, flood shelters have been built and often double up as a classroom for children. Embankments have been repaired and strengthened and attempts have been made to reduce deforestation in the upper course.

Homework and enrichment opportunities

Case study#2 Boscastle 2004

On the 16th August 2004, the village of Boscastle had 200mm of rainfall - this is double the monthly average in just 4 hours! The waters quickly flowed downstream due to the steep valley sides, towards Boscastle near the mouth of the River Valency. This led to a wall of water 3m high flowing down the high street. 5 buildings collapsed and 100 people were airlifted out of the area by helicopter. The powerful water carried whole trees and cars downstream. The water also destroyed or damaged 60 properties, and forced 20 B&B's to close for the rest of the year.

This flood happened right in the middle of the tourist season, which Boscastle relies on for 90% of its money or *income*. This means that local businesses were severely affected by the flood and this took a long time to repair and recover from economically.

To stop this happening again the government has spent £4.5 million to protect Boscastle. This includes a wider, straighter river channel so that the water can quickly pass through the area, and also the river bed has been lowered by 0.75m so that the capacity of the river to hold water before it floods has increased.

'Hard engineering is always the best option for flood defences'

To what extent do you agree? (8 marks)

Model answer - WAGOLL

Research where tap water comes from.

How do cruise ships get safe drinking water when out at sea?

What does your local river look like? Can you spot any local flood defence schemes?

How does a river change with distance downstream?

Design a flood defence to protect London. It needs to look attractive and practical, label your flood defence and put an estimated cost on it. You will need to write a paragraph explaining how it works.

Create a mind-map for the rivers topic. It must be A4 and have: Definitions of keywords, main features of a river, one case study and flood defence options.

Hard Engineering is when flood defences are built to protect a vulnerable area from flooding. Hard engineering usually lasts longer than soft engineering projects. An example of hard engineering would be building flood walls, or embankments. This increases the height of the river channel, so more water can fit inside the river channel before it flows onto the flat floodplain on either side. This can protect some areas most likely to flood, but they take a long time to build, they can be ugly or block people from seeing the river. They can also be very expensive if they cover a large area. On the other hand, soft engineering can reduce the flood risk because if the houses weren't built on a floodplain to start with then there would not be any problem if it floods. Therefore, floodplain zoning can be used so the land nearest the river is used for playgrounds and football pitches because this causes the least amount of damage if it floods. They have done this in Boscastle, England. They have designed the floodplain so that some areas flood, so there is less chance of the other areas flooding downstream. Overall I think that the best option for flood defences would be a mix of both hard and soft engineering, but if I had to choose one it would be hard engineering because it can protect people's homes immediately and reliably.