

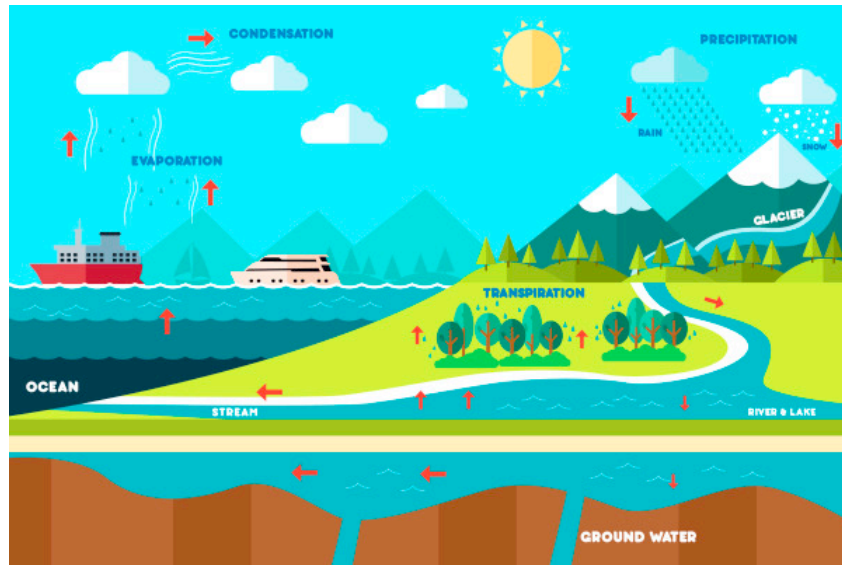


Stewards Academy

Geography KS3 Summer 1 (Year 8)

Blended Learning Booklet

Water & Hydrology



Name:

Form:

Aim to complete one lesson each week. Write out the title and LI and then complete the tasks. Upload all work onto ClassCharts for feedback.

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Lesson 1 – The Water Cycle

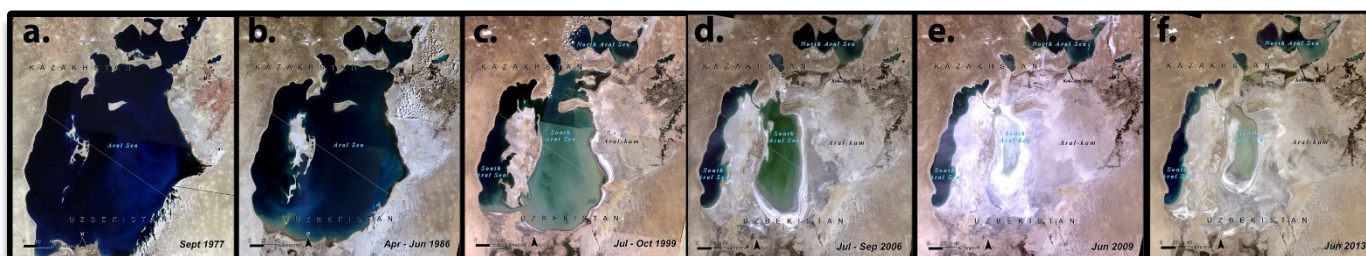
LI: To describe and explain the water cycle

Task 1 - Put these stores in order of where you think the most water is found around the world

Oceans Groundwater Soil moisture Ice caps & glaciers
Lakes Streams & rivers Biosphere Atmosphere

*****Challenge***** Can you guess the percentage (%) of the total amount of water?

Task 2 - Water stores are constantly changing, and water is moved from one store to another. Look at the photographs below, why do you think this store has shrunk over time?



Task 3 – Watch the video on the water cycle: <https://www.youtube.com/watch?v=TWb4KIM2vts>

Task 4 – Complete the key term match up about the water cycle.

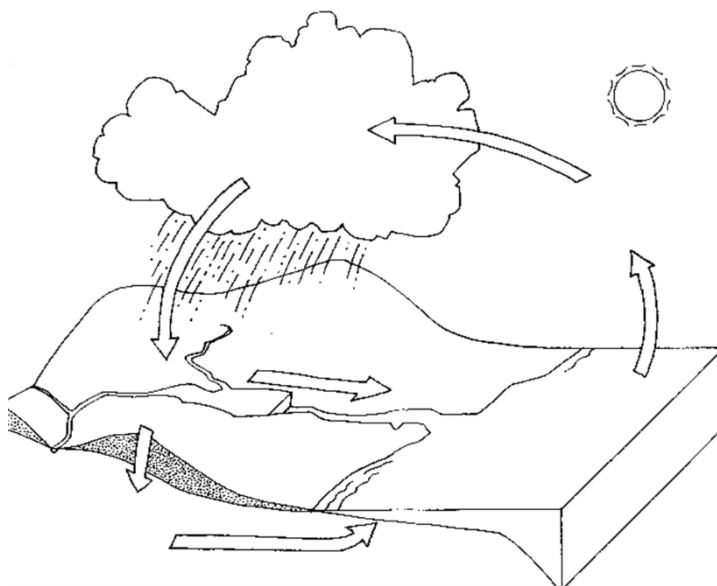
Precipitation
Condensation
Evaporation
Surface run-off
Infiltration
Transpiration

Moisture falling from the atmosphere
The transfer of water from a gas to a liquid
The transfer of water from a liquid to a gas
The flow of water across the surface of the ground
The movement of water through rocks
The loss of moisture from vegetation

Task 5 – Add labels to the diagram and colour the arrows (red: sun powered movement, blue: water powered movement)

Task 6 - Write a story about the journey of water droplet. Include all the key terms that you have learnt over the course of the lesson.

Try to make the story interesting and dramatic rather than just listing what happens.

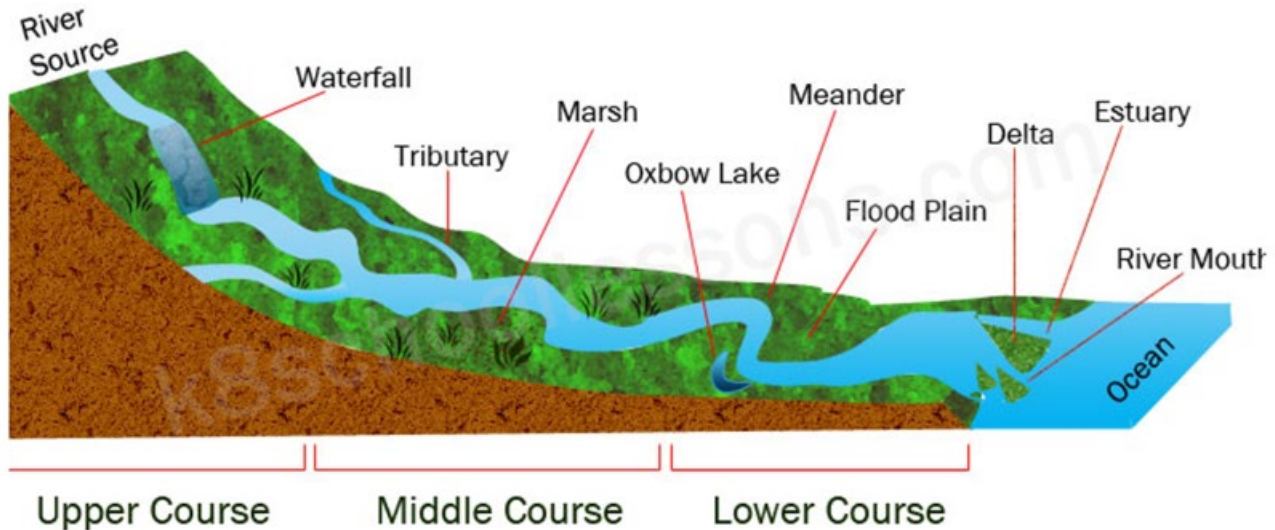


Lesson 2 – How do rivers shape the land?

LI: To describe how rivers can change and shape the land

Task 1 – Recall: 3 stores of water around the world, 2 processes in the water cycle, 1 famous river.

Task 2 – Look at the images of the different courses / sections of a river.



Upper, middle and lower course of a river

Task 3 – Read through the processes that shape rivers.

Erosion - rivers can erode the banks and bed of a river. This usually occurs when the river is flowing at its fastest or is carrying lots of rocks and sand in the water.

Transportation - the movement of eroded material up and down, and along the course of the river.

Deposition - when the river loses energy, it drops the sand, rock particles and pebbles that it has been carrying, depositing them.

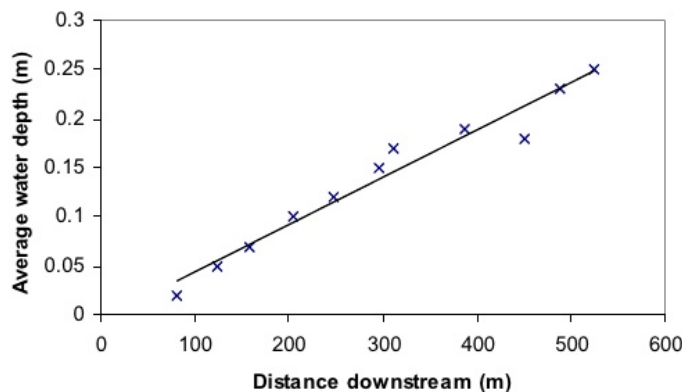


Task 4 – Match the characteristics to the correct stage of the river (upper, middle, lower)

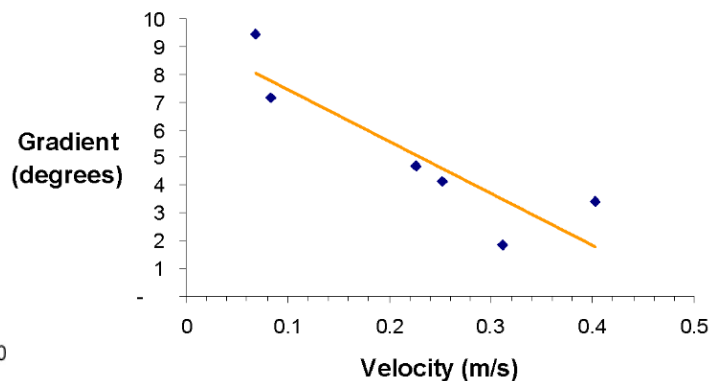
Very steep	Very little erosion (more deposition)	Very flat land	Waterfalls and V-shaped valleys
Wider river	Gentle gradients	Large cities and factories	
Meanders and oxbow lakes	Small streams	Lots of erosion	Lots of floodplains
High altitude and high rainfall	Very wide river	Area used for farming	Sometimes snow melt

Task 5 – Complete the scatter graph questions.

Average depth of river and distance downstream, Loughton Brook 11/10/04



Scatter graph to compare gradient and velocity down stream



1. Describe the relationship between river depth and distance downstream.
2. What happens to the velocity (speed) as the gradient of the river decreases?
3. At 500m downstream, what is the depth of the river?
4. At 5 degrees gradient, what is the velocity of the river?
5. What part of the river is the fastest – upper, middle, or lower course?
6. Plot the point for 350 metres and 0.15m average river depth?

Lesson 3 - River landforms

LI: To explain the formation of waterfalls and meanders at different stages of a river

Task 1 – Recap: Rivers shaping the land.

1. What A is the breakdown of rocks into smaller/smooth rocks?
2. What T is the rolling of rock along the riverbed?
3. What S is a process of erosion and transportation?
4. What LC is the bottom section of a river?

5. What W is a feature we find in the upper course of the river?
6. What S is the start of a river?
7. What M do we find in the middle and lower course of a river?

Task 2 – Watch the video about the formation of a waterfall:

https://timeforgeography.co.uk/videos_list/rivers/formation-waterfall-gorge/

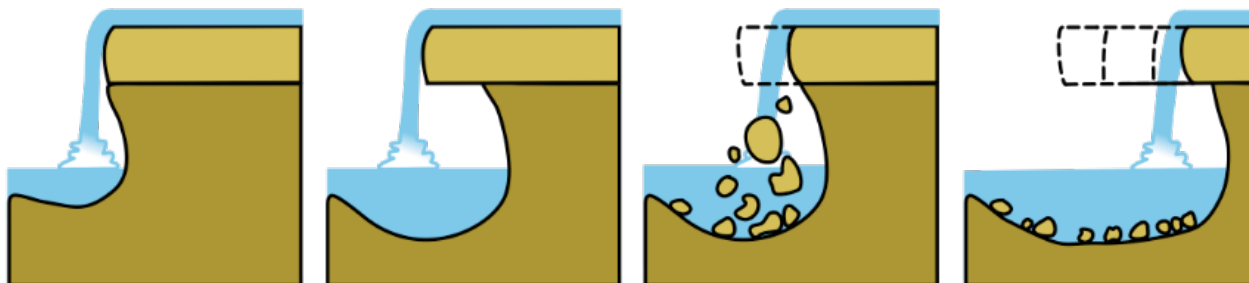
Task 3 – Watch the video about the formation of a meander: <https://www.youtube.com/watch?v=8a3r-cG8Wic>

Task 4 – Using the information below, label the blank diagram to show how a waterfall is formed.

Waterfalls often form in the upper stages of a river where it flows over different bands of rock. It erodes soft rock more quickly than hard rock and this may lead to the creation of a waterfall.

Formation of a waterfall:

1. The soft rock erodes more quickly, undercutting the hard rock.
2. The hard rock is left overhanging and because it isn't supported, it eventually collapses.
3. The fallen rocks crash into the plunge pool. They swirl around, causing more erosion.
4. Over time, this process is **repeated**, and the waterfall moves upstream.
5. A steep-sided gorge is formed as the waterfall retreats.



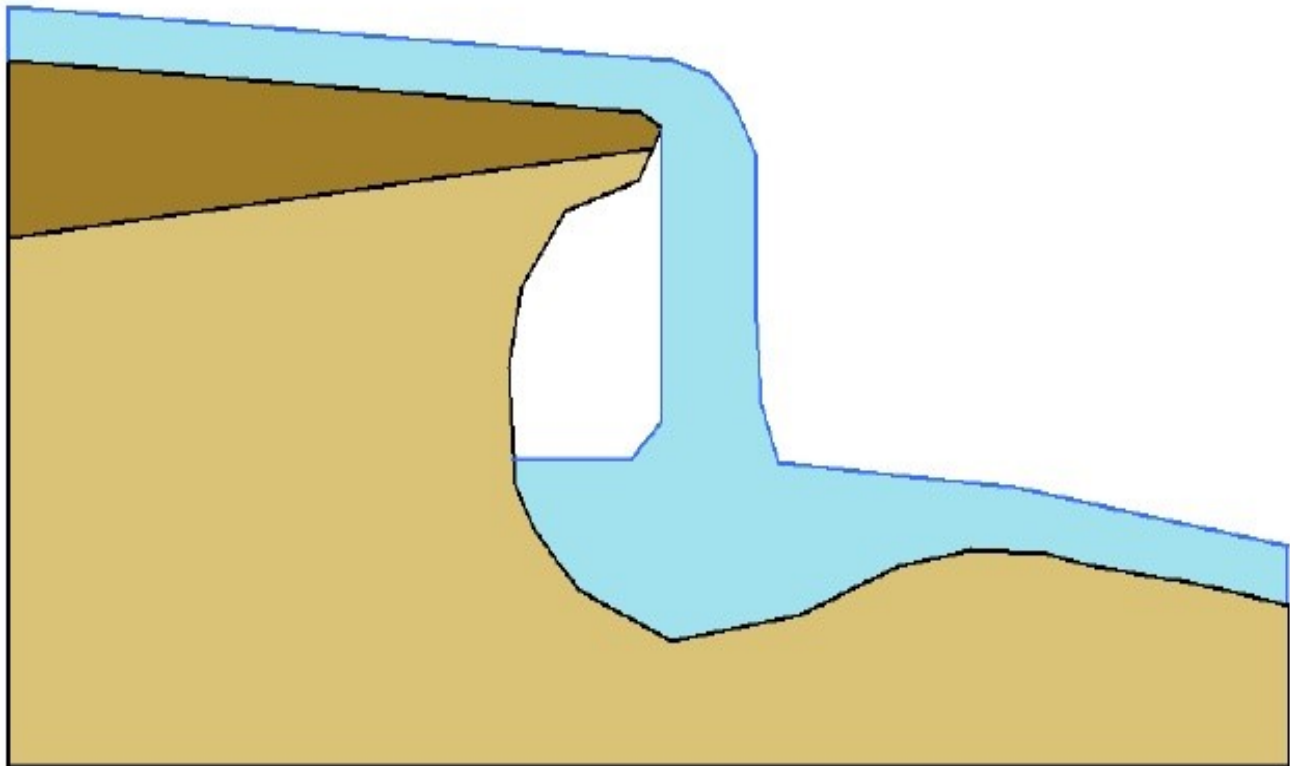
1. Waterfalls typically form in the upper stages of a river. They occur where a band of hard rock overlies a softer rock. Falling water and rock particles erode the soft rock below the waterfall, creating a plunge pool.

2. The soft rock is undercut by erosional processes such as hydraulic action and abrasion creating a plunge pool where water and debris swirl around eroding the rock through corraision further deepening it and creating an overhang.

3. Hard rock overhang above the plunge pool collapses as its weight is no longer supported.

4. Erosion continues and the waterfall retreats upstream leaving behind a gorge.

www.internetgeography.net



Task 5 – Add the labels to the diagram of a meander (Page 8).

Erosion

Less water on the inside

Deposition

More friction so the water goes slower

Outside of the bend

Fast flow erodes the outside bank

Inside of the bend

Meander grows over time

Fast flowing water with lots of energy

An oxbow lake will eventually form

Task 6 – Pick a waterfall **or** a meander. Explain in full sentences how the landform is formed. Use the sentence starters below to help with your writing.

Upper course: waterfall

Waterfalls are formed by the process of ...

Firstly, the river flows over...The soft rock...

A plunge pool is formed.

Erosion continues which eventually causes...

This means that the waterfall...

Middle/lower course: meander

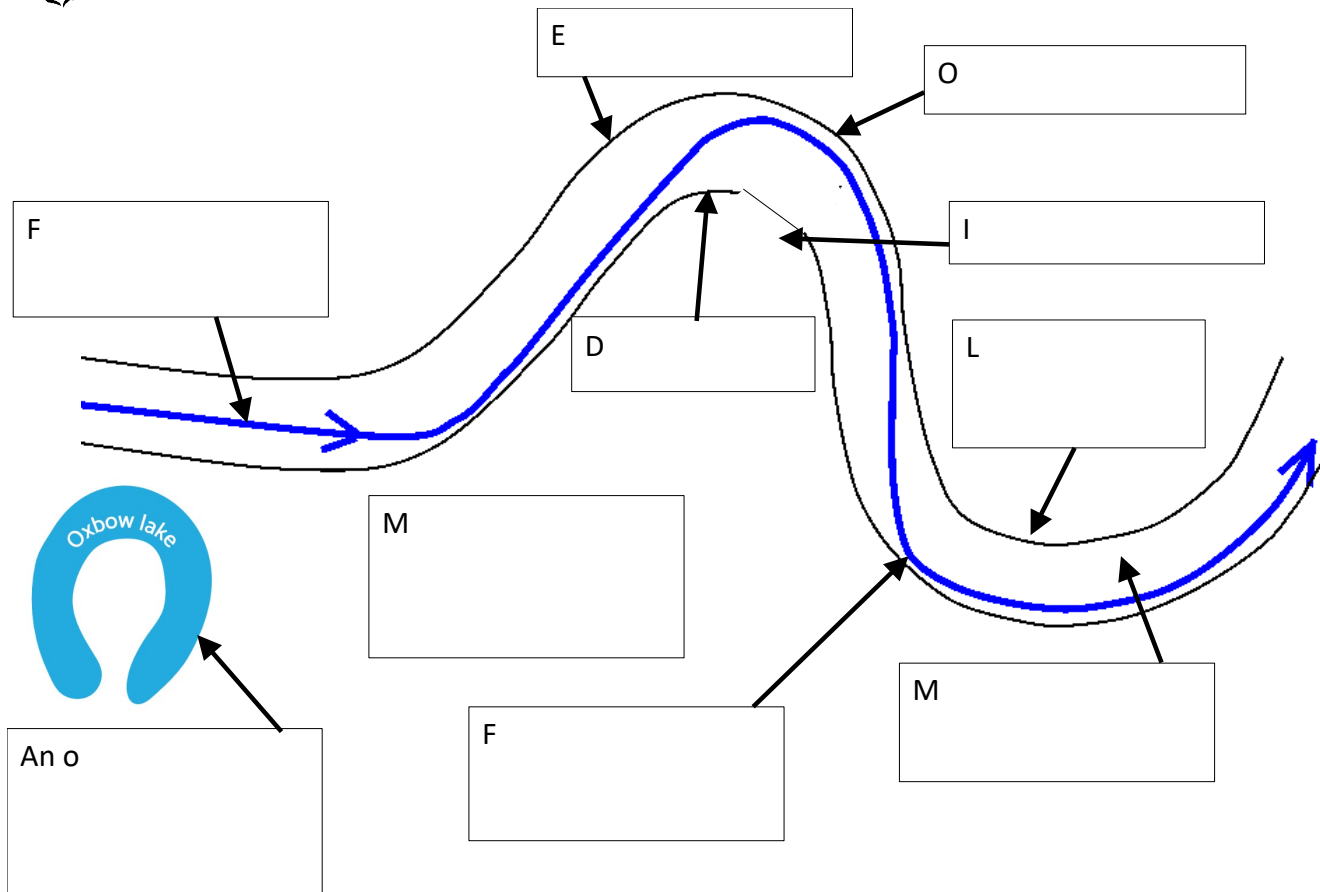
Meanders are formed by the processes of...

The fast flow of water has more energy which causes...

On the outside of the bend...

On the inside of the bend...

Over time the meander... It will eventually become...

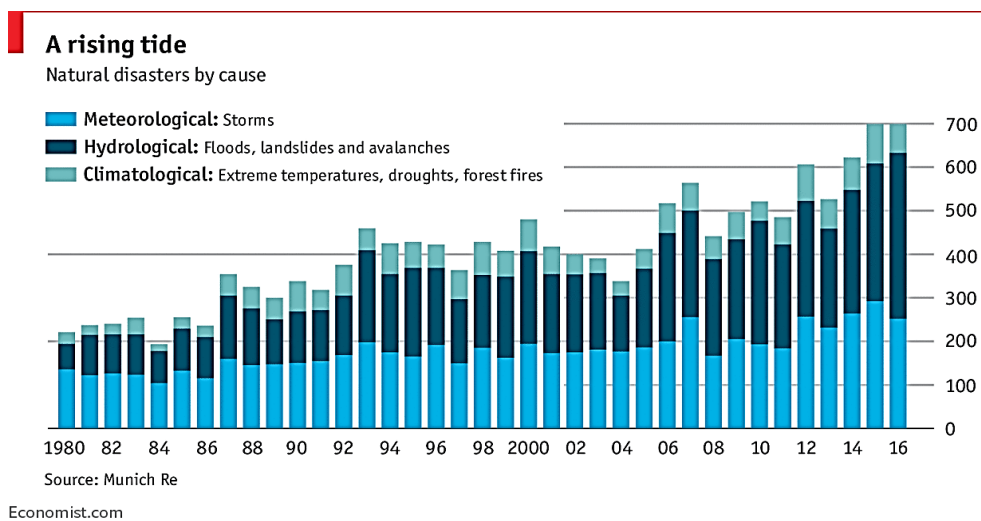


Lesson 4 – Changes in global flooding

LI: To analyse how flooding disasters can affect people and the environment

Task 1 - Name 3 extreme weather events in the UK.

Task 2 – Describe what the graph is showing.





Task 3 – Using the information provided, fill out the world map (Page 11) to annotate the different flooding events that have happened around the world.

Cyclone Idai

- In 2019, Cyclone Idai hit the south eastern Africa
- It badly affected Mozambique, Zimbabwe, and Malawi
- It is one of the worst cyclones to hit Africa and its heavy rains and strong winds led to flash flooding
- It caused hundreds of deaths in the areas affected, damaged buildings and homes, and wiped-out crops which led to food shortages

China 2010

- Provinces in northern China were affected by the worst floods in a decade
- Weeks of heavy rain have swollen rivers and caused damage, landslides, and bridges collapsed
- It is estimated that the floods caused more than \$13.7 billion (USD) of damage
- Across China 230 million people were affected, around 51,000 had to be evacuated from their homes
- Throughout July and August around 1, 500 people were killed by the flooding with many more missing

Storm Ciara and Storm Dennis

- In February 2020, the UK was affected by Storm Ciara and Storm Dennis on two consecutive weekends
- The weather than came with the storms has caused widespread flooding across the UK
- Some of the worst affected areas include south Wales, Herefordshire, Worcestershire and Shropshire
- Over 1000 properties have been flooded and millions will need to be spent on new defences to protect at risk areas

India

- August and September 2019 led to severe flooding across 13 states in India
- It took 9 days to completely flood the regions around the River Ganges
- The heavy rain caused flooding across the two states leading to over 100 deaths
- Cities and towns were some of the worst affected places due to the impact on transport, buildings and housing
- In Uttar Pradesh more than 500 prisoners had to be relocated to new facilities due to the flood waters

Hurricane Harvey

- In August 2017, Hurricane Harvey hit the USA with the worst affected areas of Texas and Louisiana
- The hurricane brought high speed winds, heavy rain and flooding
- It became the second most costly storm ever to hit the USA with \$125 billion worth of damage
- The main problems of the hurricane was the flooding and destruction of home, roads and other important buildings
- The rebuilding process would take a long time with millions of people affected

South East Asia 2011

- Thailand and Cambodia were the worst affected places by the 2011 monsoon rains and floods
- The area was affected by several weeks of heavy rain
- The flooding lasted for several months
- More than 400 people drowned in Thailand, and 250 in Cambodia
- The floods swamped farm land
- The UN warned that this raised the possibility of food shortages
- Many popular tourist destinations were also damaged by the floods

North Korea 2015

- Summer rains in North Korea are usually destructive due to poor drainage, deforestation and droughts causing the ground to harden
- In August 2015, torrential rain over 2 days led to flash flooding
- 40 people were killed in floods
- Around 2000 buildings were destroyed (homes and public buildings)
- Farmland was also flooded leading to crop damage and food shortages



Mozambique

- Between December 2006 and February 2007, heavy rains across northern and central Mozambique led to flooding in the Zambezi River and the overflowing of a big dam
- 29 people were killed and 285,000 people affected across the country
- The heavy rains and floods also damaged health centres, public buildings and affected safe water
- In total, the floods and cyclone caused approximately US\$ 71 million and kept Mozambique very poor

Task 4 – complete the climate change and flooding gap fill.

Climate _____ appears to be intensifying _____ around the world. More _____ are now being affected by flooding and the floods that hit are more _____ than ever before. Climate change causes more flooding because of heavier rain, more _____ and higher _____.

Climate scientists have been _____ for years that climate change would make weather events more _____ and happen more often. The evidence now shows that they were _____.

Right
Change

Hurricanes
Disastrous

Predicting
Countries

Extreme

Flooding
Sea levels



Global flooding examples

NAME: Storm _____, Storm
YEAR:
EVENT: hurricane / cyclone / flooding / rain
IMPACTS:

NAME:
YEAR:
EVENT: hurricane / cyclone / flooding / rain
IMPACTS:

NAME:
YEAR:
EVENT: hurricane / cyclone / flooding / rain
IMPACTS:

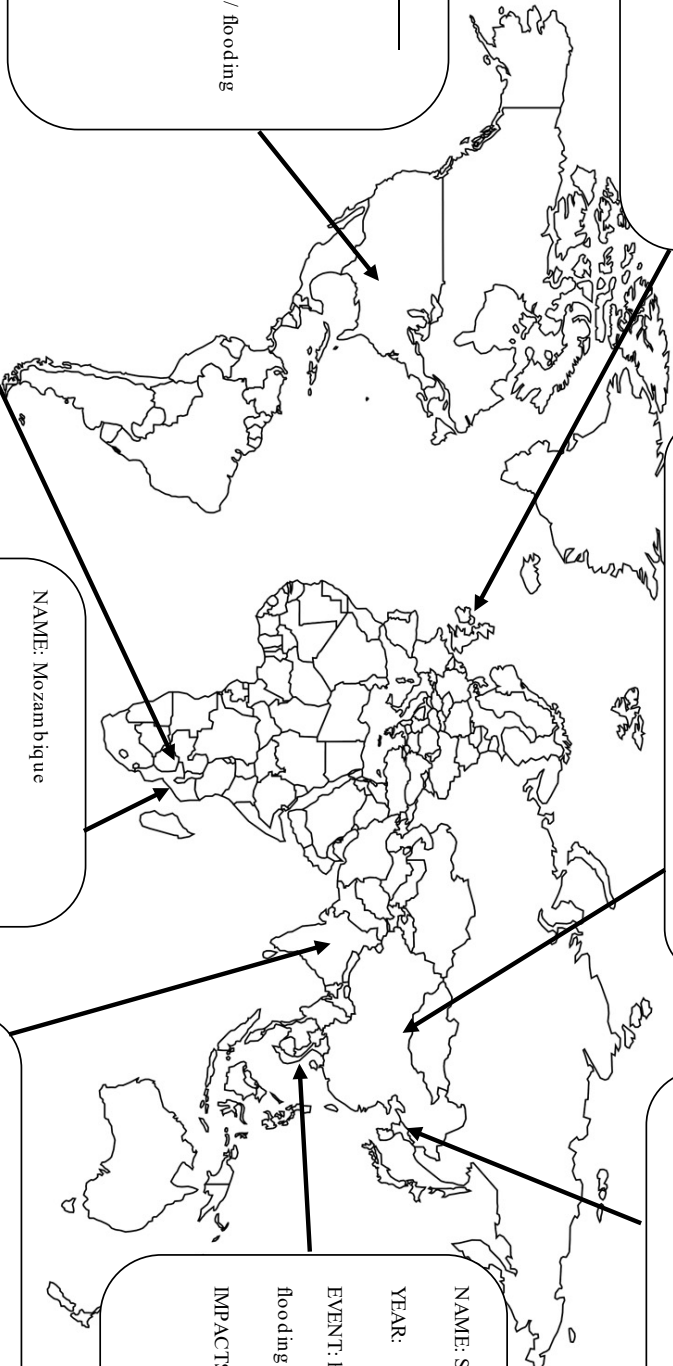
NAME: Hurricane _____
YEAR:
EVENT: hurricane / cyclone / flooding / rain
IMPACTS:

NAME: Southeast Asia 2011
YEAR:
EVENT: hurricane / cyclone / flooding / rain
IMPACTS:

NAME: Cyclone _____
YEAR:
EVENT: hurricane / cyclone / flooding / rain
IMPACTS:

NAME: Mozambique
YEAR:
EVENT: hurricane / cyclone / flooding / rain
IMPACTS:

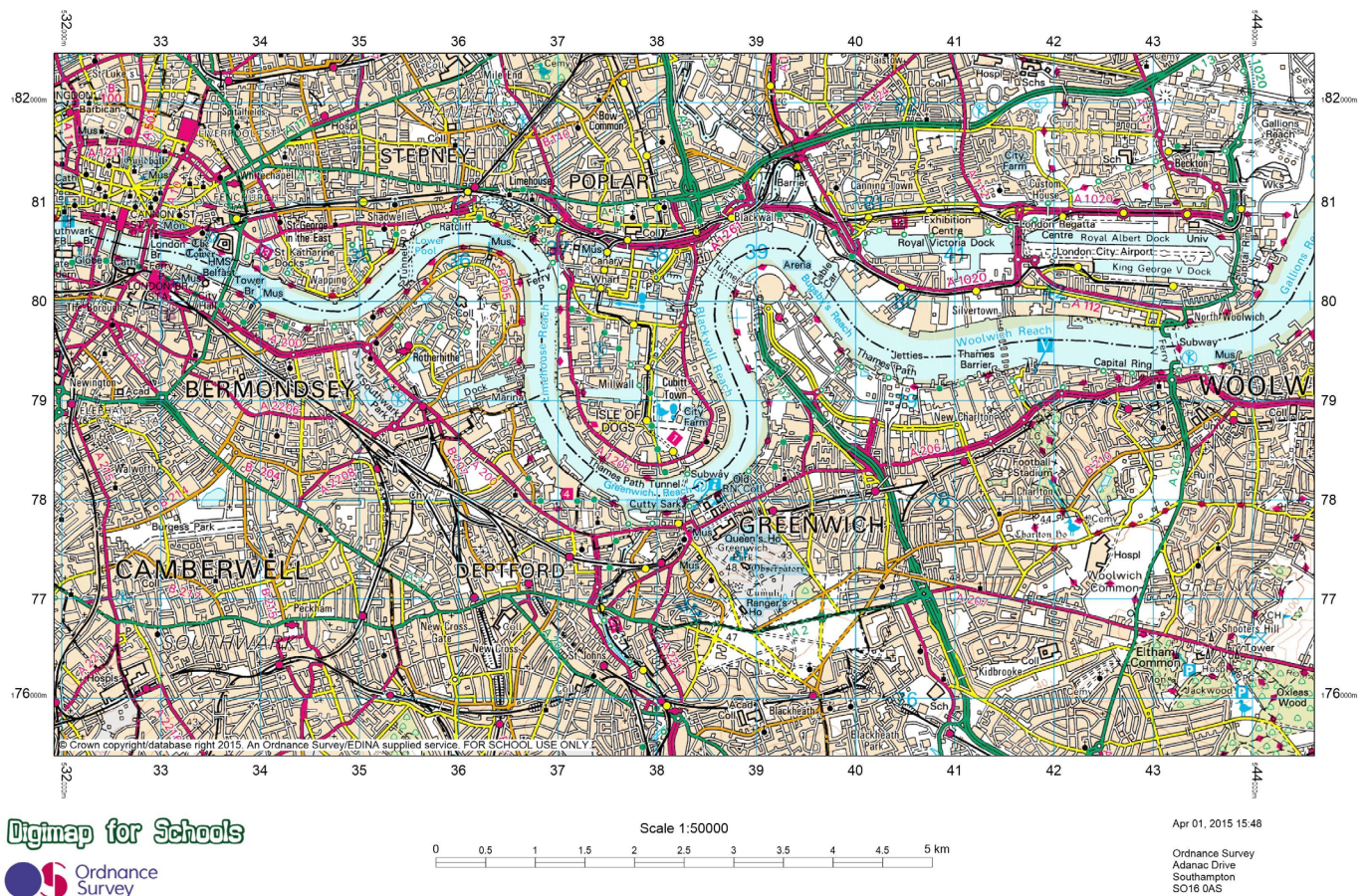
NAME: India
YEAR:
EVENT: hurricane / cyclone / flooding / rain
IMPACTS:





LI: To discuss the opportunities and challenges of rivers

Task 1 – Map skills practice. Answer the questions using the map below.



1. What river is this?
2. What city is this?
3. What part of the river course do you think this is?
4. Give the 4-figure grid reference for the Thames Barrier.
5. What unusual physical feature is found in 3778?
6. In 3980, what entertainment feature is located along the river?

Task 2 - How can rivers impact human activity? Make a list of positive and negative impacts.

Task 3 – Describe the location of the River Thames.



Task 4 – Read through the facts about the River Thames. Colour code the facts into opportunities and challenges created by the river.

Challenge Sort further into ‘social’, ‘economic’ and ‘environmental’.

Opportunities (+)

Challenges (-)

Water can generate electricity. There is a hydroelectric power machine in Oxford	Rivers provide great places for people to live such as London, Oxford, and Reading	Using water from the Thames for factories causes pollution	Sporting events attract tourists who spend money in the area
Tourism and sporting events produce litter	New electricity turbines could negatively impact wildlife	The London Wetlands Centre is a place for wildlife conservation	The River Thames is very dangerous due to undercurrents and cold water
The River Thames has some of the highest levels of microplastics in the world	There are many sporting events along the River Thames	Lots of settlements along the River Thames can lead to more flooding	300kW of electricity produced along the River Thames will reduce CO2 output
Some plants and animals along the Thames help to keep the river clean	The Thames is at risk from flooding. The rainy weather causes quick changes in the river levels	‘Thames tummy’ - Legionnaires' disease, salmonella, hepatitis, cryptosporidiosis, and Weil's Disease.	One of the most famous industrial areas along the River Thames in the London Docklands

Task 5 – Writing task.

‘The River Thames provides only opportunities for people and the environment’. How much do you agree with this statement? Explain your answer.

Lesson 6 - Water, water everywhere

LI: To understand the importance of water, its use and conservation

Task 1 - Label the major world rivers.



Task 2 - Where is all the water? Can you remember any of the stores of water?

Task 3 – Read through the information about ‘Global inequality and water’.

- Access to safe water is a good example of a ‘global inequality’. This is where something is not fairly shared out to everyone. In many areas of the world, we take it for granted that the tap will always provide safe and clean water for drinking, cooking and for washing with. However, more than one billion people worldwide have no choice but to use potentially harmful sources of water for bathing, cooking, and even drinking. Every day this has the result of causing the death of more than 6,000 children.
- In the UK, we are lucky because we have plenty of water and it is clean and safe to use. The average daily water usage is about 150 litres a day and the average person uses more than 50 litres of water a day just flushing toilets.
- In the developing world more than one billion people in have inadequate access to water. It has been estimated that 12% of the world’s population uses 85% of its water.

Task 4 - Look at the pictures showing water supplies in different countries. For each picture answer the questions in as much detail as you can.



Collecting drinking water from an open hole dug in the sand of a dry riverbed in Tanzania.

- a) Would you drink this water?
Explain your answer.
- b) Why might somebody drink from this river



A well in India.

- c) Why is well water safer than waterholes, streams and rivers?



A jawbone.

- d) What does the picture tell you about the availability of water?
- e) What does the ground look like where you live?
- f) Why does the ground in the UK look different from the ground in the picture?



A bathroom sink.

- g) How many times do you use water in one day?
- h) If all the taps stopped working, where would you find water to use?
- i) Why do the people in the first two photographs not have a sink or tap?

Task 5 - Suggest 3 ways we could improve our personal water usage

***Challenge:** suggest 3 ways we could start to tackle the problem of global inequality of water*

Attainment band:	KS3 Topic 8 – ‘Hydrology and Water’	
	Knowledge and Understanding	Skills
Yellow Plus	<ul style="list-style-type: none"> - Explain the relationship between water and the land using key terminology - Explain in detail the formation of meanders and waterfalls - Evaluate the opportunities and challenges created by rivers and flooding - Discuss global distribution of water 	<ul style="list-style-type: none"> - Effectively use figures to ask geographical questions and draw geographical conclusions - Independently use maps to locate places and identify key features - Clearly justifies a viewpoint using key terminology and relevant examples
Yellow	<ul style="list-style-type: none"> - Explain the relationship between water and the land - Explain the formation of meanders and waterfalls - Discuss the opportunities and challenges created by rivers and flooding - Explain global distribution of water 	<ul style="list-style-type: none"> - Shows an ability to use figures to ask geographical questions and draw geographical conclusions - Confidently use maps to locate places and identify key features - Justifies a viewpoint using key terminology and examples
Blue	<ul style="list-style-type: none"> - Describe the relationship between water and the land - Describe the formation of meanders and waterfalls - Compare the opportunities and challenges created by rivers and flooding - Suggest reasons for the global distribution of water 	<ul style="list-style-type: none"> - Identify useful geographic information from figures - Use maps to locate places and identify some key features - Makes attempt to justify a viewpoint (answer is mainly descriptive)
Green	<ul style="list-style-type: none"> - Identify the relationship between water and the land - Label a diagram to show how meanders and waterfalls are formed with some attempt to describe their formation - Describe the opportunities and challenges created by rivers and flooding - Describe the global distribution of water 	<ul style="list-style-type: none"> - Describe what figures are showing and link them to the topic of cold environments - Use maps to locate places - States an opinion and offers some explanation to back it up
White	<ul style="list-style-type: none"> - Name/ list the relationships between water and the land - Label a diagram to show how meanders and waterfalls are formed - List some opportunities and challenges created by rivers and flooding - Identify access to water in different areas of the world 	<ul style="list-style-type: none"> - Describe basic facts about what figures are showing - Use maps to locate places with support - States an opinion that is relevant to the question