YEAR 5: SPRING 2 – ROCKETMAN: MISSION TO MARS

GEOGRAPHY: PHYSICAL – THE WATER CYCLE AND RIVERS

UNDERSTAND, DESCRIBE AND EXPLAIN: THE WATER CYCLE

Physical Geography: Understanding the water cycle

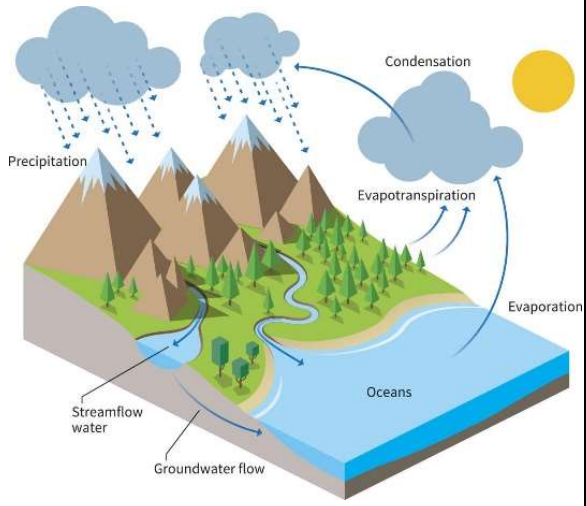
Learning links:
Geography:
Y3: Water Cycle All areas of learning
Y5: Rivers Throughflow/ Surface run-off

Learning links:
Science:
Y4: States of Matter Evaporation/ Condensation/Solid/ Liquid/Gas
Y5: Properties of materials Evaporation/ Condensation/ Temperature/Solid/ Liquid/Gas

The Water Cycle	*Atmosphere*	*Evaporation*	*Water Vapour*	*Condensation*	*Precipitation*	*Rain/Sleet/Snow/Hail*	*Collection*

The Water Cycle:

Earth has been ***recycling*** water for over ***4 billion years***!
The world's water moves between ***lakes, rivers, oceans***, the ***atmosphere*** and the ***land*** in an ***ongoing cycle*** called the ***water cycle***.
As it goes through this ***continuous system***, it can be a ***liquid*** (water), a ***gas*** (vapour) or a ***solid*** (ice).
There are ***4 stages*** of the ***water cycle*** which ***continuously repeats***:



1. Evaporation:
Energy from the ***Sun heats up*** the surface of the ***Earth***, causing the ***temperature*** of the ***water*** in our rivers, lakes and oceans to ***rise***. When this happens, some of the water ***evaporates*** into the ***air/atmosphere***, turning into a ***gas*** called ***vapour***.

2. Condensation:
As ***water vapour rises up*** high into the sky, it ***cools*** and turns back into a ***liquid***, forming ***clouds***.
This process is called ***condensation***. ***Air currents*** high up in the air ***move*** these ***clouds*** around the globe.
Depending on the ***temperature*** and how ***quickly*** the ***vapour condenses*** or sometimes ***freezes***, the vapour can turn to ***rain, sleet, hail or snow***.

3. Precipitation:
When ***too much*** water has ***condensed***, the ***water droplets*** in the clouds become too ***big and heavy*** for the air to hold them.
They ***fall back down*** to ***Earth*** as rain, snow, hail or sleet, a process known as ***precipitation***.

4. Collection:
The fallen ***precipitation*** is then ***collected*** in bodies of water – such as ***rivers, lakes and oceans*** – from where it will eventually ***evaporate*** back into the air, ***beginning the cycle all over again***.
How it is **collected**, depends on ***where it lands***:

- Some will ***fall directly*** into ***lakes, rivers or the sea***, from where it will ***evaporate*** and begin the cycle all over again.
- If the water falls on ***vegetation***, it may ***evaporate*** from leaves back into the air, or ***trickle*** down ***into the ground***. Some of this water may then be ***taken up*** by the ***plant roots*** in the earth.
- In ***cold climates***, the ***precipitation*** may build up on land as ***snow, ice or glaciers***. If ***temperatures rise***, the ice will ***melt to liquid water*** and then ***soak*** into the ***ground***, or ***flow into rivers*** or the ***ocean***.
- Water that ***reaches land directly*** may flow ***across the ground*** and ***collect in the oceans, rivers or lakes***. This water is called ***surface run-off***.
- Some of the ***precipitation*** will instead ***soak*** or ***infiltrate*** into the ***soil***, from where it will ***slowly move through the ground*** until eventually reaching a ***river or the ocean***. This is called **throughflow**.

THINKING POINT:

With your eyes closed, can you remember the 4 stages of the water cycle?

FIELDWORK IN THE LOCAL AREA – OBSERVE, MEASURE, RECORD AND PRESENT:

Climate and weather survey: Report on the climate and weather conditions of Poole	Design a format to collect answers systematically and accurately	Collect and measure data of temperature and rainfall accurately over time	Represent the data and find answers (tables, graphs)	Present the findings to others and how this impacts the local area (tourism, agriculture)	Plan for action – what good can be used from these findings?
Rainforest resources survey: Report the number of UK foods containing palm oil	Design a format to collect answers systematically and accurately	Collect evidence samples (food packaging) from a range of sources and record data	Represent the data and find answers (tables, graphs)	Present the findings to others and how this impacts the world (sustainability)	Plan for action – how can we implement change?

UNDERSTAND, DESCRIBE AND EXPLAIN: RIVERS

Physical Geography: Understanding the physical development and features of rivers: The Amazon

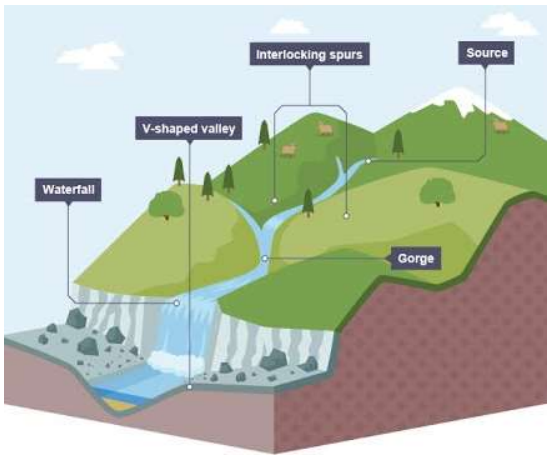
Rivers	***Source***	***Upper Course***	***Middle Course***	***Lower Course***	***Surface runoff***	***Throughflow***	***Tributaries***
Freshwater biome	***Estuary(ies)***		***Mouth***		***River bank***		***River bed***
Abrasion	***Attrition***	***Transportation***	***Deposition***	***Erosion***	***Undercutting***		***Meander(ing)***

Learning links:
Geography:
Y3: Coastal Erosion Erosion/Abrasion/ Attrition/Deposition

Learning links:
Science:
Y3: Rocks Erosion/Abrasion/ Attrition/Hardness/ Sedimentary

Rivers:

A ***river*** is a ***flowing***, moving ***stream of water***.
Usually, a river feeds water into an ocean, lake, pond, or even another river.
Rivers can ***vary in size*** and there is no hard definition or rule on how big a ***flow of water*** must be to be categorised as a ***river***.
Water from a ***river*** can come from ***rain, melting snow, lakes, ponds, or even glaciers***.
Rivers flow ***downhill*** from their ***source***. They are considered part of the ***freshwater biome***.



The Upper Course:

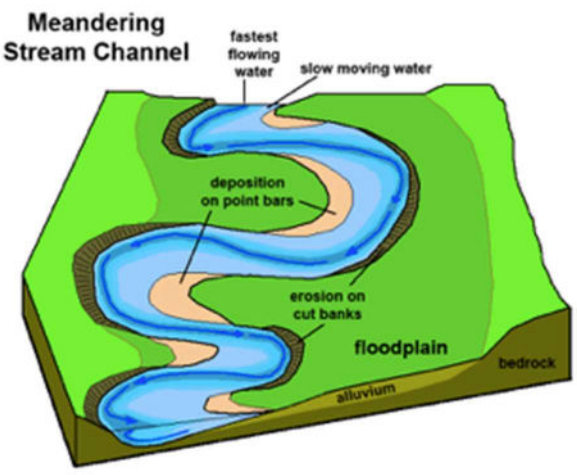
In the ***upper course***, ***precipitation*** feeds the ***emerging river***. ***Water stored*** in and on the land ***collects*** and ***begins to flow downhill***. Additionally, ***rivers*** can also begin as ***snow melts*** of ***hills and mountains***. ***Rivers typically*** start on ***high land***.
The point where a ***river starts*** is called the ***source***. The ***river*** in the ***upper course flows*** through ***steep gradients*** and ***flows quickly.*** Because of the ***steep gradients*** and ***fast flow*** of the water, ***waterfalls*** often ***form*** in the ***upper course*** of a river.

THINKING POINT:

Without looking, can you describe the upper course of a river to a partner?

The Middle Course:

In the ***middle course***, rivers become ***wider and deeper***. While the water is ***less turbulent*** than in the upper course, the ***water*** is actually moving with ***greater speed***. With a ***wider river bed*** and ***deeper water*** there is also ***less friction***. As such, the river has a ***greater energy*** to ***erode the river bank***.
In the ***middle course***, the ***shape*** of the ***river*** is under ***constant change***. The ***moving water erodes***, ***transports*** and ***deposits*** soil and other material to determine the ***shape*** and ***size*** of the river – they are ***constantly changing*** because of the following:



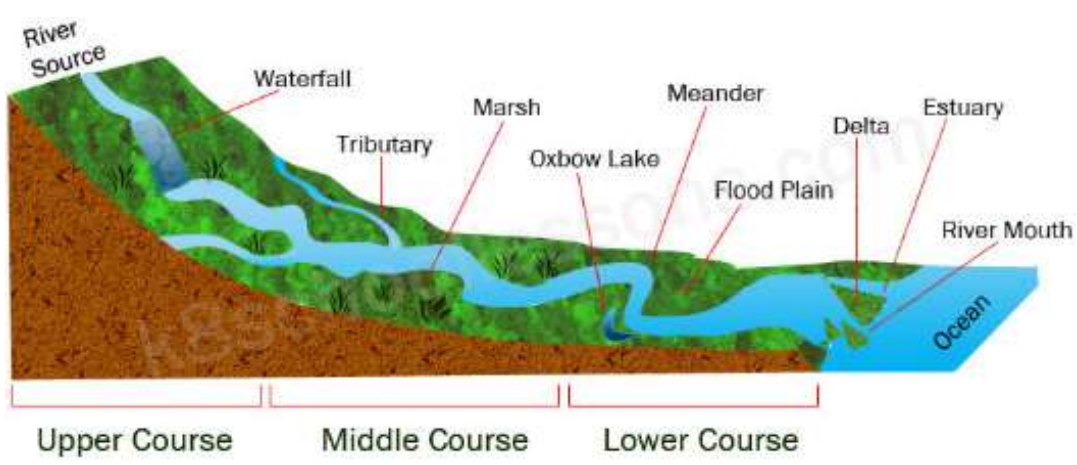
- ***Transportation***: The sheer ***weight and speed of the moving water*** can ***move material*** (rock/stone) from the ***river bed and river bank*** downstream.
- ***Abrasion***: In a process called ***abrasion***, ***small rocks*** and ***sediment*** can also act like sand paper, ***rubbing away*** at the ***river bed***.
- ***Attrition:*** In a process called ***attrition***, ***rocks and pebbles collide*** with each other and ***break apart***.
- ***Erosion:*** Occurs on the outside of the ***meander (bend)*** where the ***water*** is ***moving*** at its ***fastest***. This will cause ***a deeper channel*** to be formed and so the water on the ***outside*** of a ***meander (bend)*** will be ***deeper*** than on the inside.
- ***Deposition***: This occurs where ***water lacks the energy*** to ***transport the load*** it is carrying so the ***rocks/stones*** are ***deposited/left in place***. In the ***middle course***, this happens on the ***inside of a bend or meander***, where the ***water flows slowly***.
- ***Meanders***: Because of these ***processes***, ***meanders*** are created. The ***continuous flow*** of water and ***constant process*** of ***erosion, transportation and deposition***, will result in ***areas of faster and slower moving water*** and the ***river*** will gradually begin to ***flow a more winding course***.

THINKING POINT:

Why do rivers bend and meander, particularly in the middle course?

The Lower Course:

In the ***lower course*** of the river, the ***land*** is ***flatter*** and the ***river wider***. The ***water*** is at its ***deepest*** in the ***lower course***.
Many rivers have ***estuaries***, which are characterised by ***wide, flat land*** where the ***river flows into the sea.*** This is known as the ***mouth of the river.***



The Amazon River:

Source: Lago Villafro in the Andes Mountains, Peru	**Length:** 6400km or 3977 miles	**Number of Tributaries:** 200
Mouth: Brazil, Atlantic Ocean	**Widest point:** 190km or 118 miles	**Width of its mouth:** 60km or 37 miles

THINKING POINT:

How many features of a river can you remember?

KEY ASSESSMENT QUESTIONS AND SCENARIOS:

EXS:	GDS:
Describe the process of river erosion and transportation. Explain why the Amazon river is a valuable resource.	Why are rivers bendy (meanders) and never straight? Why is the Amazon river unique?