

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.

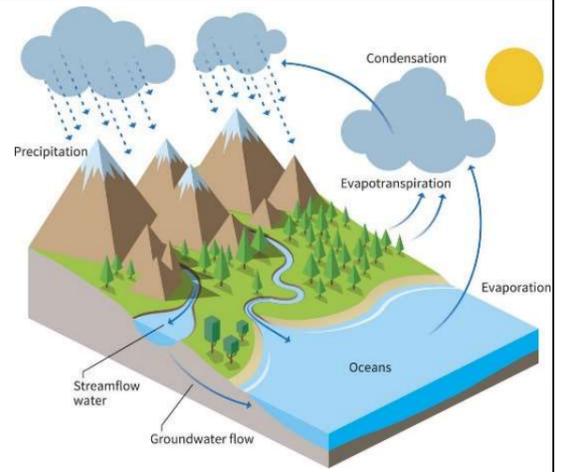
They **fall back down** to **Earth** as rain, snow, hail or sleet, a process known as **precipitation**.

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:

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

UNDERSTAND, DESCRIBE AND EXPLAIN: RIVERS

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

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

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

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

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**.

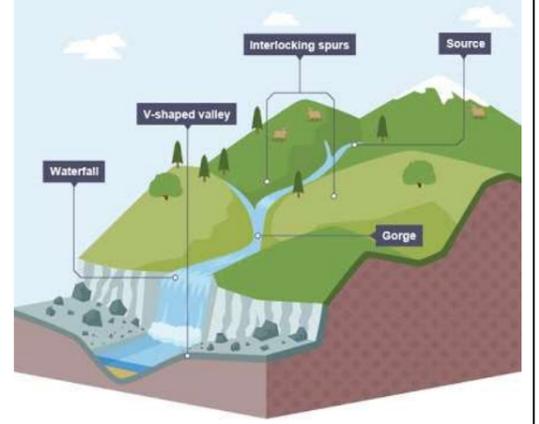
Rivers flow **downhill** from their **source**. They are considered part of the **freshwater biome**.

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:

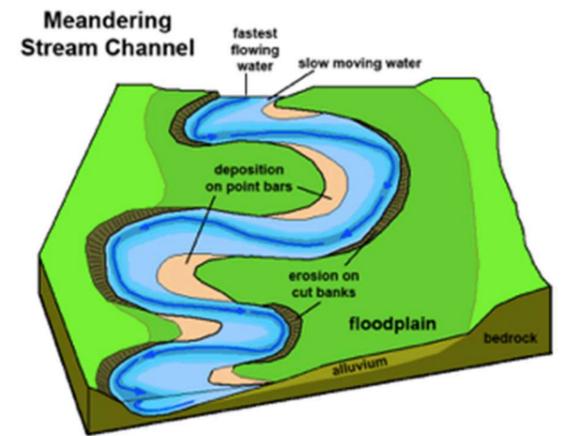
Without looking, can you describe the upper course of a river to a partner?

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