

YEAR 5: AUTUMN 1 – OCEAN EXPLORERS: DESTINATION SOUTH AMERICA

GEOGRAPHY:

LOCATIONAL KNOWLEDGE - RECALL AND NAME:

The 7 continents:	Europe	Asia	Africa	Oceania	North America	South America	Antarctica
The 5 Oceans:	Pacific Ocean		Arctic Ocean	Atlantic Ocean		Indian Ocean	Southern Ocean
The 2 poles/circles:	North Pole/ Arctic Circle			South Pole/ Antarctic Circle			
The lines of latitude and hemispheres:	The Equator	The Tropic of Cancer		The Tropic of Capricorn		Northern Hemisphere	Southern Hemisphere
The 4 major climate zones of the World	Tropical Climate Zone		Subtropical Climate Zone	Temperate Climate Zones		Polar Climate Zones	
Examples of the 5 major biomes of the World	Aquatic Biomes: Coral Reefs: Great Barrier Reef, Aus Freshwater: Amazon River Marine: Pacific Ocean		Desert Biomes: Sahara Desert, Africa Antarctica Atacama Desert, Chile	Forest Biomes: Rainforest: Amazon Rainforest, Brazil Temperate forest: New Forest, UK Alpine forest: Andes mountain range		Grassland Biomes: The South American Pampas, Argentina and Uruguay	Tundra Biomes: The North Pole/Arctic Circle Greenland Parts of Antarctica
The countries of S. America and their capital cities	Brazil Brasilia	Chile Santiago	Bolivia La Paz	Uruguay Montevideo	Ecuador Quito	Guyana Georgetown	French Guiana (FRA) Cayenne
	Argentina Buenos Aires	Peru Lima	Colombia Bogota	Paraguay Asuncion	Venezuela Caracas	Suriname Paramaribo	Falkland Islands (GBR) Stanley
The 4 layers of the rainforest	Forest Floor		Understory	Canopy		Emergent	

LOCATIONAL KNOWLEDGE – USE RESOURCES TO LOCATE:

Globe:	The 7 continents	The 5 Oceans	Major seas	2 poles	The Equator	The Tropics
Atlas: (4 point grid reference)	The countries of South America and their capital cities		Brazil and its major cities	Major physical landmarks/areas of interest (rivers, seas, mountains, volcanoes etc) of South America		Major human/manmade landmarks/areas of interest of South America
Map (Rio): (6 point grid reference)	Towns and villages of Rio de Janeiro		Heritage sites of Rio de Janeiro	Human (man-made) features of interest in Rio de Janeiro		Physical (natural) features of interest in Rio de Janeiro
Compass:	Use N, NE, E, SE, S, SW, W, NW and the compass bearings to 5° to give and follow directions to reach a chosen destination in the local area.					

UNDERSTAND, DESCRIBE AND EXPLAIN:

Physical Geography:	Biome	Ecosystem	Temperate forest	Tropical rainforest	Alpine forest	Grassland	Tundra	Desert
	Aquatic	Freshwater	Marine	Coral reef	Weather/Climate	Animals		Plants
	Climate Zones	Polar climate Zone	Tropical Climate Zone	Temperate Climate Zone	Equator	Tropic of Capricorn	Tropic of Cancer	
	Amazon Rainforest	Forest Floor	Understory	Canopy	Emergent	Environment	Adaptation	

Understanding the physical development and features of tropical rainforests: The Amazon

Ecosystems, Biomes and Climate Zones:

Each individual plant and animal **could not exist by itself** on planet Earth. All **living organisms** need millions of other living organisms to **survive**. How these organisms **interact** with the **sun, soil, water, air and each other** in a **specific area** is called an **ecosystem**.

A **biome** is a way to describe a **large group** of similar **ecosystems**. **Biomes** have **similar weather, rainfall, animals and plants**. The **plants and animals** of each **biome** have **traits** that help them to **survive** in their particular **biome**.

There are different types of biome on planet Earth. What a **biome** is like, depends on: how **warm or cold** it is; how **dry or wet** it is; and how **fertile the soil** is. **What a biome is like** will be **determined** by the **climate zone** it lies within.

There are **3 major climate zones**: The **Polar** climate zone (cold); the **Temperate** climate zone (mild); and the **Tropical** climate zone (hot). Some of the **biomes** of Earth are:

Temperate Forest	Tropical Rainforest	Alpine Forest	Grassland	Tundra	Desert	Aquatic: Coral Reef	Aquatic: Marine (saltwater)	Aquatic: Freshwater
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Tropical Rainforests:

Tropical rainforests are found in the **Tropical climate zone**. The **Tropical Climate Zone** is at the **centre** of the Earth **between** the **Tropic of Cancer** and **Tropic of Capricorn** and centre of the **Equator**. This is the **hottest, most humid** part of Earth. All **tropical rainforests** lie **within** the **Tropical Climate Zone**.

The Strata of the Rainforest:

Different **animals** and **plants** live in different parts of the rainforest. **Scientists divide** the **rainforest** into **strata (zones)** based on the living **environment**. Starting at the top, the **strata** are:

Emergents: **Giant trees** (between 60m-80m) that are much **higher** than the average **canopy** height. It **houses** many **birds and insects**.

Canopy: The **upper parts** of the **trees** (between 20m-60m). This **leafy environment** is **full of life** in a tropical rainforest and **includes**: insects, birds, reptiles and mammals. Due to the **thickness of the canopy**, the **Amazon floor** is in **permanent darkness**. In fact, it's so thick that when it **rains**, it takes around **ten minutes** for the **water** to **reach the ground**.

Understory: A **dark, cool** environment under the leaves but over the ground. Most of the **understory** of a rainforest has so little light that **plant growth** is **limited**. There are short, leafy, mostly non-flowering shrubs, small trees, ferns, and vines (lianas) that have **adapted** to **filtered light** and **poor soil**. **Animals** in the **understory** include insects, arachnids, snakes, lizards and small mammals.

Forest floor: Teeming with **animal life**, especially **insects** and **arachnids**. The **largest animals** in the rainforest generally live here including gorillas, anteaters, wild boars, tapirs, jaguars and humans.

The **largest tropical rainforest** is the **Amazon** in **South America**.

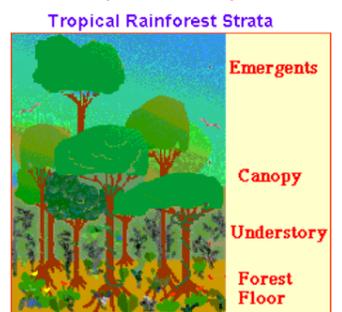
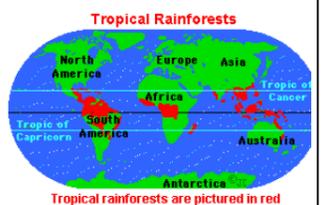
The Amazon Rainforest:

The **Amazon Rainforest** is located in **9 different countries** but the majority of it (around **60%**) is located in **Brazil**. The rest of it can be found in Peru, Colombia, Ecuador, Bolivia, Venezuela, Guyana, Suriname and French Guiana. Being the **largest rainforest on the planet** (and home to **one of the largest river systems**), it should come as no surprise that the **Amazon** covers a hefty chunk of **South America**. This gigantic patch of **natural beauty** stretches itself over a staggering **2.1 million square miles**.

The **Amazon** is referred to as 'the **lungs of the Earth**'. This is because the **rich vegetation** takes **carbon dioxide** out of the air, and **releases oxygen** back in. In fact, **more than 20%** of the **world's oxygen** is produced by the **Amazon**.

The **Amazon** has an incredibly **rich ecosystem** – there are around **40,000 plant** species, **1,300 bird** species, **3,000 fish** species, **430 mammals** and a whopping **2.5 million** different **insects**. Some **creatures** that can be found in the **Amazon Rainforest** include:

Jaguar	Capybara	Giant Anteater	Green Iguana	Harpy Eagle	Golden Lion Tamarin	Anaconda snake	Poison Dart Frog
Sloth	Macaw	Kinkajou	Puma	Ocelot	South American Tapir	Toucan	Tarantula



UNDERSTAND, DESCRIBE AND EXPLAIN:

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

<i>The Water Cycle</i>	<i>Atmosphere</i>	<i>Evaporation</i>	<i>Water Vapour</i>	<i>Condensation</i>	<i>Precipitation</i>	<i>Rain/Sleet/Snow/Hail</i>	<i>Collection</i>
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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**:

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**. **Plants and trees** also lose water to the **atmosphere** through their leaves: **Evapotranspiration**. **Animals (inc. humans)** also lose water to the **atmosphere** through their skin: **perspiration**.

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**.

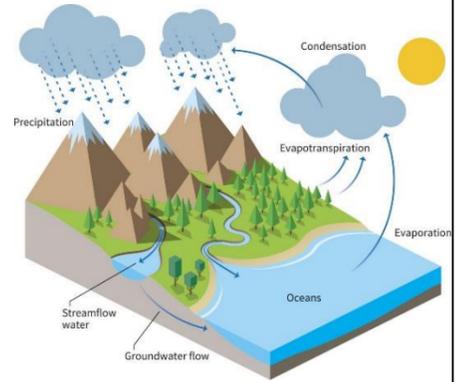
Precipitation:

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**.

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**.



UNDERSTAND, DESCRIBE AND EXPLAIN:

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

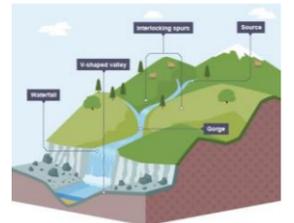
Learning links:
Geography:
Y3: Coastal Erosion Erosion/Abrasion/ Attrition/Deposition

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>	

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.



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:

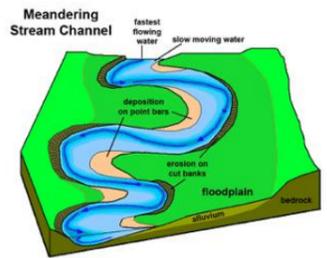
Transportation: The sheer **weight and speed of the moving water** can **move material** (rock/stone) from the **river bed and river bank** downstream.

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**.

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 Villafranco 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

UNDERSTAND, DESCRIBE AND EXPLAIN:

Human Geography:
Understanding the human impact on the Amazon rainforest and deforestation

Learning links:

Geography:

Y4: Naples

Land-use/Sustainable/
Agriculture/
Fertile soil/Minerals

Learning Links:

Science:

Y3: Plants

Photosynthesis/
Absorb/Carbon
Dioxide/Nutrients

Deforestation	Timber	Agriculture	Grazing	Extraction	Road construction	Climate change	Droughts
Forest fires	Logging	Acre	Carbon dioxide	Atmosphere	Global warming	Indigenous	Habitat

Deforestation: Every year, an area of rainforest the size of Wales is cut down and destroyed. The plants and animals that used to live in these forests either die or must find a new forest to call their home.

Why are rainforests being destroyed? Humans are the main cause of rainforest **deforestation**. We are cutting down **rainforests** for many reasons:

- **Wood** for both timber and making fires;
- **Space** for **agriculture** for both small and large farms;
- **Land** for poor farmers who don't have anywhere else to live;
- **Grazing** land for **cattle**;
- **Pulp** for making **paper**;
- **Road** construction; and
- Extraction of **minerals** and **energy**.

Rainforests are also **threatened** by **climate change**, which is contributing to **droughts** in parts of the **Amazon** and **Southeast Asia**.

Drought causes **die-offs** of **trees** and **dries out leaf litter**, increasing the **risk** of **forest fires**, which are often **set** by land developers, ranchers, plantation owners, and loggers.

In **2005** and **2010**, the **Amazon** experienced the **worst droughts** ever recorded. **Rivers dried up**, isolating communities, and **millions of acres burned**. The **smoke** caused **widespread health problems**, interfered with **transportation**, and **blocked** the **formation of rain clouds**, while the **burning** contributed huge amounts of **carbon dioxide** to the **atmosphere**, **worsening** the effects of **climate change**.

What is the problem?

Deforestation in the Amazon rainforest

Deforestation: The destruction of trees or forests on a massive scale.

Methods of clearing the rainforest:

- **Slash and burn** - trees are cleared and vegetation is burnt
- **Clear cutting** - complete removal of all trees in an area
- **Selective logging** - targeting specific valuable trees but leaving the rainforest intact



Water cycle - trees help return water vapour to the atmosphere which then falls as rain.

Carbon emissions - trees store carbon in their trunks, branches and roots which is released when they are cut down.



Indigenous people - the rainforest was once home to one million indigenous people. Now only 200,000 remain.

Climate change - deforestation contributes to global warming because trees are releasing carbon instead of storing it.

Soil erosion - without trees to protect it, soil in the rainforest is easily eroded. The soil loses its nutrients especially when it rains heavily.

Loss of habitat for millions of species like insects, birds, snakes, frogs and lizards.

Medicine - scientists have discovered that rainforest plants are sources for medicines to treat diseases like diabetes.



Why are rainforest trees important for our climate?

If rainforest trees are cut down the air becomes drier. There is less rain in the forest and less water vapour evaporates into the atmosphere. This would lead to less rain around the world and more problems with drought.

Trees store carbon in their trunks, branches and roots. When trees are chopped down, burnt or die, they give off carbon dioxide. About one fifth of all carbon dioxide being released into the atmosphere comes from dying trees.



If all the Amazon rainforest was destroyed, 77 billion tonnes of carbon dioxide would be released into the atmosphere. This would mix with other dangerous 'greenhouse gases' and contributes to global warming.



How to solve the problem:

GROWING TREES AND CROPS AT THE SAME TIME

Different crops and trees are planted together. This helps prevent soil erosion and keeps the soil fertile.

PRICE RISE

Selling products from the rainforest at higher prices, especially those produced in a rainforest-friendly way.

'SPECIAL OPS'

Train special Environment Agents who know and understand the rainforest and can track illegal loggers.

SELECTIVE LOGGING

Only cut down trees when they reach a certain height.

NATIONAL FOREST PARKS

Create more wildlife reserves which generate money for Brazil through responsible tourism.

EYE SPY

Use hi-tech satellites to take photos of people cutting down trees illegally.

Activati
Go to Set

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?