

Big question: Why are there different biomes in different places?

Lesson	Essential Knowledge						
<p>1: Biome bands – Distribution and Characteristics</p>	<p>A Biome is a unique ecosystem of fauna (animals) and flora (plants). The closer to the equator the warmer the temperature becomes, changing the biome type. Tropical rainforests are found along the equator, the further north or south of the equator you travel the biomes change.</p> <p>Biomes include unique fauna and flora which are specially adapted to suit the environment. E.g. Cacti are adapted to suit the desert as they have deep root to access ground water and needles (instead of leaves) to reduce the loss of water through evapotranspiration. Other factors influence where biomes are located, these include altitude, rock type, soil and drainage. Altitude can influence biomes; the higher the landscape from sea level the low the temperature will become, -0.5°C every 100m. Rock type and soil can influence as certain plants will grow or not grow in certain soil types or rock types. Drainage can influence the location of biomes, if water drains from a location quickly, such as a hill, certain plants will grow. If water drains from an area really slowly, such as a bog you will find different types of fauna and flora.</p> <p>Biomes provide resources which are important to people. They provide medicine, food, building material and other important services, such as regulating the atmosphere (plants absorbing carbon dioxide). Humans, fauna and flora all rely on the services that biomes provide.</p>						
<p>2: GIS – Investigating hotspots</p>	<p>Biodiversity is the mixture of fauna and flora in a location. Biomes have different levels of biodiversity. This can depend on how much precipitation there is and the average temperature. Tundra biomes have lower biodiversity than tropical rainforests as they are far colder and receive less precipitation (less than 300m a year). Africa and China have biodiversity hotspots for endemic species (fauna and flora only found in that location). It's vitally important that these locations are protected as the biodiversity of these ecosystems are extremely delicate and food webs rely on endemic species to be maintained e.g. Frankincense trees provide habitats for birds. There are 34 biodiversity hotspots worldwide and only represent 2.3% of total Earth's land surface.</p> <p>Biodiversity is dependent on 3 components. Ecosystem diversity (having a varied location), Species diversity (having a varied amount of fauna and flora) and genetic diversity (differences within a species e.g. tall, short, fat, thin, fast, slow, strong, weak). Efforts are in place to protect these locations by banning deforestation, including urbanisation and raising awareness of the importance of endemic hotspots within the world.</p>						
<p>3: Exploring biome threats and challenges</p>	<p>There are many threats to biomes including cattle ranching, logging (using wood for furniture), urbanisation (housing), mining, palm oil (growing plants for oil) and hydroelectric power (building dams). All these processes are causes for deforestation and reducing biodiversity. Stakeholders are groups of people which share a similar idea/interest. Stakeholders may be for or against the cutting down of forest e.g. environmental conservationists may be heavily against cattle ranching. However, meat businesses may be for cattle ranching as they are invested in supporting and growing cattle for their customers.</p> <p>REDD+ (Reducing Emissions from Deforestation and Forest Degradation) is an action plan to reduce the amount of carbon dioxide from deforestation. Forests absorb twice as much carbon dioxide as they emit including soils. This is an important strategy to reduce the impact of climate change and loss of biodiversity. There are various positives and negatives of REDD+.</p> <table border="1" data-bbox="735 1883 1481 2125"> <thead> <tr> <th data-bbox="735 1883 1107 1910">Positives</th> <th data-bbox="1107 1883 1481 1910">Negatives</th> </tr> </thead> <tbody> <tr> <td data-bbox="735 1910 1107 2007">Tackling deforestation is very challenging but REDD provides international expertise to develop the best approaches</td> <td data-bbox="1107 1910 1481 2007">Deforestation remains very rapid in South Asia, despite its countries signing up to the REDD scheme</td> </tr> <tr> <td data-bbox="735 2007 1107 2125">The funding that REDD can access is very attractive to governments</td> <td data-bbox="1107 2007 1481 2125">REDD is vague about what counts as forest for replanting. In some cases, funding has been given to projects that have replanted deforested areas with palm oil trees</td> </tr> </tbody> </table>	Positives	Negatives	Tackling deforestation is very challenging but REDD provides international expertise to develop the best approaches	Deforestation remains very rapid in South Asia, despite its countries signing up to the REDD scheme	The funding that REDD can access is very attractive to governments	REDD is vague about what counts as forest for replanting. In some cases, funding has been given to projects that have replanted deforested areas with palm oil trees
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<p>4: Conservation in action</p>	<p>Conservation is defined as protecting the environment and not wasting resources. Locally, Leicestershire county council have a 25-year conservation plan which includes having clean air, reducing the risk of harm from environmental hazards, clean and plentiful water and thriving plants and wildlife and enhanced beauty (to name a few). These goals came from the 2019 state of nature report which found 15% of species are under threat in the UK, 41% of UK species studied in the UK have fallen in number, the average amount of mammals have fallen by 26%, 97% of UK's wildflower meadows have been lost in the last 100 years. Leicester council have saved £1.1 million by using LED street lighting, £505,000 saved through reduced business mileage. Leicester is aiming to be carbon neutral by 2030 and to do this they've aimed to reduce their environmental impact in different ways; including</p> <ul style="list-style-type: none"> • Business → promoting energy efficient equipment, provide energy efficient incentives to save money • Housing → Provide external wall insulation for houses to reduce heat loss in winter, provide £80,000 grants to landlords for making energy improvements • Mitigation → Increase bus usage by 32 million, use cycle hire schemes, increase walking trips • People → Provide cycle training for 3400 adults, open 'get walking schemes', have 25,000 people take part in the Ride Leicester festival
<p>5: Rural diversification – Rewilding Britain</p>	<p>Rewilding is the process of bringing the wild (fauna and flora) back to an ecosystem. This can be done in a number of ways. Edward Abbey, a advocate for rewilding and conservation was concerned with protecting wild places, the freedom of movement and having fun in the wild. Edward Abbey had many famous quotes but one of the most famous was "The earth, like the sun, like the air, belongs to everyone – and to no one". Yellowstone National Park in the West of the United states (known for its wilderness) had an issue of the killing of wolves. The last wolf pack in Yellowstone was killed in 1926. From 1995 wolves are reintroduced into Yellowstone as they provide a vital service of culling (bringing down the population) of deer and other wildlife. Wolves are vital for keeping the ecosystem balanced, Wolves kill deer and elk, deer overgraze shrubs and bushes which reduce bird habitats and reduce shade for plants. Reintroducing wolves reduces deep/elk numbers which in-turn help support the ecosystem. There are many different stakeholders for rewilding around the world including the UK; for example, farmers kill wolves as they eat their livestock, environmentalist are for rewilding as they support the ecosystem, businesses would prefer to see the landscape used in alternative ways such as farm land, instead of rewilding. The UK as many other rewilding schemes, the prime minister pledge to protect 30% of Britain's land, this is to be done by controlling and mapping national parks, by doing this stakeholder are able to identify where land can be rewilded, land owners can be held to account if they damage the environment and wildlife and be reintroduced.</p>