

ACET Junior Academies'

Scheme of Work for geography

Why do animals live in different places?



About this unit: This unit introduces the concept of ecosystems and biomes. It begins with a global overview of major biomes and their relation to climate. Students will study how animals and plants are adapted to the ecosystems and biomes, before continuing their study of South America by examining key biomes on that continent. The final lesson ties learning about the Amazon rainforest from the previous unit with ecosystem and biomes. The last four lessons in the unit form the basis of a classroom display on Biomes of South America – with the central piece being created in the final lesson on the rainforest.

Unit structure

This unit is structured around the following geographical enquiries:

What is a biome?

How do plants and animals adapt to biomes?

What are the biomes of South America?

What is the alpine biome like?

Why are there penguins in Patagonia?

How does life survive in the Atacama Desert?

Why are there so many species in the Rainforest?

National Curriculum unit:

- understand geographical similarities and differences through the study of human and physical geography of a region of the United Kingdom, a region in a European country, and a region within North or South America
- physical geography, including: climate zones, biomes and vegetation belts, rivers, mountains, volcanoes and earthquakes, and the water cycle
- identify the position and significance of latitude, longitude, Equator, Northern Hemisphere, Southern Hemisphere, the Tropics of Cancer and Capricorn, Arctic and Antarctic Circle, the Prime/Greenwich Meridian and time zones (including day and night)
- identify the position and significance of latitude, longitude, Equator, Northern Hemisphere, Southern Hemisphere, the Tropics of Cancer



and Capricorn, Arctic and Antarctic Circle, the Prime/Greenwich Meridian and time zones (including day and night)

| Enquiry 1: What is a Biome? | | | | |
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| Links to previous learning | Knowledge and second order concepts | Geographical skills: | Assessment criteria: | Curriculum Links: |
| Adaptation Science | Substantive knowledge: <i>(What the children should know.)</i> What is a biome? What is the difference between a biome, ecosystem and habitat How does climate determine biome? What are the major biomes in the world, and where are they located? What are the common characteristics of those biomes? | use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied | Can your children: Define biome as a large area with similar climate and landscape Explain that many ecosystems together add up to a biome. Explain how climate (rainfall and temperature) determine biomes Link biomes such as Tropical Rainforest to their proximity to the equator | Horizontal: Vertical: |
| | | Locational Knowledge | | |
| | | locate the world’s countries, using maps to focus on Europe (including the location of Russia) and North and South America, concentrating on their environmental regions, key physical and human characteristics, countries, and major cities | | |
| | | Place Knowledge: | | |
| | | understand geographical similarities and differences through the study of human and physical geography of a region of the United Kingdom, a region in a European country, and a region within North or South America | | |
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| Suggested activities: | | Resources: | Useful links: | |

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| <p>Introduce students to the concept of Biomes – video</p> <p>Emphasize the importance of climate in determining biomes – rainfall and temperature.</p> <p>Students should be given a collage of images of different biomes and/or animals and plants from their biomes. They should then see if they can accurately deduce whether the biome has high/low temperature and high/low rainfall.</p> <p>On a map of the world students should revise their locational knowledge e.g.</p> <p>Students should recreate a biome map of the world with a blank (included in resources) and annotate it with information about the biome including its climate, and typical animals and plant life.</p> <p>They can find this information from information sheets (examples included in resources)</p> | <p>https://www.bbc.co.uk/bitesize/topics/z849q6f/articles/zvsp92p</p> <p>https://www.youtube.com/watch?v=0fb8143ndo8</p> <p>https://www.youtube.com/watch?v=VExt_o7uM_c</p> | <p>Investigating biomes from ducksters.com</p> <p>Biomes of the world with a map and information from blueplanetbiomes.org</p> <p>Information on the major biomes of the world from ucmp.berkeley.edu</p> <p>More information on the major biomes of the world from cotf.edu</p> <p>Biome by biome from mbgnet.net</p> <p>Vocabulary:</p> <p>Biome</p> <p>Ecosystem</p> <p>Climate</p> <p>Temperature</p> |
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Enquiry 2: How do plants and animals adapt to their environment. ?

| Links to previous learning | Knowledge and second order concepts | Geographical skills: | Assessment criteria: | Curriculum Links: |
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| | <p>Substantive knowledge: <i>(What the children should know.)</i></p> <p>How have animals adapted their bodies to their Biome?</p> <p>How have plants adapted to their biomes?</p> <p>How have animals adapted their behavior to their biome?</p> | <p>use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied</p> <p>Locational Knowledge</p> <p>locate the world's countries, using maps to focus on Europe (including the location of Russia) and North and South America, concentrating on their environmental regions, key physical and human</p> | <p>Can your children:</p> <p>Explain that animals are physically and/or behaviourally adapted to their environment (biome)</p> <p>Identify some adaptations common to the major biomes.</p> | <p>Horizontal:</p> <p>Vertical:</p> |

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| | | characteristics, countries, and major cities | | |
| | | Place Knowledge: | | |
| | | understand geographical similarities and differences through the study of human and physical geography of a region of the United Kingdom, a region in a European country, and a region within North or South America | | |
| Suggested activities: | | Resources: | Useful links: | |
| <p>Begin by explaining the concept of adaptation by asking students to mind map what animals need to survive. Then ask them what animals might do if one of those essential elements was restricted. This should prompt them into the idea of adaptation.</p> <p>Set up multiple stations for students to explore varieties of adaptation across similar animals.</p> <p>Station #1-Compare/Contrast Adaptations Students will look at five sets of photos of animals from the same families. They will compare and contrast the animals’ adaptations. Ex: sea turtle and snapping turtle; pelican and albatross; frog and toad; gecko and lizard; etc.</p> <p>Station #2-Behavioral or Structural Adaptation? Students will divide pictures of animals into behavioral adaptation or structural adaptation. Students will record responses in notebooks to justify why each animal was placed in each category. Ex.: bear, skunk, goose, elephant, giraffe, etc.</p> <p>Station #3-Hibernate, Migrate, or Hang out? Students will divide pictures of animals into the three categories of hibernate, migrate, or hang out. Ex.: bear, skunk, bat, goose, hummingbird, elk, deer, squirrel, etc.</p> | | <p>Pictures of animals with structural adaptations</p> <p>Pictures of animals with behavioural adaptations</p> <p>Labels: hibernate/migrate/hang out; behavioural/structural; camouflage/mimicry</p> <p>Pictures of animals with various adaptations (see examples in folder)</p> <p>Adaptation info sheets (in folder)</p> | | |
| | | | Vocabulary: | |
| | | | <p>Adaptation</p> <p>Biome</p> <p>Structural adaptation</p> <p>Behavioural adaptation</p> <p>Functional adaptation</p> | |

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| <p>Station #4-Camouflage or Mimicry? Students will divide pictures of animals into categories of camouflage or mimicry and explain why those animals fall into each category. Ex.: butterfly, stick bug, owl, moth, etc.</p> <p>Extension Beak Experiment: Students will experiment with different bird “beaks” to determine which beak is best for each food item. Students will use a toothpick, net, tweezers, spoon, scissors, and clothes pin to pick up various objects. The objects can be gummy worms, seeds, string, uncooked macaroni, grass, etc. Students will determine which beak works best for each food and why.</p> <p>Students have to pick a biome on a world biome map and design an imaginary animal and/or plant that is well adapted to the environment. These can be an amalgamation of the adaptations they have learned already, or inspiration from info sheets (in folder)</p> | | |
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| Enquiry 3: What are the biomes of South America? | | | | |
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| Links to previous learning | Knowledge and second order concepts | Geographical skills: | Assessment criteria: | Curriculum Links: |
| | <p>Substantive knowledge: <i>(What the children should know.)</i></p> <p>What are the biomes of South America?</p> <p>Where are these biomes located?</p> | <p>use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied</p> <p>Locational Knowledge</p> <p>locate the world’s countries, using maps to focus on Europe (including the location of Russia) and North and South America, concentrating on their environmental regions, key physical and human</p> | <p>Can your children:</p> <p>Identify key biomes in South America</p> | <p>Horizontal:</p> <p>Vertical:</p> |

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| | | characteristics, countries, and major cities | | |
| | | Place Knowledge: | | |
| | | understand geographical similarities and differences through the study of human and physical geography of a region of the United Kingdom, a region in a European country, and a region within North or South America | | |
| Suggested activities: | | Resources: | Useful links: | |
| <p>Introduce students to the simplified map of South American biomes, and compare it to a relief map of the continent.. Ask them to identify regions such as the Amazon Rainforest, and Andes mountain range and the biomes they are part of.</p> <p>Highlight for students four key regions: the Atacama Desert, the Andes Mountain Range, Patagonia and the Amazon and label the biomes they are a part of.</p> <p>Using an atlas students should label and identify the Atacama Desert, the Andes Mountain Range, Patagonia, and Amazon on a copy of a biomes map of South America, as these will form the basis of study in the remaining lessons.</p> <p>Use google earth/maps on the satellite setting to take a virtual tour of the key biomes. It is important to zoom in and out to show the location in context of wider South America. Recommendations:</p> <p>Andes: Dead Woman’s Pass on the Inca Trail : https://goo.gl/maps/3wfkkmUQ43Fszs6i7</p> <p>Atacama desert: https://goo.gl/maps/c8FipwTmcuUVFsug9</p> <p>The Savanna Grasslands in Patagonia on the Tierra del Fuego (land of fire) : https://goo.gl/maps/ZLYQnLFja8DQ89Y6</p> | | Relief map of South America (in folder) | | |
| | | Biome map of Continent (in folder) | | |
| | | | | Atlas |
| | | | Patagonia Andes Alpine Savanna | |

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| Enquiry 4: What is the Alpine biome like? | | | | |
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| Links to previous learning | Knowledge and second order concepts | Geographical skills: | Assessment criteria: | Curriculum Links: |
| | Substantive knowledge: <i>(What the children should know.)</i> What is the alpine climate like? How high is Alpine biome? Do animals live at the very top of the mountain range? What animals are unique to the south American Andes? | <div></div> <div>Locational Knowledge</div> <div></div> <div>Place Knowledge:</div> understand geographical similarities and differences through the study of human and physical geography of a region of the United Kingdom, a region in a European country, and a region within North or South America | Can your children: Explain that the Alpine climate starts at 3000 meters above sea level Explain that temperature drops as you climb higher so nothing lives at the very top of mountain ranges such as the Andes. Identify numerous animals unique to the Andes Alpine biome and their adaptations. | Horizontal: Vertical: |
| Suggested activities: | | Resources: | Useful links: | |
| Use videos to introduce students to animals in the Alpine biome of the Andes mountains. Students should examine a diagram of the elevation of the Andes mountains and identify that the Alpine biome begins at about 3000 meters (examples in folder). Use google earth (not maps) in a chrome browser to look at the Andes Mountains in a 3D view. Searching for Machu Pichu is a quick way to get started. As you move the cursor the elevation above sea level in meters is displayed in the bottom right of the screen. Use this to show the range of elevation in the Mountains, and ask | | Andean animals https://www.youtube.com/watch?v=b8bljb9zFwY https://www.youtube.com/watch?v=PV8hCtEYomA https://www.youtube.com/watch?v=DX_FBTk0MaM | <div></div> <div>Vocabulary:</div> Elevation Altitude | |

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| <p>Students use the animals of Patagonia resources to build their classroom display.</p> <p>Teachers may wish to share a 1945 Argentinian video of beavers originally being introduced to Patagonia after being flow in from Canada. https://www.youtube.com/watch?time_continue=6&v=sp7Ks1PKSXY&feature=emb_title</p> <p>Students investigate the impact of beaver introduction on the Patagonian ecosystems.</p> <p>Introduce penguin adaptation to cold climates: https://www.bbc.co.uk/teach/class-clips-video/what-adaptations-do-penguins-have-to-survive-in-antarctica/z6rtscw</p> <p>Students may assume that penguins are limited to Antarctica, in fact many species of penguin make southern Patagonia their home. Use googleearth to show the proximity of southern Patagonia to the Antarctic peninsula and</p> | <p>Patagonia introduction</p> <p>https://www.youtube.com/watch?v=kKqXF_HDQhI&feature=emb_title</p> <p>Penguins</p> <p>https://www.youtube.com/watch?v=i551VJLnOIk</p> <p>https://www.youtube.com/watch?v=oXp_uVH4h5U</p> <p>https://www.youtube.com/watch?v=wAfBJbn-Sd0</p> | https://www.appropedia.org/The_Patagonian_Grassland_Conservation_Project |
| | | Vocabulary: |
| | | <p>Savannah</p> <p>Grassland</p> <p>Native species</p> <p>Fur trade</p> |

| Enquiry 6: How does life survive in the Atacama Desert? | | | | |
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| Links to previous learning | Knowledge and second order concepts | Geographical skills: | Assessment criteria: | Curriculum Links: |
| | <p>Substantive knowledge: <i>(What the children should know.)</i></p> <p>How do plants and animals adapt to the extreme temperature range and lack of rainfall in deserts?</p> <p>What is special about the Atacama desert?</p> | | Can your children: | <p>Horizontal:</p> <p>Vertical:</p> |
| | | Locational Knowledge | Explain that a desert is defined by lack of rainfall, not temperature | |
| | | Place Knowledge: | Explain some plant and animal adaptations to the environment. | |
| | | understand geographical similarities and differences through the study of human and physical geography of a region of the United Kingdom, a region in a European country, and a region within North or South America | | |

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| Suggested activities: | Resources: | Useful links: | |
| <p>Begin with students facing the back of the classroom. Play a video of desert animal or atmospheric sounds. When students take a guess, if they are successful they are able to turn around to see the video and enjoy watching the other students struggle to guess the animals. In the context of the biomes unit students should eventually work out that the animals will all be from the same biome, which will aid their guessing.</p> <p>Play a trivia or quiz game with students based on general desert biome facts (examples in folder) reward students with extra points if they can identify the question that relates to South America.</p> <p>e.g.</p> <p>The teacher should introduce the “Thumbs Up, Thumbs Down” activity. The teacher will read 10 desert facts—5 of which are true and 5 of which are false. After reading each card, the teacher should ask the students if it deserves a “thumbs up” (meaning what was read is true) or if it deserves a “thumbs down” (meaning what was read is false).</p> <p>During the day, the desert is very hot. At night, the desert gets very cold (TRUE)</p> <p>Antarctica does not have a desert. (FALSE)</p> <p>Half of the Earth is covered with deserts. (FALSE)</p> <p>Antarctica is the largest desert in the world. (TRUE)</p> <p>Many desert animals are nocturnal—they sleep during the day and are up at night. (TRUE)</p> <p>You can only find deserts in Africa. (FALSE)</p> <p>Many desert plants store water in their stems because it is so hot. (TRUE)</p> <p>Deserts have a lot of vegetation. (FALSE)</p> | <p>Desert animals</p> <p>https://www.youtube.com/watch?v=KePyyZ7t2x8</p> <p>Introduction to desert biome</p> <p>https://www.youtube.com/watch?v=DAs7lqce1cl</p> <p>https://www.youtube.com/watch?v=2QdlF6Ld1oc</p> <p>https://www.youtube.com/watch?v=hTfBSIYTG4k</p> | <p>Vocabulary:</p> <p>Desert Precipitation Nocturnal</p> | |

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| <p>Many desert animals store fat in one part of their body because the temperature is so hot. (TRUE)</p> <p>It never rains in the desert. (FALSE)</p> <p>Each student will be given an animal/plant to play. They are responsible for learning information about them, especially adaptations. Other students then interview each other to collect information about multiple desert species. (example interview worksheet in folder)</p> <p>These interviews may be incorporated into classroom display.</p> <p>Starting from this image: https://goo.gl/maps/1MxPwQVowTSEBgVv9 use google maps to explore the Atacama, visit the town of San Pedro. Students could write a story from the perspective of someone flying over the desert, like in the microlight and what animals and plants they might see. To compliment this students might choose an aspect of the desert and capture it as a screen grab to highlight the artistic qualities of deserts captured from the sky.</p> | | |
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| Enquiry 7: Why are there so many species in the Rainforest? | | | | |
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| Links to previous learning | Knowledge and second order concepts | Geographical skills: | Assessment criteria: | Curriculum Links: |
| Amazon rainforest from previous South America unit. | Substantive knowledge: <i>(What the children should know.)</i> What are the layers of the Rainforest? How do animals rely on each layer in their ecosystem? How is the soil of the rainforest different to other biomes? What are the adaptations of plants and animals to the Rainforest biome? | | Can your children: Identify the characteristic of the layers of the rainforest | Horizontal: Vertical: |
| | | Locational Knowledge | | |
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| | | Place Knowledge: | Explain how plants and animals have adapted to the rainforest biome. | |
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| Suggested activities: | | Resources: | Useful links: | |

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| <p>Begin by asking students to close their eyes and listen. Play a rainforest sounds video or similar. Ask students to imagine where they are, describe what they see, and identify any sounds they recognize.</p> <p>Follow with a revision activity on the importance of the Rainforest from the previous unit.</p> <p>Explain to the students that they are going to watch a short Eden Project video about the adaptations that plants have evolved to survive in the rainforest. Encourage the pairs of students to record key bits of information as they watch. For example – the main challenges the plants face and perhaps some of the adaptations that the plants have.</p> <p>Give pupils in pairs a worksheet showing a blank cross section of rainforest, with height labelled on the vertical axis. Label the layers of rainforest and decide which layers you are most likely to find particular adaptations in. Draw and label the adaptations.</p> <p>State a plant adaptation (eg thick, waxy leaves). Ask a student to explain why this adaptation has evolved and identify a plant (or picture of a plant) that exhibits this. If successful, this student then says the name of another adaptation and nominates a fellow student to explain. Repeat the process until all adaptations have been discussed.</p> <p>A model plant: Ask each student to design a model plant which is ideally suited to a tropical rainforest environment. Be able to explain the thought process. Students could engage in any number of creative rainforest representations:</p> <p>https://www.3dgeography.co.uk/rainforest-dioramas</p> <p>These should be annotated with information about plant and animal adaptations and how they relate to the layers of the rainforest. Students may wish to record a video pretending to be nature documentarians introducing their diorama/poster and explaining their understanding of the rainforest biome.</p> | <p>Rainforest sounds</p> <p>https://www.youtube.com/watch?v=8myYyMg1fFE</p> <p>Layers of the rainforest</p> <p>https://www.youtube.com/watch?v=XuJ8iip01YU</p> <p>https://www.youtube.com/watch?v=vy2UENSgZ6A</p> <p>Plant adaptations:</p> <p>https://www.youtube.com/watch?feature=player_embedded&v=C1lb0-BIBKU</p> | |
| | <p>Vocabulary:</p> <p>Understory Canopy Emergent</p> | |