

Physical Adaptations – Case Studies

Introduction

Adaptations are characteristics of organisms that make them suited to their environments. The two main types of adaptations are **physical** and **behavioral**. Physical adaptations are physical features, such as coat color, limb size, leaf types, or root systems. Behavioral adaptations are the things organisms do, either learned or instinctual, such as digging burrows, vocalizations, dropping seeds, and symbiotic relationships. Here, we will take a look at several physical adaptations of animals and plants for three very different environments, the arctic, the desert, and the rainforest.



Plants and animals, like this grass and these zebras, have many adaptations that allow them to survive in their environments.

Animal Physical Adaptations in Extreme Environments

Two animals that are physically adapted to extreme environments include the Arctic fox, which lives in a very cold climate, and the greater bilby, a desert-dwelling marsupial.

Ecobottle Sample

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The greater bilby lives in the deserts of Australia. They have silky, brownish-gray fur that acts as camouflage against the sand. A Bilby's strong forelimbs end in long claws, enabling them to dig in the dry, hard ground. They use these adaptations to dig burrows and uncover subterranean food (insects, seeds, and bulbs). Bilby's have large ears and a good sense of smell, both of which they use to find food. They also have long sticky tongues that allow them to lick seeds from the ground. They are well-adapted to the low water environment of the desert, obtaining all the water they need from their food. Bilby's carry their young in backward-facing pouches, which prevents dirt from getting into the pouch when they dig.



The greater bilby is adapted to life in a hot, dry environment.

Plant Physical Adaptations in Extreme Environments

Different plant species are also adapted to survive in extreme environments. The Arctic poppy and the desert cactus are two such species.

Reading Sample



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Rainforest plants have many and varied adaptations, so rather than focusing on a single species, this section will discuss the different traits rainforest plants have evolved for thriving in their environment. Buttress roots and stilt roots both allow trees to get enough nutrients from the thin soil of the rainforest floor. Buttress roots are large and widespread, providing increased surface area over which to absorb nutrients. In addition, buttress roots are thick and grow aboveground (up to 15 feet), lending stability to the tall trees. Because the soil is so thin, trees can't develop underground root systems with enough support to keep them upright. Buttress roots provide this support. Stilt roots are thinner than buttress roots, branching off from the trunk aboveground and growing down to anchor in the soil. The branch-like extensions form a cage, trapping soil beneath for added stability. The bark of rainforest trees is thin because there is no need to develop thick bark to prevent water loss. It is also smooth, perhaps to make it harder for other plants that may harm the tree to grow on them. When rainforest trees are young, some species grow red leaves. This color is thought to serve as sunscreen, protecting the leaves from some harmful wavelengths of light while they are growing and developing their photosynthetic structures. As trees get older, some grow leaves at off angles to one another so that they don't shade their own leaves. This allows better light absorption through as many surfaces as possible. Most rainforest leaves are also waxy and have pointed tips so that water runs off easily and doesn't pool, thus preventing algal growth.



Buttress roots are one plant adaptation for life in the rainforest.

Reading Comprehension Questions:

1. What are the two main types of adaptations?
2. Give
3. Give three adaptations of the greater bilby.
4. Give
5. Give three adaptations of the cactus.
6. Give
7. Give

Extension Questions:

8. Research what other animals have countercurrent heat exchangers. Choose one and explain why that is a good adaptation for its environment.
9. Choose

Ecobottle Sample



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