

Adult Guidance

Adaptation

Adaptation and Adaptive Traits

It is important that the children understand that adaptation is a process, not a part of a living thing. These are the adaptive traits.

Furthermore, misconceptions could arise with children mistaking behavioural traits with adaptive ones. So while the spikes of a hedgehog are adaptive traits, curling up if sensing it is in danger is a behavioural trait.

Behavioural Traits

Behavioural traits can also be referred to as acquired traits – i.e. those traits that we learn. Some living things have far more acquired traits than others, for example animals more than plants.

Plants do not have brains or neural tissues but nevertheless they have a sophisticated calcium-based signalling network in their cells similar to an animal's memory processes. Therefore, it is possible for plants to learn behaviour. A good example of this is the Mimosa plant, which can learn through repetition when to close its leaves and when not to depending on the likelihood of a damaging consequence.

Favourable and Unfavourable Adaptive Traits

It is essential that children understand that we are at a point in time where the vast majority of species have evolved so that they seem entirely suited to their habitat or environment. However, as will be explored in Lessons 4 and 5, those living things where either no mutations or mutations that were unfavourable to surviving and reproducing, have become extinct. If they had lived at a different point in the past, they would have seen a greater variety of the same species than now.

Accidental Adaptations

It is also important to reinforce in this, and future lessons, that adaptation is accidental (not deliberately caused). A good example would be to highlight marine mammals such as whales and dolphins, who have never developed gills despite living entirely in the water. As they have lungs, they have to surface in order to breathe. In other ways they are 'fish-like' in terms of adaptive traits such as fins and tails.

Additionally, mutations in genes can occur due to the environment affecting the living things cell structure and DNA. Again, this is not deliberate and any adaptive traits that are the result of this are entirely accidental.

Theories of Adaptation and Evolution

Over the last 200 years the narrative relating to life on earth and how it has developed has changed significantly due to scientific breakthroughs.

It is important that children understand that we are still making discoveries in this area and that explanations put forward as little as 20 or 30 years ago have changed profoundly (for example the idea of genes as solitary structures controlling a specific aspect of development, instead we know now that genes interact and affect one another in many yet unknown ways).