

Creature Features – 1st Grade

Summary

Students learn how seeds are dispersed, how nature inspires inventions, and how animals have features that help them thrive in their habitats. Students will meet a snake as they learn about how animals use their senses, and a toad as they learn about life cycles. In May, students can go into the butterfly house to observe animals using native plants for food and shelter. *This program is 90 minutes.*

Objectives

- Students will understand that animals have special body parts which help them to survive in their habitats
- Students will be able to compare and contrast human *inventions* with their animal inspirations
- Students will understand that animals use their *senses* in much the same way that humans use their senses – as a way to interpret the environment around them
- Students will determine methods of *seed dispersal* by testing them
- Students will learn how baby animals can look more or less like their parents as they go through *life cycles*

Key Terms

Inventions – something new created to solve a problem

Senses – the different parts of our bodies that help us notice things about the world; humans use sight, hearing, smell, touch, and taste; animals use senses too but sometimes in surprising ways.

Life Cycle – the growth that a living thing goes through from birth to death

Habitats - a living' thing's home; there are many different kinds of habitats on planet Earth, such as a desert, a forest, or a coral reef bed

Background Information

Biomimicry

Biomimicry is simply inventions inspired by nature. Historically many inventors have gotten ideas for technology that would benefit people by observing organisms and stealing ideas from their physiology and processes. One of the best known examples of this was when a man by the name of George de Mestral was hiking in the Swiss mountains when he noticed tiny cockle-burs stuck on his pants and socks in 1941. Upon closer examination he noticed the tiny hooks on the cockle-burs that grabbed onto and stuck to the fibers on his clothes. He realized the potential for this to be a useful tool for people and patented his Velcro in 1955. To this day researchers continue to study all kinds of living things in the field of 'bio-inspired design'. Many engineering schools have entire departments dedicated to this field! Here are close-up photos of cockle-burs and Velcro:



Adaptations

An adaptation is an organism's body parts or behaviors that help it to survive in the wild. All animals – even humans – have adaptations. We have large brains, opposable thumbs, bipedal legs, and empathy – all things that you can argue make us uniquely suited to live on planet Earth. Some animals may have incredibly specialized features – like the pouch on a female marsupial, or the narrow beak on a hummingbird. Many of these adaptations are genetically inherited, but some might be learned behaviors. For example, beavers have the innate instinct to chew or gnaw on wood, probably because of their extra long front incisors. Without this gnawing behavior, their teeth would grow too long and could pose a threat (inhibit them from eating properly). However, turning that gnawed-on wood into a beaver dam or lodge is a completely learned behavior. Beavers that have been raised in captivity do not possess this instinct and therefore just leave their branches and twigs scattered about once they're done chewing on them. All adaptations make living things especially suited for the habitats in which they live. A polar bear wouldn't survive very well in Southern California – why? For many reasons – but perhaps the first that comes to mind is its camouflage. Although polar bear hairs are technically translucent, they appear white when grouped together. The white camouflage makes polar bears blend in with their arctic surroundings, which means they can hide better from the animals that they hunt. Polar bears would not have this camouflage in any other kind of habitat.

Seed Dispersal

All plants need water, air, sunlight, and space to survive. The first three needs mentioned are obvious, but many people overlook 'space'. We forget about how important a plant's root structure is. It not only absorbs groundwater for the plant (which is then needed for photosynthesis), but the root structure also keeps the plant in the ground and upright, so that the plant can reach up towards the sunlight (also needed for photosynthesis). Plants make more plants by creating and releasing seeds at different times of the year. If these seeds fell straight to the ground and stayed there, they would not be able to grow. The shadow cast by the parent tree's canopy would prevent sunlight from reaching the seeds, any water that falls on the ground will get sucked up by the parent tree, and most importantly there is not enough SPACE for the new seeds to spread their roots. Therefore, seeds must travel to new places. They can do this several clever adaptations. Some seeds are lightweight and aerodynamically shaped to be able to fly in the wind. Other seeds are buoyant and can float in water. Some seeds are round and prone to rolling away. Some seeds even rely on animals for their dispersal. Some animals accidentally pick up barbed seeds in their fur (see Velcro example above), while others ingest seeds that are encased in delicious fruits (like a peach or an apple) and then conveniently fertilize these seeds upon defecation! Here are some examples of seed shapes that allow for different types of dispersal:



Animal Senses

Our senses help keep us safe – they tell us important information about the world around us, and they alert us to when there is danger afoot. Many animals use senses in much the same way we humans do. Birds of prey (like hawks and eagles) have excellent eyesight, which helps them hunt for small animals. Bats use a unique kind of hearing called echolocation, so that they can more accurately pinpoint where insects are flying around when they hunt at night. Some butterflies can taste with their feet – to help identify if they have landed on the right plant species for laying their eggs (some caterpillars are very particular about what they eat!). Snakes (in)famously smell with their tongues – the scent particles from the air stick to their tongues when it appears they are 'hissing'. Then an organ in the roof of their mouth acts like a smell-o-matic and sends a signal to the brain for processing. Many mammals have whiskers which are used for spatial awareness. If a rabbit tries to enter a burrow that is too small for her, her whiskers will touch the sides of the burrow and the vibrations let her know not to enter.