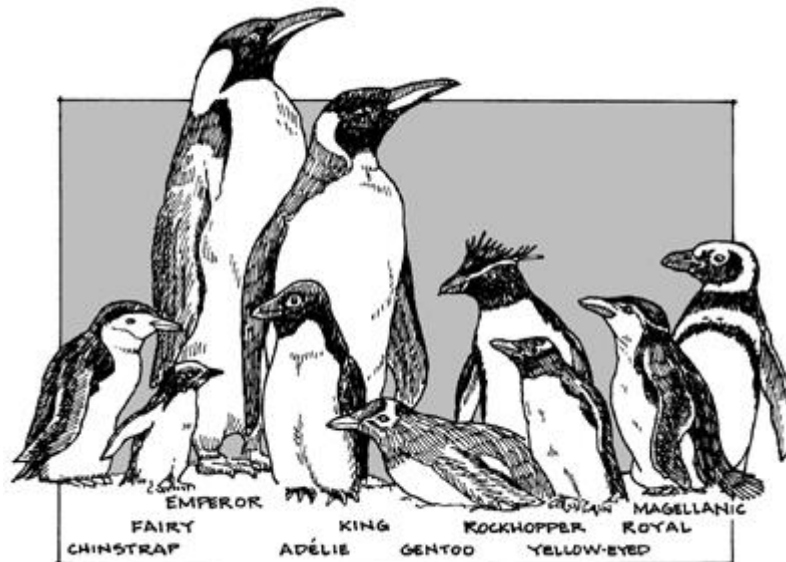
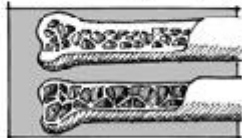
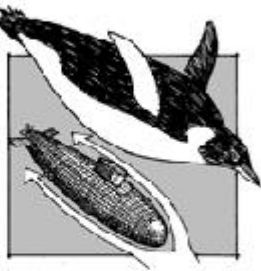


# Penguin Adaptation



Penguins are designed for life in the sea. Some species spend as much as 75% of their lives in the water. (They lay their eggs and to raise their chicks on land.) Heavy, solid bones act like a diver's weight belt, allowing them to stay underwater. Their wings, shaped like flippers, help them "fly" underwater at speeds up to 15 mph. A streamlined body, paddle-like feet, insulating blubber, and watertight feathers all add to their efficiency and comfort underwater. They also have a remarkable deep-diving ability.



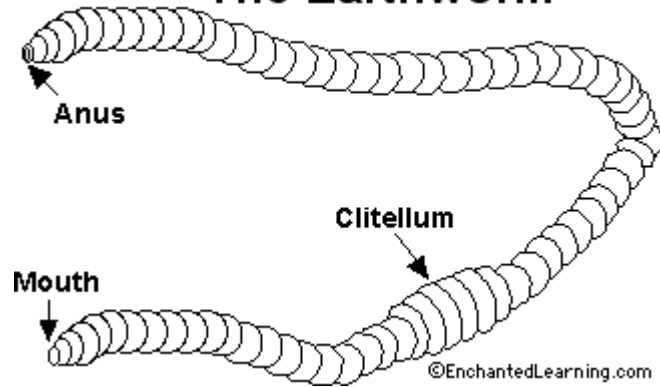
In addition to blubber for insulating warmth, penguins have stiff, tightly packed feathers (up to 70 per sq. in.) that overlap to provide waterproofing. They coat their feathers with oil from a gland near the tail to increase impermeability. Black and white countershading makes them nearly invisible to predators from above and below.

Like most birds, penguins have little or no sense of smell (a boon for those in a crowded penguin rookery!) Like other birds, their sense of taste is also limited. Their vision appears to be better when they are underwater. Scientists suspect they may be nearsighted on land.

Penguins are considered to be the most social of birds. Rookeries may contain thousands of individuals. (As many as 24 million penguins visit the Antarctic continent!) Even at sea, they tend to swim and feed in groups.

Most species of penguins build nests, but the nests may consist only of a pile of rocks or scrapings or hollows in the dirt. Emperor penguins build no nests; they hold the egg on top of their feet under a loose fold of skin called the brood patch.

## The Earthworm



Earthworms are an organism which has been able to survive for millions of years due to the fact that they have been able to adapt to their surroundings in order to survive. Adaptation is an alternation or adjustment by which a species or individual improves its condition in relationship to its environment. Earthworms have adapted in many ways over the pass generations in order to improve reproduction, to get food and to improve their defenses.

Earthworms live in moist soil which contains organic matter. Earthworms do not have eyes or ears but they have a mouth and are sensitive to heat, light and touch. This adaptation is important to the survival of the earthworm. In the winter the earthworm travels deep in the soil to avoid the frost. In the hot summer the worm also travels deep into the soil in order to avoid dehydration. During the night an earthworm surfaces to let off their castings.

The earthworm moves by stretching its front section through the soil and then pulling its hind section up. The earthworm has two kinds of muscles that it uses to move. The circular muscles surround the worm's body and can make the body shrink or spread out. The longitudinal muscles run along the length of the body and can shorten or lengthen the worm. An important adaptation for the movement of the worm are the setae. These are tiny bristles which cover the body of the worm and enable the worm to grip the soil as it passes through. This really helps the worm moves through the soil quickly without slipping.

The earthworm is a hermaphrodite. This means the earthworm contains both male and female reproductive organs. The eggs which contain yolk are buried in the earth in capsules formed from secretions of the clitellum. The clitellum is the thickened section of the body near the front end. The capsules protect the young until they hatch as worms. The fact that the earthworm is a hermaphrodite means the earthworm can easily reproduce which is an excellent adaptation. Another adaptation would be the protective capsules around the eggs. This would give the eggs a better chance of hatching without being damaged in any way.

The earthworm eats decaying matter in the soil. They then let off castings which are good for plant growth. The worm's ability to move through the soil quickly makes it very easy for the earthworms to find the right decaying matter to get food. Also decaying matter is very plentiful.

The earthworm plays an important role in soil ecology and are a source of food for many animals. There is a huge amount of worms found in soil all around the world which is once of the main reasons that earthworm is such a great organism today. Great amounts of an organism means more variation which leads to better adaptation. The earthworm is a very common and plentiful organism which has adapted very well.