

Identifying Animals

Objective

To use simple biological keys to examine the physical characteristics of species and identify their names.

Background Information

It is estimated that there are nearly 9 million species of living things on the planet. This vast figure includes everything from microscopic bacteria and fungi to large mammals and birds. Of this 9 million species, there are approximately 1.5 million species living in the sea, many of which have not yet been discovered. Over time, new species evolve and others become extinct. Extinctions may be caused by natural events such as a volcano erupting and wiping out an island colony, or may be due to human actions such as hunting.

Biodiversity

Biodiversity is the variety of living things existing on Earth. An environment can be described as rich in biodiversity; it has many different species surviving in it, or poor in biodiversity; lacking a variety of species living within it.

Experiences and Outcomes

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I can identify and classify examples of living things, past and present, to help me appreciate their diversity. I can relate physical and behavioural characteristics to their survival and extinction.

For centuries scientists have been discovering new species and classifying them into groups according to their common characteristics. Each organism is grouped into categories according to its features and given a name.

The classification system starts by organising living things into kingdoms and then each kingdom is further organised into a 'phylum'. The phylum is then split into a 'class', then 'order', 'family', 'genus' and finally 'species' – the last grouping which contains only one kind of organism.

There are 5 kingdoms of living things:

Animals including organisms with backbones such as mammals, fish and birds or organisms without backbones such as insects, crustaceans and molluscs.

Plants including algae, liverworts, mosses, conifers and flowering plants. Algae such as seaweed dominate the marine environment and there are plants specialised to live in the coastal zones of the sea.

Monera, this group is made up of simple single celled organisms including bacteria and blue-green algae.

Fungi, there are over 500 species of marine fungi, some of which grow on the bodies of other animals such as fish.

Protists are simple organisms, most of which are only one cell in size. There are over 6,000 species and includes phytoplankton, which are able to photosynthesis like plants.

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Here is an example of how we group animals according to their features – a thornback ray is classified like this:

Kingdom: Animalia. This group includes organisms that need to eat other organisms for energy. All animals can move around for at least part of their lives.

Phylum: Chordata. Animals in this group have a backbone.

Class: Chondrichthyes. This group includes all fish with a skeleton made from cartilage – such as sharks and rays

Order: Rajiformes. Skates and rays are flattened with wing-like pectoral fins and the mouth on the underside.

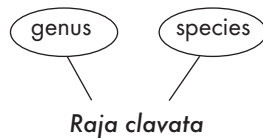
Family: Rajidae. A group of egg-laying rays with a long thin tail but no poisonous spine (as in sting rays).

Genus: Raja. Includes several types of ray with two small dorsal fins near the tip of the tail, brownish colouration, spots and spines.

Species: Raja clavata. Specifies a single type of ray with large spots and spines down the centre of the back and tail.



The naming system that scientists use is called 'binomial nomenclature' (a two part name) and is written in Latin so that it can be identified by individuals worldwide regardless of cultural languages. This two-part name is made up of both the genus and the species; so a thornback ray's scientific name is:



Although animals are classified into groups with common characteristics, some species share traits with other groups. The most common example is the duck billed platypus, it has fur like a mammal but also has a beak and lays eggs like a bird. The descriptions of the animal groups on the following pages are typical features of each group but some species can be difficult to classify.

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Exploring the Animal Kingdom

The animal kingdom branches into:

- **Invertebrates**, animals without backbones
- **Vertebrates**, animals with backbones.

Invertebrates

These animals lack a backbone in their bodies. 97% of all animals are invertebrates and in the marine environment there are over 160,000 known species. There is an incredible diversity of invertebrate forms, from simple sponges and jellyfish to octopuses and insects. There are no marine insects so insects have not been described below.

Sponges are very simple animals; they come in all shapes, colours and sizes. Sponges stick to the sea floor and feed by drawing water in through hundreds of holes in their bodies, filtering it for food and pushing it out again.

Anemones, corals and jellyfish have a circular body shape with a central mouth that is surrounded by stinging tentacles. They may exist as stuck-down polyps, like sea anemones, or be free-swimming like adult jellyfish.

Worms have long bodies with a head end and a tail end. They may be flat, round or segmented. Familiar marine worms include lugworms and peacock worms.

Molluscs have a head, a soft body and a muscular foot and some have shells. They are a diverse group and include gastropods (snails with a single shell), bivalves (with two-part shells such as oysters, mussels and clams) and cephalopods – octopus, squid and cuttlefish.

Arthropods are a large group of animals with over 1.5 million species on the planet. It includes crustaceans such as crabs, lobsters, shrimps and barnacles. All have several pairs of jointed limbs, a tough external skeleton and stalked eyes.

Echinoderms, the spiny skinned animals, are all marine animals and include starfish, sea urchins, brittle stars and sea cucumbers. These animals have radiating body parts (star-shaped), with a central mouth and special tube feet for moving around.

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Vertebrates

There are 5 groups of vertebrate; mammals, birds, reptiles, amphibians and fish.

Fish are cold blooded animals with scales covering their bodies. They breathe air through gills. Fishes' eggs are laid and hatch in water. The egg contains nutrients which the young uses to develop before it hatches and is left to fend for itself alone in the sea.

Amphibians are cold blooded animals with soft leathery skin. Amphibians breathe air through gills when they are young and lungs when they are adults. They lay eggs outside their bodies, in water. After hatching they spend part of their life in the water before they lose their gills and come onto land. There are no marine amphibians.

Reptiles are cold blooded animals; they breathe air through lungs and have scales covering their bodies. The female lays eggs in the ground that are fertilised outside her body. The egg contains nutrients which the young uses to develop before it hatches. The parents do not nurture either the egg or the young.

Birds are warm blooded animals and breathe through lungs. Their bodies are covered with feathers and their feet are covered in scales. The adult birds mate and fertilisation occurs inside the female's body, eggs are laid in nests and the young are protected in a hard shelled egg which contains nutrients for the developing chick. The parents nurture the egg until it hatches, and care for the young after it has fledged.

Mammals are warm blooded animals and most have hair or fur on their bodies, they breathe through lungs and the young develop inside the female gaining nutrients from a placenta. After birth the young suckle milk from the mother and stay with her several months or years.

Biological keys are used to distinguish the differences between living things and identify each individual plant or animal to its species. Scientists use biological keys to ensure the correct plant or animal is identified and this is very important, to understand population numbers, their distribution and to help conserve species that are under threat.

Activity

Identifying Animals Worksheets 1, 2 and 3

Use the Identifying Animals Activity Worksheets. Follow the keys to identify the creatures and their proper name.

Discussion Points and Follow-on Activities

Further investigation into identification keys.
Study the adaptation of different species to their survival.
Investigate the Latin names of the animals found in the worksheet.