

Living things and their habitats

Classification:



- Animals and plants can be classified into different groups based on their characteristics.
- Animals can be grouped into vertebrates (with a backbone) and invertebrates (without a backbone).
- They can then be subdivided into further groups, for example mammals, fish, reptiles etc. (vertebrates) or spiders, snails, worms etc. (invertebrates).
- Plants are commonly grouped into flowering plants and non-flowering plants. They too can be sub-divided beyond these broad classifications.

Classification of Animals:

M-R-S G-R-E-N

You can remember the seven features of living things by using the acronym MRS GREN (Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion and Nutrition).

Mammals	Bears, Lions, Dogs, Cats, Rabbits, Squirrels, Whales, Monkeys, Horses, Cows, Pigs, Sheep, Tigers, Humans.	Snails	Garden Snail, Scutalus, Giant African Land Snail.
Mammals -Mammals are warm-blooded. -They often have hair/fur on their bodies. -Mammals give birth to live young. -Mammals often drink milk from their mothers.		Snails -Snails have shells. -They have a large muscular foot, which secretes mucus. -Their stomach is directly above their muscular foot. -Most snails live underwater.	
Reptiles -Reptiles are cold-blooded. -They normally lay eggs (but some don't). -Reptiles have scales or scutes.	Crocodiles, Lizards, Turtles, Chameleons, Snakes, Geckos, Iguanas, Dinosaurs.	Slugs -Slugs do not have shells. -They have a large muscular foot, which secretes mucus. -Their stomach is directly above their muscular foot.	Leopard Slug, Black Slug, Yellow Slug.
Amphibians -Amphibians are cold-blooded animals. -They have moist, scaleless skin. It is often permeable. -Amphibians lay eggs.	Frogs, Salamanders, Toads, Newts, Tadpole.	Worms -Worms have long, narrow bodies. -Worms do not have limbs (arms and legs). -They are bilaterally symmetrical (both sides the same).	Flatworms, Round Worms, Segmented Worms
Fish -Fish are cold-blooded animals. -Fish can breathe underwater, using gills. -Fish lay eggs. -Fins help to propel fish through the water.	Sharks, Goldfish, Carp, Swordfish, Stingray, Clownfish, Pike, Salmon, Bass, Haddock, Tuna, Cod, Eel, Turbot.	Spiders -Spiders have eight legs. -Spiders bodies are made of two main parts. -Spiders create silk from their spinneret glands. -Spiders lay eggs.	Tarantula, Wolf Spider, Huntsman Spider, Widow Spider.
Birds -Birds are warm-blooded. -Birds have feathers, wings and a beak. -Birds lay eggs.	Parrot, Owl, Eel, Flamingo, Penguin, Puffin, Chicken, Toucan, Blackbird, Sparrow, Pigeon.	Insects -Insects have exoskeletons: hard shell-like coverings of their body. They also have three main body parts. -They have antennae on the top of their heads.	Beetle, Ant, Fly, Flea, Butterfly, Mosquito, Bee, Cricket.

Classification in local habitats:



Garden

- Vertebrates: Mammals = cats, dogs, rabbits, foxes. Birds = sparrow, robin, crow. Amphibians = frogs, toads.
- Invertebrates: Insects = bee, wasp, fly, Spiders, Worms = earthworm, Snails = garden snail, Crustaceans = woodlouse.



Seaside

- Vertebrates: Mammals = Beach mice, Birds = seagulls, pigeons, Reptiles = sea turtles, Fish = cod, haddock.
- Invertebrates: Crustaceans = crabs, lobsters, prawns, Echinoderms = starfish, sea cucumbers, sea urchins.



Forest

- Vertebrates: Mammals = badger, deer, squirrel, boar, pine marten. Birds = woodpecker, owl, warbler. Reptiles = adder, lizard, slowworm.
- Invertebrates: Spiders: harvestman, woodlouse spider, Insects: Ants, crickets, grasshoppers.

Linnaeus classification system:

Carl Linnaeus

Carl Linnaeus was a Swedish scientist, botanist and zoologist who is known as the 'father of taxonomy.'

He created something called the binomial nomenclature, which was a way of classifying plants and animals (taxonomy).

He classified man among the primates, which brought him criticism at the time!

He was made a noble by the Swedish King. He lived from 1707-1778. Parts of his system are still used today.

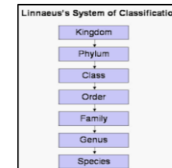


Classification System

Linnaeus gave each organism a two-part Latin scientific name, based on their genus and species. A genus is a group made up of several species.

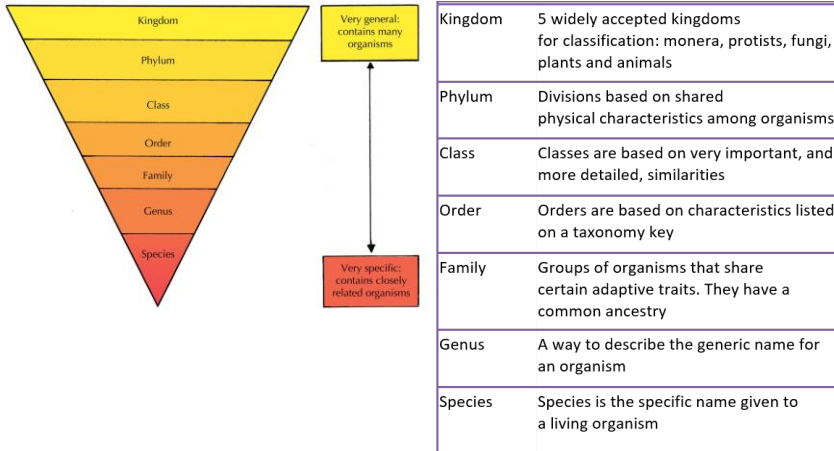
For example, the genus 'Pan' is made up of the chimpanzee (pan troglodytes) and the bonobo (pan paniscus).

His scientific process involved observing, recording the information and making conclusions.

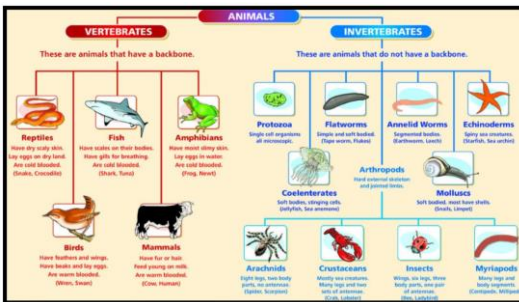


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Greek Gods and Goddesses:



Examples of Classification:

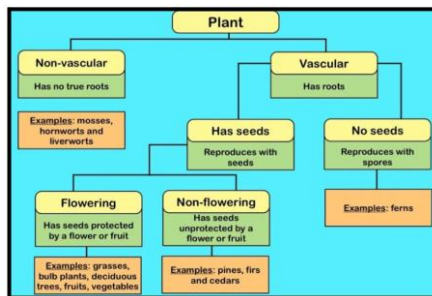


Animals can be divided into groups or 'classified' by looking at the **similarities** and **differences** between them.

Animals are divided into two main groups:

- Animals that have a **backbone** are called **vertebrates**.
- Animals that don't have a **backbone** are called **invertebrates**.

Plants are divided into two main groups. The largest group contains the **plants** that produce seeds. These are **flowering plants** (angiosperms) and conifers, Ginkgos, and cycads (gymnosperms). The other group contains the seedless **plants** that reproduce by spores.

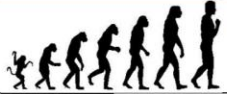
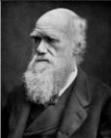



Key Vocabulary

Amphibian	A cold-blooded vertebrate animal that comprises frogs, toads, newts, salamanders and caecilians
Annelid	A segmented worm
Arachnid	An animal that has eight legs and a body formed of two parts
Bird	A warm-blooded egg-laying vertebrate animal distinguished by the possession of feathers, wings, a beak and typically able to fly
Crustaceans	Mostly live in water with a hard shell and segmented body
Habitat	The natural home or environment of an animal, plant or other organism
Insect	A small animal that has six legs and generally one or two pairs of wings
Invertebrate	An animal lacking a backbone
Mammal	A warm-blooded vertebrate animal, distinguishable by the possession of hair or fur, females secreting milk for young and typically giving birth to live young
Microorganism	A microscopic organism, especially a bacteria, virus or fungus
Reptile	A vertebrate animal that has dry scaly skin and typically lay soft-shelled eggs on land
Taxonomy	The science of naming, identifying and classifying organisms
Vertebrate	An animal with possession of a backbone/ spinal column

Evolution and Inheritance

Key information:

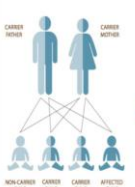
Evolution	 The process by which living things can gradually change over time.
Charles Darwin	 Charles Darwin published a book on his theory of Natural Selection in 1859.
Mary Anning	 Over the course of her life she made many incredible discoveries. This made her famous among some of the most important scientists of the day. They would visit her for advice and to discuss scientific ideas about fossils. Today, Mary is remembered as one of the greatest fossil hunters to have ever lived.
Recessive genes	A recessive gene is a gene that can be masked by a dominant gene. In order to have a trait that is expressed by a recessive gene, such as blue eyes, you must get the gene for blue eyes from both of your parents.
Natural selection	The process whereby organisms better adapted to their environment tend to survive and produce more offspring. The theory of its action was first fully expounded by Charles Darwin, and it is now regarded as the main process that brings about evolution.
Inherited characteristics	Inherited. ... Something you receive from your parents, grandparents, or other family members is inherited. Some things are inherited genetically, like blue eyes, freckles or a personality trait such as rolling your tongue.
Dominant characteristic	Being or produced by a form of a gene that prevents or hides the effect of another form A dominant gene produces brown eye colour
Mutation	The changing of the structure of a gene, resulting in a variant form which may be transmitted to subsequent generations, caused by the alteration of single base units in DNA, or the deletion, insertion, or rearrangement of larger sections of genes or chromosomes
Reproduction	The process by which a living organism creates a likeness of itself.

Key Vocabulary

Adaption	The process of change so that an organism or species can become better suited to their environment
Body fossil	Preserved remains of the body of the actual animal or plant itself
Breeding	The mating and production of offspring by animals
Environment	The surroundings or conditions in which a person, animal, or plant lives
Evolution	The process by which different kinds of living organism are believed to have developed from earlier forms during the history of the earth
Fossil	The remains or impression of a prehistoric plant or animal embedded in rock and preserved
Inherit	To gain a quality, characteristic or predisposition genetically from a parent or ancestor
Offspring	A person's child or children/ an animal's young
Reproduction	The production of offspring by a sexual or asexual process
Selective breeding	The process by which humans use animal breeding and plant breeding to develop selective characteristics by choosing particular animals and plants
Trace fossil	Indirect evidence of life in the past such as the footprints, tracks, burrows, borings and waste left behind by animals

Inheritance and mutation:

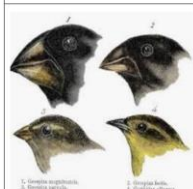
Evolution is the name given for changes to a species over time.



- Living things produce offspring of the same kind.
- Some of a parent's characteristics are passed down to the offspring – this is called inheritance.
- This is why we often share similar features with our parents, and some conditions are shared (see image).
- Inheritance is **genetic**, not environmental. E.g. If two blonde-haired parents dye their hair black, this does not mean they will have a black-haired child.
- Some features are new to the offspring. These are called mutations. This is why we are not exact copies of our parents.
- These changes in offspring **over time** allow evolution to take place.

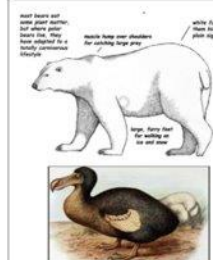
Evidence of Evolution:

Fossils are the remains of living things, found in sedimentary rocks.



- When paleontologists compare animals in fossils to animals today, they can see similarities and differences between them.
- e.g. Fossils show that giraffes necks did not used to be as long. They have developed over time to reach high branches.
- Living things also provide evidence of natural selection and evolution.
- e.g. On the Galapagos Islands, Charles Darwin found differences between finches from island to island. They had adapted for the different foods that they eat.

Inheritance and mutation:



- Sometimes, changes that offspring have from their parents are advantageous – they allow the offspring to cope better in their environment.
- However, often the changes are not advantageous (called maladaptations). When this is the case, the offspring will find it more difficult to thrive.
- Natural selection can ensure that, over time, the advantageous characteristics survive in the species.
- For example, many polar animals have adapted to possess layers of blubber and/or fur (for warmth) and white outer coats (for camouflage).
- The dodo, with no predators on its island, had adapted in a number of ways that made it unable to survive when humans arrived (maladaptations).