



KNOWLEDGE ORGANISER

SCIENCE: THE NATURE LIBRARY

YEAR SIX

KEY KNOWLEDGE:

QUESTION 1: How are vertebrates grouped together?

ANSWER

Vertebrates are classified by the chordate subphylum vertebrata. Invertebrates are any other animal that is classified outside of that class.

There are currently around 65,000 known species of vertebrate animals. This sounds like a lot, but vertebrates are only around 3% of all the animals on Earth. Most of the animal species are invertebrates. Examples of how vertebrate animals are grouped are:

- Fish - Fish are animals that live in the water. They have gills that allow them to breathe under water. Different species of fish may live in fresh water or salt water. Some examples of fish include the brook trout, the great white shark, lionfish, and the swordfish.
- Birds - Birds are animals that have feathers, wings, and lay eggs. Many, but not all, birds can fly. Some examples of bird species include the bald eagle, the cardinal, the flamingo, ostriches, and the red-tailed hawk.
- Mammals - Mammals are warm-blooded animals that nurse their young with milk and have fur or hair. Some examples of mammals include humans, dolphins, giraffes, horses, and spotted hyenas.
- Amphibians - Amphibians are cold-blooded animals. They start out their lives living in the water with gills just like fish. Later they develop lungs and can move to dry land. Amphibians include frogs, toads, newts, and salamanders.
- Reptiles - Reptiles are cold-blooded animals which lay eggs. Their skin is covered with hard and dry scales. Reptile species include alligators, crocodiles, snakes, lizards, and turtles.

Vertebrate animals can be either warm-blooded or cold-blooded. A cold-blooded animal cannot maintain a constant body temperature. The temperature of their body is determined by the outside surroundings. Cold-blooded animals will move around during the day between the shade and the sun to warm up or cool down. Cold-blooded animals are ectothermic, which means outside heat. Reptiles, amphibians, and fish are all cold-blooded.

Warm-blooded animals are able to regulate their internal temperature. They can sweat or pant to cool off and have fur and feathers to help keep them warm. Warm-blooded animals are called endothermic, meaning "heat inside". Only birds and mammals are warm-blooded.



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QUESTION 2: How are invertebrates grouped together?

ANSWER

Invertebrates as a group do not have a specific classification. Since vertebrates are classified by the chordate subphylum vertebrata, invertebrates are any other animal that is classified outside of that class.

Mammals, amphibians, reptiles, fish, and birds all have vertebrae. This might seem like a lot of the animals you know, but all these animals make up less than 4% of the total animals species. This means that over 96% of all the animal species on Earth are invertebrates.

Invertebrates are grouped into:

- Marine Invertebrates - There are a wide variety of interesting ocean animals that are invertebrates. These include sponges, corals, jellyfish, anemones, and starfish.
- Mollusks - Mollusks have a soft body that is covered by an outer layer called a mantle. Many mollusks live inside a shell, but not all of them. Some examples of mollusks include squid, snails, slugs, octopuses, and oysters.
- Crustaceans - Crustaceans are a type of arthropod, meaning that they have jointed legs. They also have an exoskeleton (their bones are on the outside like a shell). Some examples of crustaceans are crabs, lobster, shrimp, and barnacles.
- Worms - The term "worm" is not a scientific word, but is often used to refer to invertebrate animals that don't have legs. Worms may live in the soil, in the water, or even inside other animals as parasites. Some examples include the tapeworm, the leech, and the earthworm.
- Insects - Insects are part of the Earth's largest animal phylum, the arthropods. There are over 1 million species of insects including such animals as the grasshopper, dragonfly, yellow jacket, butterfly, and praying mantis.
- Spiders, Centipedes and Scorpions - These animals are all part of the arthropod phylum. Spiders and scorpions are arachnids because they have eight legs. Centipedes and millipedes are myriapods and have lots of legs. Some myriapods have as many as 750 legs. Some example species include the tarantula and black widow, which are both spiders.

QUESTION 3: What are Microorganisms?

ANSWER

Microorganisms are very tiny living things. They are so small that you need a microscope to see them. Microorganisms are all around us, in the air, in our bodies and in water. Some microorganisms are harmful to us, but others are helpful to us.

There are three types of microorganism:

- viruses
- bacteria
- fungi

