

Chapter 1 : Animals: 7 StudyJams! Interactive Science Activities | Scholastic

Invertebrates are not a taxon like vertebrates are, but rather a generic name for all the animals that do not have a vertebral column or spine. There are millions of invertebrate species, as more animals do not have a spine than have one.

Can be classified into five groups: The second group also have well-developed sensory organs, a respiratory system with either gills or lungs, and an advanced nervous system. Vertebrates are divided into two groups: Most of them cannot create their own food, however, invertebrates are capable of making their own. One is the radial symmetry plan a circular shape arranged around a central mouth , which includes animals who spend their adult lives stuck in one place; and the bilateral symmetry plan right and left halves that mirror each other and typically have a definite front and back end. This includes animals who move in search of food. Adaptation to the Environment Vertebrates have a highly developed nervous system, therefore can react very quickly to changes in their surroundings, giving them a competitive edge. On the other hand, most invertebrates have simple nervous systems, and behave almost entirely by instinct. They do not learn from their mistakes in the same way as vertebrates. Of course, there are exceptions. Since, octopuses are considered one of the most intelligent animals in the world. Read our AnimalWised article on some examples of vertebrate and invertebrate animals , to give you a better idea. The main groups of invertebrate animals Finally, what you came to discover! The seven major groups of invertebrates are: They are the simplest invertebrates. They live in water and filter food from the water that surrounds them. Ctenophora - Ctenophores are very similar to cnidarians; they usually have soft gelatinous bodies. There are very few Ctenophora, but they include: Cnidaria - Another ancient group of animals, cnidarians usually have stinging tentacles and can reproduce asexually. Cnidaria were grouped with Ctenophora for a long time but were placed in separate phyla after scientists discovered new differences between the groups. Animals in this group have a central opening surrounded by tentacles. This is how they get rid of waste. Echinoderms - Echinoderms notably have external skeletons. They are water animals that have a central opening for taking in food. These spiny, radial marine animals include: They have soft, tube-shaped bodies and a distinct head. Some worms even live inside other animals! Others live in the water or on land. Molluscs - Molluscs are soft creatures that usually reside inside a shell. They have a muscular foot that allows them to move and hunt for food. Some mollusks live on land. Others live in water. The mollusc classification includes: Arthropods - Arthropods are easily the largest group of animals on Earth thanks to the inclusion of insects. They also include arachnids, centipedes and crustaceans. They are found on land, in the water, and in the air. Some have legs and some have wings. These animals possess a segmented body, appendages and an exoskeleton. This classification includes arachnids like scorpions and spiders, crustaceans like crabs, lobsters and shrimp, and insects like ants, bees, beetles, butterflies, crickets, dragonflies, flies, grasshoppers, mosquitoes, moths, praying mantises and stick insects. We hope you found this article informative. If you did, you may be interested in the largest insects in the world and what are indicator species? If you want to read similar articles to Major Groups of Invertebrate Animals, we recommend you visit our Facts about the animal kingdom category.

Chapter 2 : Vertebrates and Invertebrates

Animals can be classified into two main groups: vertebrates and invertebrates. The main difference between vertebrates and invertebrates is that invertebrates, like insects and flatworms, do not have a backbone or a spinal column. Examples of vertebrates include humans, birds, and snakes. Due to.

Reproductive systems[edit] Nearly all vertebrates undergo sexual reproduction. They produce haploid gametes by meiosis. The smaller, motile gametes are spermatozoa and the larger, non-motile gametes are ova. These fuse by the process of fertilisation to form diploid zygotes , which develop into new individuals. Inbreeding[edit] During sexual reproduction, mating with a close relative inbreeding often leads to inbreeding depression. Inbreeding depression is considered to be largely due to expression of deleterious recessive mutations. In several species of fish, inbreeding was found to decrease reproductive success. Numerous inbreeding avoidance mechanisms operating prior to mating have been described. Toads and many other amphibians display breeding site fidelity. Individuals that return to natal ponds to breed will likely encounter siblings as potential mates. Although incest is possible, *Bufo americanus* siblings rarely mate. Advertisement vocalizations by males appear to serve as cues by which females recognize their kin. In guppies, a post-copulatory mechanism of inbreeding avoidance occurs based on competition between sperm of rival males for achieving fertilization. Active selection of sperm by females appears to occur in a manner that enhances female fitness. Outcrossing[edit] Mating with unrelated or distantly related members of the same species is generally thought to provide the advantage of masking deleterious recessive mutations in progeny [52] and see Heterosis. Vertebrates have evolved numerous diverse mechanisms for avoiding close inbreeding and promoting outcrossing [53] and see Inbreeding avoidance. Outcrossing as a way of avoiding inbreeding depression, has been especially well studied in birds. For instance, inbreeding depression occurs in the great tit when the offspring are produced as a result of a mating between close relatives. In natural populations of the great tit *Parus major* , inbreeding is avoided by dispersal of individuals from their birthplace, which reduces the chance of mating with a close relative. However, there are ecological and demographic constraints on extra pair matings. The first is through dispersal, and the second is by avoiding familiar group members as mates. Within their group, individuals only acquire breeding positions when the opposite-sex breeder is unrelated. Cooperative breeding in birds typically occurs when offspring, usually males, delay dispersal from their natal group in order to remain with the family to help rear younger kin. Parthenogenesis[edit] Parthenogenesis is a natural form of reproduction in which growth and development of embryos occur without fertilization. Reproduction in squamate reptiles is ordinarily sexual, with males having a ZZ pair of sex determining chromosomes, and females a ZW pair. However, various species, including the Colombian Rainbow boa *Epicrates maurus* , *Agkistrodon contortrix* copperhead snake and *Agkistrodon piscivorus* cotton mouth snake can also reproduce by facultative parthenogenesis -that is, they are capable of switching from a sexual mode of reproduction to an asexual mode- resulting in production of WW female progeny. Mole salamanders are an ancient 2. As a result, the mature eggs produced subsequent to the two meiotic divisions have the same ploidy as the somatic cells of the female salamander. Synapsis and recombination during meiotic prophase I in these unisexual females is thought to ordinarily occur between identical sister chromosomes and occasionally between homologous chromosomes. Thus little, if any, genetic variation is produced. Recombination between homeologous chromosomes occurs only rarely, if at all. However, meiosis may have been maintained during evolution by the efficient recombinational repair of DNA damages that meiosis provides, an advantage that could be realized at each generation. The capacity for selfing in these fishes has apparently persisted for at least several hundred thousand years.

Chapter 3 : Introduction to Animals | Basic Biology

Invertebrates are animals that do not have a spine, or backbone. Vertebrates are animals that do! Vertebrates are further classified into fish, amphibians, reptiles, birds, and mammals.

How are animals classified? What are vertebrate animals? The main characteristic of this group of animals is that they possess vertebrae. Commonly known as a spine, this is a highly specialized bone-type which joins together to compose a backbone. Its function is to protect and sustain the spinal cord and connect it to the nervous system. These animals are distinguished by their bilateral symmetry, and the fact that they have a skull to protect their brain. The bodies of vertebrate animals are divided into head, trunk and limbs, while some species also have a tail. Another important feature is that vertebrates have different sexes. There are approximately 62, animal species that belong to this group, so we have a wide range to choose our examples. One of the important ways to differentiate between vertebrates and invertebrates are their skeletons. Vertebrates will have some kind of endoskeleton. This means a skeleton which is on the inside of the body, either under the skin or further under tissue. This skeleton is not always made up of bone. Some fish and marine animals, for example, mainly have cartilage to support their frame. One fish, known as the hagfish, has some debate over whether they are a vertebrate. Although they have a cranium skull, they do not actually have vertebrae. Instead they have a notochord, similar to vertebrae in that it runs the length of their body, but which is much more flexible and supple. This allows them to curl easily. However, there are vertebrates which also have part of their skeleton on the outside an exoskeleton [1]. These animals such as a turtle which have the bones inside their body, but also have a hard shell which is used for protection. Other reptiles have large scales on the outside of their skin which are used for protection. The vertebrae is very important in housing the central nervous system of vertebrates. This system sends signals up and down the vertebrae to relay messages about movement, pain or any physical response the body might need. If the vertebrae is damaged, then these signals may not be able to transmit, resulting in incapacitation. Grouping any animal, whether vertebrate or invertebrate, requires a very complicated taxonomic organization. The taxonomy grouping of the animal kingdom starts with all living organisms, subdividing into different parts from major groups into individual species. One stage in this subdivision is the phyla which can be loosely described as being grouped according to body structure. Whether or not an animal has a backbone is a very important aspect because it affects so many aspects of how they live. What are invertebrate animals? Invertebrates are characterized by their lack of vertebrae, i. This is not true, of course. They just exist in a different way and are adapted to their environment differently. Examples of invertebrates and their habitat include jellyfish which live in the sea, bees which fly in the air and earthworms which live underground. No invertebrate will have a spine, but they can have a skeleton, i. Many insects such as the grasshopper seen in the picture below have exoskeletons which they may even shed. This supports and protects their body. A common example of an invertebrate with an exoskeleton is a cockroach which is infamous to humans for being resilient. However, there are invertebrates which have an endoskeleton. An octopus has an endoskeleton, although it is very soft and not made from bone like many vertebrates. As there are so many more invertebrate species than vertebrates, their taxonomic groups are vast. There are different types of land animals such as insects and worms. However, these too are very broad groups and there are many different types of worms with various body structures. This is not to mention other fascinating parts of their body structure such as tentacles [3] and the slime like substance which constitutes most of their body. Whether the invertebrate lives in the ocean or the desert, there are various examples which we can provide below. Examples of vertebrate animals Vertebrate animals can be categorized into 5 main groups: Mammals, birds, fish, amphibians, and reptiles. The following are examples of vertebrate animals, some of them given by their generic names; when we say "deer", we mean that all the species of deer are vertebrates, for instance. Many of these animals we only know from fossils as they are currently extinct. We can give you a list of vertebrates which are well-known to give you an idea of what we mean.

Chapter 4 : Invertebrate - Wikipedia

The IUCN estimates that 66, extant vertebrate species have been described, which means that over 95% of the described animal species in the world are invertebrates. Characteristics The trait that is common to all invertebrates is the absence of a vertebral column (backbone): this creates a distinction between invertebrates and vertebrates.

Students will be able to classify animals as a vertebrate or an invertebrate. Introduction Tell your students that they will be learning about vertebrates and invertebrates. Tell your students that a vertebrate has a backbone while an invertebrate does not. Ask your students if they are vertebrates or invertebrates. Tell them to write the different types for each kind in their columns as you explain them. Tell your students that there are five main types of vertebrates: Write these on the board. Give your students examples of each type, such as humans, crocodiles, goldfish, parrots, and frogs. Tell your students that there are five main types of invertebrates: Write these on the board and ask your students to write them in the second column. Offer examples of each, such as algae and bacteria, starfish, earthworms, octopi, and spiders. Tell your students to write the example that you give next to each kind in their columns as well. Go over the worksheet as a class. Independent working time Have your students complete the Animal Classes worksheet. Ask your students to pick an invertebrate. Have them go to the library and find a book on that invertebrate. Ask your students to find and write five facts about that particular invertebrate. Tell them to draw a picture of the invertebrate as well. Have your students come to the back of the class. Give them each ten index cards. Tell them to write the five kinds of vertebrates on five of the cards. They should use one card per kind. Show them a picture of each kind on the computer. Ask them to draw the picture on their card. Repeat this for invertebrates. Assessment 10 minutes Conduct a short quiz on vertebrates and invertebrates. Which type of animal has a backbone? Which type of animal does not have a backbone? Name any two types of vertebrates. Name any two types of invertebrates. Review and closing 15 minutes Ask your students to pick a vertebrate and an invertebrate. Instruct them to draw them on white paper. Ask your students to write the name of the vertebrate and invertebrate as well.

Chapter 5 : Lesson Day 1- Vertebrates vs Invertebrates | BetterLesson

All animals are simply divided into two groups; vertebrates and invertebrates, before they are minutely separated in different groups and sub-groups of the animal kingdom classification criteria. Before going into the details of evolutionary traits, identical traits, genetic differences, physical characteristics, etc., animals are first.

Characteristics The trait that is common to all invertebrates is the absence of a vertebral column backbone: The distinction is one of convenience only; it is not based on any clear biologically homologous trait, any more than the common trait of having wings functionally unites insects, bats, and birds, or than not having wings unites tortoises , snails and sponges. Being animals, invertebrates are heterotrophs, and require sustenance in the form of the consumption of other organisms. With a few exceptions, such as the Porifera , invertebrates generally have bodies composed of differentiated tissues. There is also typically a digestive chamber with one or two openings to the exterior. **Morphology and symmetry** The body plans of most multicellular organisms exhibit some form of symmetry , whether radial, bilateral, or spherical. A minority, however, exhibit no symmetry. One example of asymmetric invertebrates includes all gastropod species. This is easily seen in snails and sea snails , which have helical shells. Slugs appear externally symmetrical, but their pneumostome breathing hole is located on the right side. Other gastropods develop external asymmetry, such as *Glaucus atlanticus* that develops asymmetrical cerata as they mature. The origin of gastropod asymmetry is a subject of scientific debate. They often have one claw much larger than the other. If a male fiddler loses its large claw, it will grow another on the opposite side after moulting. Sessile animals such as sponges are asymmetrical [11] alongside coral colonies with the exception of the individual polyps that exhibit radial symmetry ; alpheidae claws that lack pincers; and some copepods , polyopisthocotyleans , and monogeneans which parasitize by attachment or residency within the gill chamber of their fish hosts. **Nervous system** Neurons differ in invertebrates from mammalian cells. Invertebrates cells fire in response to similar stimuli as mammals, such as tissue trauma, high temperature, or changes in pH. The first invertebrate in which a neuron cell was identified was the medicinal leech , *Hirudo medicinalis*. The largest tracheae run across the width of the body of the cockroach and are horizontal in this image. Scale bar, 2 mm. The tracheal system branches into progressively smaller tubes, here supplying the crop of the cockroach. One type of invertebrate respiratory system is the open respiratory system composed of spiracles , tracheae, and tracheoles that terrestrial arthropods have to transport metabolic gases to and from tissues. The tracheae are invaginations of the cuticular exoskeleton that branch anastomose throughout the body with diameters from only a few micrometres up to 0. The smallest tubes, tracheoles, penetrate cells and serve as sites of diffusion for water , oxygen , and carbon dioxide. Gas may be conducted through the respiratory system by means of active ventilation or passive diffusion. Unlike vertebrates, insects do not generally carry oxygen in their haemolymph. In the head , thorax , or abdomen , tracheae may also be connected to air sacs. Many insects, such as grasshoppers and bees , which actively pump the air sacs in their abdomen, are able to control the flow of air through their body. In some aquatic insects, the tracheae exchange gas through the body wall directly, in the form of a gill , or function essentially as normal, via a plastron. Note that despite being internal, the tracheae of arthropods are shed during moulting ecdysis. They produce specialized reproductive cells that undergo meiosis to produce smaller, motile spermatozoa or larger, non-motile ova. **Social interaction** Social behavior is widespread in invertebrates, including cockroaches, termites, aphids, thrips , ants, bees, Passalidae , Acari , spiders, and more. Insects recognize information transmitted by other insects. One of these are the sponges Porifera. They were long thought to have diverged from other animals early. As such, they are sometimes called diploblastic. All these organisms have a body divided into repeating segments, typically with paired appendages. In addition, they possess a hardened exoskeleton that is periodically shed during growth. The Nematoda or roundworms, are perhaps the second largest animal phylum, and are also invertebrates. Roundworms are typically microscopic, and occur in nearly every environment where there is water. These groups have a reduced coelom, called a pseudocoelom. Other invertebrates include the Nemertea or ribbon worms, and the Sipuncula. Another phylum is Platyhelminthes , the flatworms. Invertebrates also include the

Acanthocephala or spiny-headed worms, the Gnathostomulida , Micrognathozoa , and the Cycliophora. These two groups have long been considered close relatives because of the common presence of trochophore larvae, but the annelids were considered closer to the arthropods because they are both segmented. Classification of invertebrates This section does not cite any sources. Please help improve this section by adding citations to reliable sources. Unsourced material may be challenged and removed. November Invertebrates can be classified into several main categories, some of which are taxonomically obsolescent or debatable, but still used as terms of convenience. Each however appears in its own article at the following links. Protozoa like the worms, an arbitrary grouping of convenience.

Chapter 6 : Differences Between Invertebrates And Vertebrates

In the animal kingdom, animals have been classified into two main categories invertebrate and vertebrate. This differentiation is mainly based on the presence and absence of the backbone or a spinal column.

They are a very familiar group of organisms and are the very kingdom of life that humans belong to. The first animals are thought to have evolved over million years ago. Over the last million years the animal kingdom has become incredibly successful and diverse with many million species now inhabiting Earth. The general description of an animal is a multicellular, heterotrophic organism. The term multicellular simply means that an animal is made from more than one cell. A human, for example, is made from around 30 trillion cells. Heterotrophic means that animals are unable to make their own food and can only obtain energy by eating other organisms. Key to an introduction to animals is the distinction between vertebrate and invertebrate animals. Vertebrate animals are those that have an internal backbone such as humans, cats and dogs. These include animals such as insects, spiders, jellyfish, crabs and even sea anemones. Invertebrates are animals that are missing a backbone. Many invertebrates we know very little about or are even yet to be discovered. Sponges are thought to be one of the first animals to have evolved. They retain some of the single-celled ancestry that animals evolved from. Sponges are able live and reproduce as a single-celled organism for a short period. Corals and anemones are slightly more advanced than sponges and belong to the same group of animals as jellyfish. Many of these invertebrates are very advanced and display complex behaviors and body types. Arthropods have complex bodies with hard external skeletons and jointed limbs. Many species from these group show advanced behaviors. Bees for example communicate with each other by wagging their backside in various ways. Spiders produce complex webs to catch prey and stake out until an unsuspecting insect gets caught. Arthropods are arguably the most successful group of animals on Earth. They are an incredibly diverse group and estimates of the total number of arthropod species is well over a million. Insects are particularly diverse and account for over half of all animal species. Between jellyfish and insects there is a wide range of many other invertebrates. Some examples include worms , millipedes, centipedes, starfish, urchins, squid, octopi, oysters and snails. Vertebrates A vertebrate animal is any animal with an internal backbone. These include many of best known animals such as cats, dogs, horses, birds, lizards, snakes and elephants. The largest animals on Earth are all vertebrates but many vertebrate animals can also be relatively small such as mice, skinks and some birds. Vertebrates are also the most intelligent of all organisms, although an octopus is also pretty darn smart. Vertebrate animals can be split into four groups: The remainder of this introduction to animals will introduce these four different vertebrate groups. Fish Fish were the first vertebrates to appear on the scene. The first fish evolved from an invertebrate ancestor and has since diversified into more than 30, species. All other vertebrate animals have since evolved from prehistoric fish. A fish is an aquatic animal that has gills and limbs without fingers or toes. There are four different groups of fish. The first group includes fish without true bones known as cartilaginous fish which includes sharks and rays. We also have bony fish, jawless fish and hagfish. Living in water has its issues. Fish have evolved various adaptations to help them with aspects of life such as movement, buoyancy and avoiding being eaten by bigger fish. Amphibians Amphibians helped vertebrate animals to move onto land. This group of vertebrates include animals such as frogs, toads, salamanders and newts. Most amphibians start life out as a larvae living into water and then undergo metamorphosis transform into an air-breathing adult. Amphibians have been around for over million years. Despite their long survival, many species of amphibians are under serious threat of extinction due to problems such as habitat loss and predation from invasive species. Reptiles and Birds Reptiles are cold-blooded, egg laying animals that have scales or scutes, rather than hair. They were the first group of vertebrate animals to live entirely on land and some species have since moved back into the water. Some different reptiles include lizards , snakes , crocodiles and turtles. Birds are a class of reptiles that are distinct from all other animals because they have wings and feathers. Birds are renowned for their incredibly ability to fly. Many species perform incredible migrations each year, flying thousands of miles across Earth. While birds are famous for flying, some species have lost the ability to fly such as penguins and ostriches.

Mammals Mammals are a group of warm-blooded animals that have hair and mammary glands. Many mammals species are much-loved and adored animals. Animals such as cats, dogs, monkeys, sheep, cows, horses, giraffes, elephants, dolphins, whales, beers, goats, deer and pigs are all mammals. Humans also belong to this group of animals. More specifically we belong to a group of mammals called primates. Primates include animals such as monkeys, baboons, gorillas, chimpanzees and orangutans. Mammals are most definitely the smartest of all the animal groups. Dolphins and monkeys are considered two of the smartest animals in the world. And then there are humans who are undoubtedly more intelligent than any other organism on Earth.

Chapter 7 : Third grade Lesson Vertebrate vs. Invertebrate | BetterLesson

The total number of invertebrate species could be 5, 10, or even 30 million, compared to just 60, vertebrates. One reason for the success of invertebrates is how quickly they reproduce.

Vertebrates range in size from tiny fish to the whales, which include the largest animals ever to have existed. General features Although the vertebral column is perhaps the most obvious vertebrate feature, it was not present in the first vertebrates, which probably had only a notochord. The vertebrate has a distinct head, with a differentiated tubular brain and three pairs of sense organs nasal, optic, and otic. The body is divided into trunk and tail regions. The presence of pharyngeal slits with gills indicates a relatively high metabolic rate. A well-developed notochord enclosed in perichordal connective tissue, with a tubular spinal cord in a connective tissue canal above it, is flanked by a number of segmented muscle masses. A sensory ganglion develops on the dorsal root of the spinal nerve, and segmental autonomic ganglia grow below the notochord. The trunk region is filled with a large, bilateral body cavity coelom with contained viscera, and this coelom extends anteriorly into the visceral arches. A digestive system consists of an esophagus extending from the pharynx to the stomach and a gut from the stomach to the anus. A distinct heart, anteroventral to the liver, is enclosed in a pericardial sac. A basic pattern of closed circulatory vessels is largely preserved in most living forms. Unique, bilateral kidneys lie retroperitoneally dorsal to the main body cavity and serve blood maintenance and excretory functions. Reproductive organs are formed from tissue adjacent to the kidneys; this original close association is attested by the tubular connections seen in males of living forms. The ducts of the excretory organs open through the body wall into a cloacal chamber, as does the anus of the digestive tract. Reproductive cells are shed through nearby abdominal pores or through special ducts. A muscular tail continues the axial musculature of the trunk. Approximately 45, living species constitute the vertebrates. Species of several classes are found from the high Arctic or Antarctic to the tropics around the Earth; they are missing only from interior Antarctica and Greenland and from the North Polar ice pack. In size, vertebrates range from minute fishes to elephants and whales of up to tons, the largest animals ever to have existed. Vertebrates are adapted to life underground, on the surface, and in the air. They feed upon plants, invertebrate animals, and one another. Vertebrate faunas are important to humans for food and recreation. Natural history In order to give a broad and comparative view of their life histories, the vertebrates are subdivided here into major groups based on morphology: The cyclostomes The cyclostomes include two classes of living, jawless fishes agnathous – Petromyzontiformes lamprey eels and Myxiniiformes hagfishes. The hagfishes are totally marine, often living in deep waters associated with muddy bottoms. The lampreys may be marine as adults but spawn in fresh waters, where the larvae spend some time before metamorphosing to the adult. Some lampreys live entirely in fresh water and may change only slightly in habit as a result of metamorphosis. Without lateral fins, lampreys swim by undulations of the body and can control direction only for short distances. Hagfishes are primitive, jawless fish. The living agnaths are predatory, the lampreys being well known for attacking salmonoid fishes. The lamprey attaches to its prey using its round, suctorial mouth, and it rasps a hole through the outer tissues using a tongue armed with keratinized teeth. It suctions off bits of tissue, blood, and body fluids. The hagfishes feed somewhat similarly, but on a variety of prey – invertebrates worms and soft-bodied forms and dead fishes. The lampreys produce small eggs, which develop directly into larvae that burrow into the muddy bottom of the stream. With its mouth at the surface of the mud, the larva filter feeds until large enough to metamorphose and swim off as a small adult. In contrast, the hagfishes produce relatively large encapsulated, yolky eggs up to two centimetres in length. When laid, these eggs attach to any available object by terminal hooks. The encased egg develops more or less directly into a miniature adult. The chondrichthyes The sharks, rays, and chimaerids are usually marine, but some sharks have entered fresh waters the Amazon or even live there permanently Lake Nicaragua. In size, sharks range from the whale shark, nearly 10 metres in length, to rather small species, three centimetres in length. They usually weigh 25 to kilograms 55 to pounds. Sharks are predatory animals. Some large shark species basking and whale sharks filter feed on small crustaceans. Herbivorous sharks are unknown. Most species occur in near-shore waters, but some range

widely throughout the oceans. A few are found in deep water. Southern stingrays *Dasyatis americana*. Bull shark *Carcharhinus leucas*. Bob Abramsâ€™ Bruce Coleman Inc. A few sharks produce live young viviparous after internal fertilization. Most sharks lay large yolky, encapsulated eggs with hooks for attachment. The young develop directly and begin life as miniature adults. In a few cases, the uterine wall secretes nutrients. The teleostome, or osteichthyan, fishes those having an internal bony skeleton can be divided into two groups: The latter group includes the lungfishes, which live in marshes, ponds, or streams, and are frequent air breathers. They lay fairly large eggs, with a limited amount of yolk, that are enclosed in jelly coats like those of an amphibian. The eggs develop into small fishes that feed on live prey. The larvae of the African lungfish have external gills to supplement oxygen intake. The teleostomes Actinopterygian fishes are the common bony fishes of modern aquatic environments. They range in size from fishes that are only millimetres in size to those two or more metres. Large species sturgeons are found in fresh waters several other large species are found in the Amazon as well as in marine environments. The diet may include plants, animals, and carrion. Most species are midwater swimmers, but many spend much time lying on the bottom. Tail, pectoral, and even dorsal fins are used in swimming. Reproduction in this group is by way of large numbers of small eggs, which produce small larvae or develop directly to the adult. American paddlefish *Polyodon spathula* Common mola, or ocean sunfish *Mola mola*. The tetrapods The tetrapods live primarily on land and are rather similar in habit. Members include the amphibians, reptiles, birds, and mammals. Amphibians are widespread in the warmer parts of the continents, being absent only in the far north and in the Antarctic. Three orders are recognized: Caudata the salamanders, the frogs and toads Anura, or Salientia, and the Apoda or Gymnophiona caecilians. Modification takes many forms, from the moist glandular skin some scale remnants persist in apodans to the loss of many of the bones of the skull. Like their ancestors, amphibians are cold-blooded and tend to be aquatic or limited to moist surroundings. Salamanders are seemingly the least modified in body form. They do not actively pursue prey and at best are only marginal swimmers. Frogs and toads hop using hind-limb propulsion and the forelimbs as body props. This dominance of the hind limb in locomotion is best seen in swimming when the forelimbs are drawn back against the body. In contrast to the salamanders and frogs, the burrowing, wormlike apodans are without limbs. European pond turtle *Emys orbicularis*. There is great variation in foods; only the larvae of frogs and toads appear to be plant feeders, a specialization that is reflected in the highly modified jaws and guts of the tadpoles. Amphibians have retained a simple egg cell with a gelatinous cover. The eggs are laid in ponds, streams, or even in damp places high in trees, usually in great numbers. Fertilized eggs develop into free-swimming larvae, which then metamorphose to adults, but in highly specialized forms. The class Reptilia retains many of the structural characteristics of the ancestral amphibian. While most reptiles are carnivorous, feeding on other organisms, a few are herbivorous e. As cold-blooded animals, reptiles tend to be limited to temperate and tropical areas, but, where found, they are relatively common, although not as large or conspicuous as birds or mammals. Most reptiles are terrestrial, but a few are aquatic. As basic tetrapods, reptiles move about by creeping or swimming in a fashion similar to amphibians. Some reptiles, however, can lift the body from the ground and run rapidly either in a quadrupedal or bipedal fashion. Reptiles lay relatively large, shelled eggs. In a few instances, the eggs and young are cared for by the female; in others, the young are born alive ovovivipary. Birds are warm-blooded, and, although most are capable of flight, others are sedentary and some are flightless. Like their relatives the reptiles, birds lay shelled eggs that differ largely in the amount of calcification hardening of the shell. The young are usually cared for in a nest until they are capable of flight and self-feeding, but some birds hatch in a well-developed state that allows them to begin feeding immediately or even take flight. The megapods lay their eggs in mounds of rotting vegetation, which supplies the heat for incubation. Nesting activities similar to those of some birds are seen in the crocodylians. The mammals range in size from tiny shrews or small bats weighing only a few grams to the largest known animals, the whales. Most mammals are terrestrial, feeding on both animal and vegetable matter, but a few are partially aquatic or entirely so, as in the case of the whales or porpoises. Mammals move about in a great variety of ways:

Chapter 8 : Vertebrate or Invertebrate? Quiz

The primary difference between vertebrates and invertebrates is the presence of a backbone or spinal column, which vertebrates have and invertebrates do not. Examples of vertebrates are humans, dogs, cats and birds. Examples of invertebrates are flatworms, mollusks, sea urchins and insects.

Check new design of our homepage! Vertebrates and Invertebrates The animal kingdom is classified under two major groups, the vertebrates and invertebrates. The following article attempts to help you understand the differences between these groups. BiologyWise Staff Last Updated: Feb 22, All animals are simply divided into two groups; vertebrates and invertebrates, before they are minutely separated in different groups and sub-groups of the animal kingdom classification criteria. Before going into the details of evolutionary traits, identical traits, genetic differences, physical characteristics, etc. This simple criteria to divide the animals is whether the animal possesses a backbone or no. It helps place the animal species in one of the two groups, the vertebrates and the invertebrates. The individual characteristics of the categories are enlisted in the paragraphs below. Difference Between Vertebrates and Invertebrates The following information on animals will help you understand the differences between each group. Which Animals are Known as Invertebrates? Invertebrates are animals that belong to a large animal group. These animals do not belong to a single sub-phylum like the vertebrates. They are the animals without a backbone. They are multicellular organisms, and mostly form a colony of individual cell that function as one. All the cells in the colony have a particular function. They have no cell walls and many have tissues, except the sponges. Most of the invertebrates produce sexually. Most of the invertebrates can move except the adult sponges. There are many invertebrates that follow symmetrical organization. This means one can draw a line down the middle of the animal and the two sides will be similar like mirror images. Invertebrates are heterotrophs that feed on plants and animals. The invertebrates include the following animals:

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Vertebrates are often larger and have more complex bodies than invertebrates. However, there are many more invertebrates than vertebrates. Fish breathe through gills, and live in water; most are cold-blooded and lay eggs (although sharks give birth to live young).

Back to Animals What are vertebrates? Vertebrates are animals that have a backbone or spinal column, also called vertebrae. These animals include fish, birds, mammals, amphibians, and reptiles. How are they classified? Vertebrates are classified by the chordate subphylum vertebrata. Invertebrates are any other animal that is classified outside of that class. Are there a lot of vertebrate species? There are currently around 65,000 known species of vertebrate animals. Most of the animal species are invertebrates. What are some vertebrate animals? 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. Cold-blooded and Warm-blooded 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. Big and Small The smallest vertebrate is thought to be a tiny frog called the Paedophryne amauensis. It only grows to about 0.5 inches. The largest is the blue whale, which can grow to over 100 feet long and 400,000 pounds. Fun Facts about Vertebrates The only mammals that lay eggs are monotremes such as the platypus and spiny anteater. There are reptiles that live on every continent except Antarctica. Most fish have skeletons made of bone, they are called bony fish. Other fish have skeletons made of cartilage. These include sharks and rays. Frogs can breathe through their skin. The shortest childhood of any mammal is the hooded seal. They are considered adults when they are just four days old. Vertebrates tend to be much more intelligent than invertebrates.