

**forewing**  
Appendage of flight attached to the central segment of the thorax.

**cell**  
Constituent element of a butterfly's wing contained between the wing veins.

# ANIMAL KINGDOM

**hind wing**  
Appendage of flight attached to the terminal segment of the thorax.

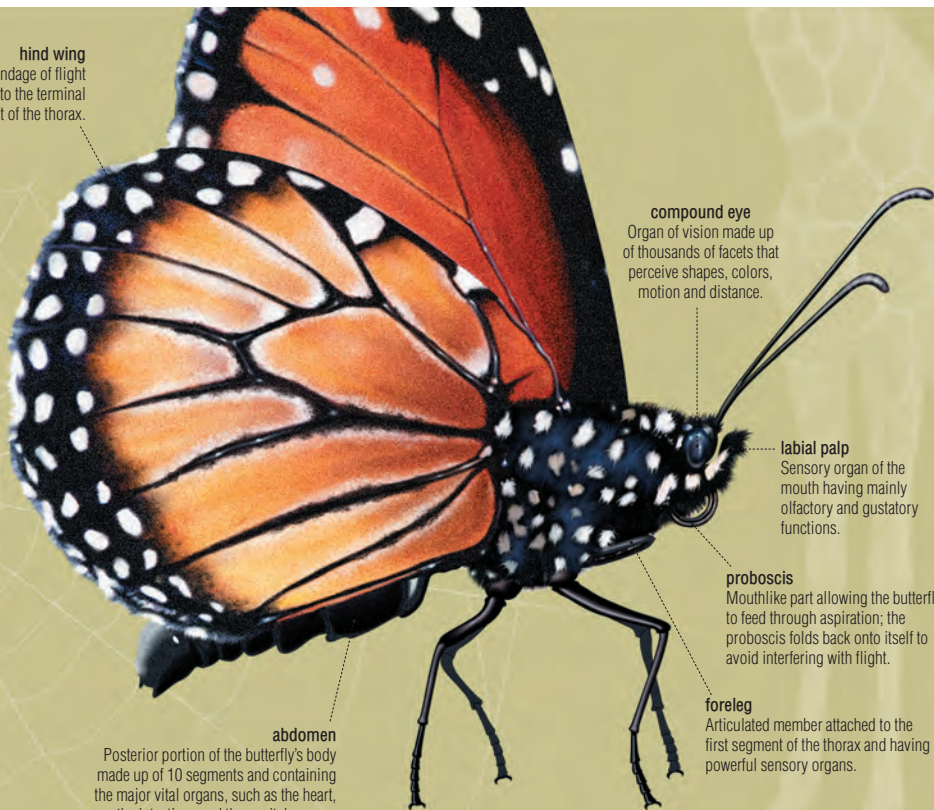
**compound eye**  
Organ of vision made up of thousands of facets that perceive shapes, colors, motion and distance.

**labial palp**  
Sensory organ of the mouth having mainly olfactory and gustatory functions.

**proboscis**  
Mouthlike part allowing the butterfly to feed through aspiration; the proboscis folds back onto itself to avoid interfering with flight.

**abdomen**  
Posterior portion of the butterfly's body made up of 10 segments and containing the major vital organs, such as the heart, the intestines and the genital organs.

**foreleg**  
Articulated member attached to the first segment of the thorax and having powerful sensory organs.



# ANIMAL KINGDOM

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# INTRODUCTION

## EDITORIAL POLICY

*The Visual Dictionary* takes an inventory of the physical environment of a person who is part of today's technological age and who knows and uses a large number of specialized terms in a wide variety of fields.

Designed for the general public, it responds to the needs of anyone seeking the precise, correct terms for a wide range of personal or professional reasons: finding an unknown term, checking the meaning of a word, translation, advertising, teaching material, etc.

The target user has guided the choice of contents for *The Visual Dictionary*, which aims to bring together in 12 thematic books the technical terms required to express the contemporary world, in the specialized fields that shape our daily experience.

## STRUCTURE

Each tome has three sections: the preliminary pages, including the table of contents; the body of the text (i.e. the detailed treatment of the theme); the index.

Information is presented moving from the most abstract to the most concrete: sub-theme, title, subtitle, illustration, terminology.

## TERMINOLOGY

Each word in *The Visual Dictionary* has been carefully selected following examination of high-quality documentation, at the required level of specialization.

There may be cases where different terms are used to name the same item. In such instances, the word most frequently used by the most highly regarded authors has been chosen.

Words are usually referred to in the singular, even if the illustration shows a number of individual examples. The word designates the concept, not the actual illustration.

## DEFINITIONS

Within the hierarchical format of *The Visual Dictionary's* presentation, the definitions fit together like a Russian doll. For example, the information within the definition for the term *insect* at the top of the page does not have to be repeated for each of the insects illustrated. Instead, the text concentrates on defining the distinguishing characteristics of each insect (the *louse* is a parasite, the female *yellow jacket* stings, and so forth).

Since the definition leaves out what is obvious from the illustration, the illustrations and definitions complement one another.

The vast majority of the terms in the *Visual Dictionary* are defined. Terms are not defined when the illustration makes the meaning absolutely clear, or when the illustration suggests the usual meaning of the word (for example, the numerous *handles*).

## METHODS OF CONSULTATION

Users may gain access to the contents of *The Visual Dictionary* in a variety of ways:

- From the TABLE OF CONTENTS at the end of the preliminary pages, the user can locate by title the section that is of interest.
- With the INDEX, the user can consult *The Visual Dictionary* from a word, so as to see what it corresponds to, or to verify accuracy by examining the illustration that depicts it.
- The most original aspect of *The Visual Dictionary* is the fact that the illustrations enable the user to find a word even if he or she only has a vague idea of what it is. The dictionary is unique in this feature, as consultation of any other dictionary requires the user first to know the word.

## TITLE

Its definition is found below. If the title refers to information that continues over several pages, after the first page it is shown in a shaded tone with no definition.

## DEFINITION

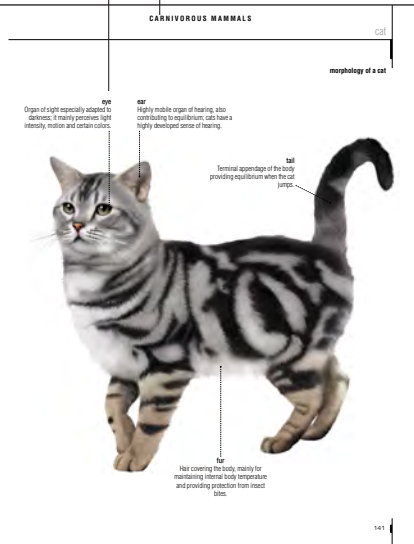
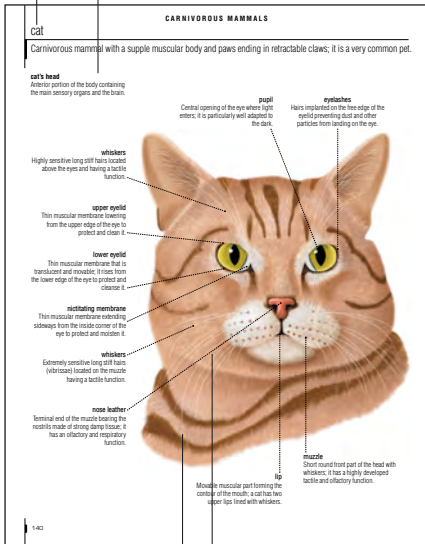
It explains the inherent qualities, function, or characteristics of the element depicted in the illustration.

## TERM

Each term appears in the index with a reference to the pages on which it appears.

## SUB-THEME

These are shown at the end of the preliminary pages along with their definitions. They are then repeated on each page of a section, but without the definition.



## ILLUSTRATION

It is an integral part of the visual definition for each of the terms that refer to it.

## NARROW LINES

These link the word to the item indicated. Where too many lines would make reading difficult, they have been replaced by color codes with captions or, in rare cases, by numbers.

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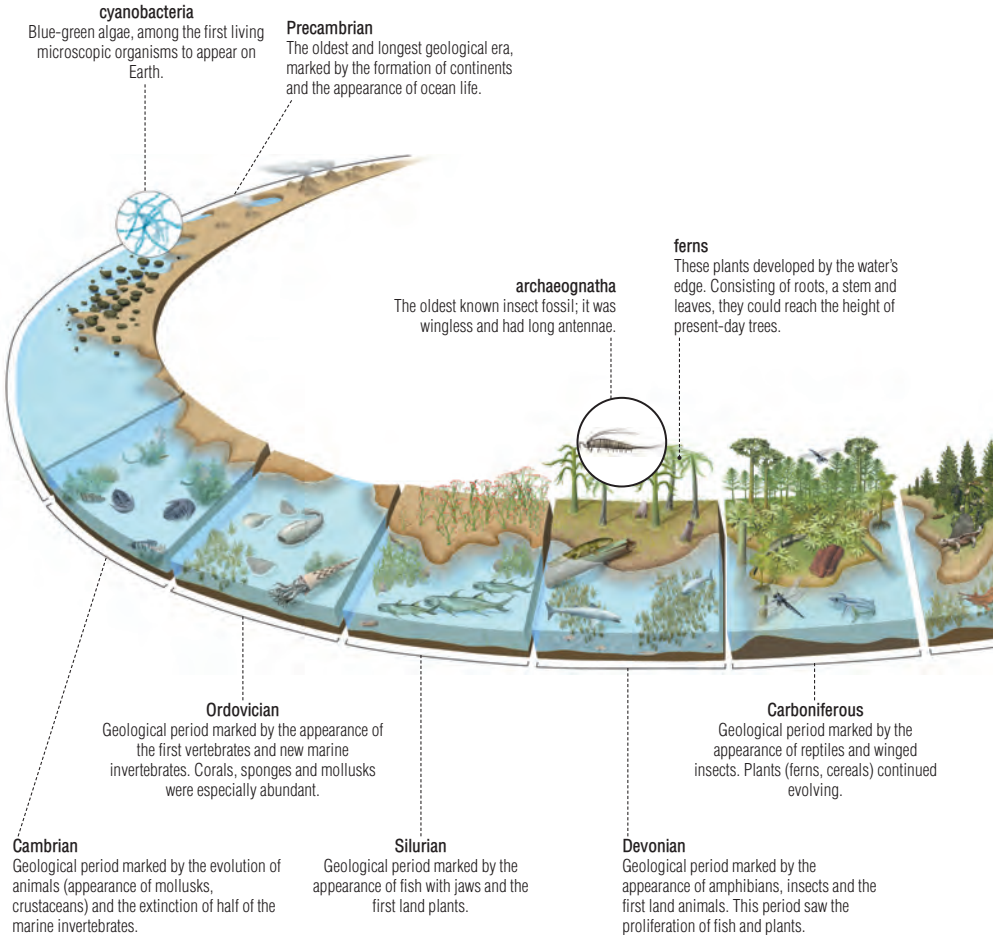
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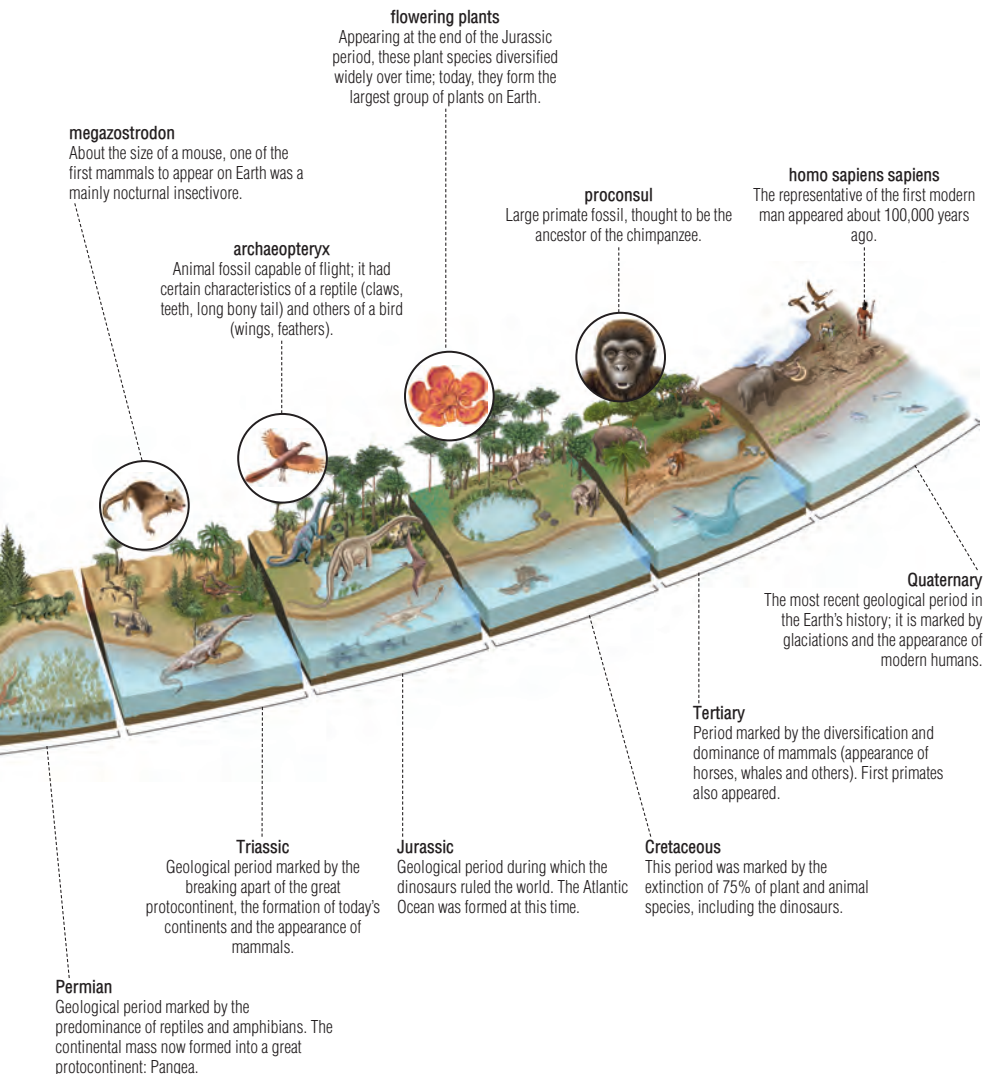
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# origin and evolution of species

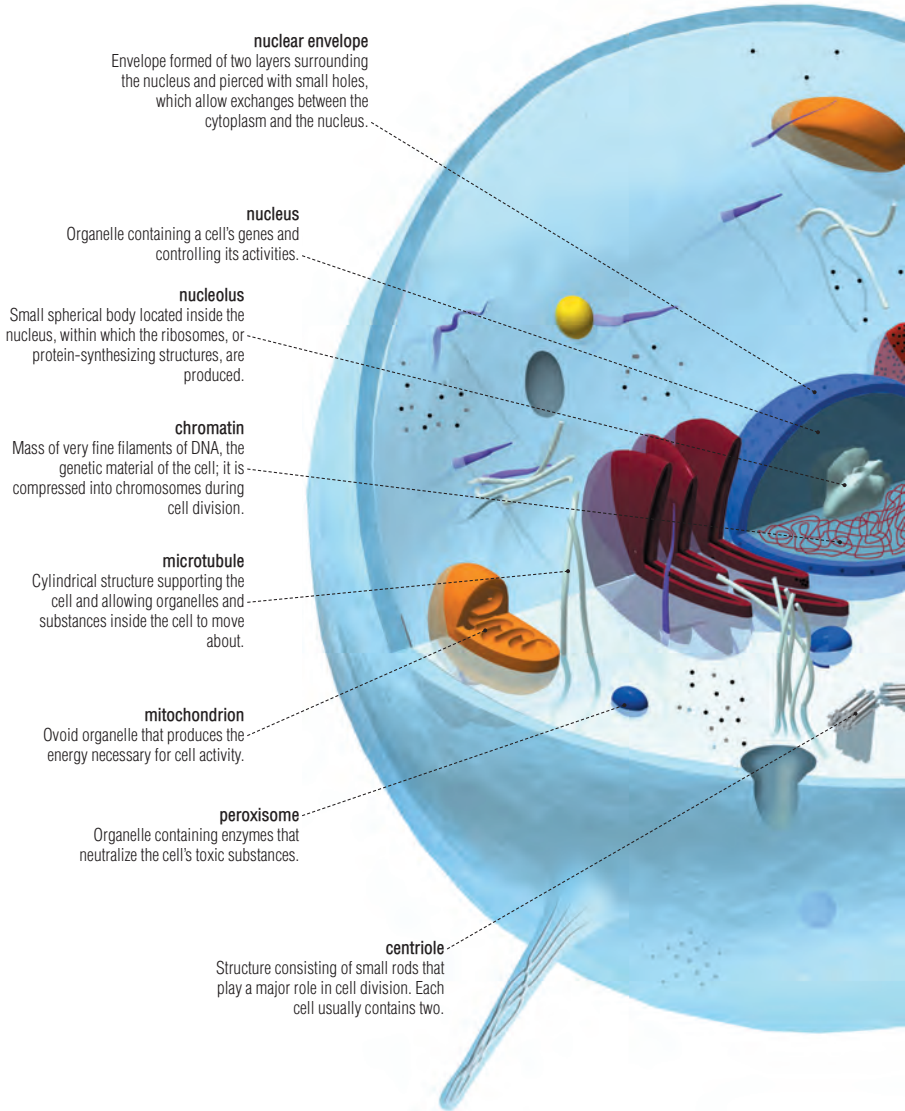
Since its formation some 4.6 billion years ago, the Earth has witnessed the genesis of continents and oceans and the appearance of animals and vegetation.





## animal cell

Smallest living structure and constituent unit of all animals, including human beings; its size and shape vary according to function.

**nuclear envelope**

Envelope formed of two layers surrounding the nucleus and pierced with small holes, which allow exchanges between the cytoplasm and the nucleus.

**nucleus**

Organelle containing a cell's genes and controlling its activities.

**nucleolus**

Small spherical body located inside the nucleus, within which the ribosomes, or protein-synthesizing structures, are produced.

**chromatin**

Mass of very fine filaments of DNA, the genetic material of the cell; it is compressed into chromosomes during cell division.

**microtubule**

Cylindrical structure supporting the cell and allowing organelles and substances inside the cell to move about.

**mitochondrion**

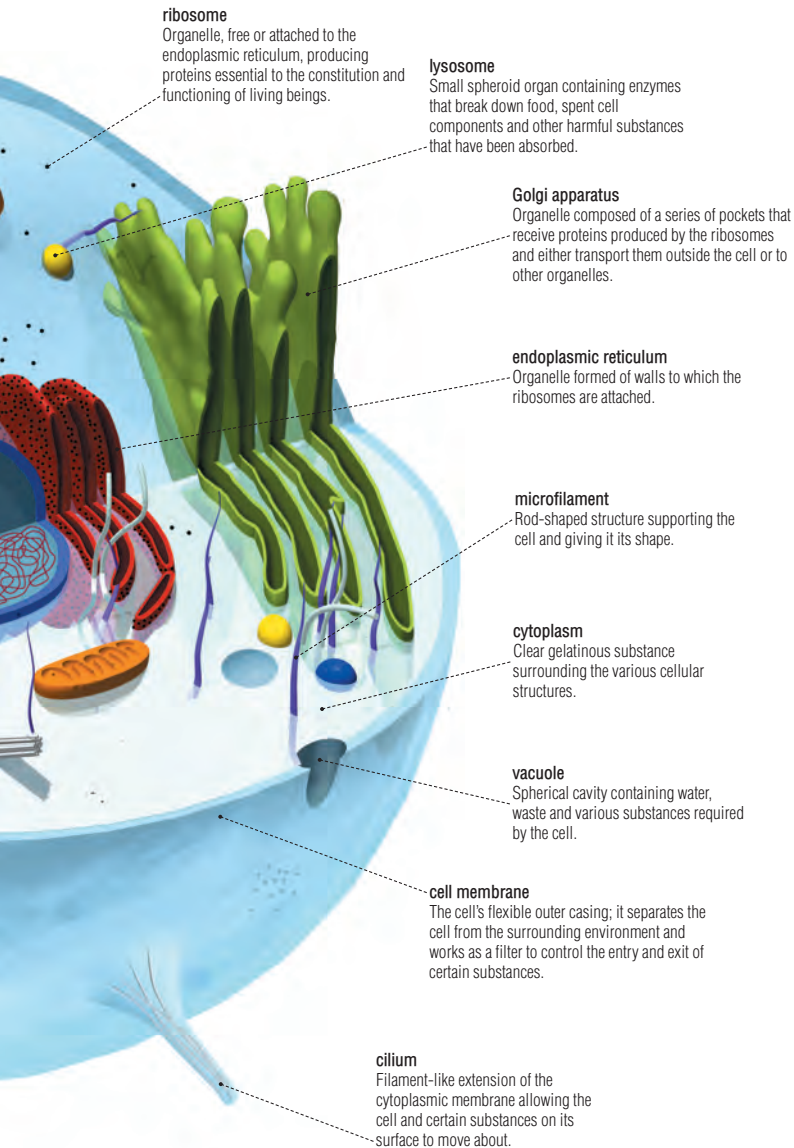
Ovoid organelle that produces the energy necessary for cell activity.

**peroxisome**

Organelle containing enzymes that neutralize the cell's toxic substances.

**centriole**

Structure consisting of small rods that play a major role in cell division. Each cell usually contains two.



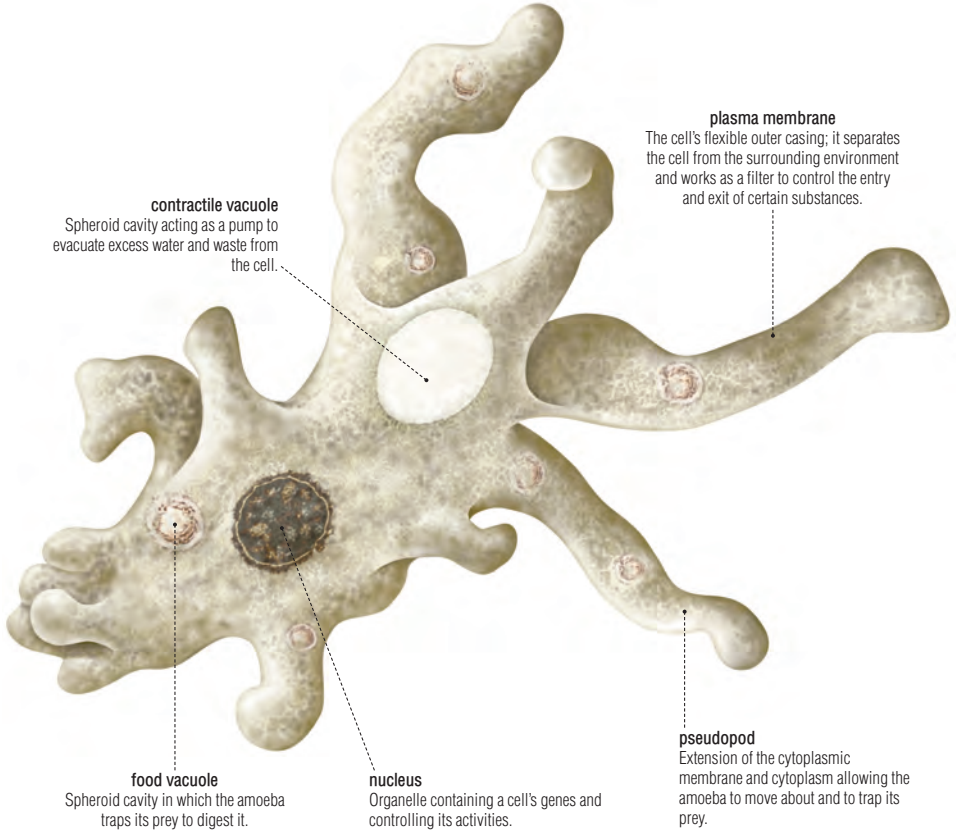


## unicellulars

Single-cell organisms living in freshwater or salt water, in humid soil or as parasites of other organisms (plants or animals).

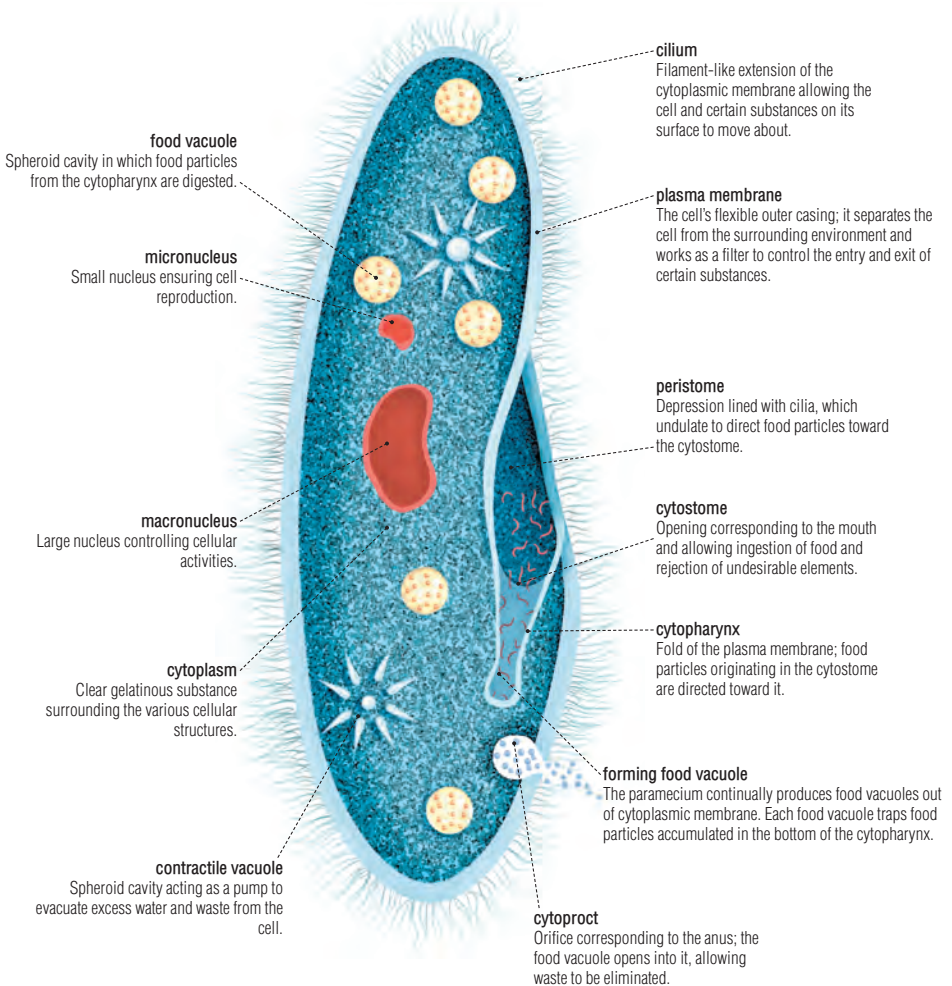
**amoeba**

Variably shaped one-cell organism, found in freshwater or salt water, in humid soil or, sometimes, as a parasite of animals. It moves about and feeds with the help of pseudopodia.



**paramecium**

Ovoid-shaped one-cell organism generally found in freshwater and covered with cilia, which allow it to move about and to feed, mainly on bacteria.

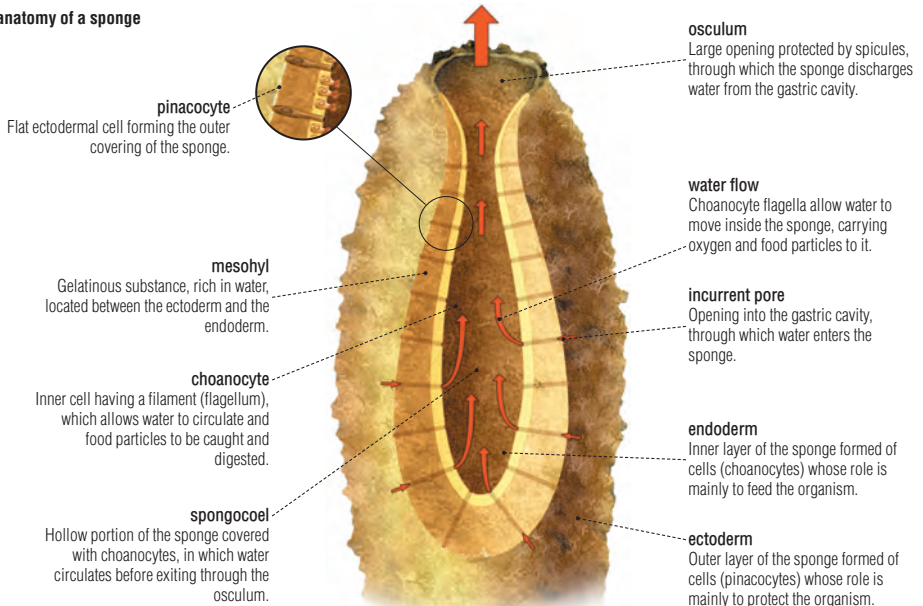


## sponge

Porous multicell organism, mostly marine (currently about 5,000 species); it anchors itself to a support and filters water to take in food particles.

**calcareous sponge**

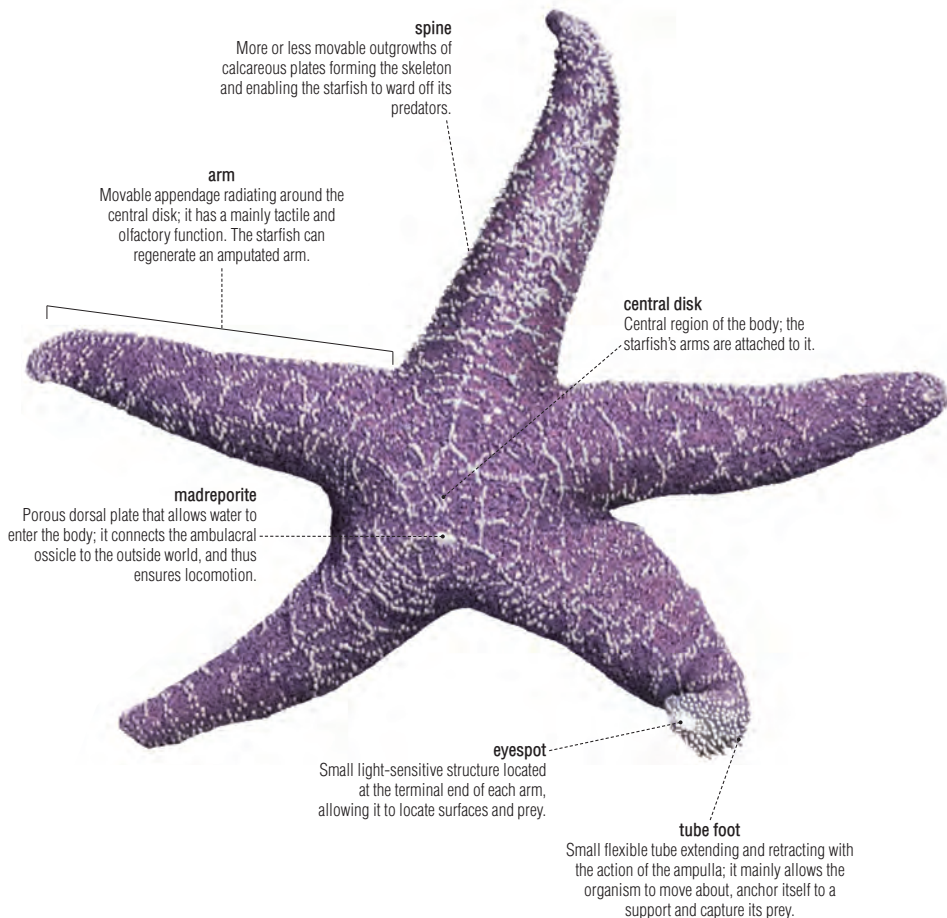
Marine sponge with a skeleton composed of small calcareous needles (spicules).

**anatomy of a sponge**

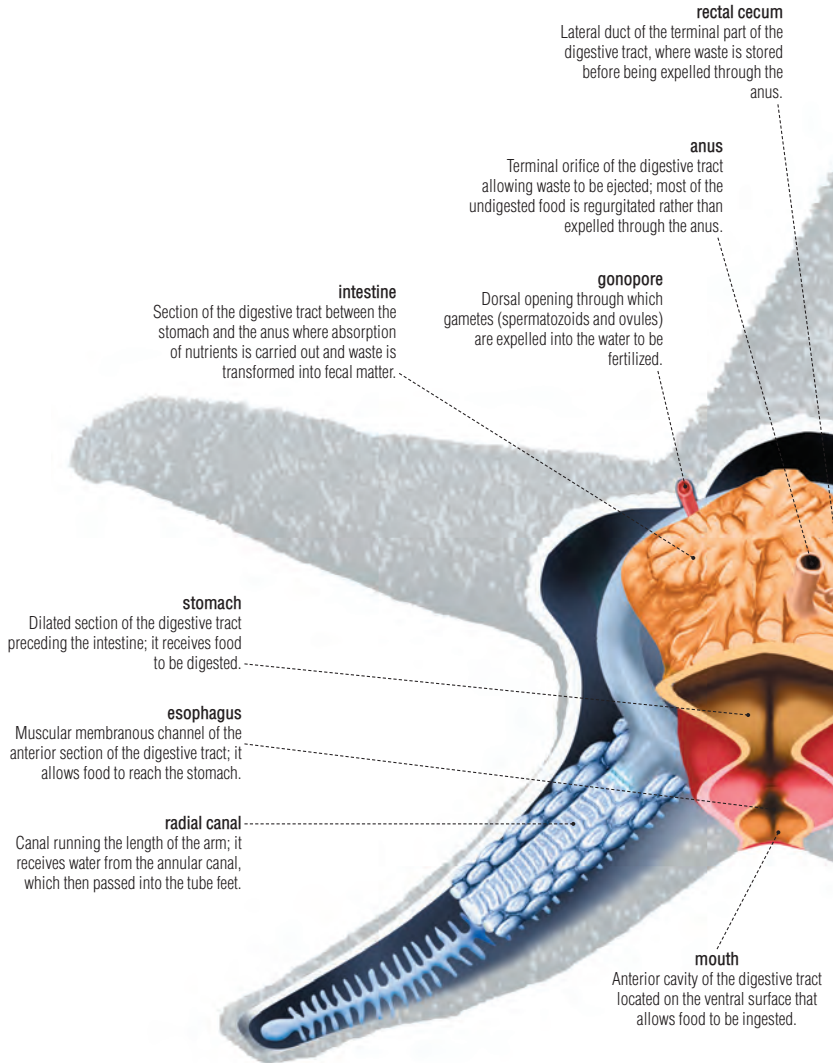
Marine invertebrates (currently more than 6,000 species) covered with calcareous plates; an ambulacral ossicle runs along the body, helping the organism to move, anchor itself to a support and capture its prey.

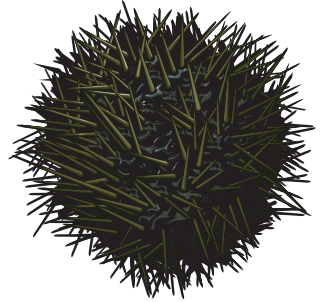
#### morphology of a starfish

Starfish: carnivorous echinoderm found in the ocean depths; it generally has five arms, which allow it to crawl slowly along surfaces.



## anatomy of a starfish



**sea urchin**

Echinoderm found in the ocean depths and usually covered with movable quills; it has teeth that help it to graze on (rake) algae.

**pyloric cecum**

Radiated duct of the digestive tract producing digestive enzymes and also allowing digested food to be stored.

**ampulla**

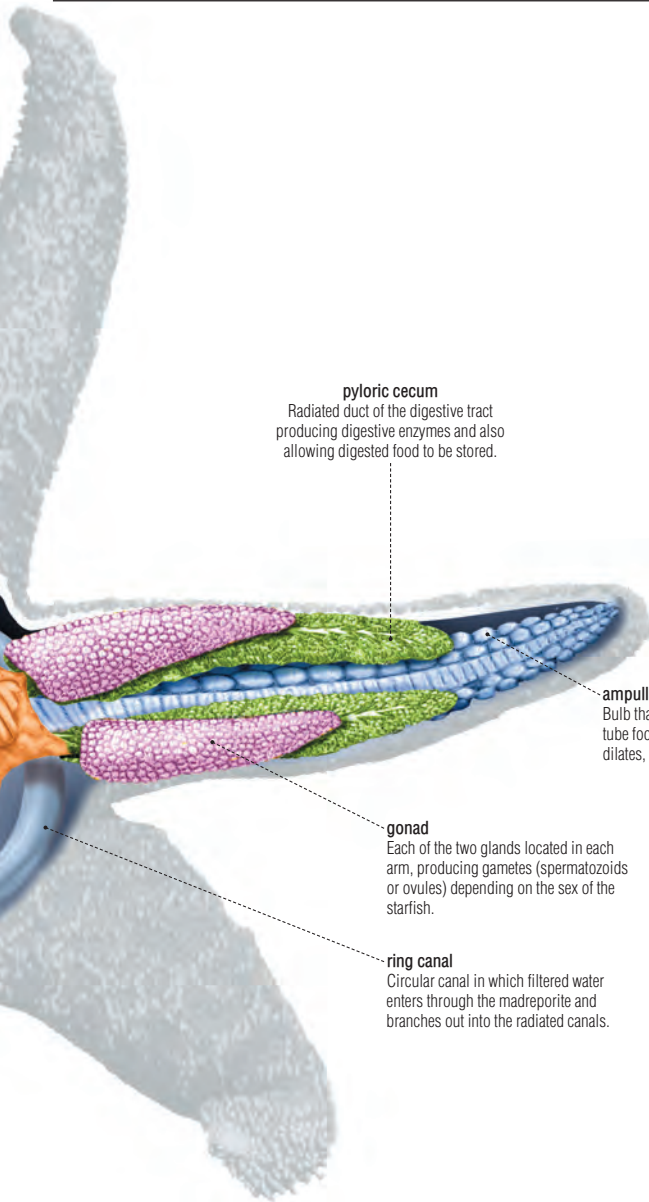
Bulb that contracts to let water enter the tube foot, allowing it to extend; when it dilates, the foot retracts.

**gonad**

Each of the two glands located in each arm, producing gametes (spermatozooids or ovules) depending on the sex of the starfish.

**ring canal**

Circular canal in which filtered water enters through the madreporite and branches out into the radiated canals.

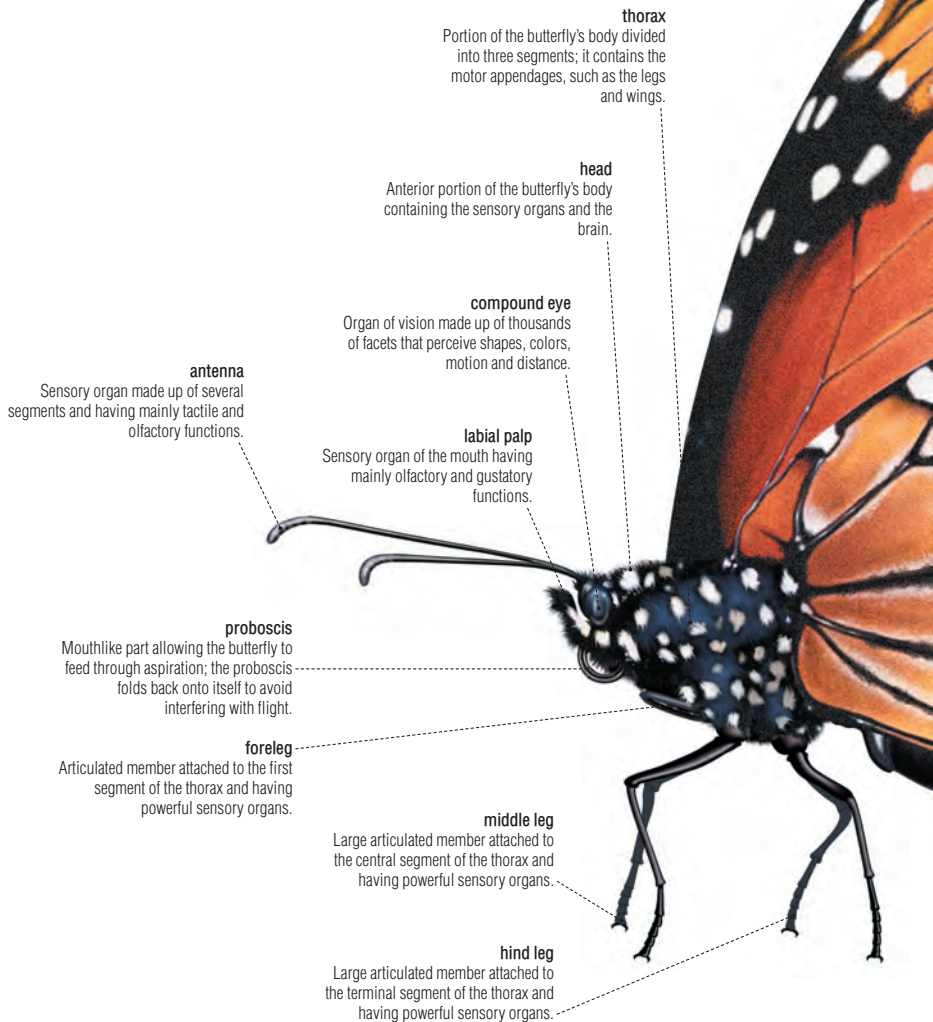


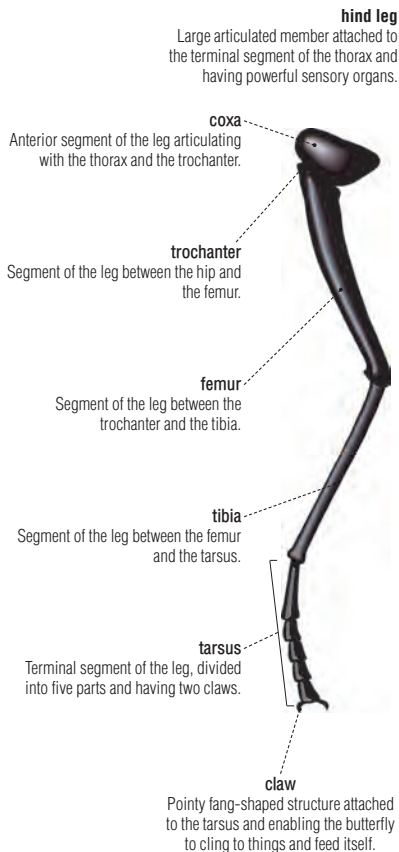
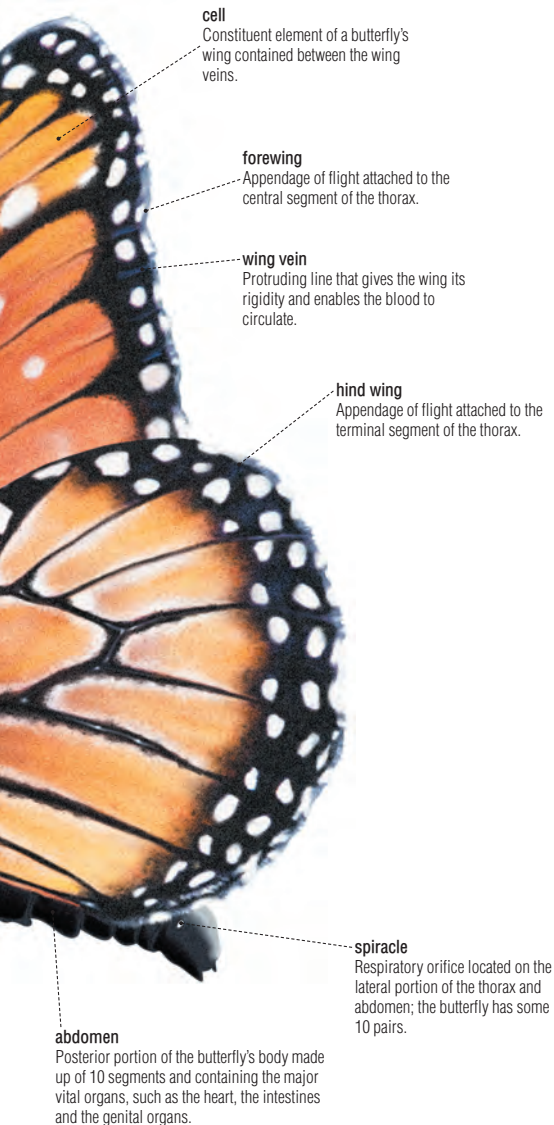


## butterfly

Adult insect having two pairs of wings and three pairs of legs; it emerges after the first three stages of metamorphosis: the egg, the caterpillar and the chrysalis.

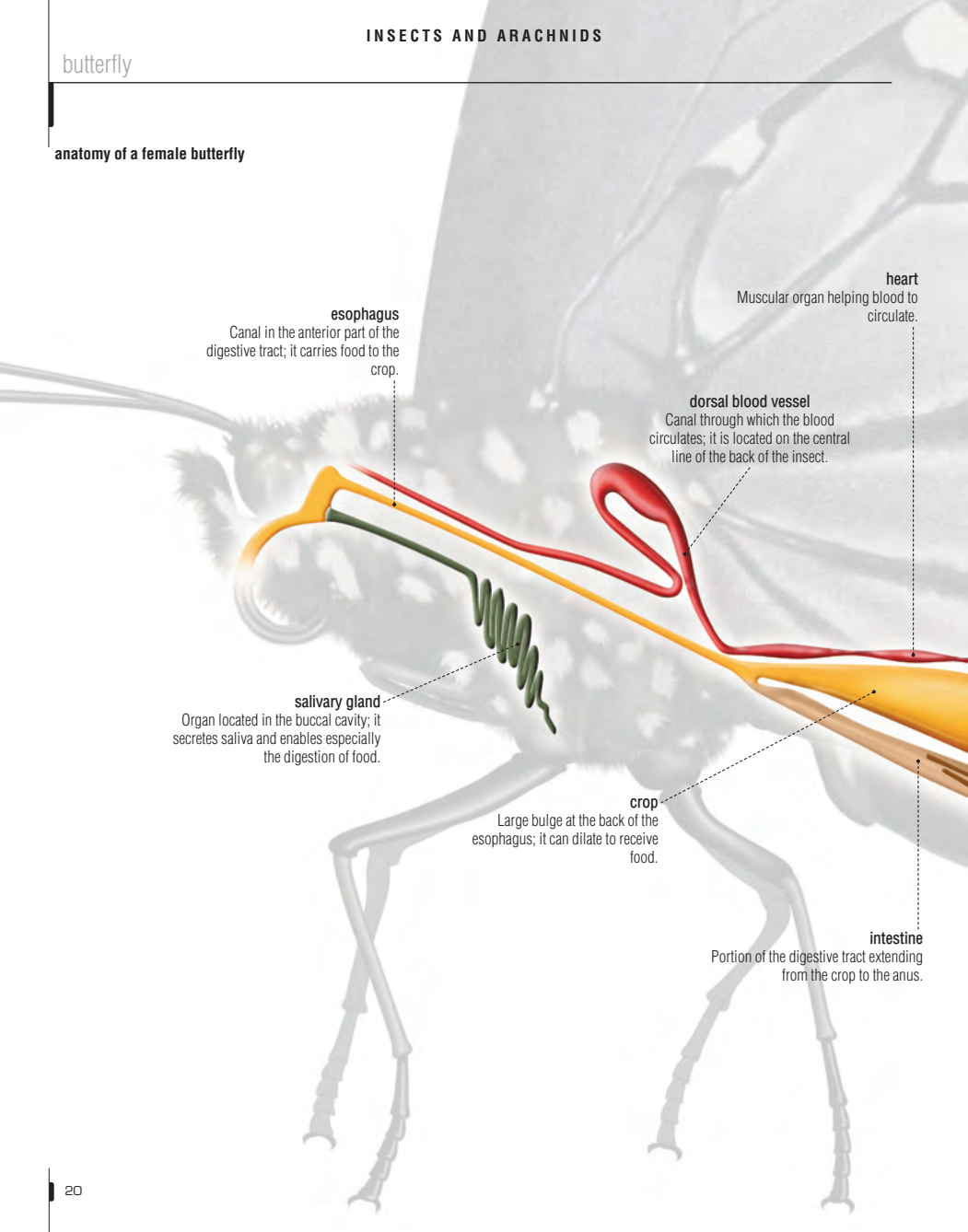
## morphology of a butterfly







**anatomy of a female butterfly**



**esophagus**

Canal in the anterior part of the digestive tract; it carries food to the crop.

**heart**  
Muscular organ helping blood to circulate.

**dorsal blood vessel**

Canal through which the blood circulates; it is located on the central line of the back of the insect.

**salivary gland**

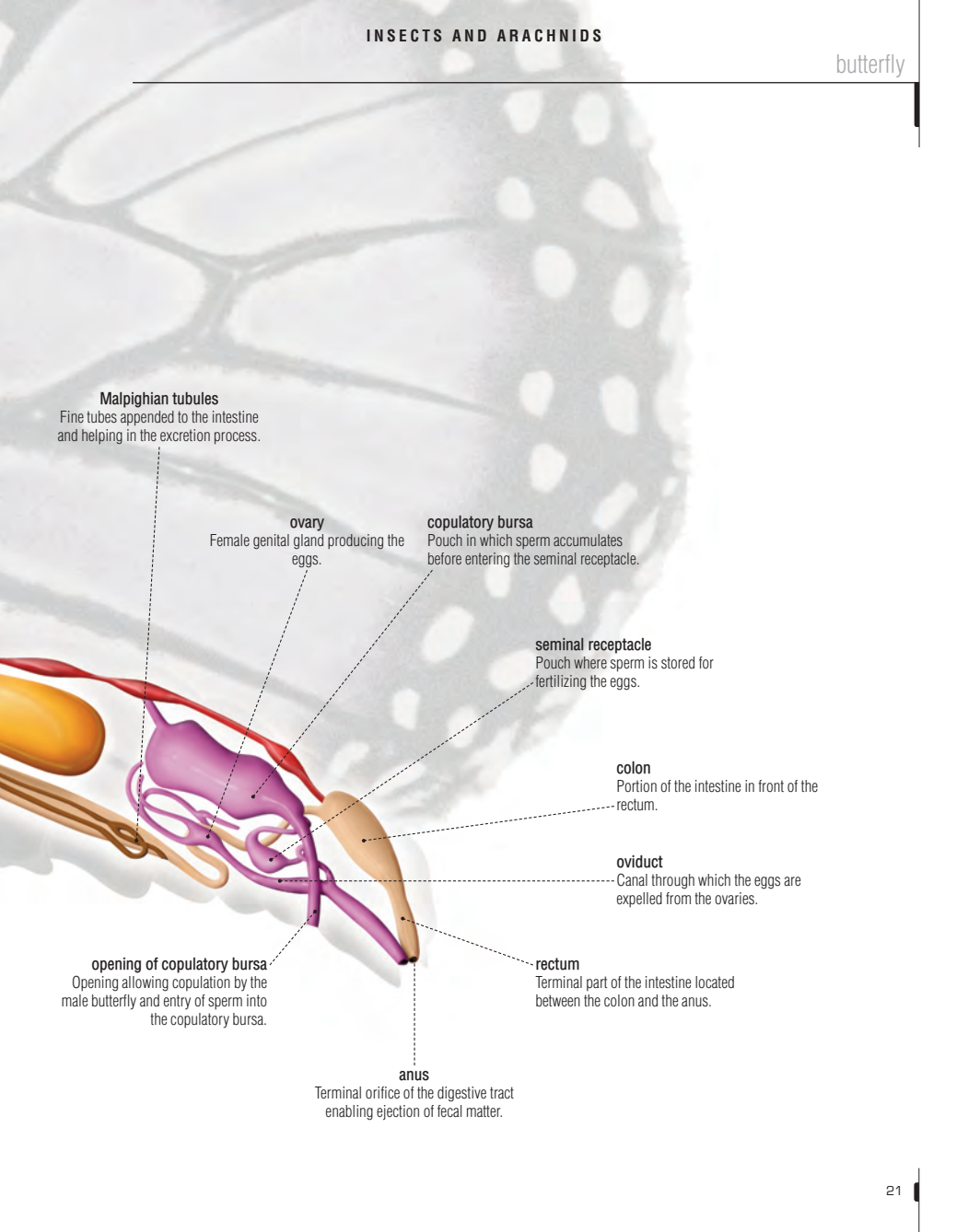
Organ located in the buccal cavity; it secretes saliva and enables especially the digestion of food.

**crop**

Large bulge at the back of the esophagus; it can dilate to receive food.

**intestine**

Portion of the digestive tract extending from the crop to the anus.



**Malpighian tubules**

Fine tubes appended to the intestine and helping in the excretion process.

**ovary**

Female genital gland producing the eggs.

**copulatory bursa**

Pouch in which sperm accumulates before entering the seminal receptacle.

**seminal receptacle**

Pouch where sperm is stored for fertilizing the eggs.

**colon**

Portion of the intestine in front of the rectum.

**oviduct**

Canal through which the eggs are expelled from the ovaries.

**opening of copulatory bursa**

Opening allowing copulation by the male butterfly and entry of sperm into the copulatory bursa.

**rectum**

Terminal part of the intestine located between the colon and the anus.

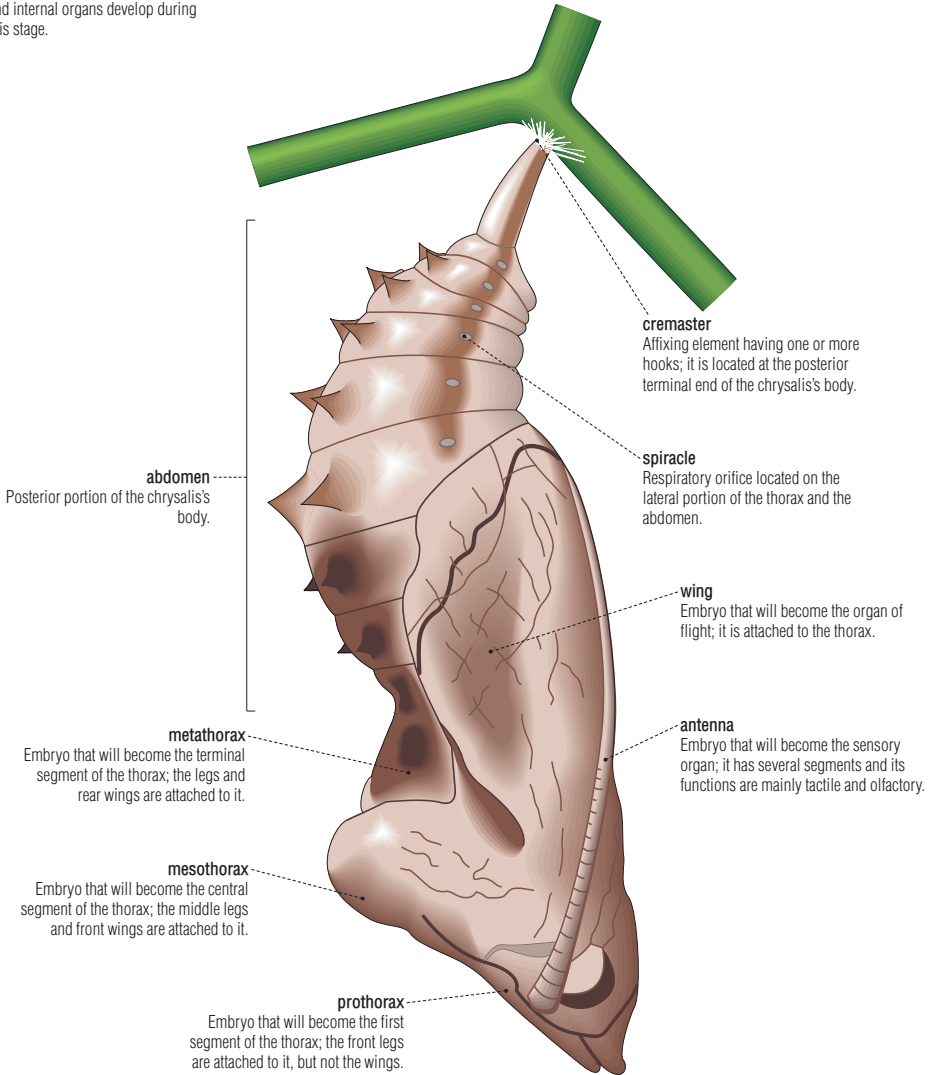
**anus**

Terminal orifice of the digestive tract enabling ejection of fecal matter.

butterfly

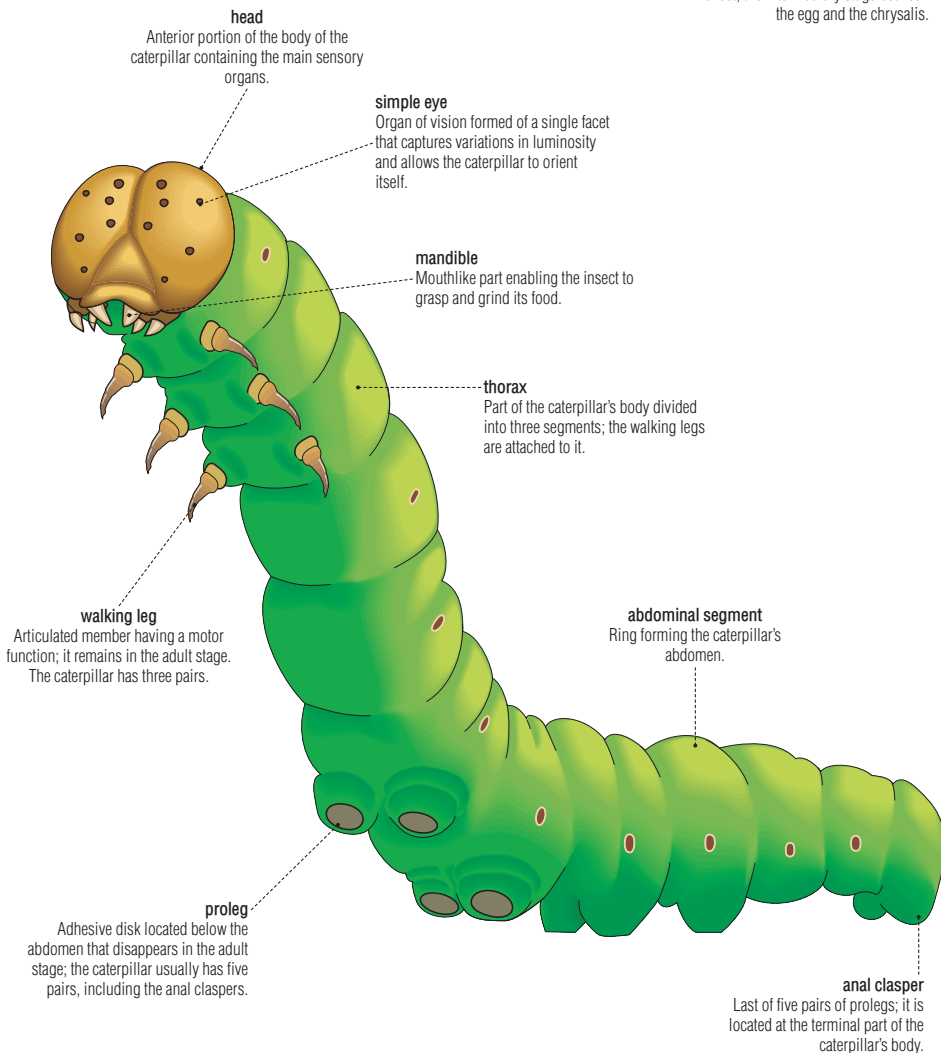
**chrysalis**

Intermediary stage between the caterpillar and the butterfly; the limbs and internal organs develop during this stage.



**caterpillar**

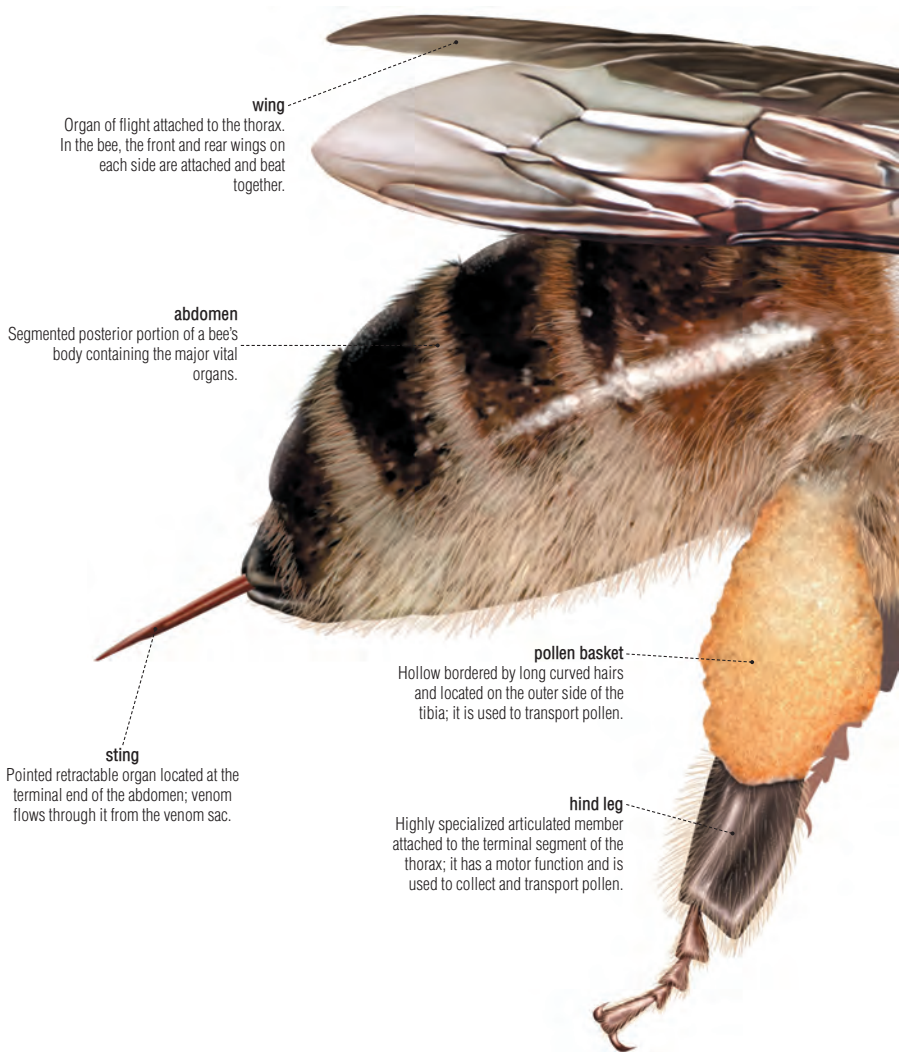
Butterfly larva having a long body and 10 feet; the intermediary stage between the egg and the chrysalis.



## honeybee

Insect living in a highly complex social order; it instinctively produces honey as a food reserve.

**morphology of a honeybee: worker**



**wing**

Organ of flight attached to the thorax. In the bee, the front and rear wings on each side are attached and beat together.

**abdomen**

Segmented posterior portion of a bee's body containing the major vital organs.

**sting**

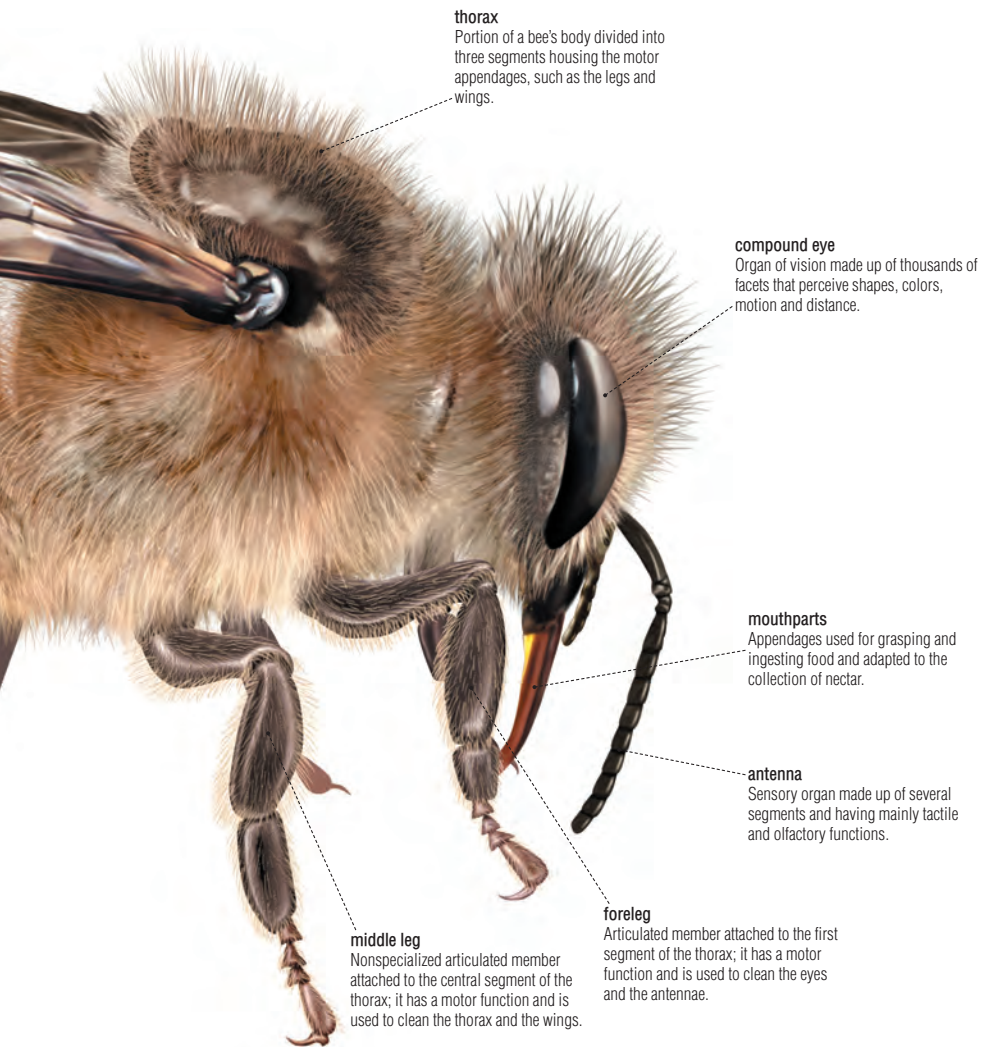
Pointed retractable organ located at the terminal end of the abdomen; venom flows through it from the venom sac.

**pollen basket**

Hollow bordered by long curved hairs and located on the outer side of the tibia; it is used to transport pollen.

**hind leg**

Highly specialized articulated member attached to the terminal segment of the thorax; it has a motor function and is used to collect and transport pollen.

**thorax**

Portion of a bee's body divided into three segments housing the motor appendages, such as the legs and wings.

**compound eye**

Organ of vision made up of thousands of facets that perceive shapes, colors, motion and distance.

**mouthparts**

Appendages used for grasping and ingesting food and adapted to the collection of nectar.

**antenna**

Sensory organ made up of several segments and having mainly tactile and olfactory functions.

**foreleg**

Articulated member attached to the first segment of the thorax; it has a motor function and is used to clean the eyes and the antennae.

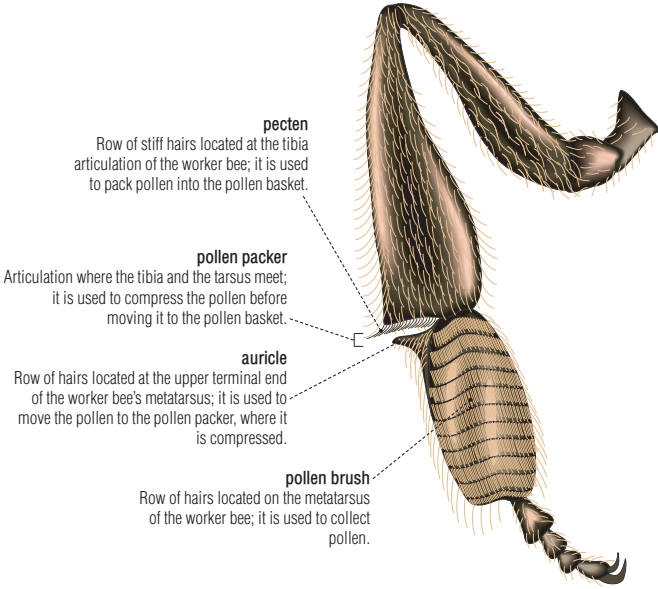
**middle leg**

Nonspecialized articulated member attached to the central segment of the thorax; it has a motor function and is used to clean the thorax and the wings.

honeybee

**hind leg (inner surface)**

Highly specialized articulated member attached to the terminal segment of the thorax; it has a motor function and is used to collect and transport pollen.



**pecten**

Row of stiff hairs located at the tibia articulation of the worker bee; it is used to pack pollen into the pollen basket.

**pollen pucker**

Articulation where the tibia and the tarsi meet; it is used to compress the pollen before moving it to the pollen basket.

**auricle**

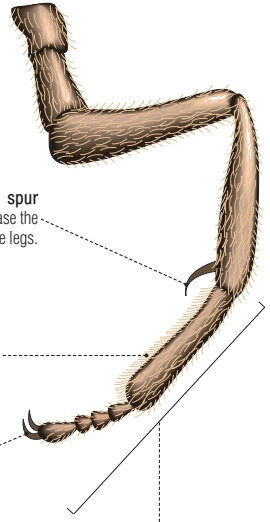
Row of hairs located at the upper terminal end of the worker bee's metatarsus; it is used to move the pollen to the pollen pucker, where it is compressed.

**pollen brush**

Row of hairs located on the metatarsus of the worker bee; it is used to collect pollen.

**middle leg (outer surface)**

Nonspecialized articulated member attached to the central segment of the thorax; it has a motor function and is used to clean the thorax and the wings.



**spur**

Movable appendage located on the tibia and used to release the pollen from the legs.

**pollen brush**

Row of hairs located on the metatarsus of the worker bee; it is used to collect pollen.

**claw**

Pointy hook-shaped structure attached to the tarsus and allowing the bee to grab hold of things.

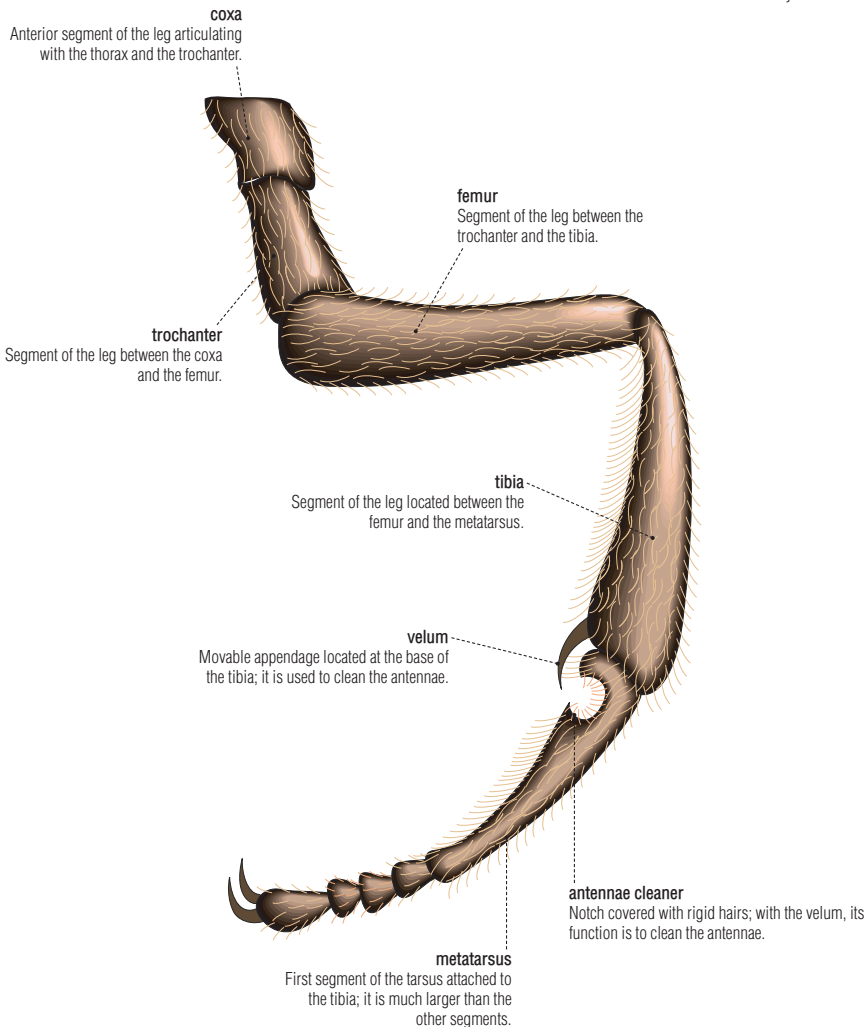
**tarsus**

Terminal segment of the leg; it is divided into five parts and has two claws.



**foreleg (outer surface)**

Articulated member attached to the first segment of the thorax; it has a motor function and is used to clean the eyes and the antennae.

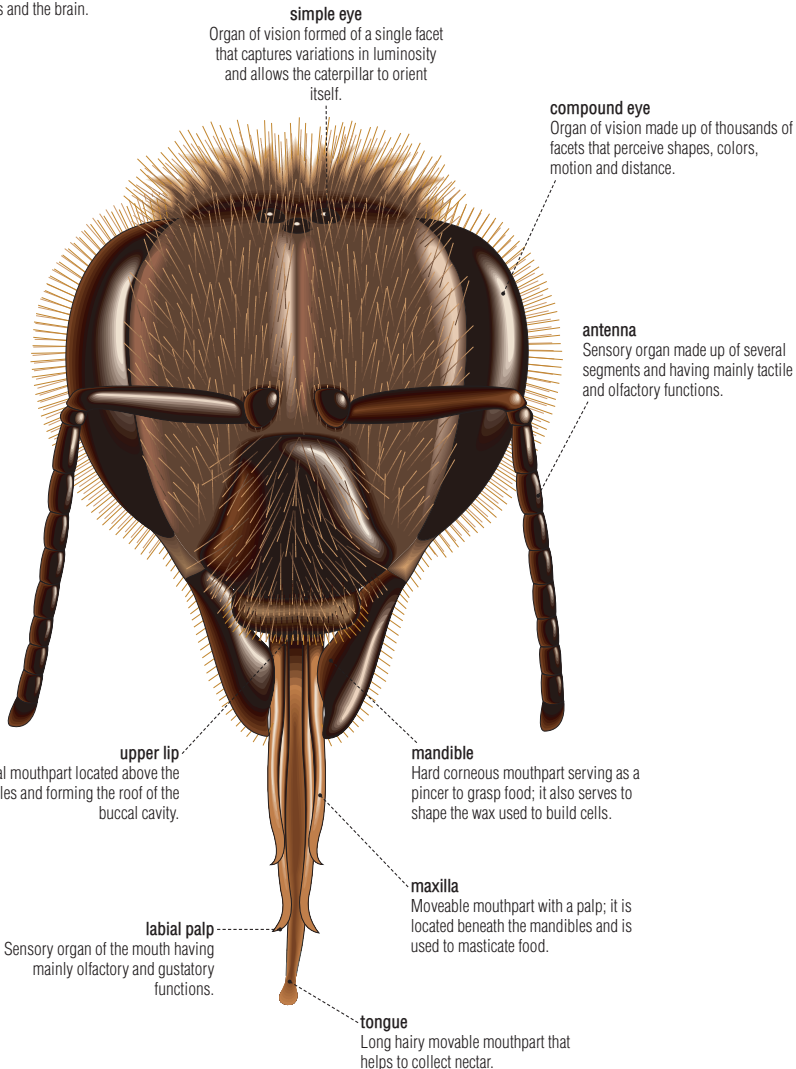




honeybee

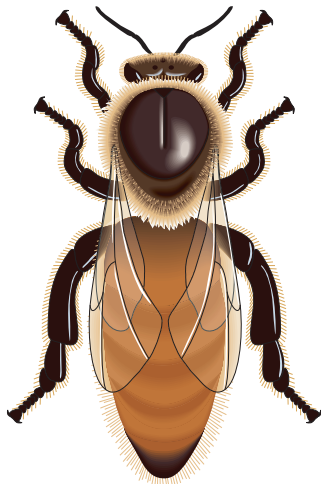
**head**

Anterior portion of the body containing the sensory organs and the brain.

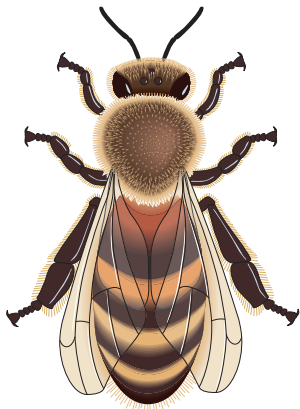


**castes**

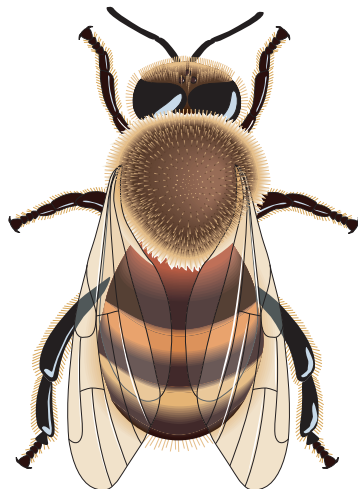
The three types of bees in a hive are classified according to their function: the queen, the drones and the workers.

**queen**

The only reproductive female in the colony, whose sole function is to lay eggs; it is fertilized by five to 10 drones.

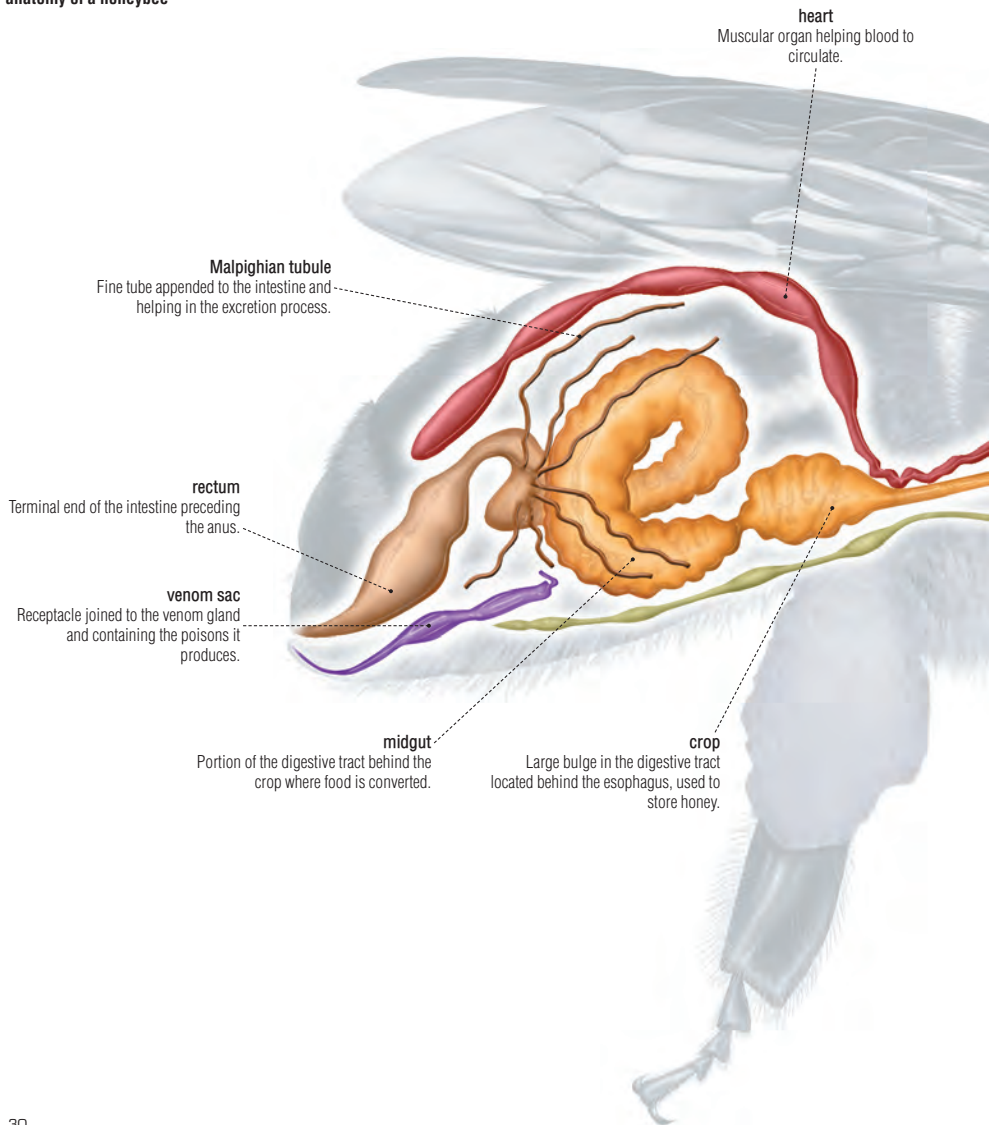
**worker**

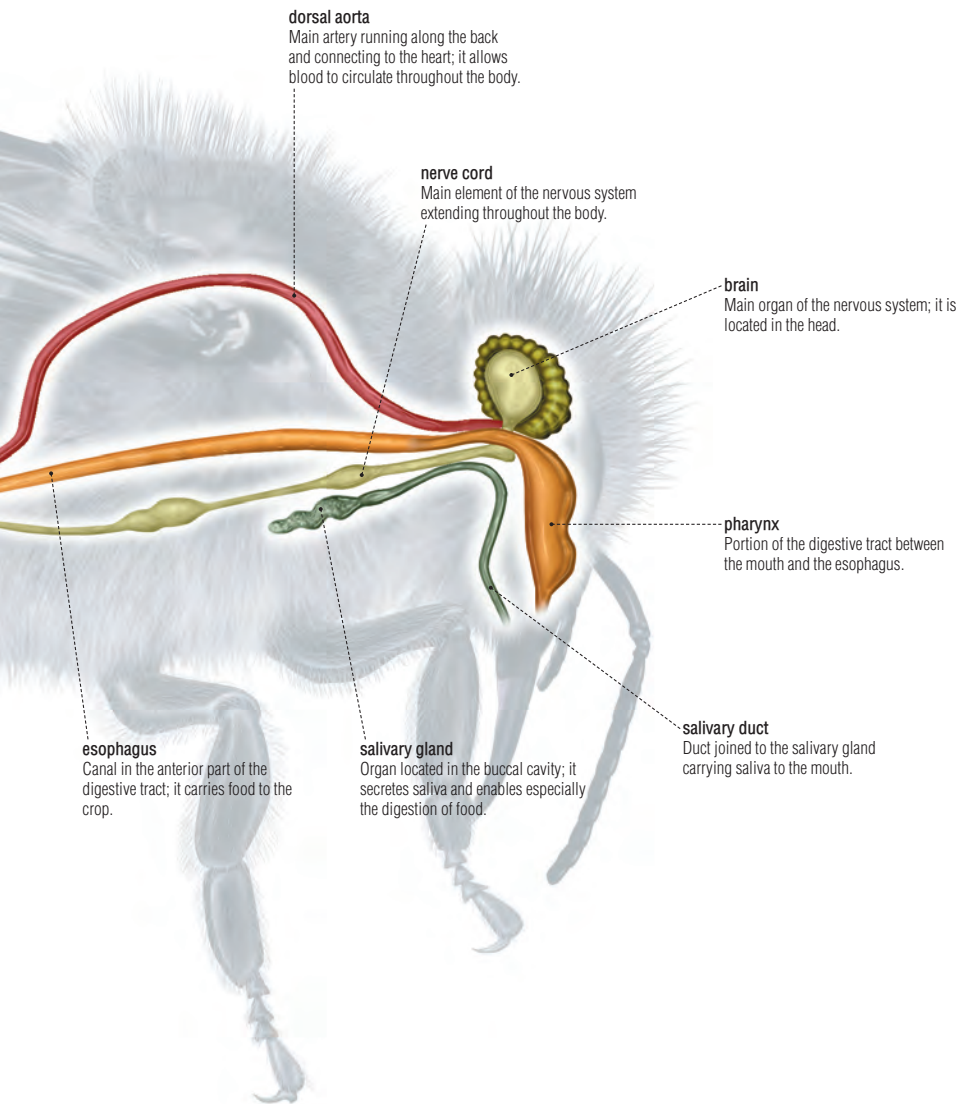
Sterile female who does various tasks, such as searching for food, building cells and defending the colony.

**drone**

Stingless male bee; its only function is to reproduce.

## anatomy of a honeybee





**dorsal aorta**

Main artery running along the back and connecting to the heart; it allows blood to circulate throughout the body.

**nerve cord**

Main element of the nervous system extending throughout the body.

**brain**

Main organ of the nervous system; it is located in the head.

**esophagus**

Canal in the anterior part of the digestive tract; it carries food to the crop.

**salivary gland**

Organ located in the buccal cavity; it secretes saliva and enables especially the digestion of food.

**pharynx**

Portion of the digestive tract between the mouth and the esophagus.

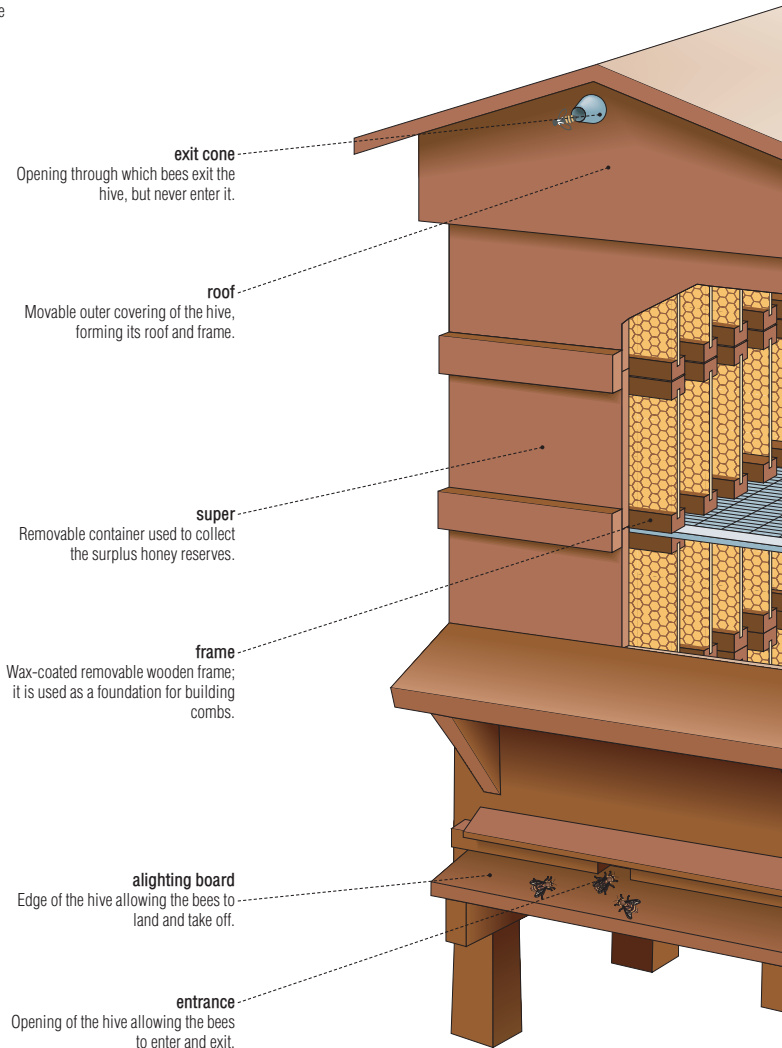
**salivary duct**

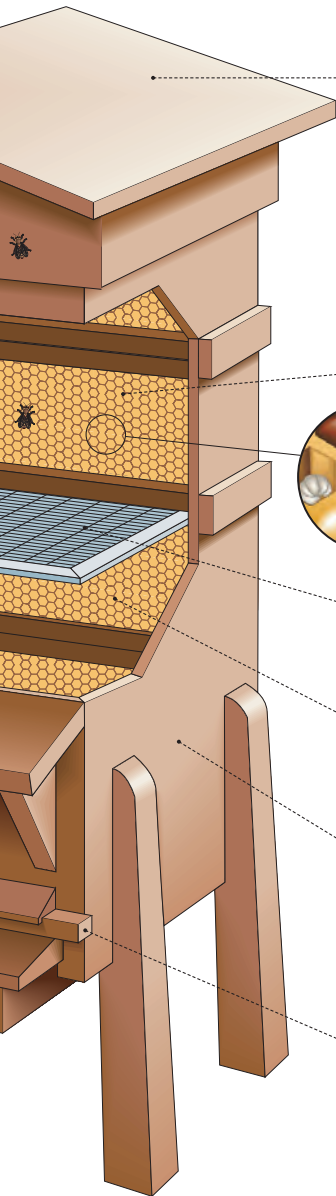
Duct joined to the salivary gland carrying saliva to the mouth.

## honeybee

**hive**

Shelter constructed to house a bee colony that produces honey and pollinates fruit trees.

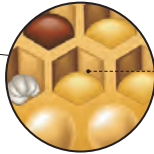


**roof**

Top of the hive providing protection.

**honeycomb**

Cake of wax made by bees in the hive made up of cells placed side by side and filled with honey or used as brood chambers for embryos.

**cell**

Hexagonal cavity contained within walls of wax, the constituent unit of honeycombs.

**queen excluder**

Wire frame separating the brood chamber from the super; it prevents the queen from entering while allowing the worker bees to pass through.

**brood chamber**

Part of the hive formed of combs; its cells house the queen, eggs, larvae, pupae and reserves of pollen and honey.

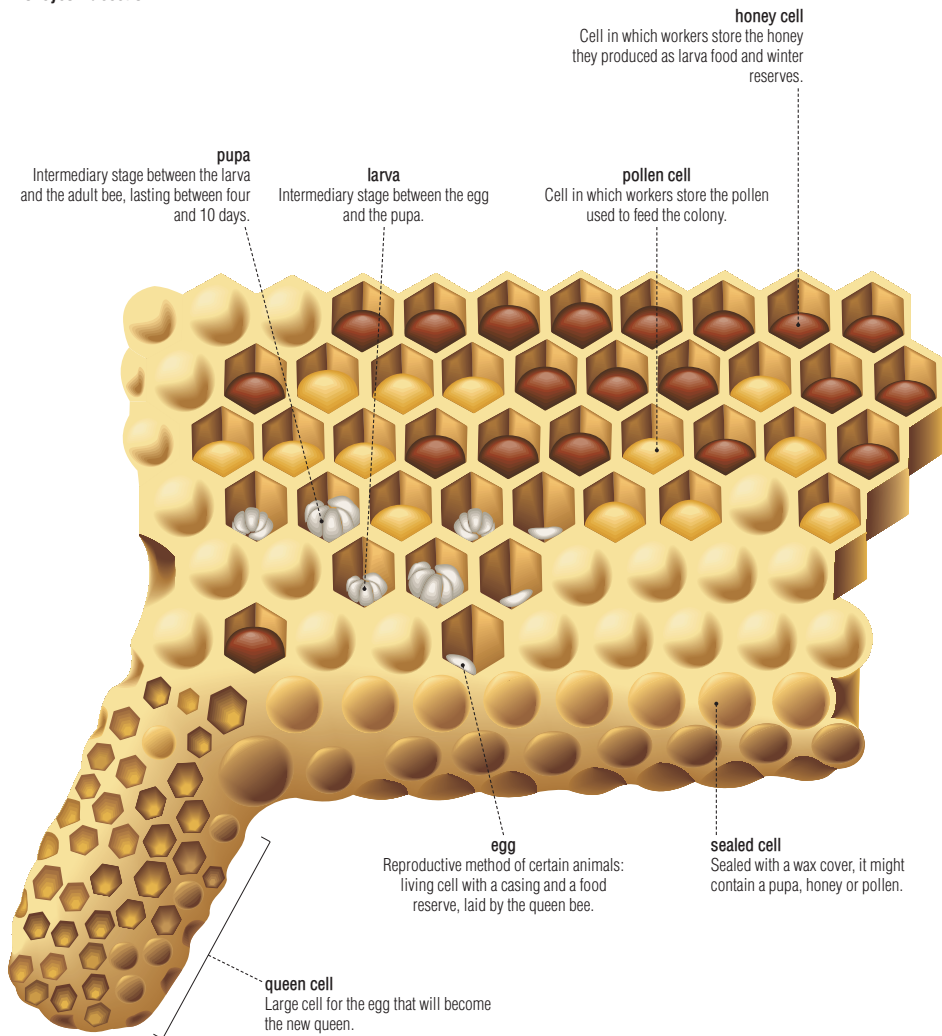
**hive body**

Main portion of the hive enclosing the brood chamber.

**entrance slide**

Movable wooden slat for decreasing or enlarging the size of the entrance, mainly to prevent small animals from entering the hive.

honeycomb section



Insects: invertebrates with bodies divided into three parts; they usually have three pairs of legs, two pairs of wings and antennae.



**tsetse fly**

Stinging African insect, a parasite of mammals, birds and humans; it is best known for transmitting sleeping sickness.



**termite**

Social insect that lives in hill colonies; it eats away at wood with its crushing mouthparts.



**flea**

Extremely small, wingless leaping insect, a parasite of certain mammals, birds and humans; it stings them to feed off their blood.



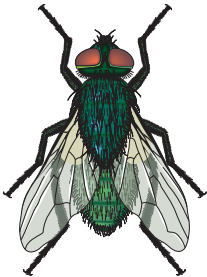
**louse**

Small wingless insect, a parasite of humans, mammals, birds and certain plants.



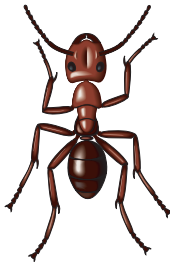
**mosquito**

Insect with two wings and long antennae; the female stings humans and animals to feed off their blood.



**fly**

Stocky insect of drab or metallic coloring and having a proboscis, two wings and short antennae; there are numerous species.



**ant**

Small social insect living in a highly complex colony; it has developed jaws and might or might not have wings. It consumes mainly insect pests.



**furniture beetle**

Small insect, common throughout Europe; its larva feeds on lumber and dead wood.



**sexton beetle**

Insect that lays its eggs on dead animals or decomposing matter, which it buries; the egg cache gives off a strong musky smell.

**ladybird beetle**

Brightly colored round-bodied insect that preys on aphids and mealybugs.

**shield bug**

Small flat-bodied land insect that stings and sucks, a parasite of humans, animals and plants; it releases an unpleasant odor as a defense.

**horsefly**

Large fly found in warm countries; the female stings animals and occasionally humans to feed off their blood.

**hornet**

Large wasp with a painful and dangerous sting; it feeds mainly on insects and fruit.

**yellowjacket**

Social insect; the female has a venomous sting that is painful.

**bumblebee**

Plump hairy insect related to the bee; it lives in colonies and produces honey.

**oriental cockroach**

Scurrying flat-bodied nocturnal insect that is widely dispersed; some species live in human dwellings, feeding on waste matter. It emits an unpleasant odor.

**cicada**

Large sap-sucking insect; the male produces a shrill monotone sound in hot weather.

**cockchafer**

Common garden insect with fringed antennae; it eats leaves and tree roots. Infestations of this pest can cause serious damage.

**water bug**

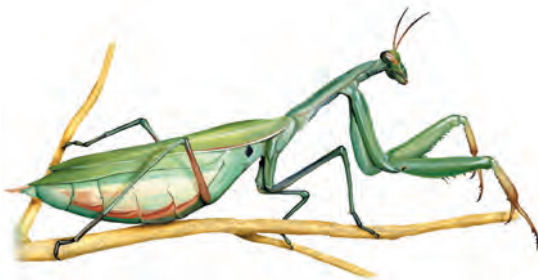
Large carnivorous insect with a lean flat body; it is widely dispersed and lives in aquatic environments.

**bow-winged grasshopper**

Hopping insect with short antennae and powerful hind legs; it lives especially in hot climates and emits an intense lively song.

**great green bush-cricket**

Carnivorous leaping insect with long antennae, growing to 1 to 2 in in length; the male produces a shrill sound.

**mantid**

Long-bodied carnivorous insect found in tropical regions and blending in with its surroundings; its pincer-shaped front legs have spines.

**monarch butterfly**

Large diurnal migratory butterfly with spotted wings; its caterpillar feeds exclusively on a wild plant called the butterfly bush.

**peppered moth**

Large butterfly with delicate wings, active at night or at dawn; its caterpillar lives in birch trees, causing major damage.

**water strider**

Widespread carnivorous insect with a long thin body and six legs, of which the four longest help it to move across water.

**dragonfly**  
Long-bodied carnivorous insect found near water, having four rigid wings and the largest compound eyes of any insect.

**atlas moth**

Large nocturnal butterfly with colored wings and a wingspan that can reach more than 1 foot; it is found mainly in Southeast Asia.

Arachnids: invertebrates usually with four pairs of legs and two pairs of appendages attached to their heads.



**garden spider**

Arachnid with a bulging stomach that weaves large webs and is commonly found in fields and gardens; its various species can be found around the world.



**crab spider**

Widespread small arachnid that moves sideways and has powerful front legs; it changes color to catch its prey.



**water spider**

Aquatic arachnid found in Eurasia; to live in the water, it weaves a kind of bell that it fills with air and carries along on the hairs of its abdomen.



**tick**

Extremely small arachnid, parasite of animals and occasionally humans; it can transmit infectious diseases.



**scorpion**

Relatively large carnivorous arachnid with spines, usually found on land; it has pincers and its abdomen ends in a tail with a poisonous sting.



**red-kneed tarantula**

Large hairy arachnid found in Mexico, having a painful but usually innocuous bite; it lives underground in a closed compartment or cocoon.

## spider

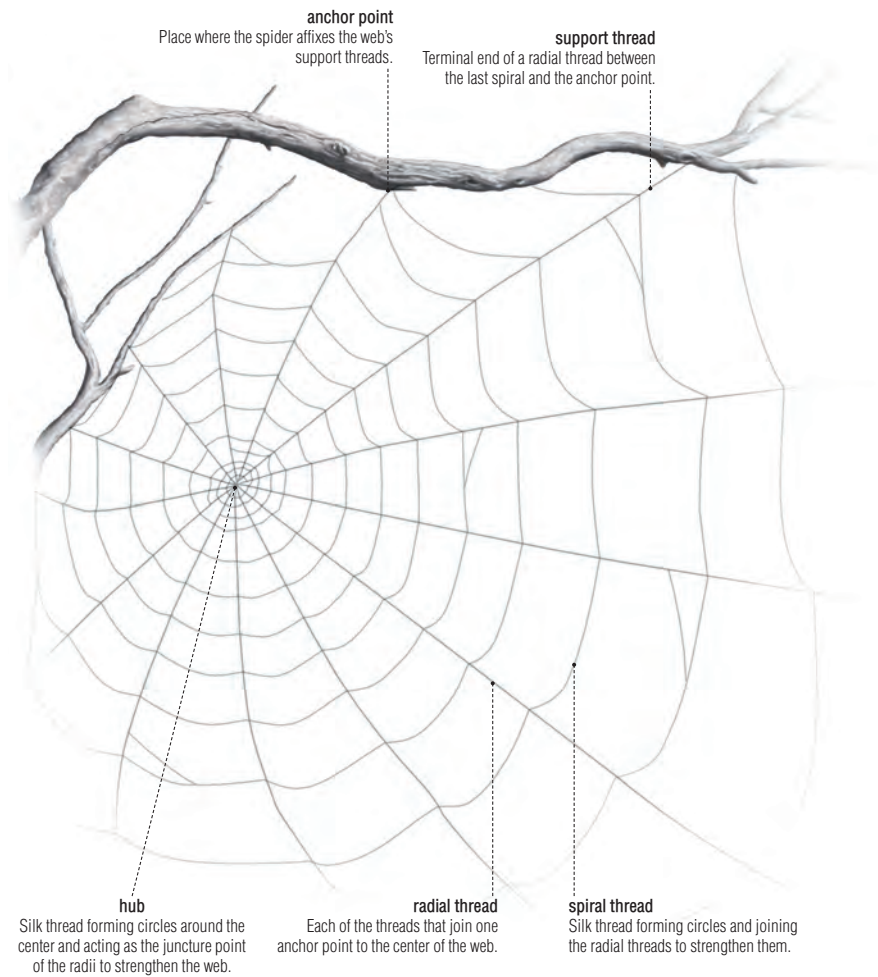
Articulated arachnid with fangs and silk-producing glands; it ranges in size from less than an inch to 3.5 in.

## morphology of a spider



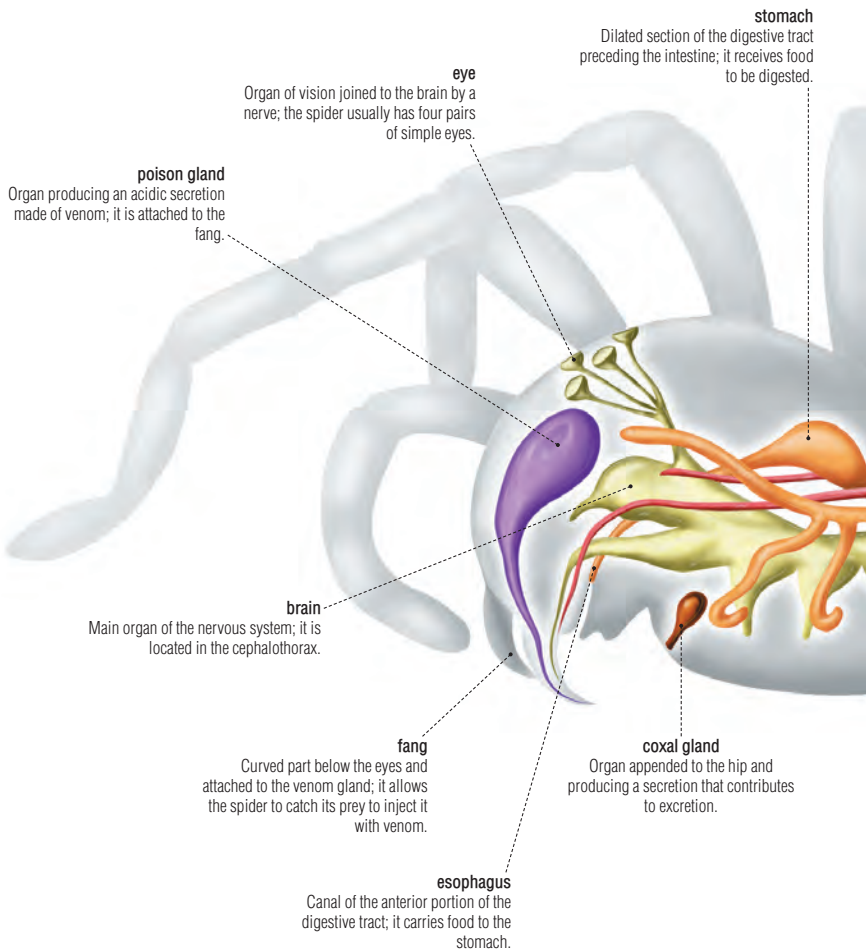
**spider web**

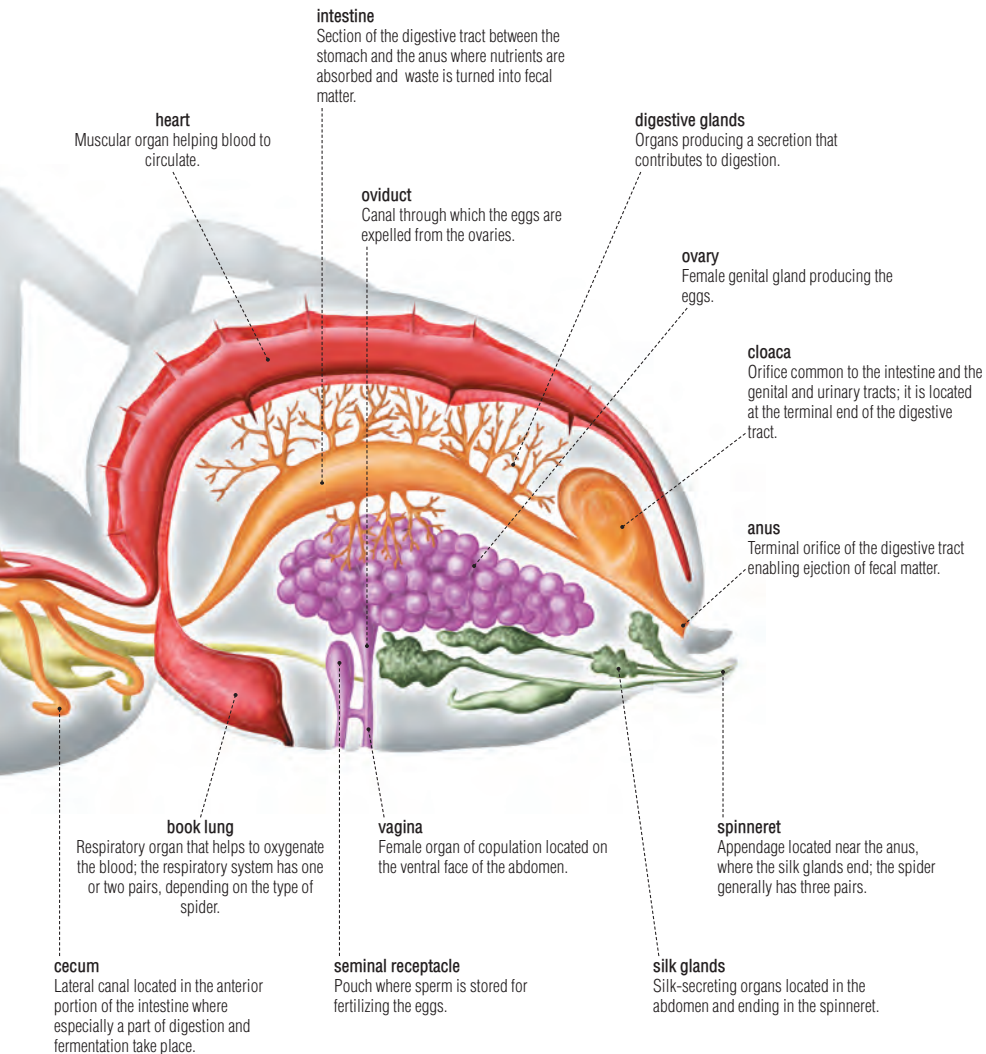
Network of silk threads woven by a spider; it solidifies in the air.





**anatomy of a female spider**



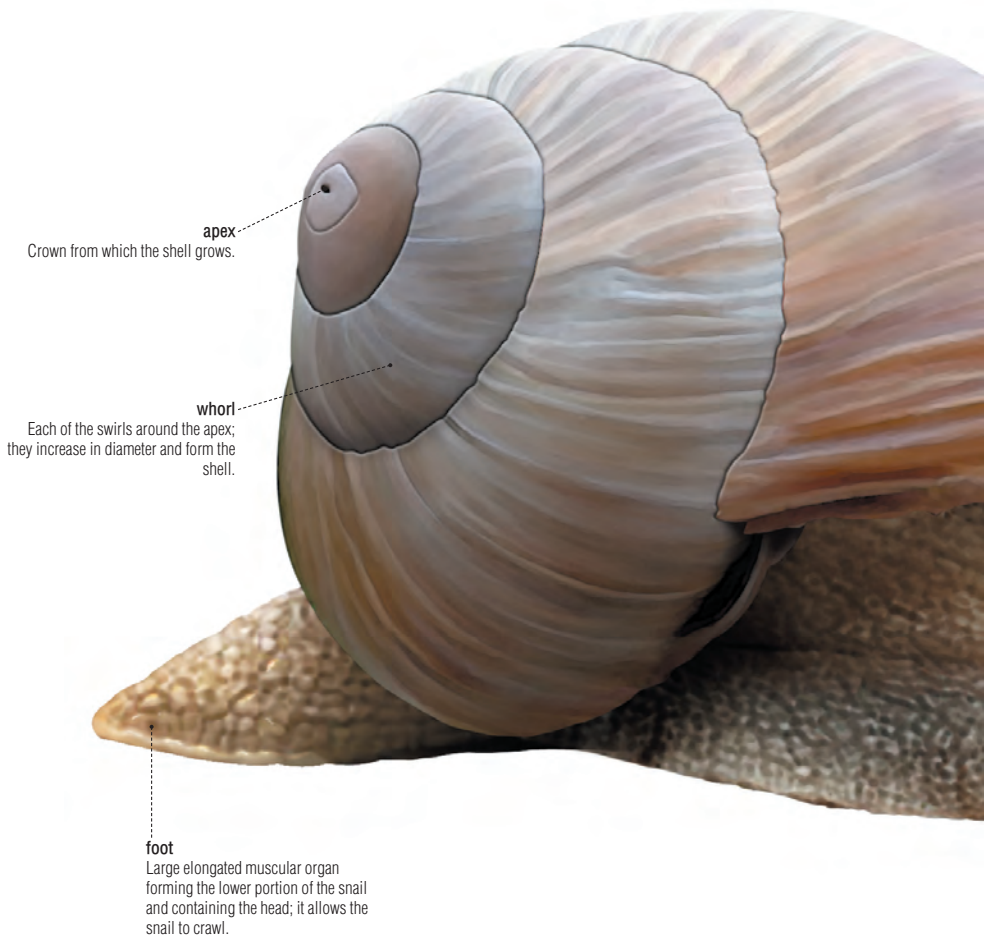


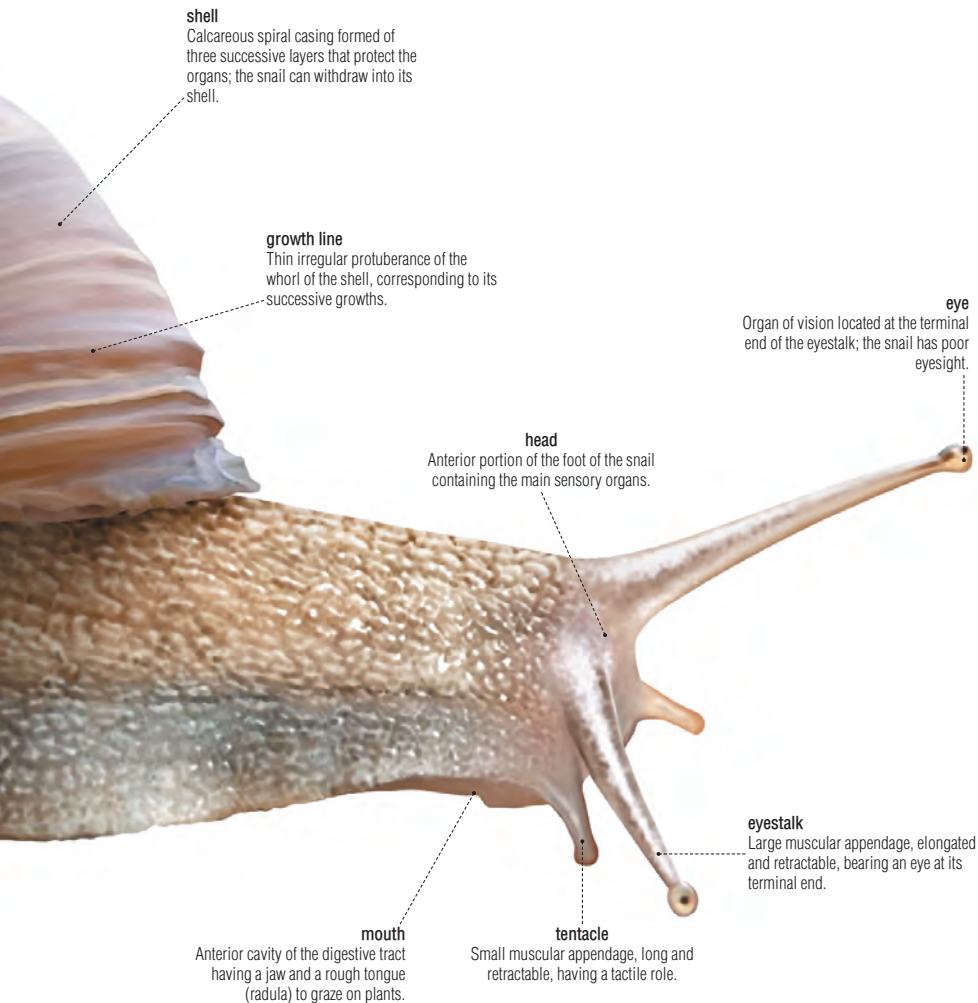


## snail

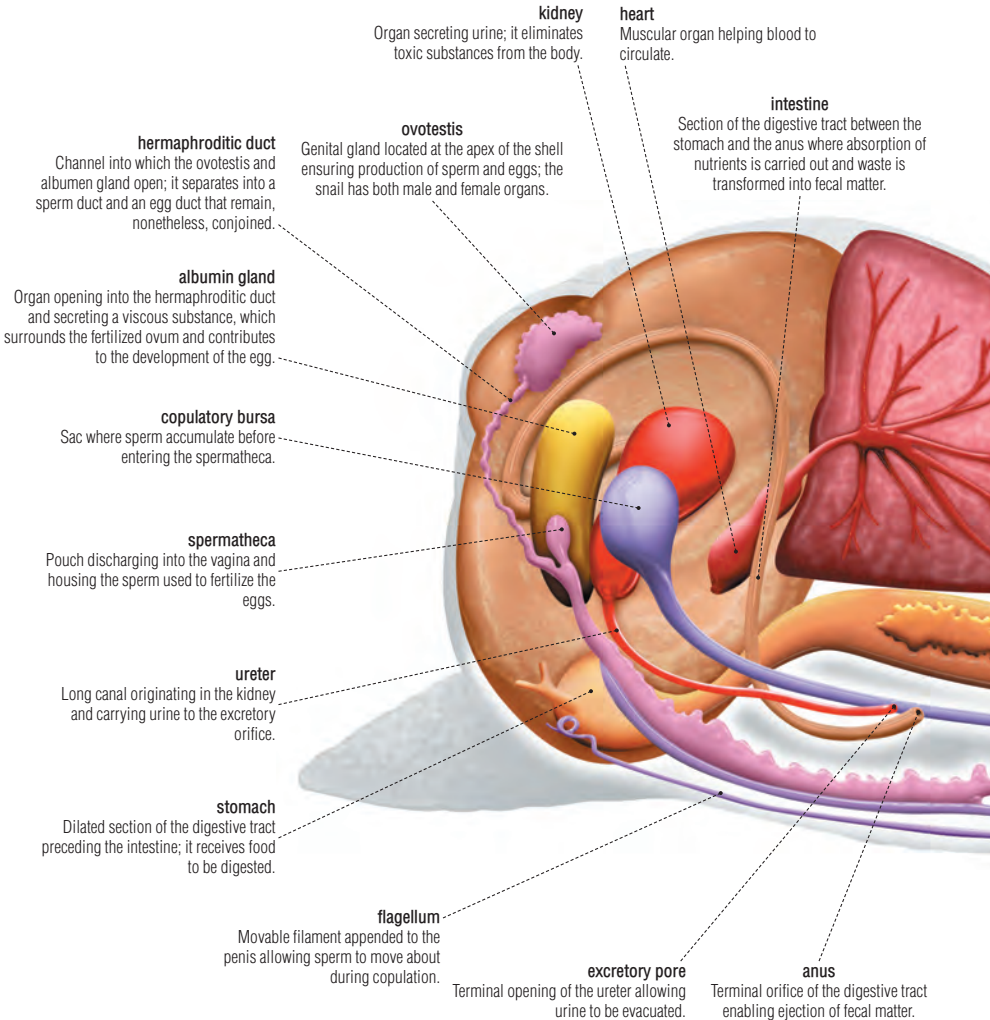
Hermaphrodite herbivore land mollusk having a spiral shell; some species of snails are edible.

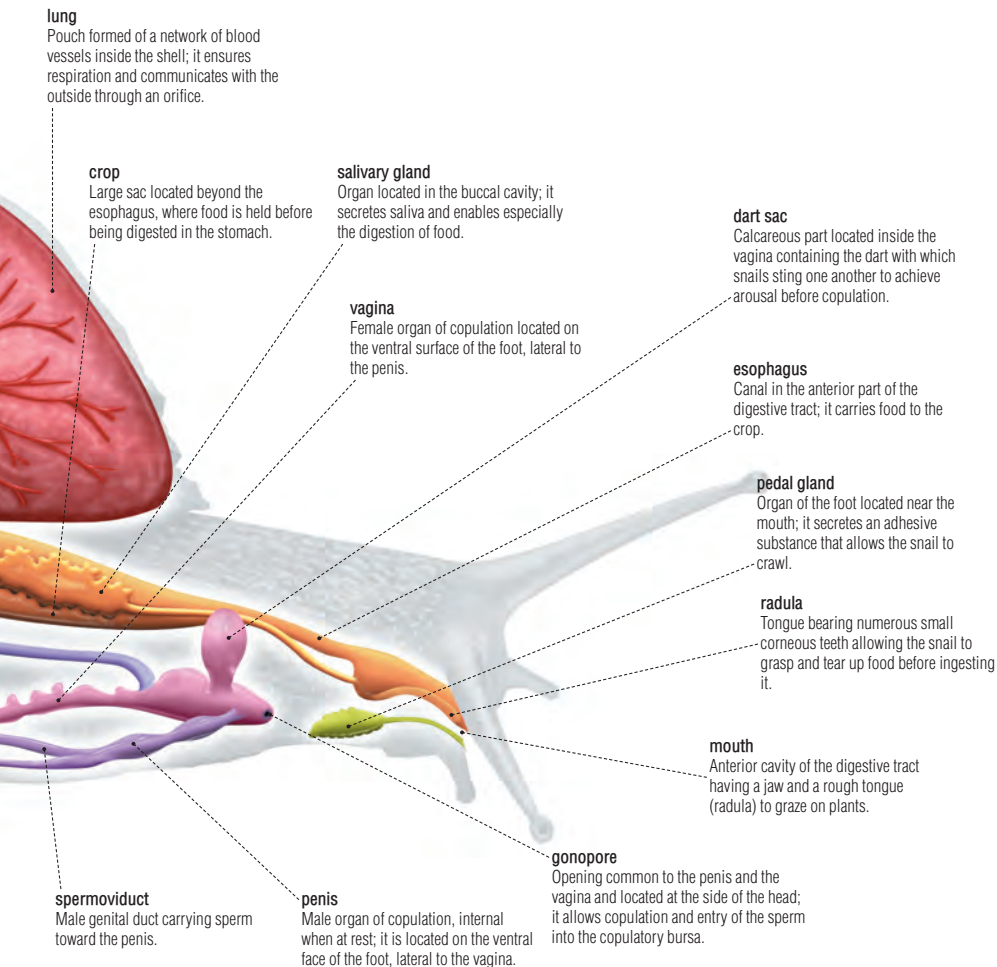
## morphology of a snail





**anatomy of a snail**

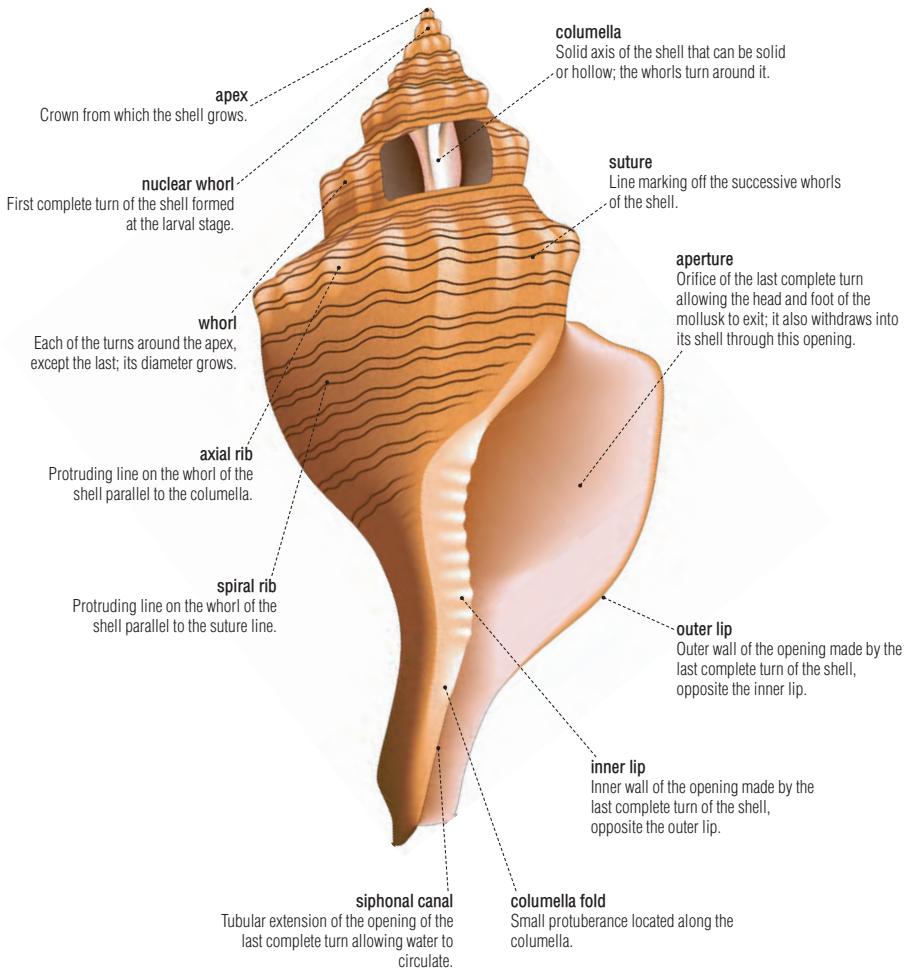




## univalve shell

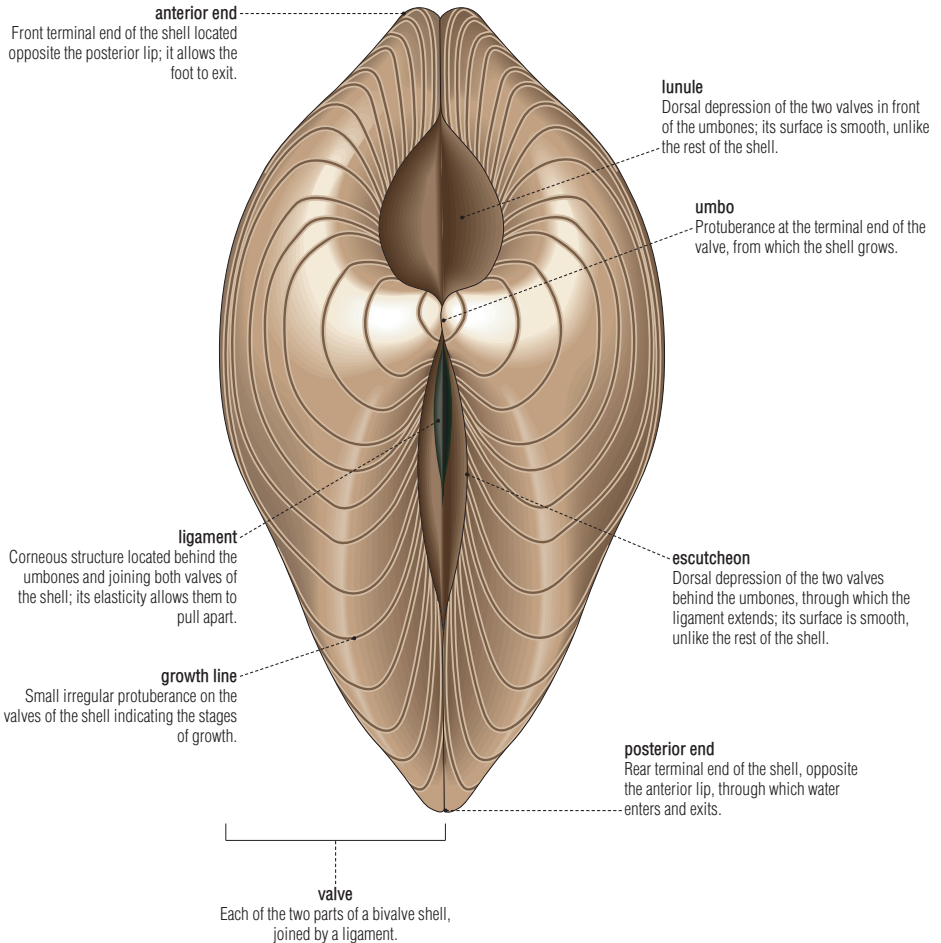
Land or aquatic mollusk having a foot and head, which retract into a spiral shell made of a single piece.

## morphology of a univalve shell



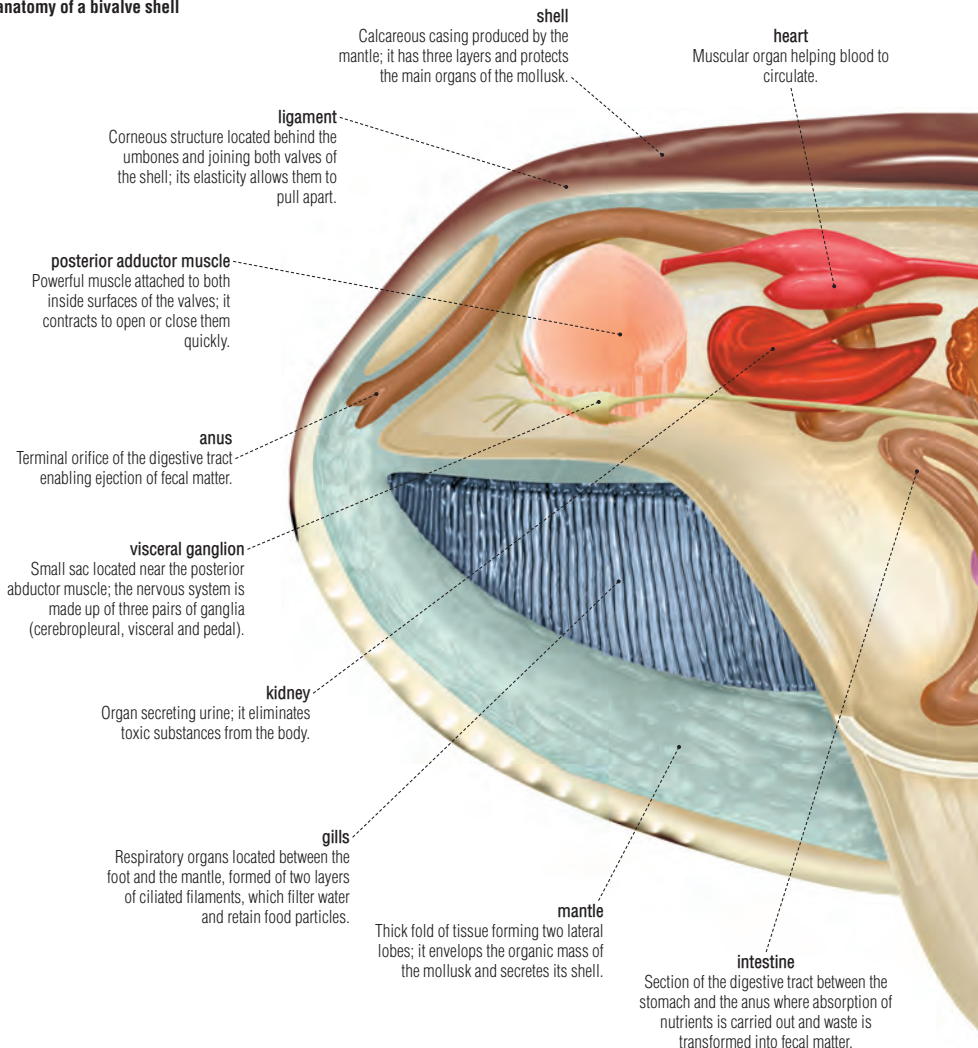
Aquatic mollusk without a defined head but having a foot, which retracts into a shell formed of two interarticulated parts.

### morphology of a bivalve shell

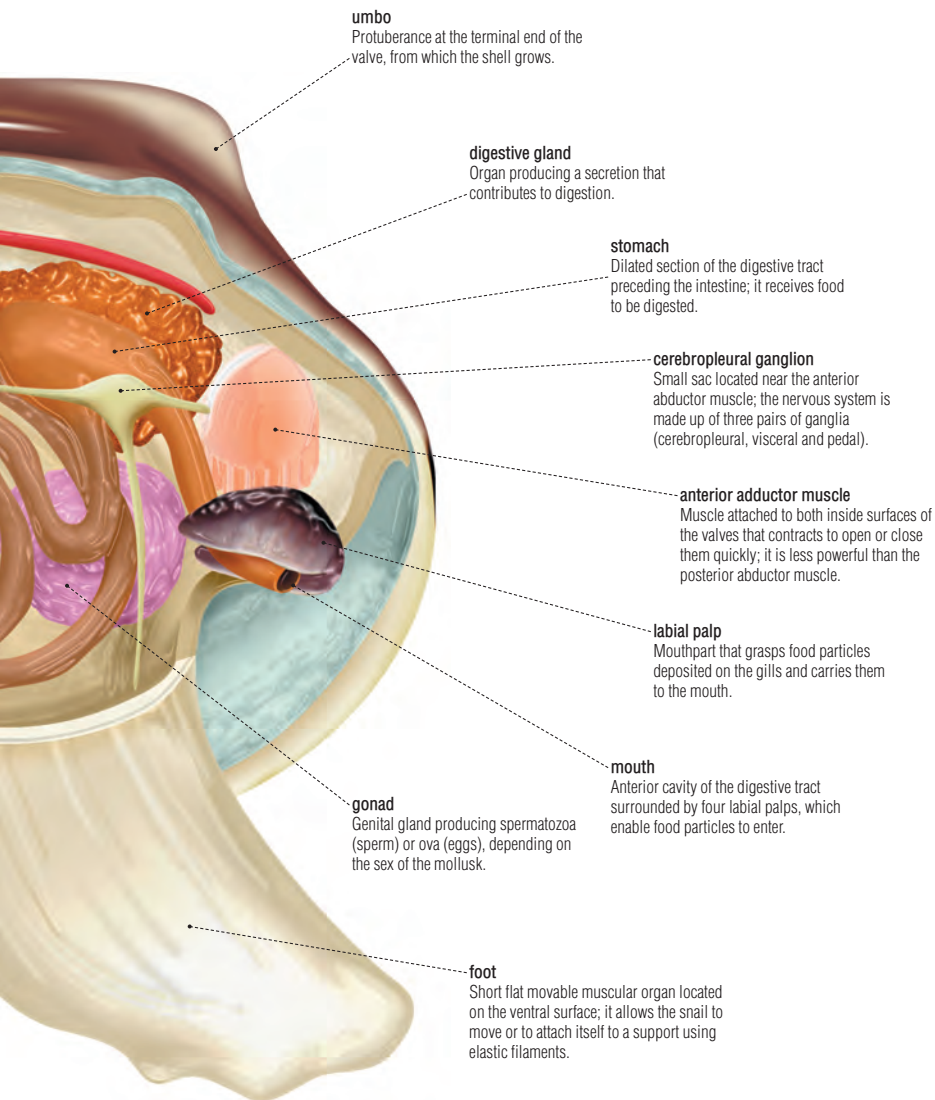


## bivalve shell

## anatomy of a bivalve shell





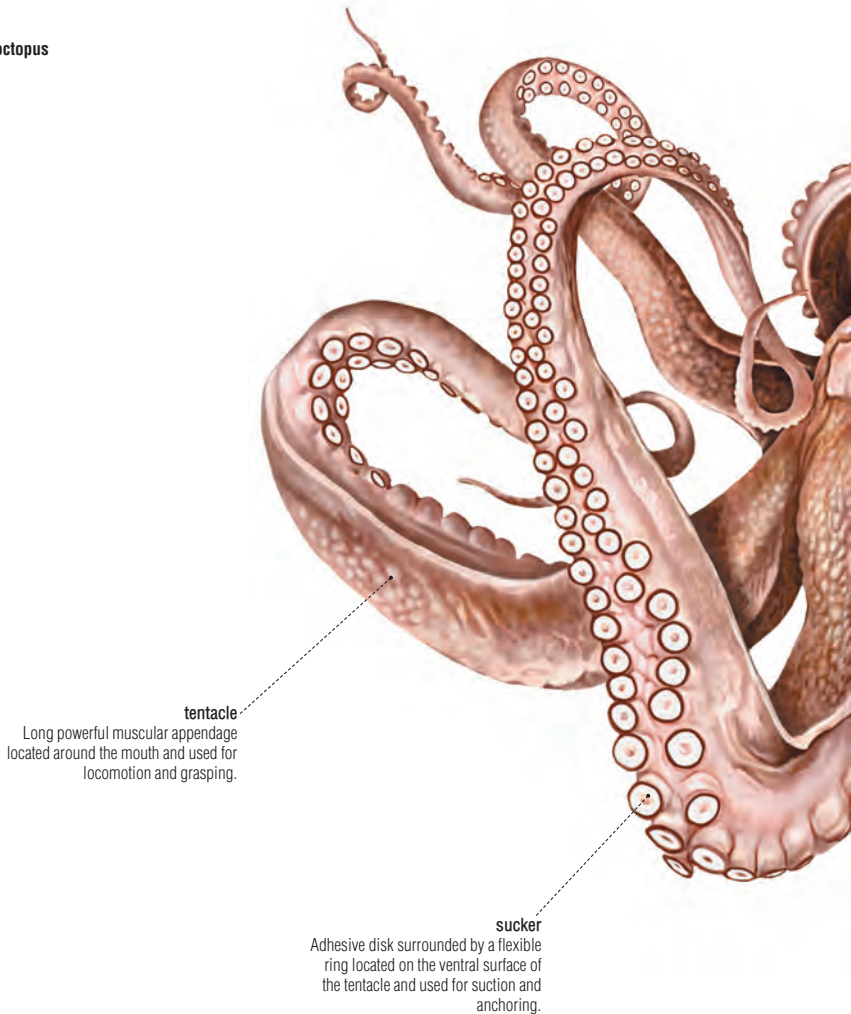


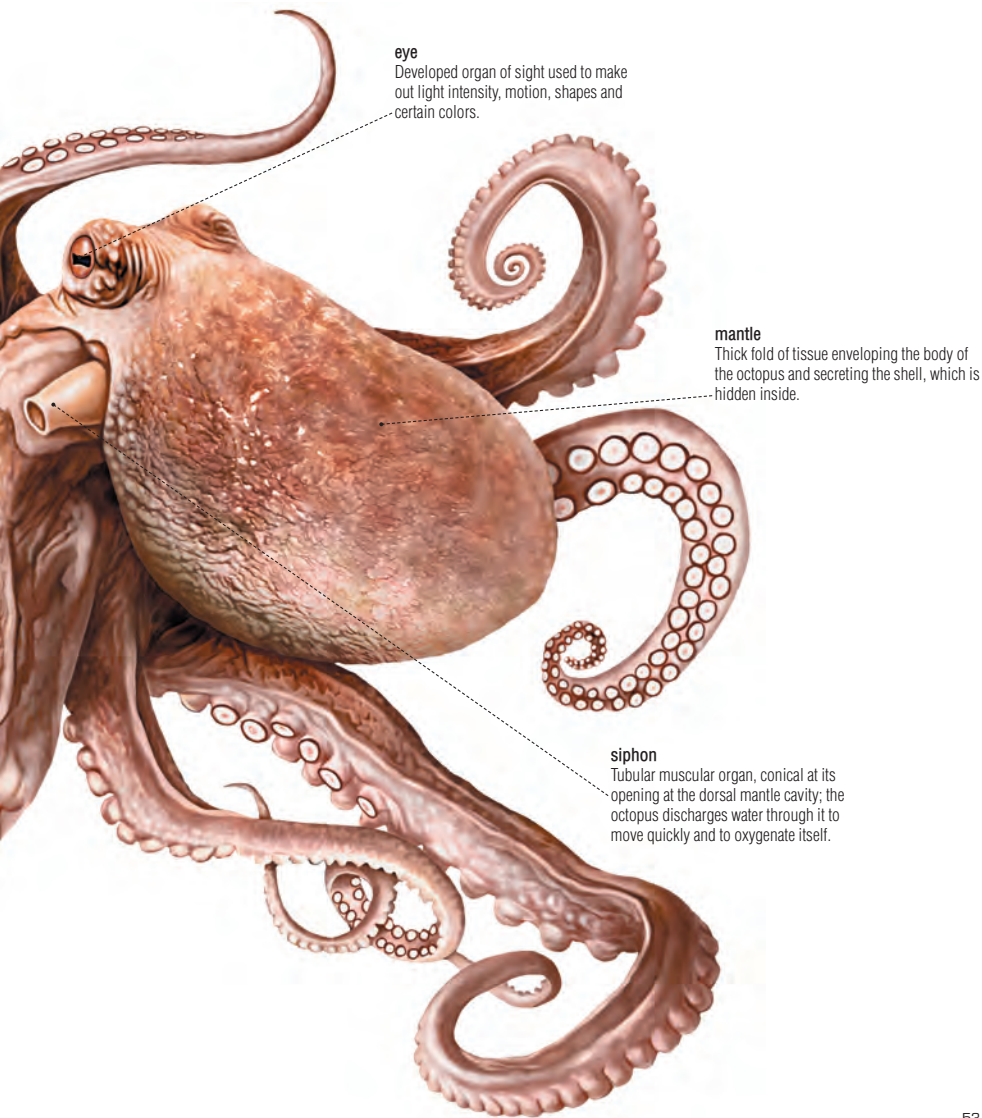


# octopus

Carnivorous marine mollusk with a head bearing eight powerful arms covered with suckers; the octopus can change color to camouflage itself. Certain species are edible.

## morphology of an octopus



**eye**

Developed organ of sight used to make out light intensity, motion, shapes and certain colors.

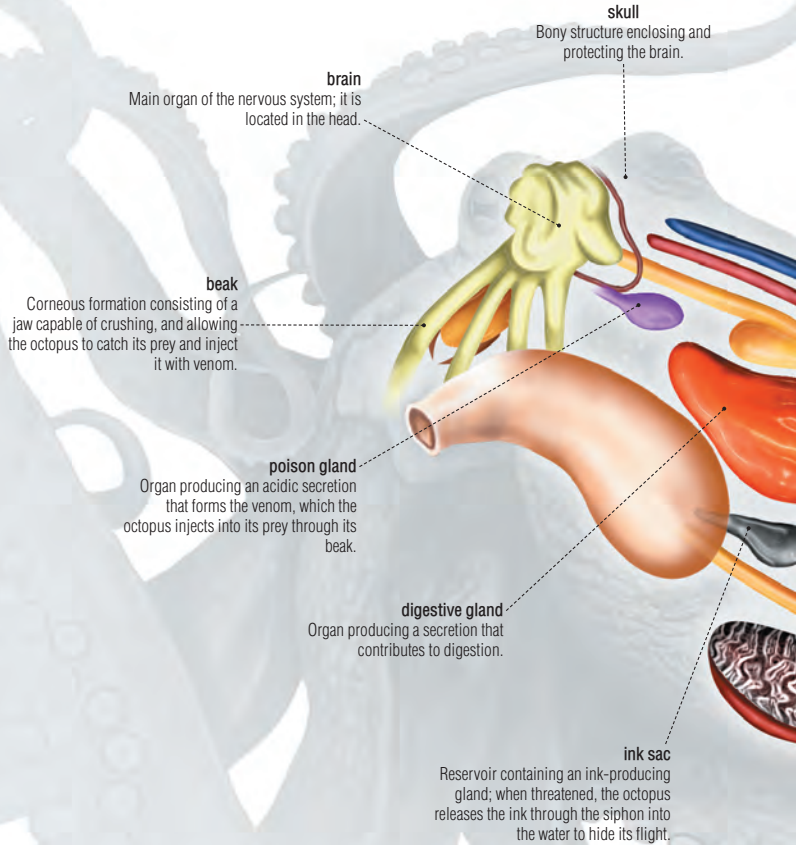
**mantle**

Thick fold of tissue enveloping the body of the octopus and secreting the shell, which is hidden inside.

**siphon**

Tubular muscular organ, conical at its opening at the dorsal mantle cavity; the octopus discharges water through it to move quickly and to oxygenate itself.

## anatomy of an octopus



**mantle muscles**

Muscles contracting to force water out of the dorsal mantle cavity through the siphon and allowing the octopus to propel itself through the water.

**crop**

Large sac located beyond the esophagus, where food is held before being digested in the stomach.

**dorsal mantle cavity**

Chamber formed of folds of the mantle; it contains the main organs, especially the gills, and connects to the outside.

**stomach**

Dilated section of the digestive tract preceding the intestine; it receives food to be digested.

**shell**

Small internal calcareous structure produced by the mantle; certain species do not have shells.

**cecum**

Lateral canal located in the anterior portion of the intestine where especially a part of digestion and fermentation take place.

**heart**

Muscular organ helping blood to circulate.

**gonad**

Genital gland producing spermatozoa (sperm) or ova (eggs), depending on the sex of the mollusk.

**kidney**

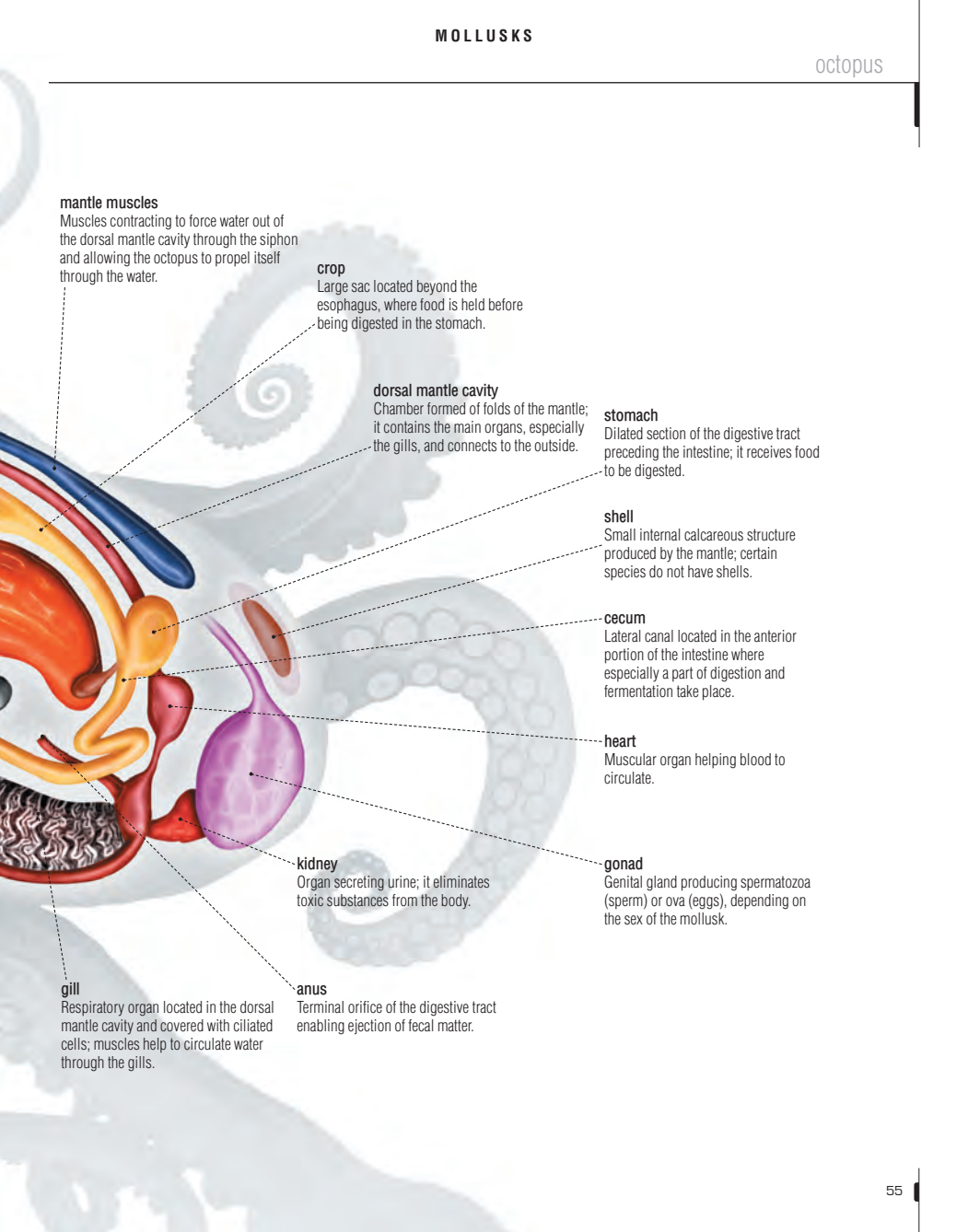
Organ secreting urine; it eliminates toxic substances from the body.

**anus**

Terminal orifice of the digestive tract enabling ejection of fecal matter.

**gill**

Respiratory organ located in the dorsal mantle cavity and covered with ciliated cells; muscles help to circulate water through the gills.



## lobster

Large marine crustacean having a carapace and five large pairs of legs, the first of which bears powerful claws; its meat is highly prized.

## morphology of a lobster

**thoracic legs**

Articulated limbs attached to the cephalothorax and having a prehensile and motor function; the first three legs bear pincer claws while the last two bear claws.

**cephalothorax**

Meeting of the head and the thorax that forms the anterior portion of the body of the lobster.

**abdomen**

Posterior portion of the body formed of six segments and bearing the pleopods, articulated appendages used for swimming, circulating water over the gills and holding the eggs.

**tail**

Swimming organ formed of the telson and the two uropods.

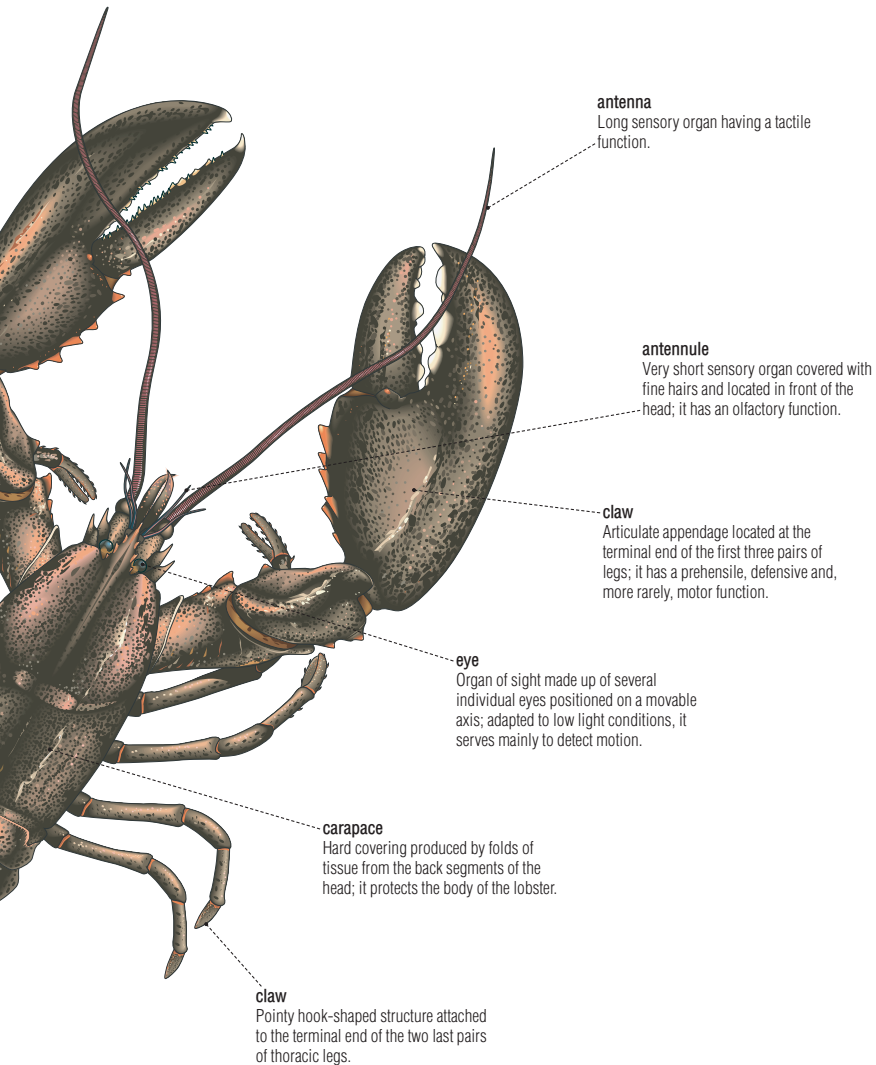
**telson**

Terminal end of the body having no appendages; the anus is located on its ventral surface. It comprises the central part of the tail.

**uropod**

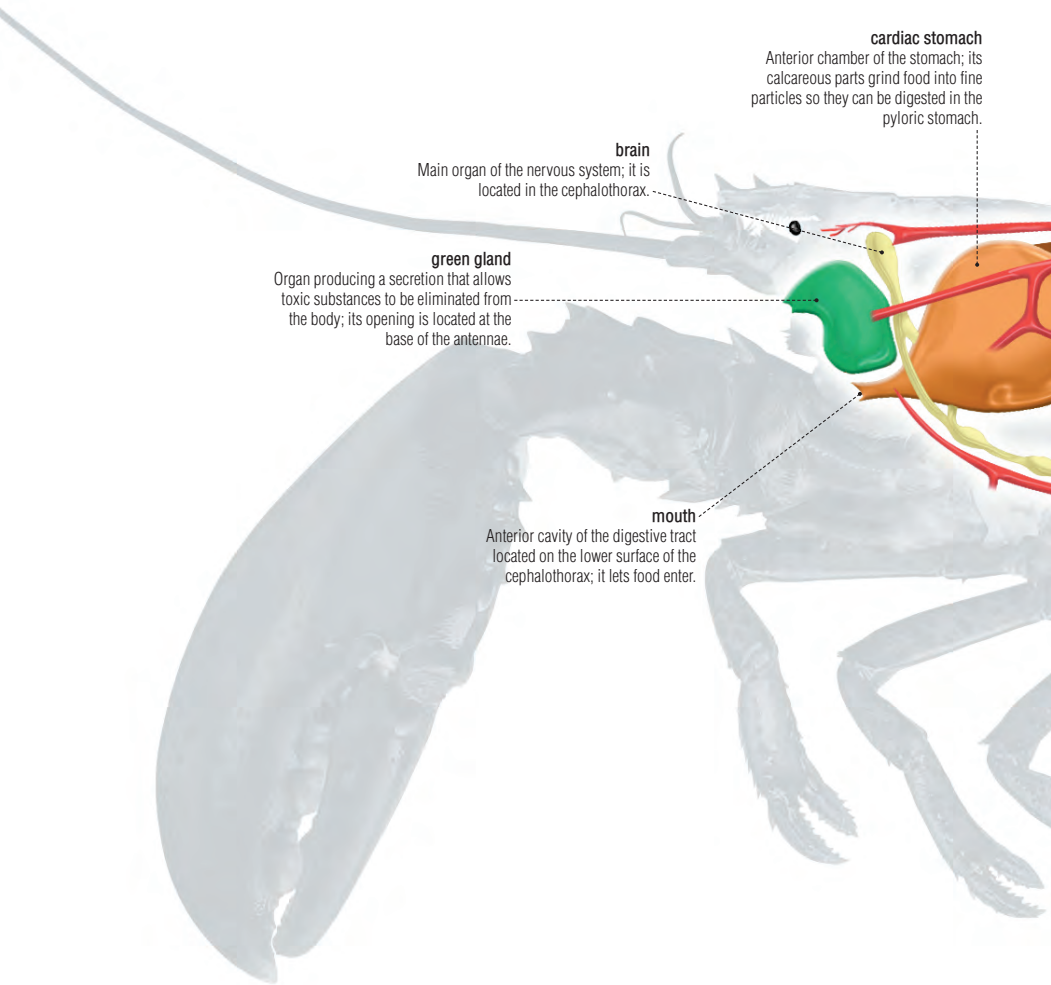
Articulated appendage attached to the last abdominal segment before the telson; it is formed of two lobes and helps the lobster to swim.







## anatomy of a lobster

**cardiac stomach**

Anterior chamber of the stomach; its calcareous parts grind food into fine particles so they can be digested in the pyloric stomach.

**brain**

Main organ of the nervous system; it is located in the cephalothorax.

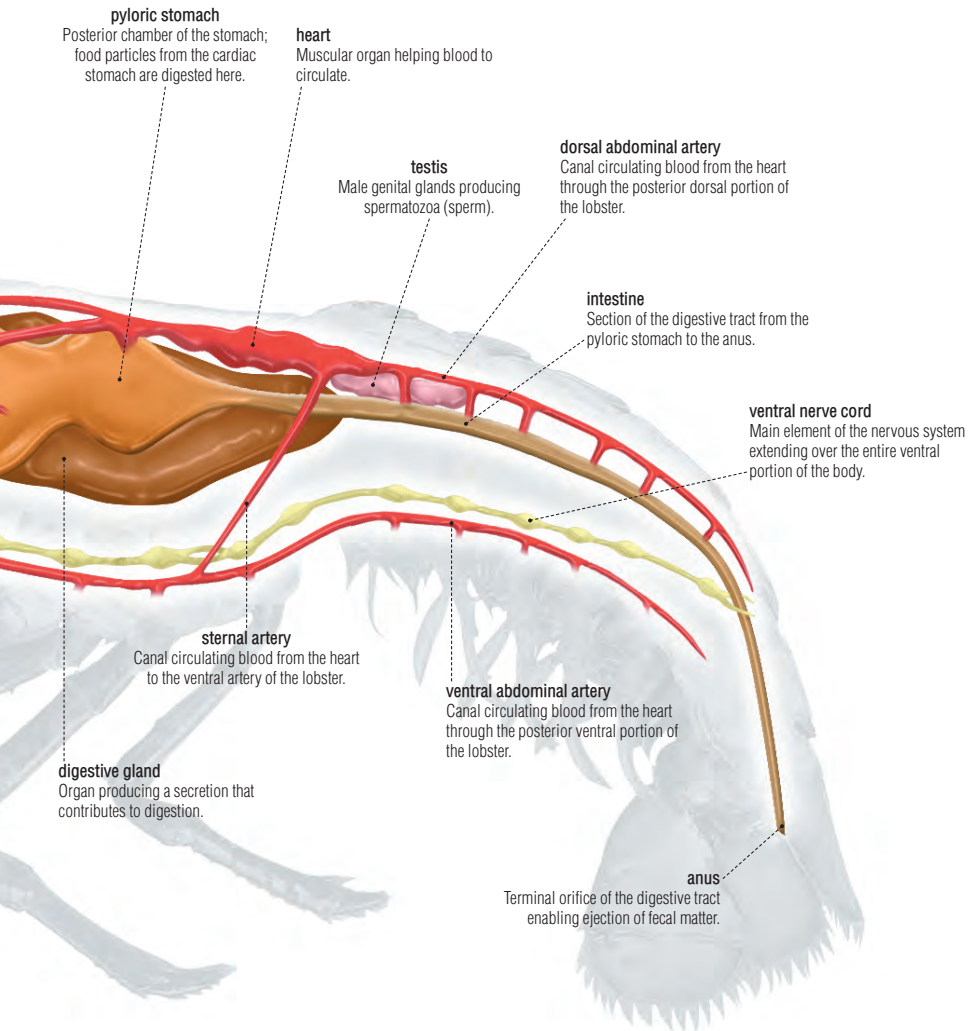
**green gland**

Organ producing a secretion that allows toxic substances to be eliminated from the body; its opening is located at the base of the antennae.

**mouth**

Anterior cavity of the digestive tract located on the lower surface of the cephalothorax; it lets food enter.





## cartilaginous fish

Fish whose skeleton is made of cartilage rather than bone; its skin is covered in hard scales called denticles. There are currently 700 species.

### morphology of a shark

Shark: large cartilaginous carnivorous fish with a tapered body and extremely powerful toothed jaws; it rarely attacks humans.

#### snout

Pointy anterior protruding portion of the head located above the mouth and bearing the nostrils on each side.

#### tooth

Hard organ arranged in several rows along the jaws and continually renewing itself; the teeth are used to catch prey and tear it apart.

#### nostril

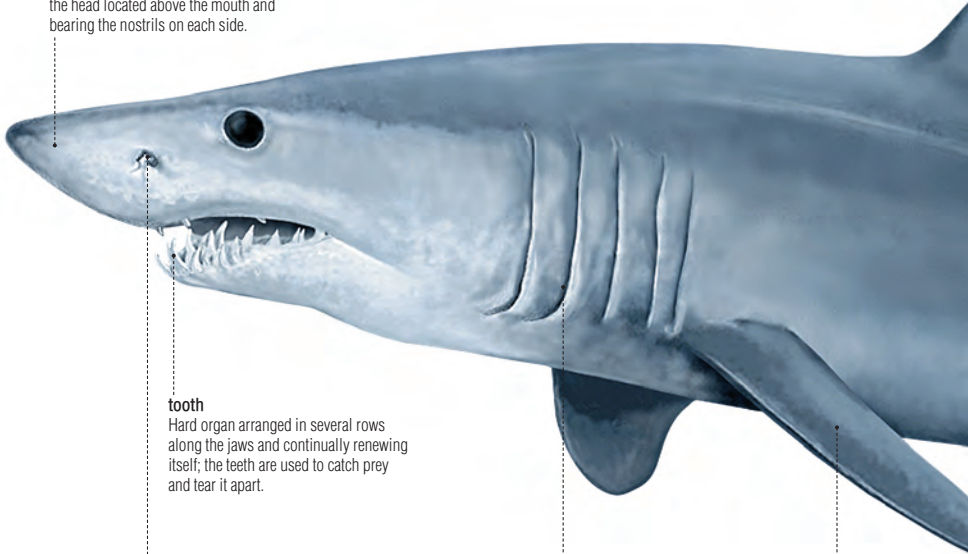
External orifice of the nasal cavity located above the mouth with a highly developed olfactory function.

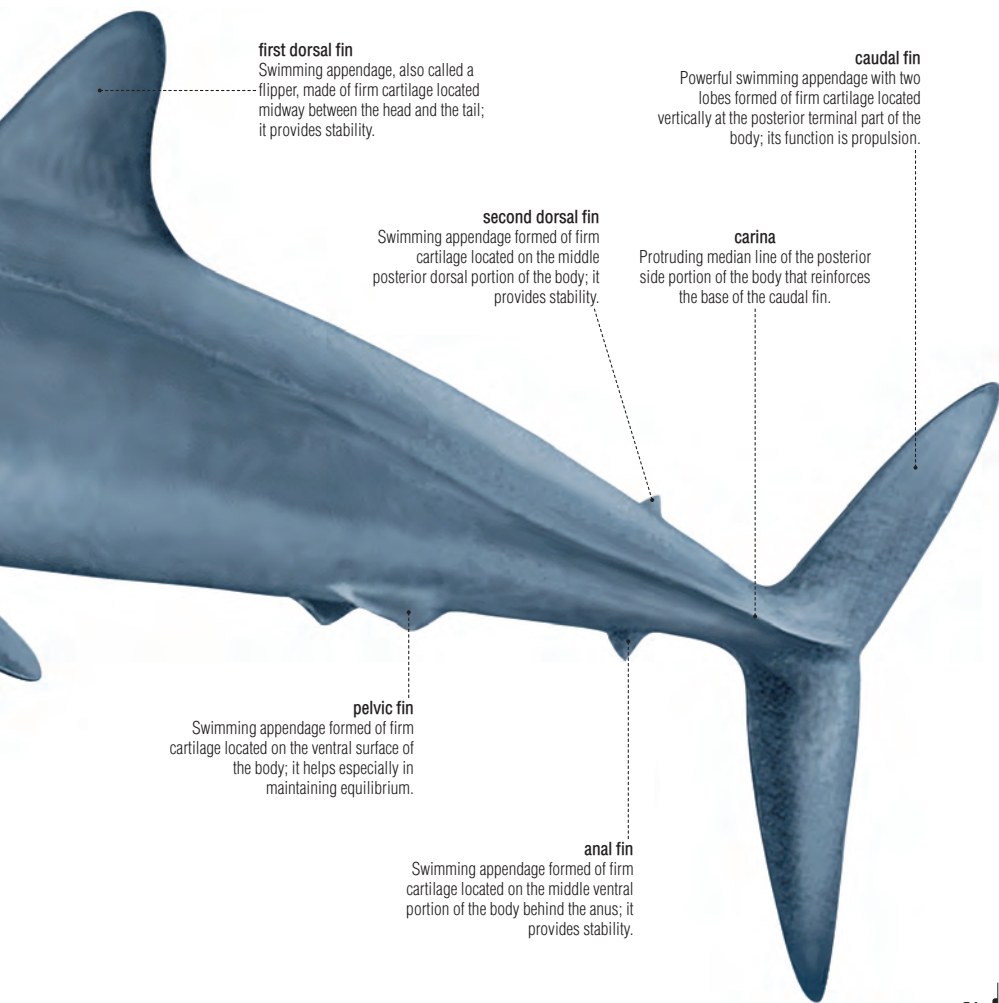
#### gill slits

Respiratory organs (five pairs) shaped like long narrow channels between the buccal cavity and the outside of the body; the shark uses them to circulate water.

#### pectoral fin

Swimming appendage made of firm cartilage that ensures stability, orientation, stopping and thermoregulation.



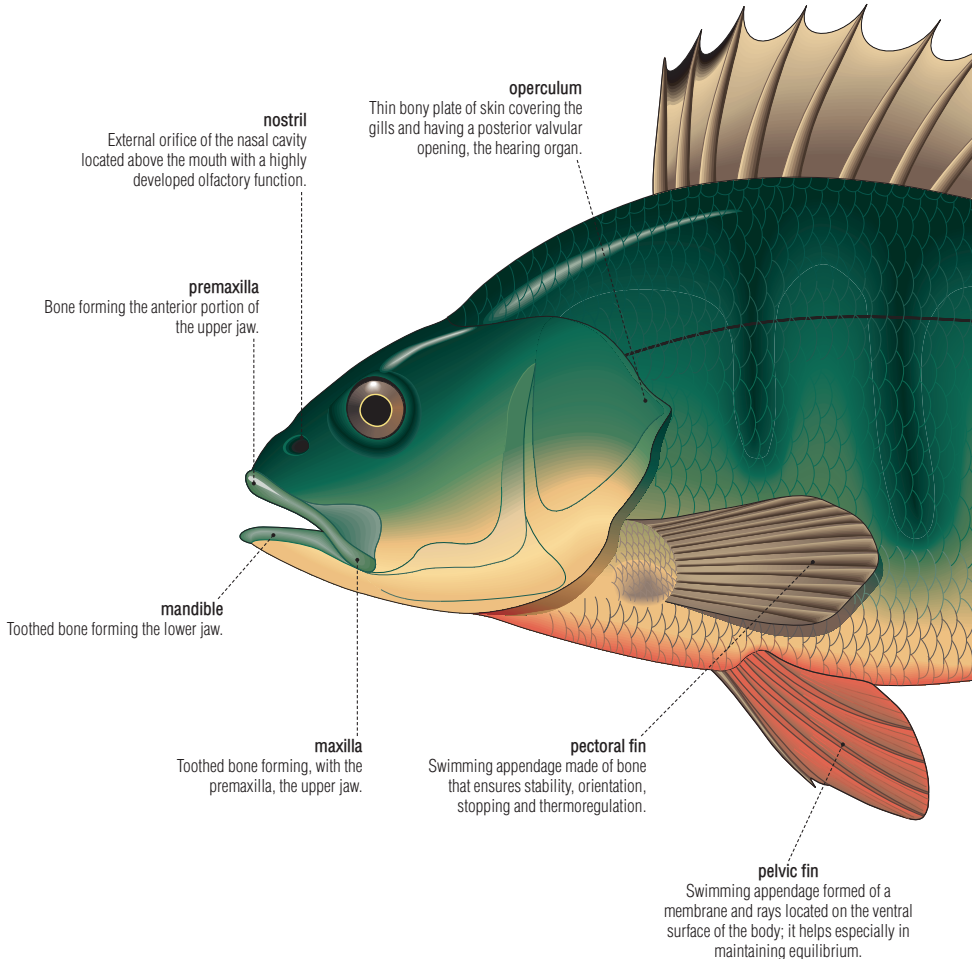


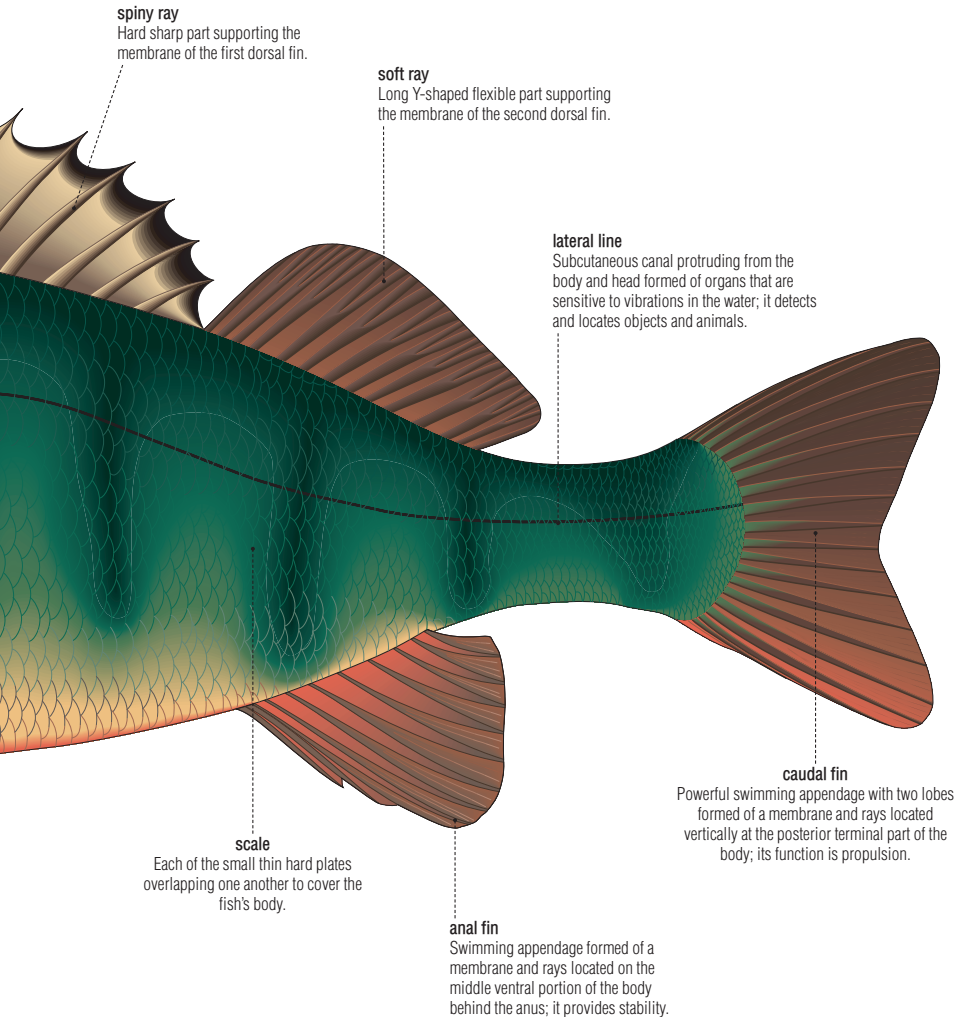
## bony fish

Fish with a rigid skeleton and smooth flat scales; the 20,000 present-day species make up the largest group of fish.

**morphology of a perch**

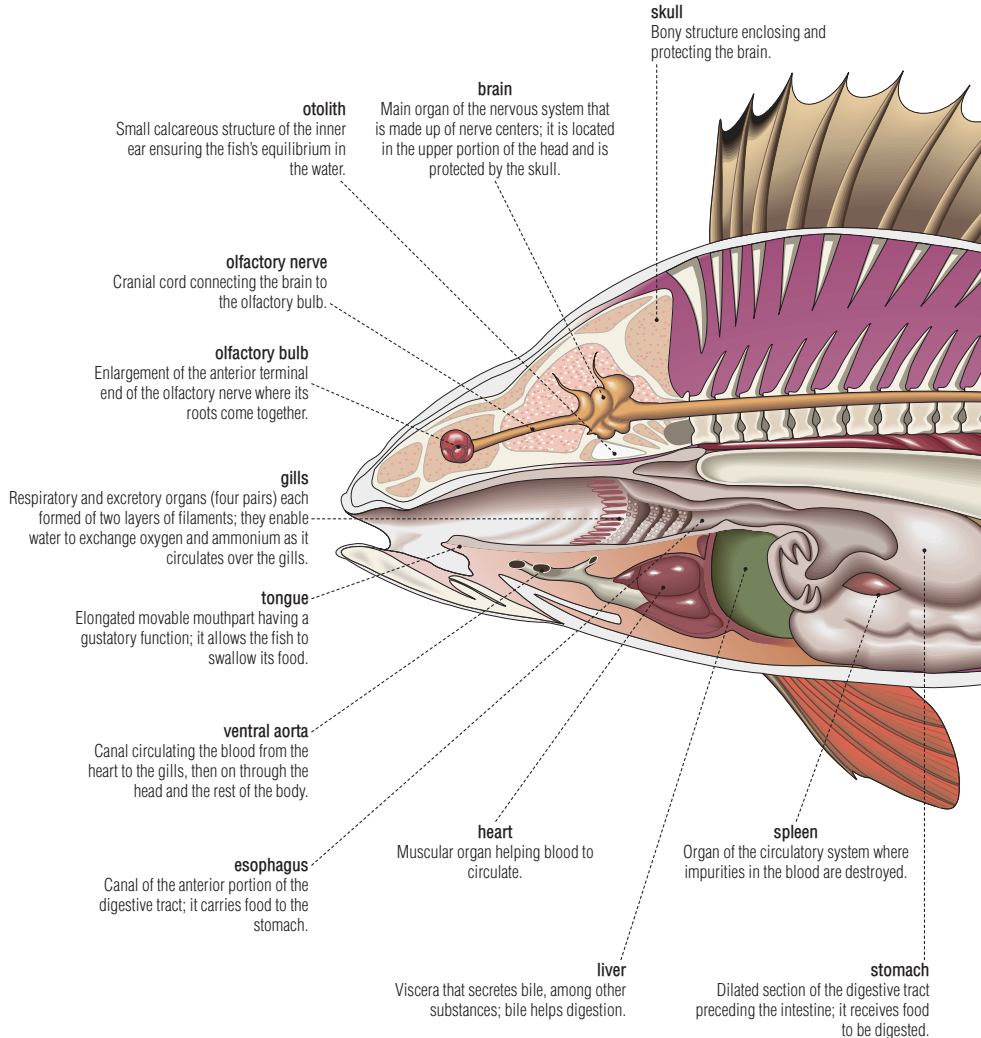
Perch: bony carnivorous freshwater fish with an oval body and a spiny dorsal fin; its flesh is highly prized.





**anatomy of a perch**

Perch: snub-nosed bony freshwater fish with an oval body and a spiny dorsal fin; the flesh of this fish is highly valued.



**skull**  
Bony structure enclosing and protecting the brain.

**brain**  
Main organ of the nervous system that is made up of nerve centers; it is located in the upper portion of the head and is protected by the skull.

**otolith**  
Small calcareous structure of the inner ear ensuring the fish's equilibrium in the water.

**olfactory nerve**  
Cranial cord connecting the brain to the olfactory bulb.

**olfactory bulb**  
Enlargement of the anterior terminal end of the olfactory nerve where its roots come together.

**gills**  
Respiratory and excretory organs (four pairs) each formed of two layers of filaments; they enable water to exchange oxygen and ammonium as it circulates over the gills.

**tongue**  
Elongated movable mouthpart having a gustatory function; it allows the fish to swallow its food.

**ventral aorta**  
Canal circulating the blood from the heart to the gills, then on through the head and the rest of the body.

**esophagus**  
Canal of the anterior portion of the digestive tract; it carries food to the stomach.

**heart**  
Muscular organ helping blood to circulate.

**spleen**  
Organ of the circulatory system where impurities in the blood are destroyed.

**liver**  
Viscera that secretes bile, among other substances; bile helps digestion.

**stomach**  
Dilated section of the digestive tract preceding the intestine; it receives food to be digested.

**spinal cord**

Component of the nervous system made up of a soft fatty substance and forming a cylindrical stem inside the vertebral column.

**air bladder**

Flexible air-filled sac located above the viscera; it allows the fish to remain buoyant at a specific depth.

**neural spine**

Bony stem of the nervous system connected to the vertebral column and forming the skeleton.

**vertebral column**

Movable bony axis made up of various parts articulating with each other (vertebrae); it supports the skeleton and contains the spinal cord.

**muscle segment**

Muscular segment of the posterior portion of the body; its zigzag arrangement contributes to efficient motion.

**kidney**

Organ that eliminates metabolic waste and maintains the pressure of internal fluids.

**urinary bladder**

Reservoir in which urine from the kidneys collects before being evacuated through the urogenital aperture.

**eggs**

In fish, the female produces eggs in the ovaries and the male produces soft roe in the testicles; the eggs and roe are expelled into the water, where fertilization occurs.

**anus**

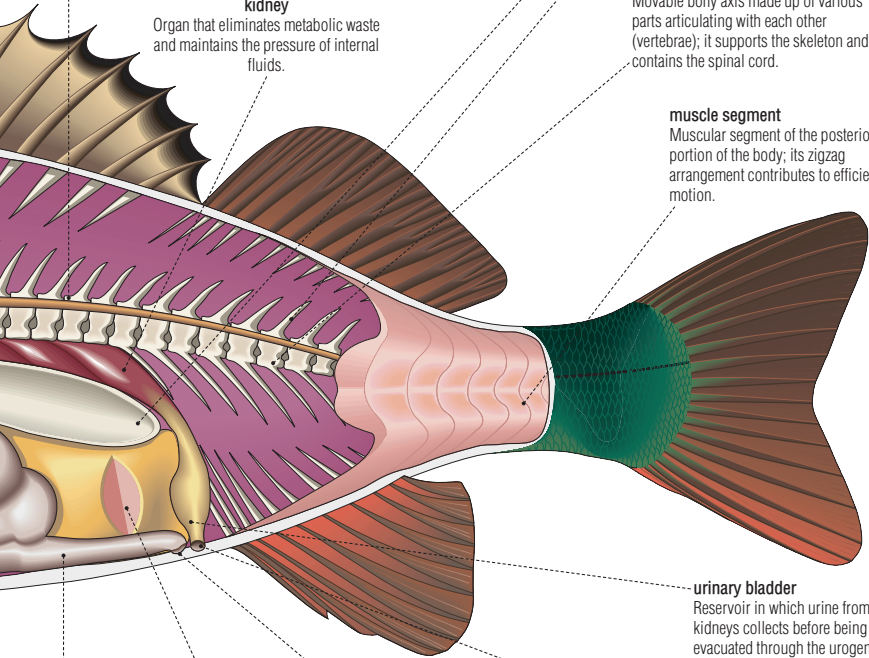
Terminal orifice of the digestive tract enabling ejection of fecal matter.

**urogenital aperture**

Opening common to the genital and urinary tracts allowing the evacuation of gametes and urine.

**intestine**

Section of the digestive tract between the stomach and the anus where absorption of nutrients is carried out and waste is transformed into fecal matter.

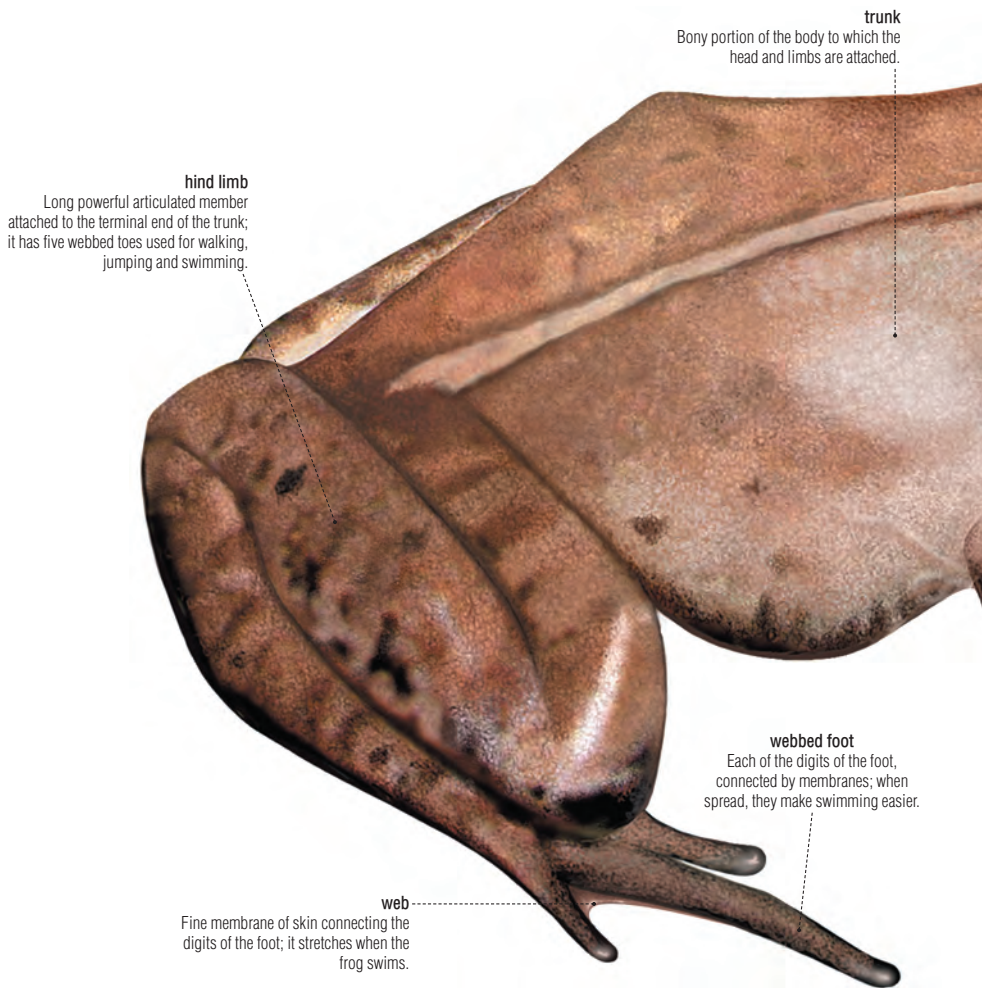


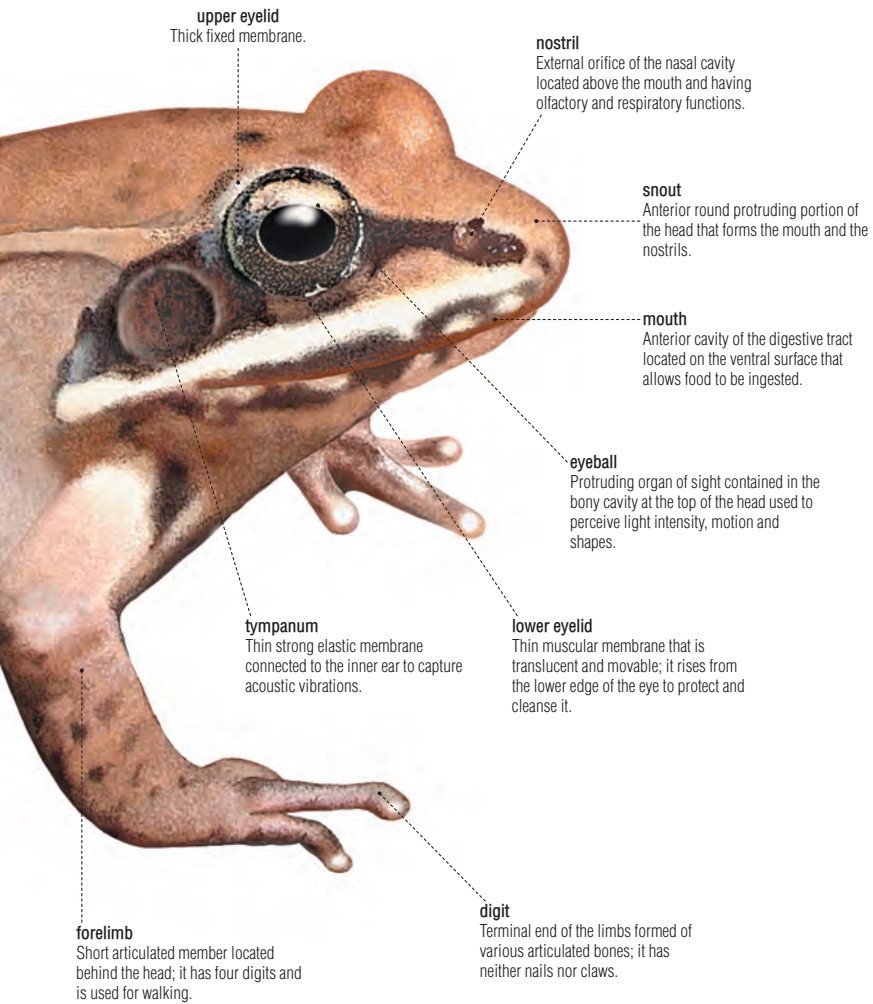


frog

Cold-blooded freshwater amphibian with smooth moist skin and powerful back legs for hopping and swimming.

morphology of a frog





**upper eyelid**  
Thick fixed membrane.

**nostril**  
External orifice of the nasal cavity located above the mouth and having olfactory and respiratory functions.

**snout**  
Anterior round protruding portion of the head that forms the mouth and the nostrils.

**mouth**  
Anterior cavity of the digestive tract located on the ventral surface that allows food to be ingested.

**eyeball**  
Protruding organ of sight contained in the bony cavity at the top of the head used to perceive light intensity, motion and shapes.

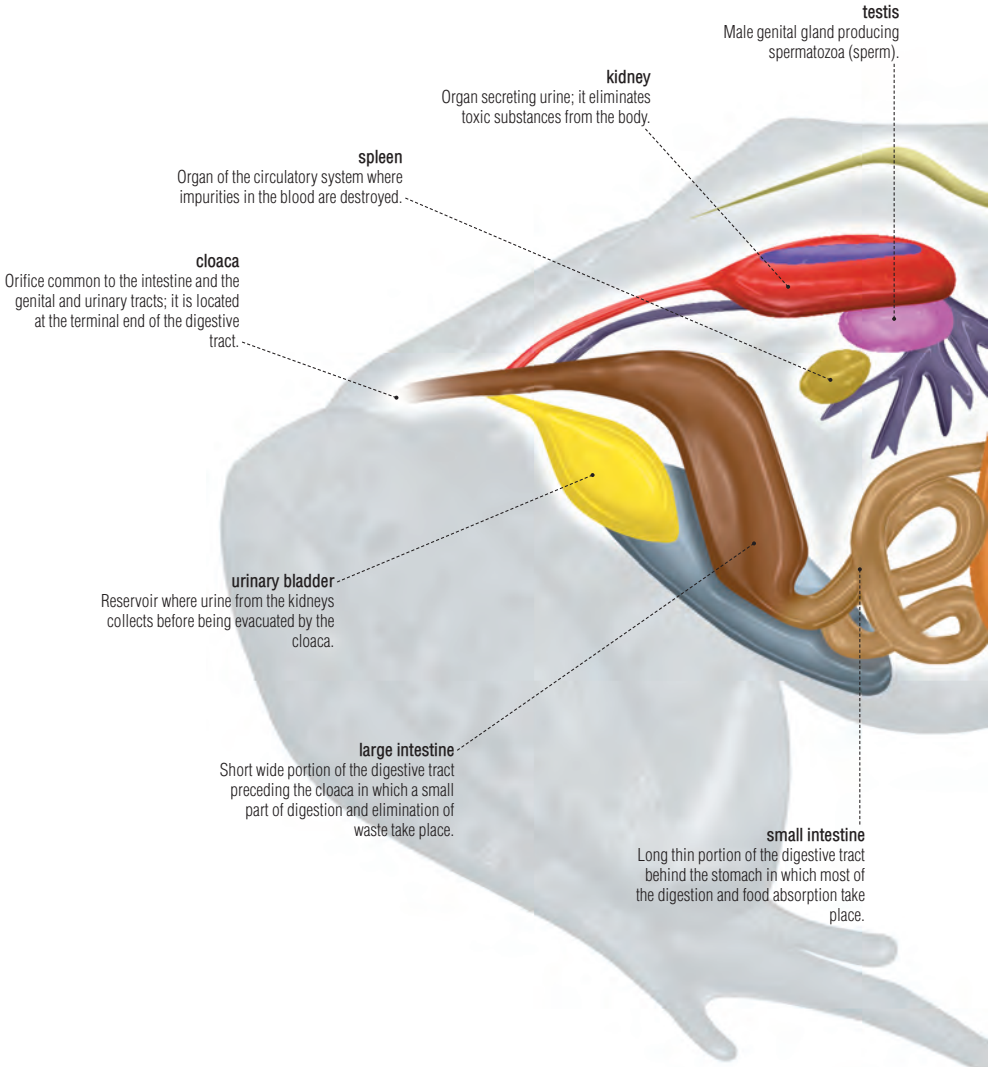
**tympanum**  
Thin strong elastic membrane connected to the inner ear to capture acoustic vibrations.

**lower eyelid**  
Thin muscular membrane that is translucent and movable; it rises from the lower edge of the eye to protect and cleanse it.

**forelimb**  
Short articulated member located behind the head; it has four digits and is used for walking.

**digit**  
Terminal end of the limbs formed of various articulated bones; it has neither nails nor claws.

**anatomy of a male frog**



**testis**  
Male genital gland producing spermatozoa (sperm).

**kidney**  
Organ secreting urine; it eliminates toxic substances from the body.

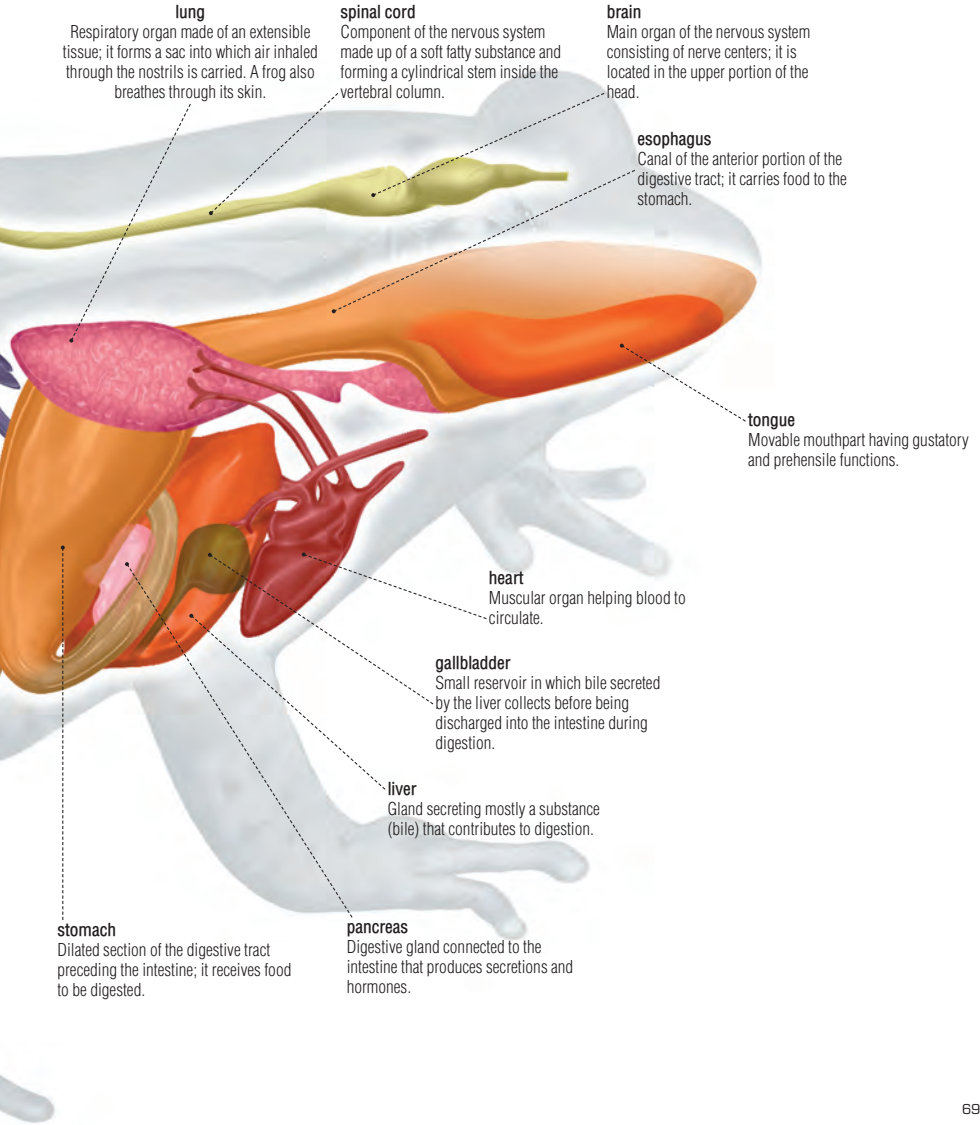
**spleen**  
Organ of the circulatory system where impurities in the blood are destroyed.

**cloaca**  
Orifice common to the intestine and the genital and urinary tracts; it is located at the terminal end of the digestive tract.

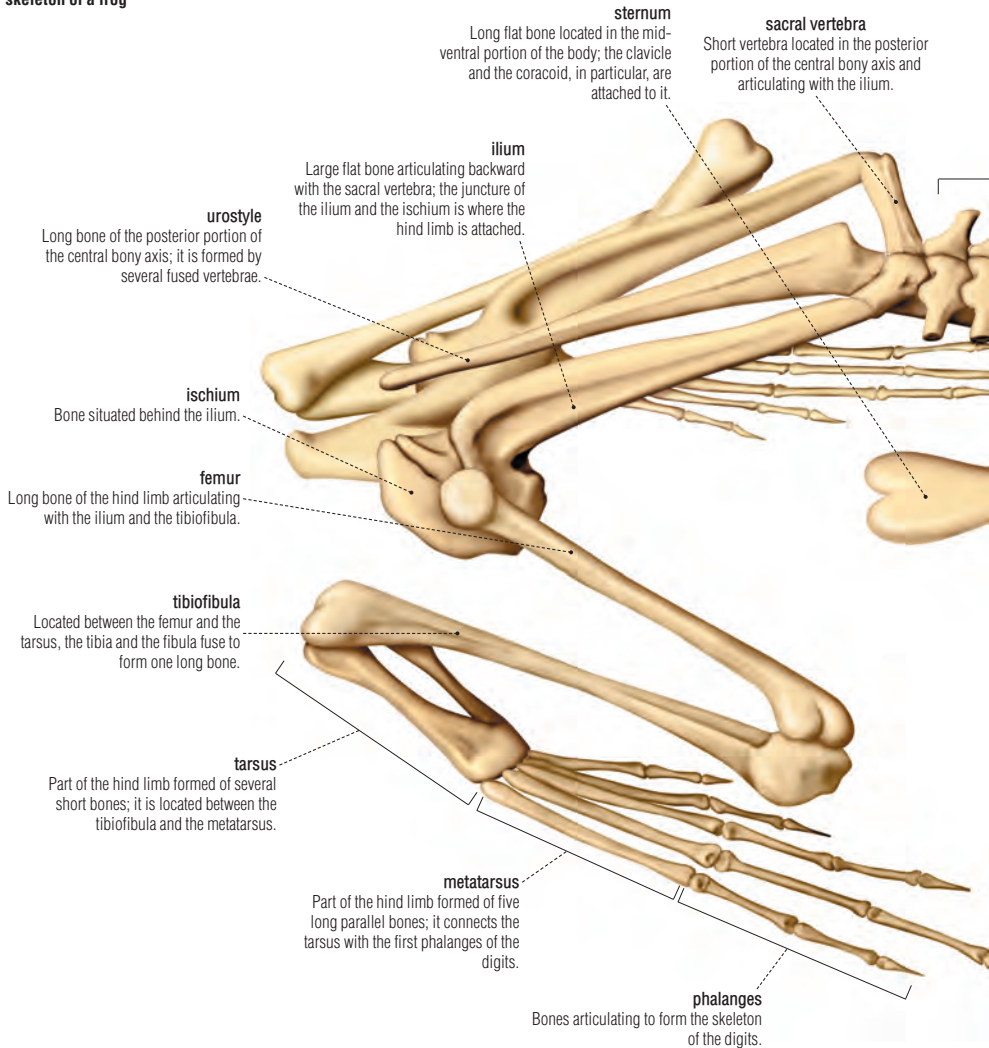
**urinary bladder**  
Reservoir where urine from the kidneys collects before being evacuated by the cloaca.

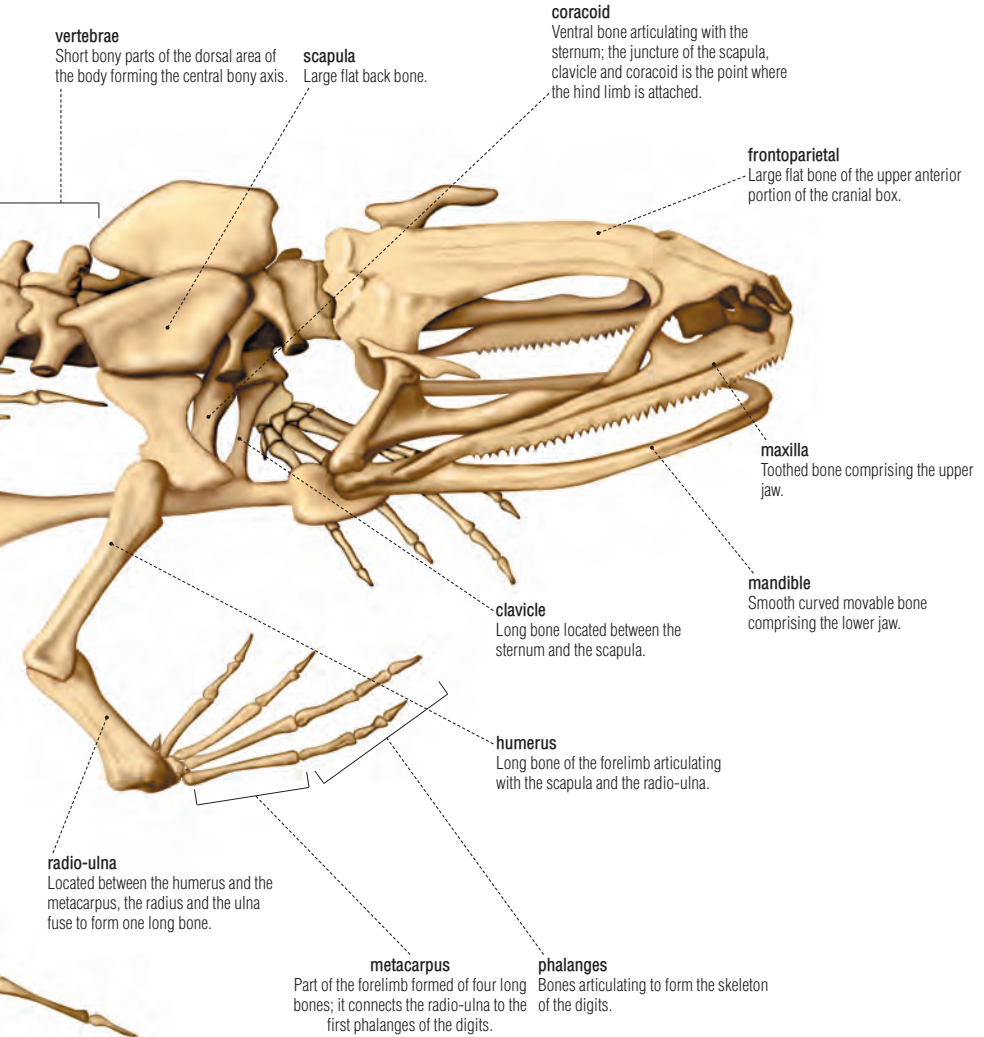
**large intestine**  
Short wide portion of the digestive tract preceding the cloaca in which a small part of digestion and elimination of waste take place.

**small intestine**  
Long thin portion of the digestive tract behind the stomach in which most of the digestion and food absorption take place.



skeleton of a frog





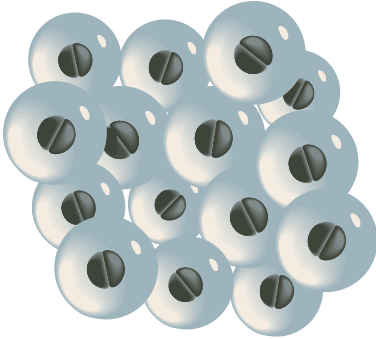


**life cycle of the frog**

The stages of development are the egg, the tadpole and the adult; each stage usually lasts several weeks, but can last up to two years in some species.

**eggs**

Embryonic stage of the frog resulting when the egg is fertilized by the sperm.



**tadpole**

Aquatic larva of the frog having a large head and a slender body ending in a tail; it breathes through gills.

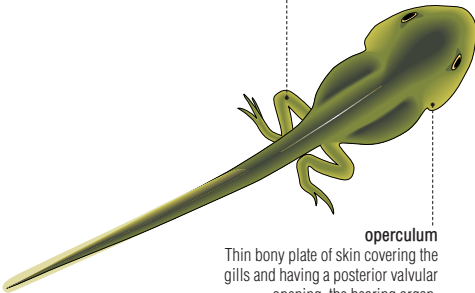


**external gills**

Respiratory organs that filter water and take in food particles; they are later replaced by internal gills.

**hind limb**

The hind limbs appear after the gills.

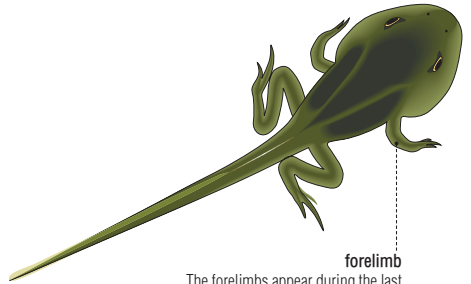


**operculum**

Thin bony plate of skin covering the gills and having a posterior valvular opening, the hearing organ.

**forelimb**

The forelimbs appear during the last stage of the tadpole's metamorphosis.





There are about 4,000 species of amphibians divided into three main groups, depending on whether or not they have a tail and limbs.



**newt**

Amphibian with a flat tail found mainly in freshwater and usually feeding on insects.



**wood frog**

Tailless amphibian found mostly in the woods of North America; it feeds on various small animals.



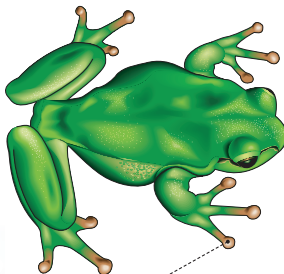
**common toad**

Tailless nocturnal insectivorous amphibian usually found on land and not very adept at jumping; its body is covered with small outgrowths.



**common frog**

Squat tailless amphibian usually found on land, mostly in Europe; it feeds on various small animals.



**adhesive disk**

Adhesive disk surrounded by a ring; it is located at the terminal end of the limbs and used for anchoring.



**Northern leopard frog**

Tailless, mostly nocturnal amphibian with a spotted body that is covered with ridges; it lives mainly in North America.



**salamander**

Nocturnal amphibian, mainly insectivorous, with a tail; there are land and aquatic species.

## dinosaurs

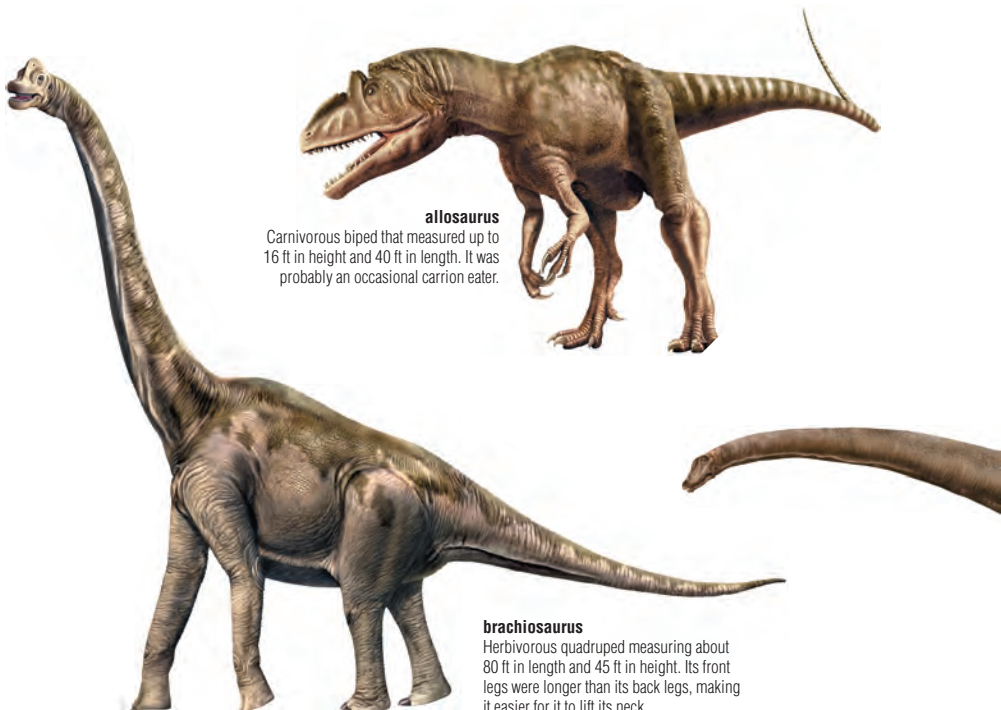
Large reptiles that lived during the Triassic, Jurassic, and Cretaceous ages. They became extinct about 65 million years ago.

**triceratops**

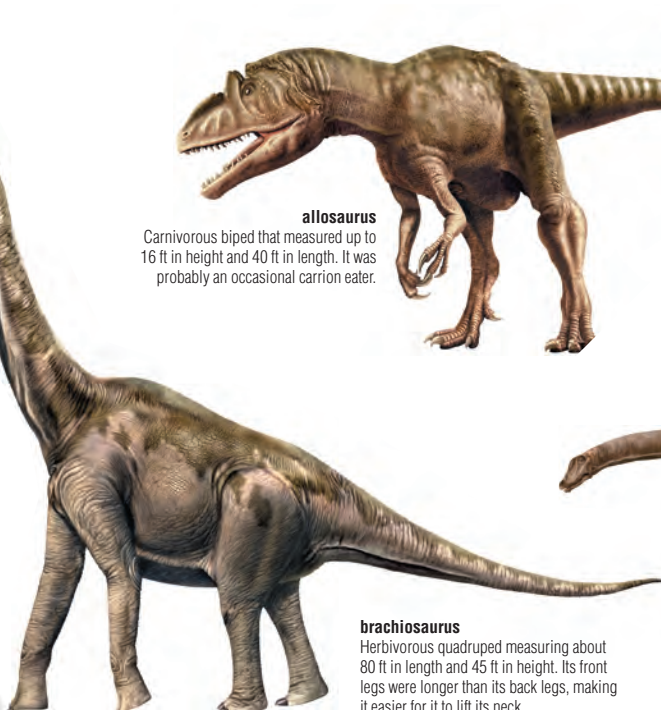
Herbivorous quadruped measuring about 26 ft. It had a bony cervical collarette and three horns, the two side ones more than 3 ft long.

**ankylosaurus**

Herbivorous quadruped measuring about 26 ft. It was covered with thick bony plates for protection against predators.

**allosaurus**

Carnivorous biped that measured up to 16 ft in height and 40 ft in length. It was probably an occasional carrion eater.

**brachiosaurus**

Herbivorous quadruped measuring about 80 ft in length and 45 ft in height. Its front legs were longer than its back legs, making it easier for it to lift its neck.

**spinosaurus**

Carnivorous (and probably piscivore) biped that had spines sticking up from its back. It measured about 50 ft in length and about 16 ft in height.

**stegosaurus**

Herbivorous quadruped from 23 to 30 ft long; the bony protuberances on its back may have had a thermoregulatory function.

**tyrannosaurus**

Carnivorous quadruped that measured about 50 ft in length. A ferocious predator, it had powerful jaws and teeth almost 8 in long.

**diplodocus**

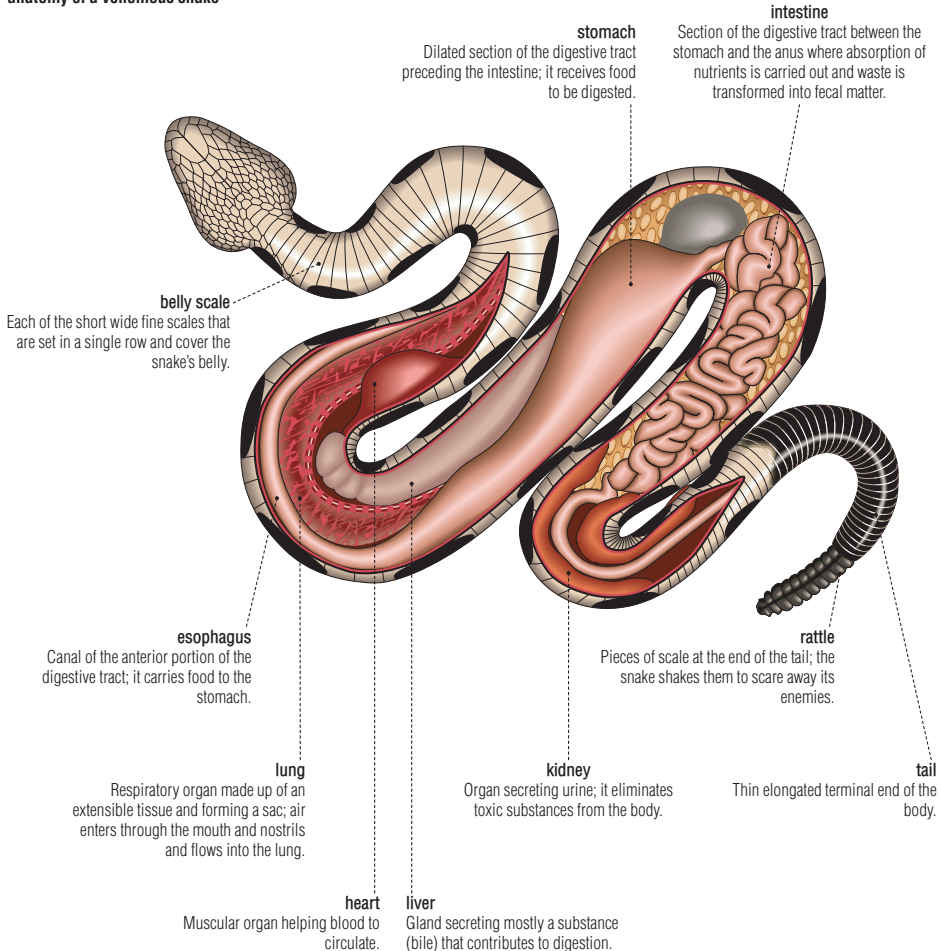
Herbivorous quadruped whose total length could reach up to about 100 ft, making it one of the largest terrestrial animals known.



## snake

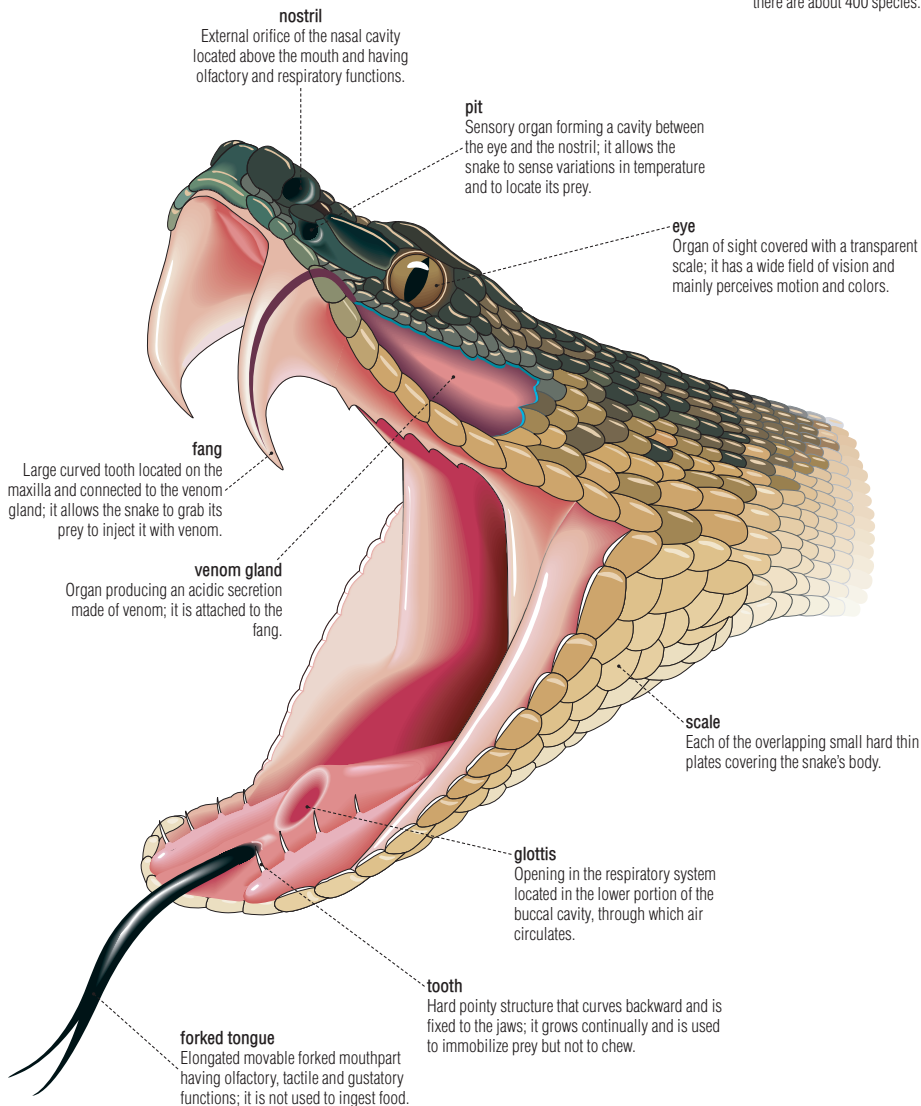
Legless reptile with a very long cylindrical body and tail, moving by undulation; there are about 2,700 species.

## anatomy of a venomous snake



**morphology of a venomous snake: head**

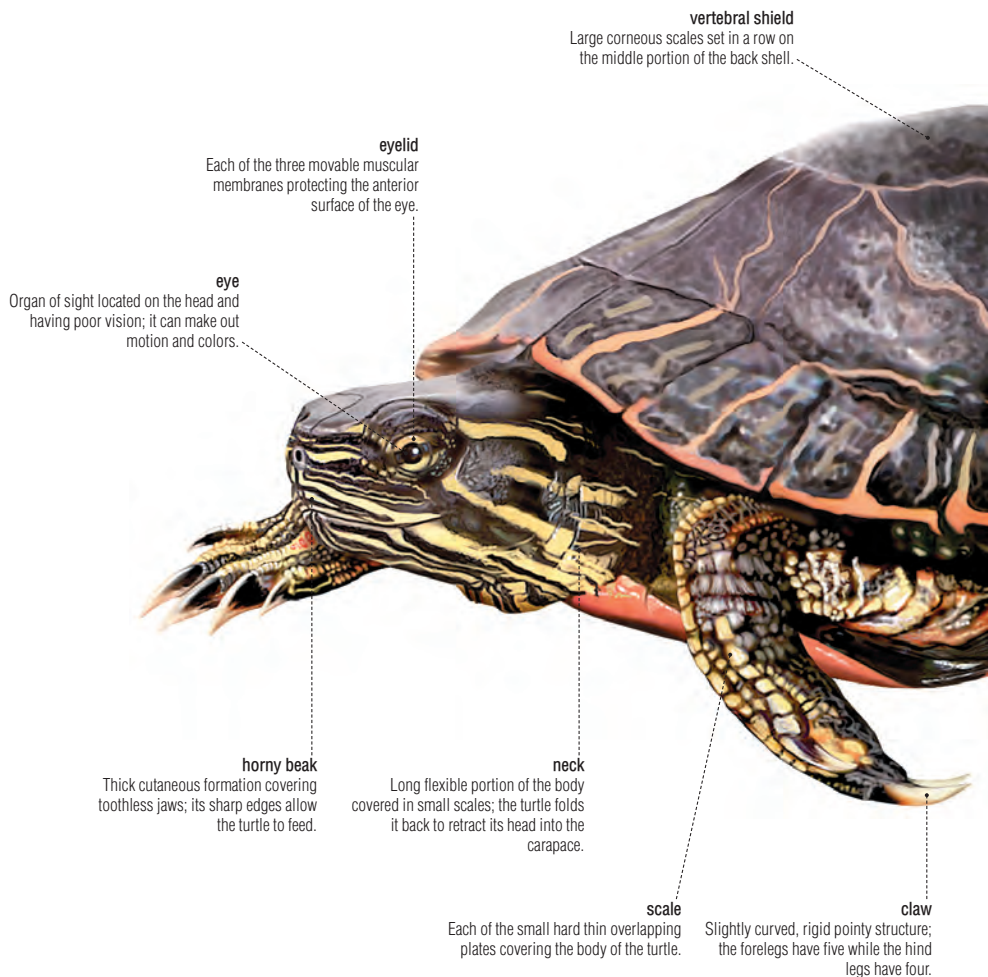
Venomous snake: it defends itself by injecting often deadly venom; there are about 400 species.



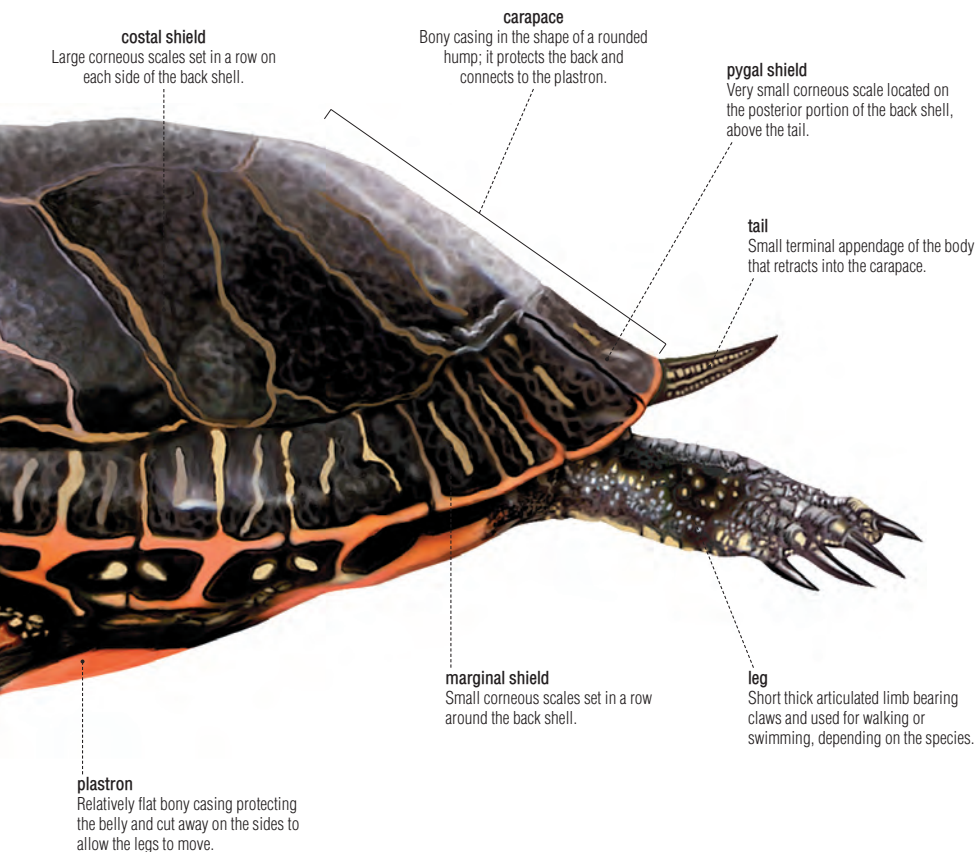
## turtle

Squat land or aquatic reptile with short legs and bearing a carapace into which it retracts; there are about 250 species.

## morphology of a turtle

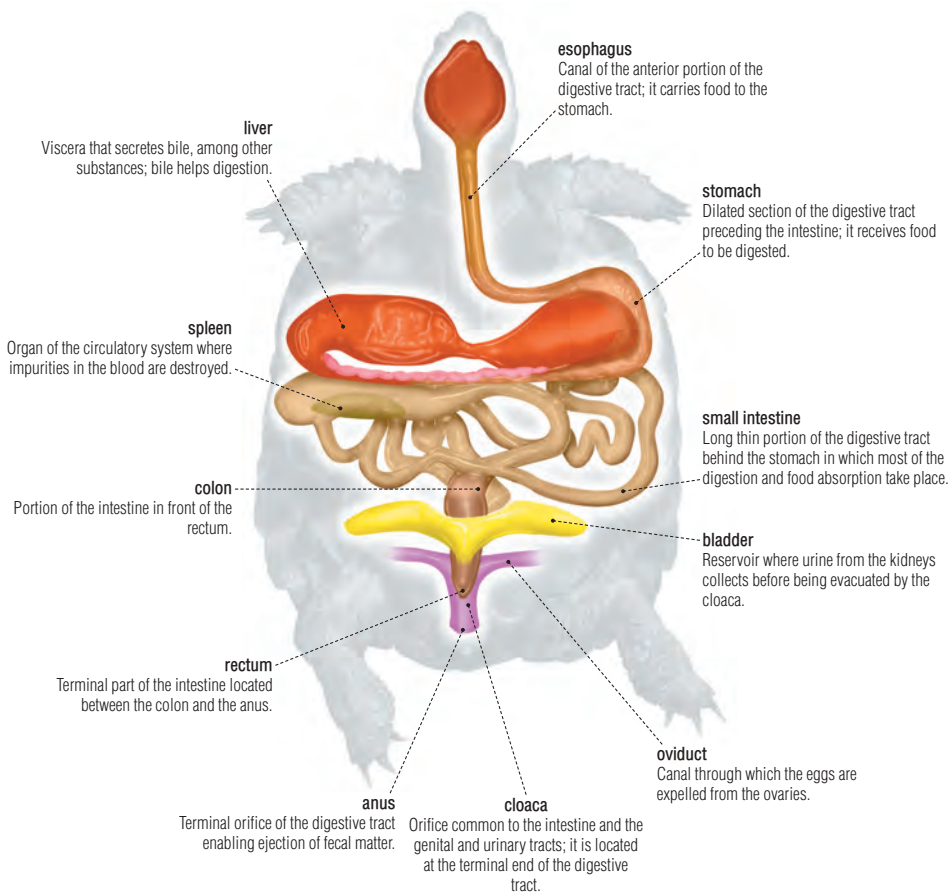








## anatomy of a turtle

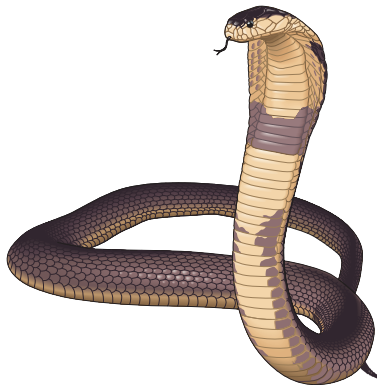


Reptiles: cold-blooded vertebrates covered in scales (about 6,000 species) having limbs that are sometimes atrophied or absent.



**viper**

Venomous snake found in hot arid regions of Eurasia and Africa with a flat triangular head and short tail; its bite can be fatal.



**cobra**

Venomous snake found in tropical regions of Asia and Africa; it inflates its neck when threatened.



**garter snake**

Widespread nonvenomous snake with a slightly flat oval head; its tail is longer than that of the viper.



**rattlesnake**

Venomous land snake of the Americas; it rattles its scaly tail to warn off enemies.

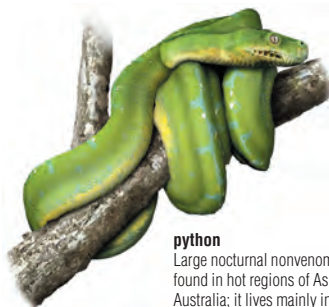


**boa**

Medium-sized nonvenomous snake found in hot regions of the Americas; it lives mainly in trees or in the water and kills its prey by strangulation.

**coral snake**

Slender venomous snake of the Americas living under rocks or hidden in the ground; its bite can be fatal.

**python**

Large nocturnal nonvenomous snake found in hot regions of Asia, Africa and Australia; it lives mainly in trees and kills its prey by strangulation.

**lizard**

Widespread diurnal and mainly insectivorous land reptile with a long brittle tail.

**chameleon**

Insectivorous lizard of Africa and India with a prehensile tail; it lives in trees and can change color to hide itself.

**iguana**

Giant lizard found in tropical regions of the Americas and the Pacific islands and having a spiny dorsal crest; it lives mainly in trees.

**monitor lizard**

Large diurnal carnivorous lizard with an elongated head found in hot regions of Africa, Asia and Australia; there are land and aquatic species.

**alligator**

Short-legged aquatic reptile found in North America and China; its head is shorter and wider than that of the crocodile.

**crocodile**

Aquatic and land reptile found in hot regions; it has an elongated head, strong jaws, short legs and a powerful tail.

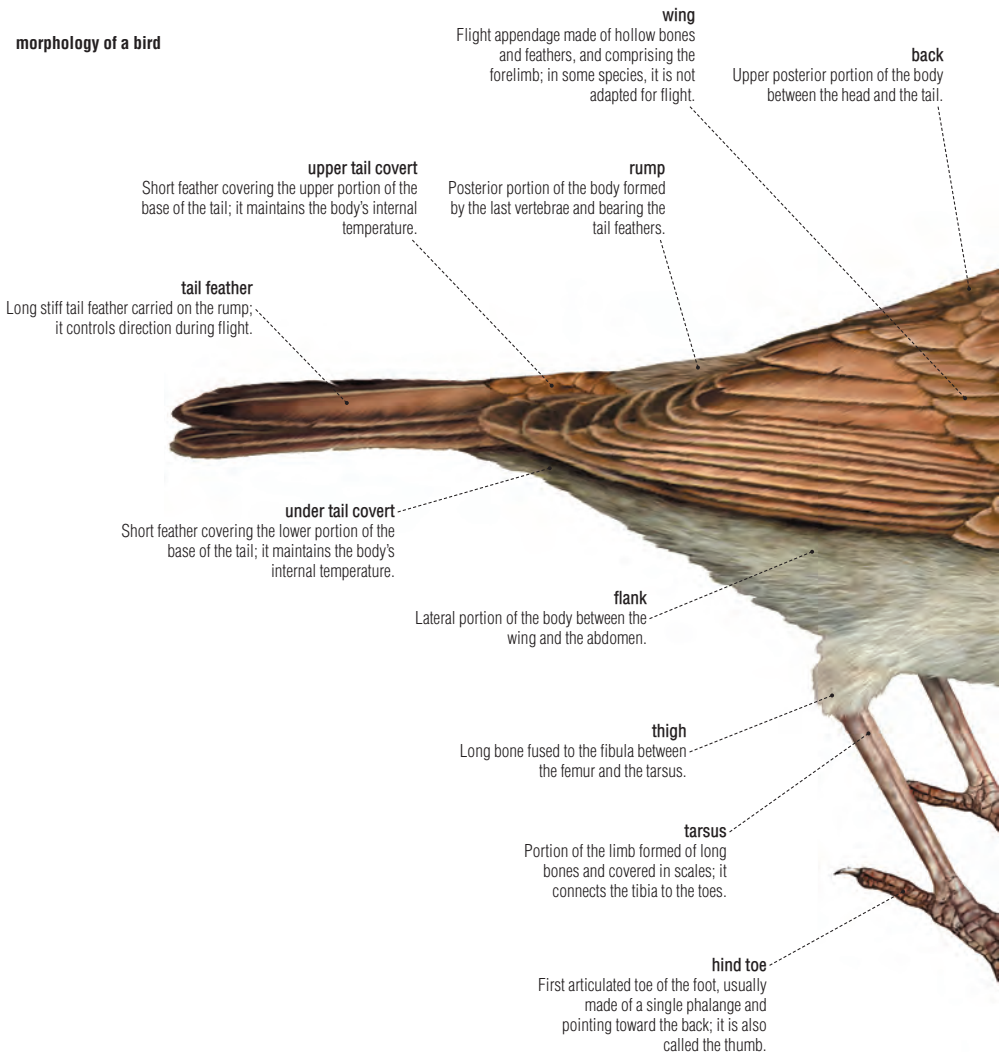
**caiman**

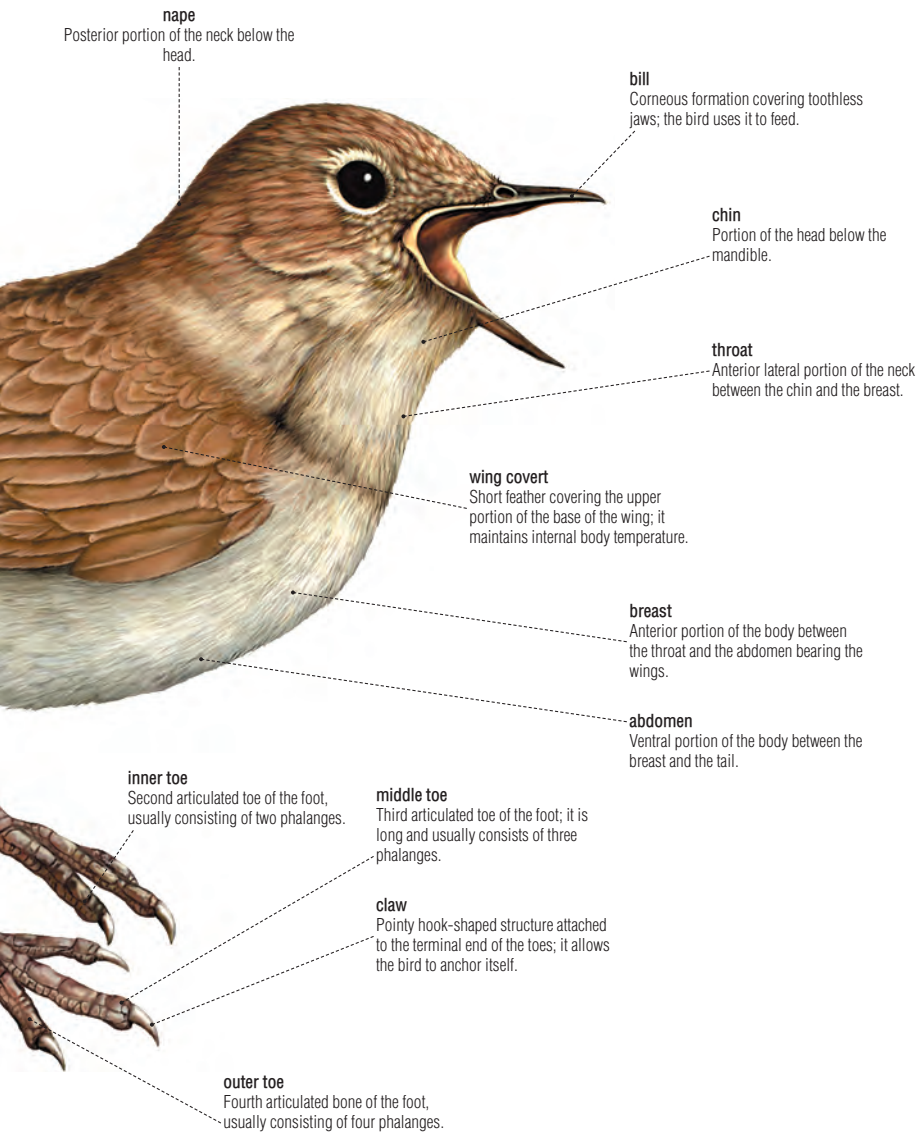
Medium-sized aquatic reptile found in Central and South America; it is less aggressive than the crocodile and the alligator.

## bird

Vertebrate with a feather-covered body and a toothless bill; its forelimbs (wings) are usually adapted for flight.

## morphology of a bird



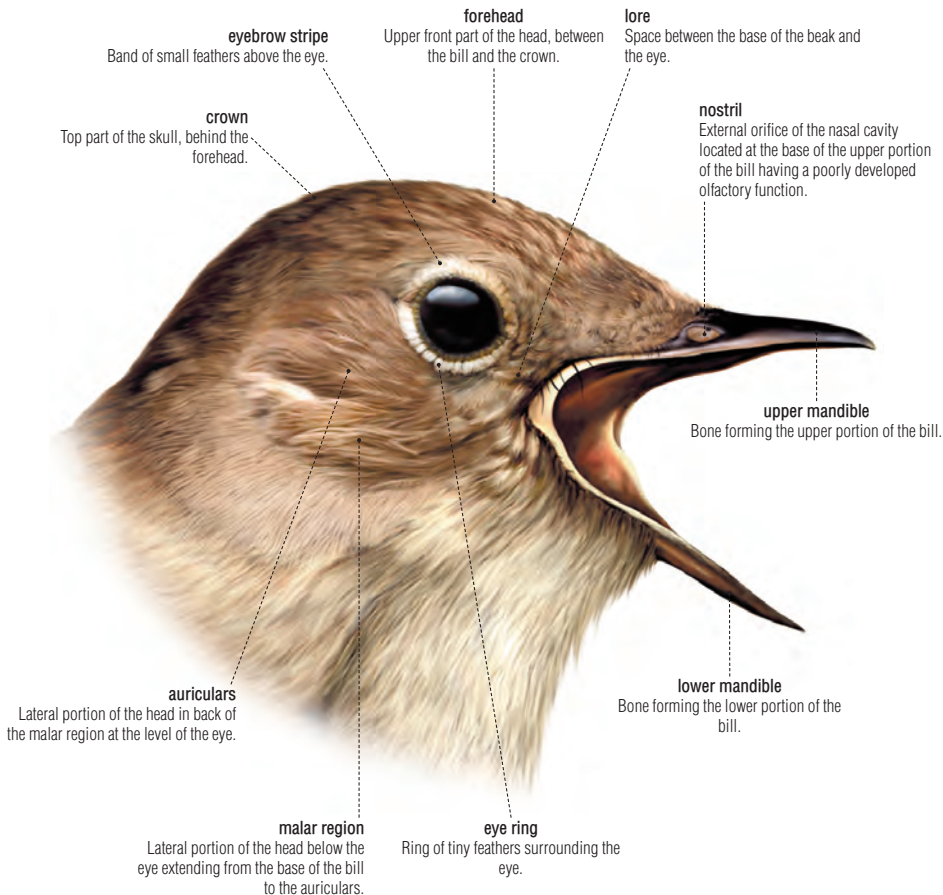




## bird

**head**

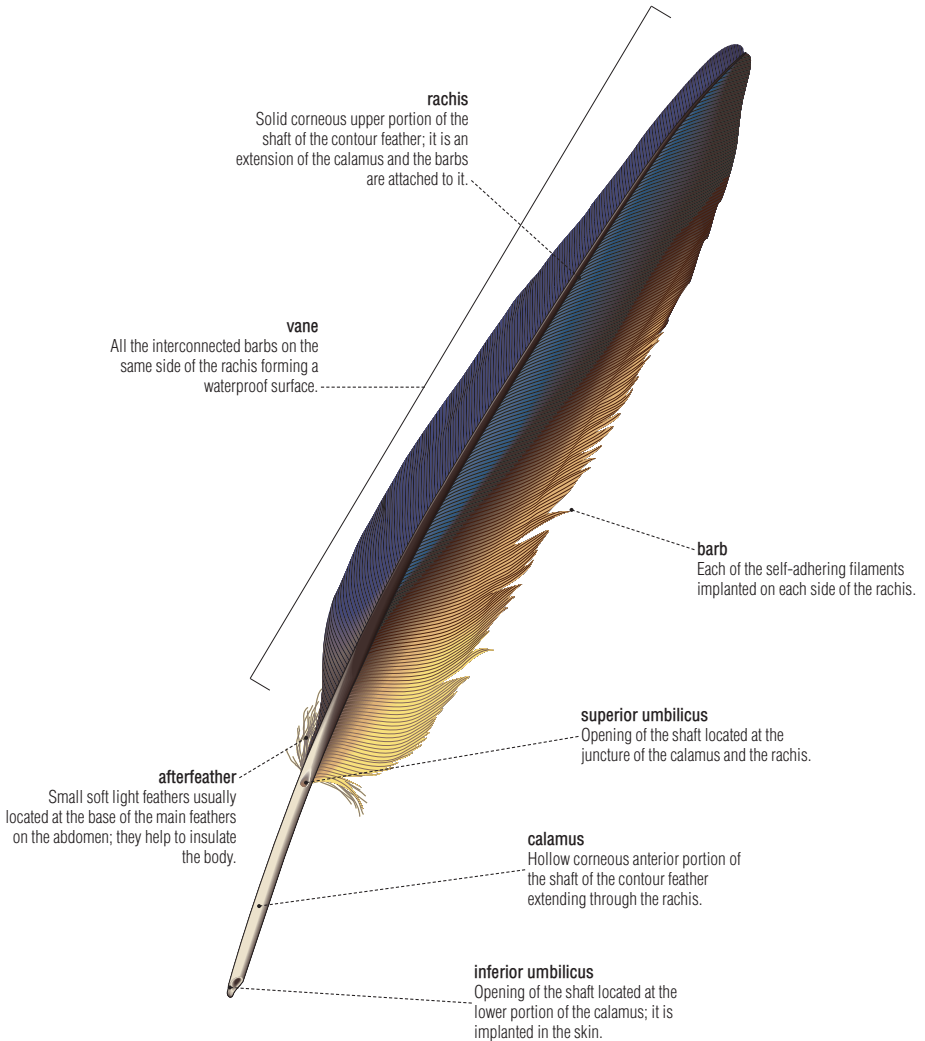
Anterior portion of the body containing the main sensory organs and the brain.





**contour feather**

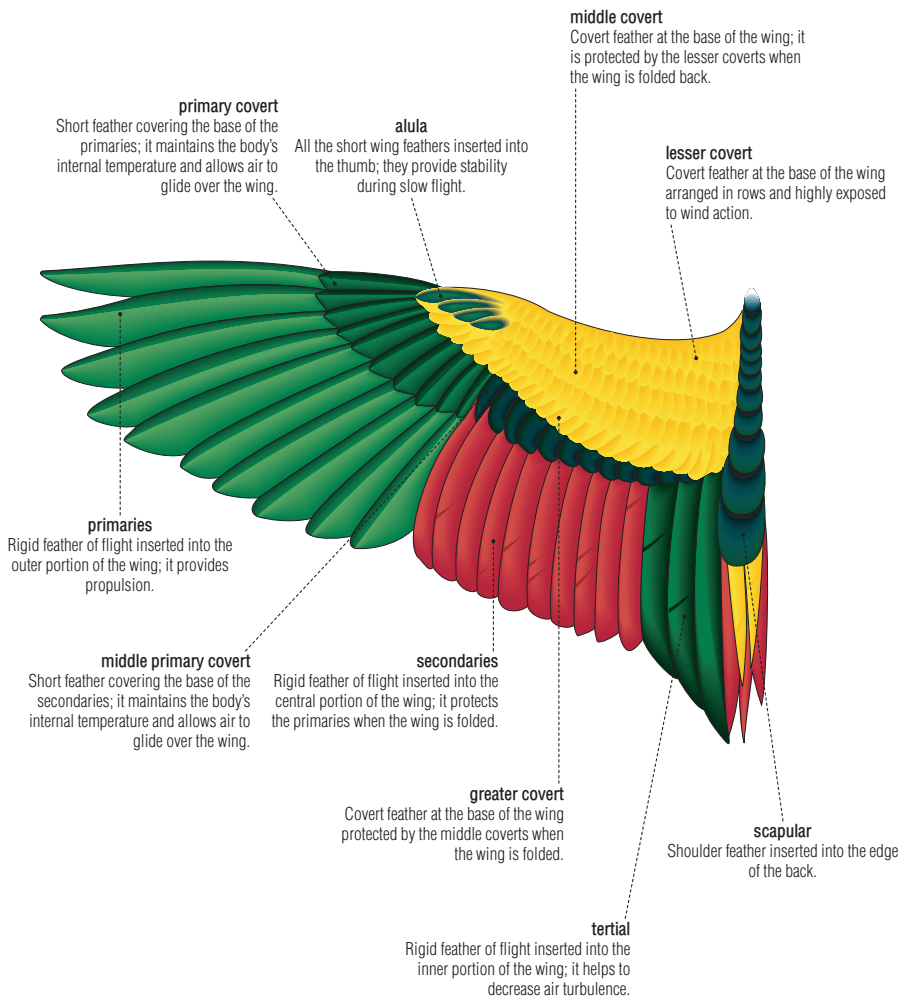
Large rigid feather of the wings and tail enabling flight.



## bird

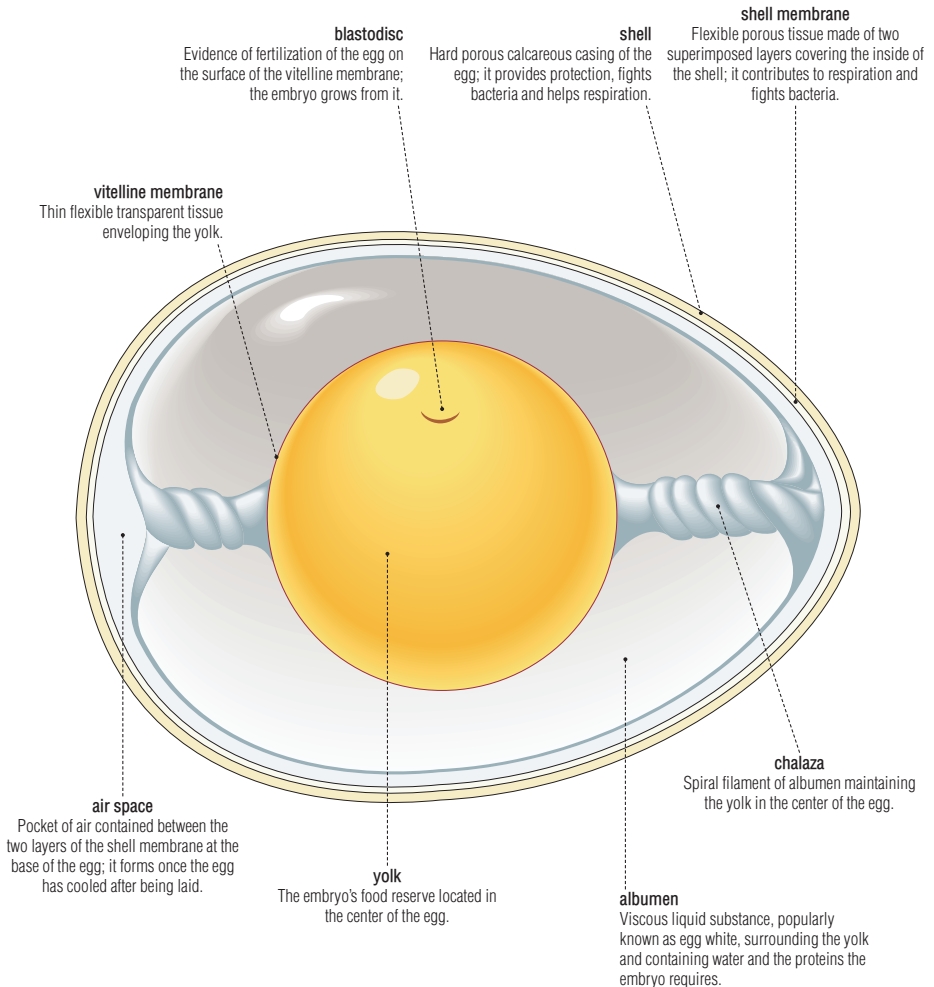
**wing**

Appendage of flight formed of hollow bones and feathers, and comprising the forelimb; in certain species, the wing is not adapted for flight.

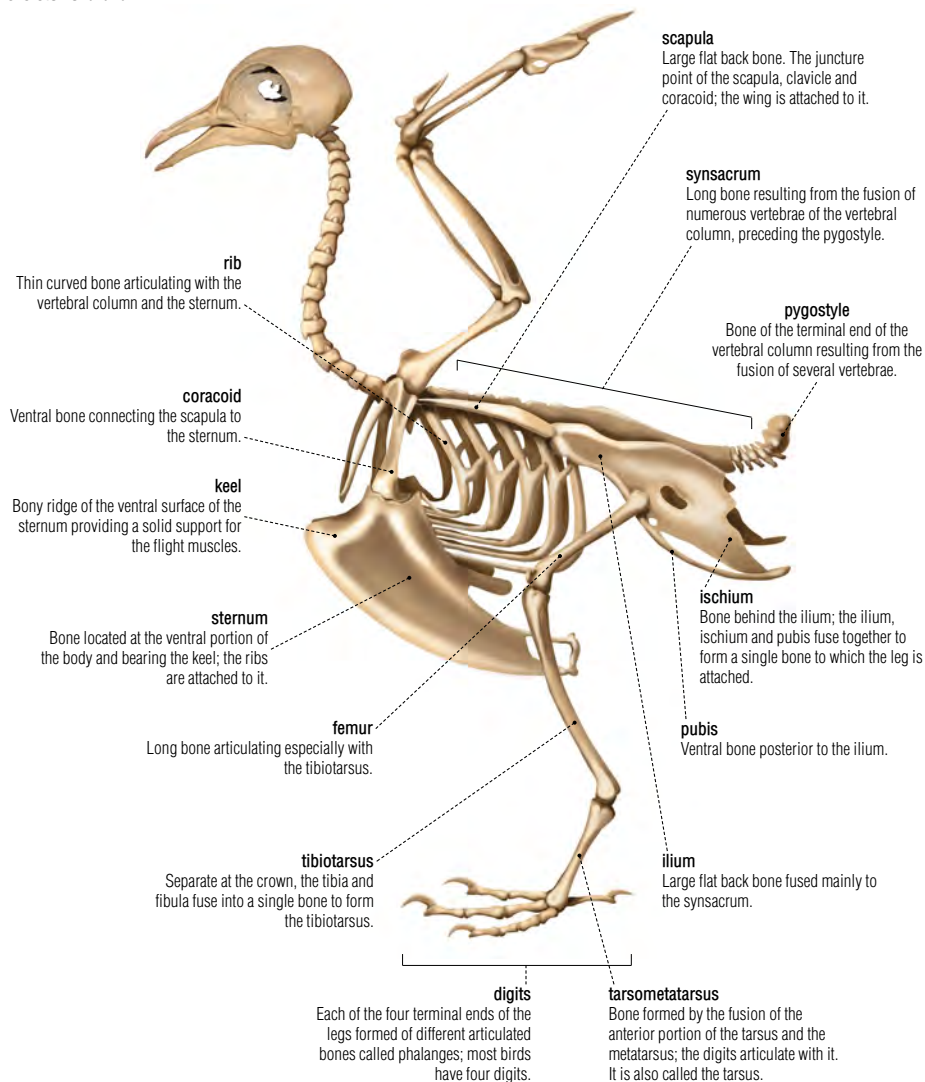


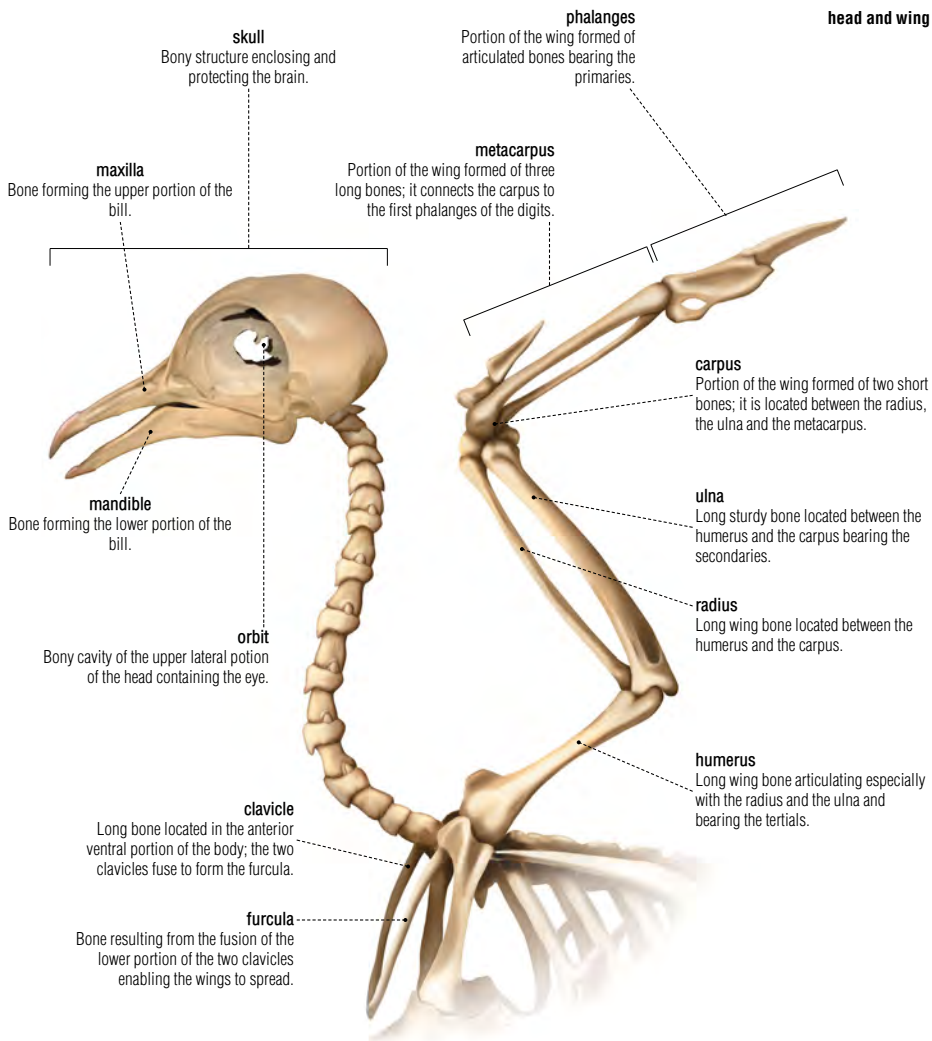
**egg**

Reproductive method of certain animal species: a living cell with a casing and a food reserve, produced by the female.

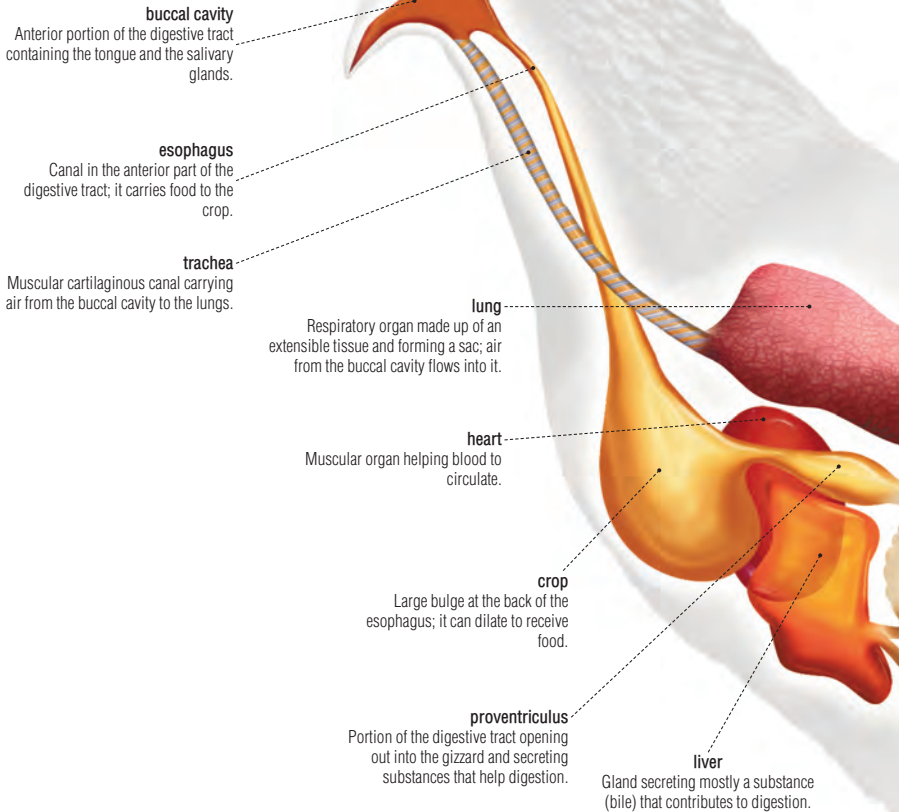


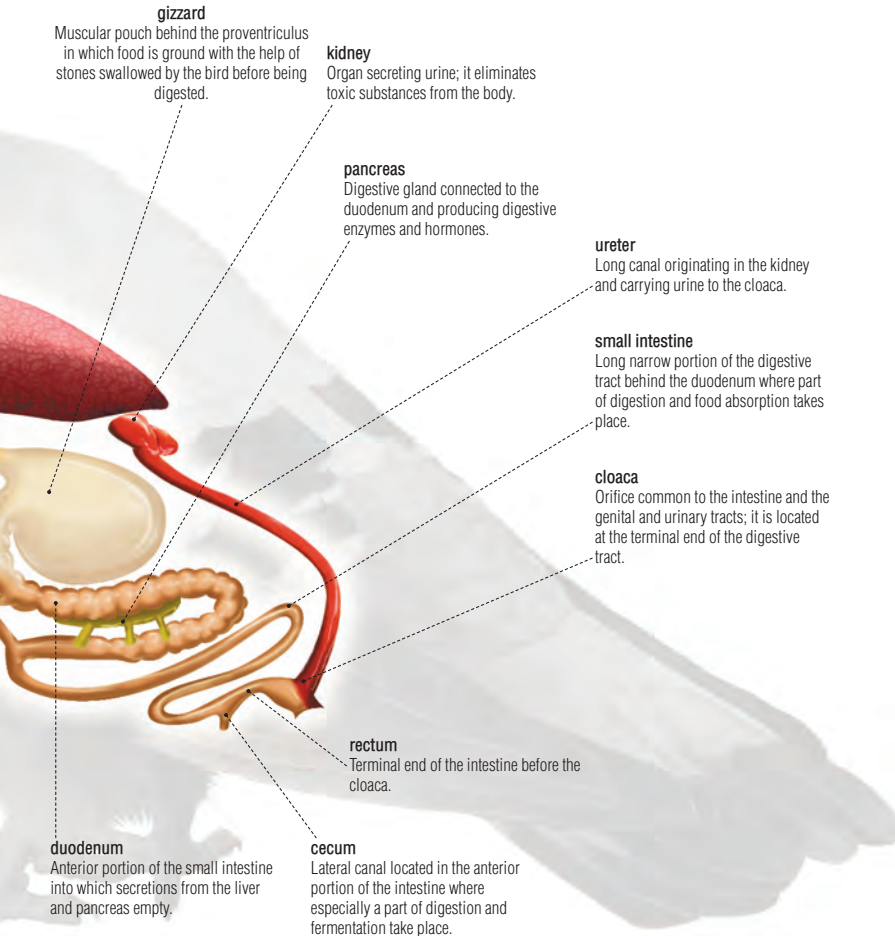
## skeleton of a bird





## anatomy of a bird





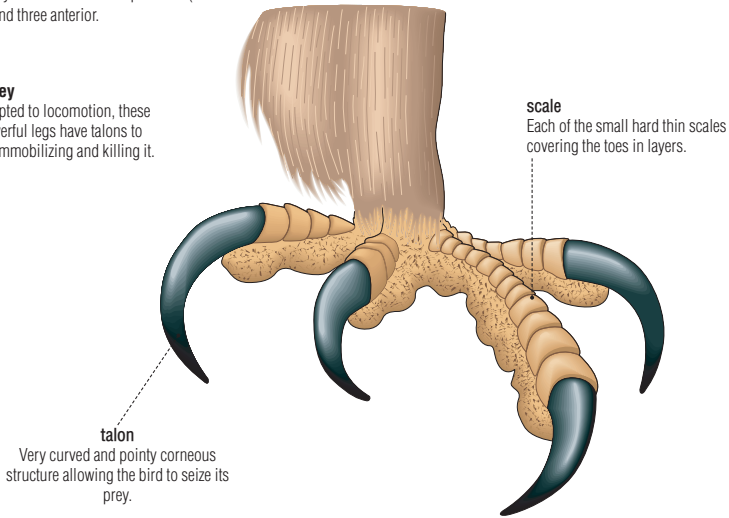


**examples of feet**

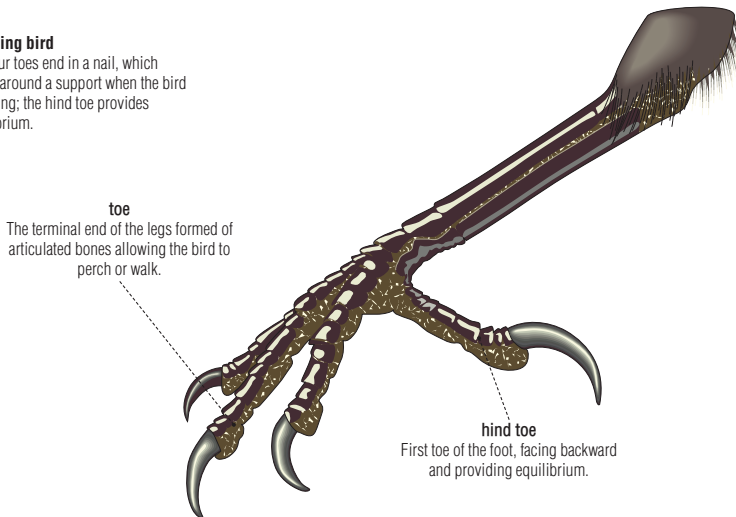
The feet of birds are adapted to their lifestyle. They usually have four toes: one posterior (the hind toe) and three anterior.

**bird of prey**

Poorly adapted to locomotion, these sturdy powerful legs have talons to grip prey, immobilizing and killing it.

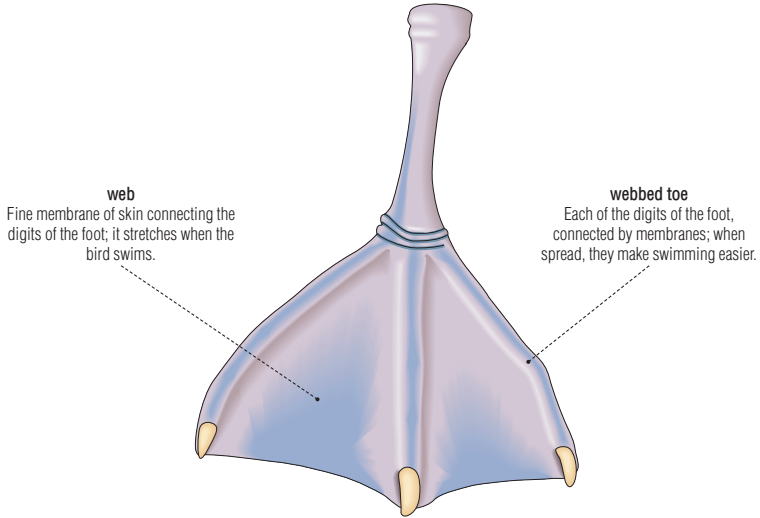
**perching bird**

The four toes end in a nail, which wraps around a support when the bird is resting; the hind toe provides equilibrium.

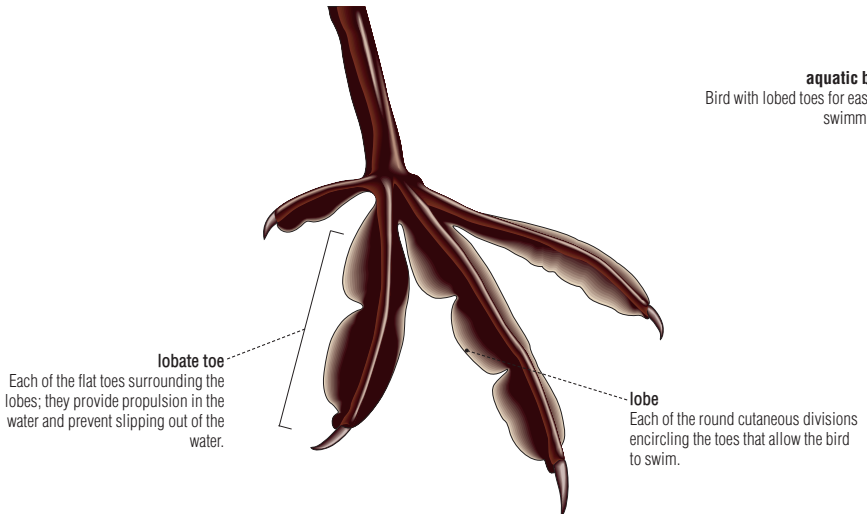


**aquatic bird**

Bird with webbed feet for ease of swimming.

**aquatic bird**

Bird with lobed toes for ease of swimming.



**examples of bills**

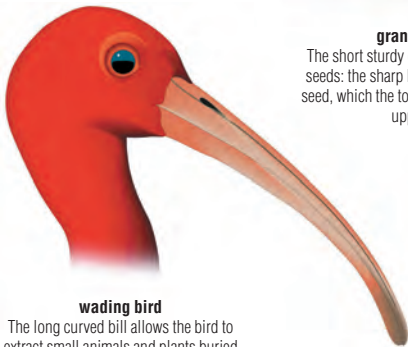
A bill's shape is characteristic of the lifestyle of the bird species. Its main function is to allow the bird to feed, to construct its nest and to defend itself.

**bird of prey**

The short sturdy hooked bill tears apart large prey.

**granivorous bird**

The short sturdy conical bill is used to hull seeds: the sharp lower mandible cracks the seed, which the tongue holds in place on the upper maxilla.

**wading bird**

The long curved bill allows the bird to extract small animals and plants buried deep in the ground, in mud and in marshes.

**aquatic bird**

The large flat bill, with corneous lateral plates, filters water and mud to extract food.

**insectivorous bird**

The long thin pointed bill allows the bird to catch insects in flight.

There are more than 9,000 species of birds scattered around the world.



**hummingbird**

Tiny brightly colored bird with a long thin bill found on the North American continent; it can hover and fly backward.



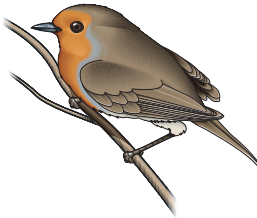
**finch**

Widespread bird with a melodious song.



**sparrow**

Bird that feeds mainly on seeds and insects; it is widespread in cities and in the countryside.



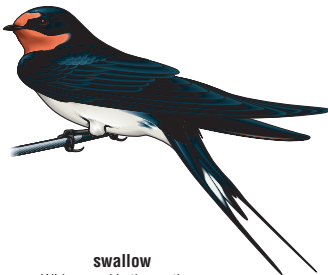
**European robin**

European perching bird found in woods and gardens characterized by a bright red throat and chest and emitting a fairly loud, lively melodious song.



**kingfisher**

Colorful fish-eating bird that spends most of its time perched by the water's edge.



**swallow**

Widespread in the northern hemisphere and found in highly diverse habitats; it usually feeds on insects caught in flight.



**goldfinch**

Brightly plumed songbird feeding mainly on the seeds of the thistle.

**magpie**

Noisy omnivore found in trees and bushes in temperate regions of the Northern hemisphere.

**starling**

Straight-billed omnivorous bird with dark plumage; it lives in trees.

**swift**

Widespread and very swift insectivore; it is usually airborne since its toes make it difficult to perch.

**oystercatcher**

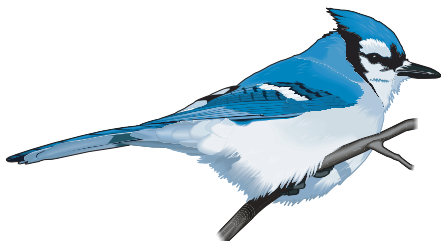
Swift long-billed bird found in Eurasia; it feeds mainly on shellfish.

**raven**

Strong-billed scavenger with usually black plumage; it sometimes damages crops.

**nightingale**

Bird with a melodious song that feeds on insects and fruit; it is found in the bushes of forests and parks.

**jay**

Usually noisy, brightly colored bird found in forests; it feeds mainly on fruit and insects.

**northern saw-whet owl**

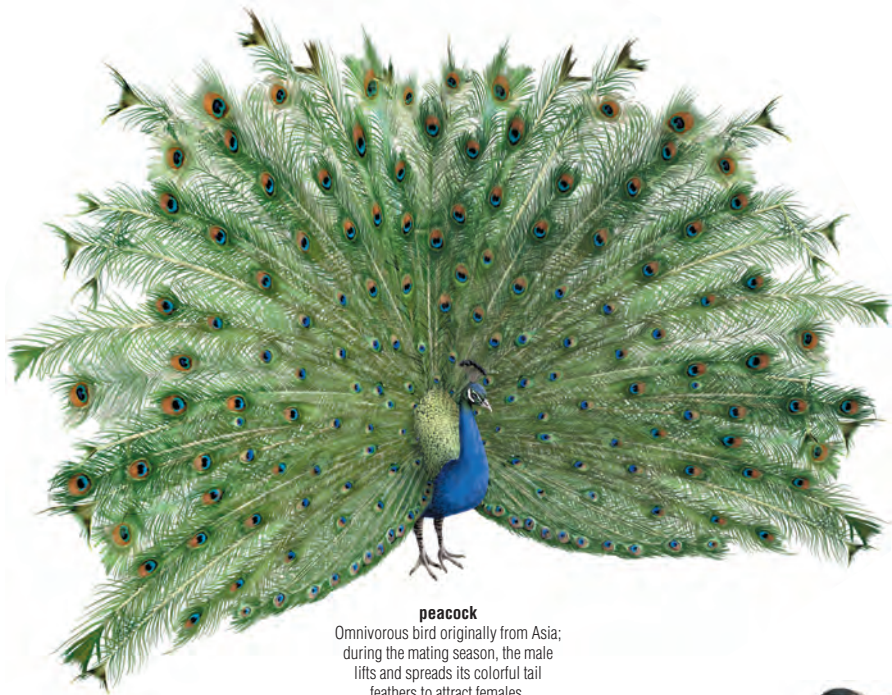
Nocturnal bird of prey found in the forests of North America.

**tern**

Widespread web-footed aquatic bird with long wings and a forked tail; it dives for the fish it feeds on.

**lapwing**

Mainly insectivorous bird found in the wetlands and marshes of Eurasia and Africa; it has a tuft of upright feathers on its head.

**peacock**

Omnivorous bird originally from Asia; during the mating season, the male lifts and spreads its colorful tail feathers to attract females.

**albatross**

Web-footed aquatic bird of the south seas; its wingspan can reach 10 ft, allowing it to glide for hours.

**toucan**

Large yet gentle bird found in the forests of the Americas; its dentate bill allows it to feed especially on fruits and insects.

**heron**

Widespread wading bird found in shallow waters and marshes, mostly piscivorous, with a neck that folds into an S when it is at rest.



**pelican**

Web-footed bird with a lower jaw featuring an extensible pouch for catching fish.

**penguin**

Piscivorous marine bird living in colonies in the southern hemisphere; it has webbed feet and wings that have evolved into fins.

**ostrich**

Flightless bird of Africa reaching over 7 ft in height, with powerful two-toed legs; it is raised for its feathers and meat.

**stork**

Wading bird found in marshes and fields; two species are threatened with extinction.

**flamingo**

Bird with webbed feet and usually pink plumage living in colonies in brackish or salt water; it feeds by filtering water through its bill.

**condor**

Diurnal scavenger of the Americas, with a bald head and neck; one California species is facing extinction.

**vulture**

Diurnal raptor of the Americas and Eurasia, mainly a scavenger, with a bald head and neck, powerful beak and weak talons.

**eagle**

Widely prevalent raptor with piercing eyes, a hooked beak and sharp talons allowing it to catch live prey.

**great horned owl**

Nocturnal raptor found in the forests of North America, with a protruding tuft of feathers on each side of its head.

**falcon**

Diurnal bird of prey with piercing eyes and powerful talons and beak; it captures its prey in flight and is sometimes trained to hunt.

**guinea fowl**

Wild terrestrial bird with a bald head and horned comb originally from Africa and domesticated in Europe for its meat.

**rooster**

Domestic bird (male of the hen) with a large serrated comb and a long-plumed tail.

**chick**

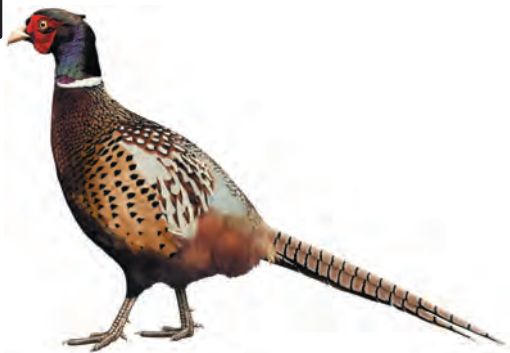
Newly hatched bird covered in down.

**hen**

Domestic fowl (female of the rooster) with a small serrated comb raised in captivity for its eggs and meat.

**turkey**

Bird originating in the Americas with a bald head and neck covered with outgrowths; it is raised in captivity for its meat.

**pheasant**

Bird originally from Asia and characterized by its long tail; its meat is highly prized. Certain pheasants are raised solely for hunting.

**pigeon**

Generally grain-eating bird prized for its meat and its keen sense of direction (carrier pigeon).

**goose**

Web-footed bird of the northern hemisphere better adapted to land than water; certain species are raised mainly for the production of foie gras.

**quail**

Bird found in fields and meadows and much prized as game; certain species are domesticated.

**duck**

Web-footed aquatic bird spending most of its time on water; the domestic duck is raised for its meat and for the production of foie gras.

**bullfinch**

Red-breasted bird found in the woods and parks of Eurasia and the Americas; it feeds mainly on seeds and insects.

**cardinal**

Brightly colored bird with a tuft of upright feathers on its head; it is found mostly in North American woods and gardens.

**partridge**

Land-based bird that flies with difficulty; it is the most hunted game bird.

**cockatoo**

Noisy perching bird with drab plumage and a tuft of upright feathers on its head, found mainly in Australia; it can mimic human speech.

**woodpecker**

Widespread insectivore that pecks at the bark of trees to find food and to nest.

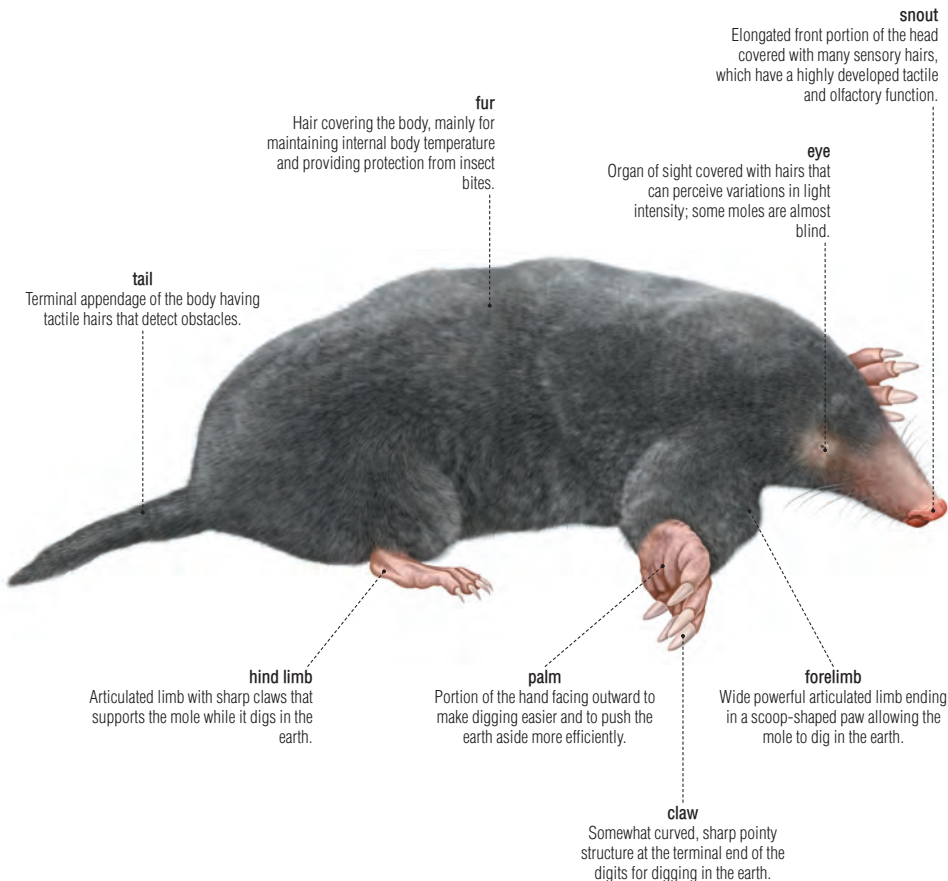
**macaw**

Noisy brightly colored perching bird found in the tropical forests of the Americas; it feeds mainly on seeds and fruit.

## mole

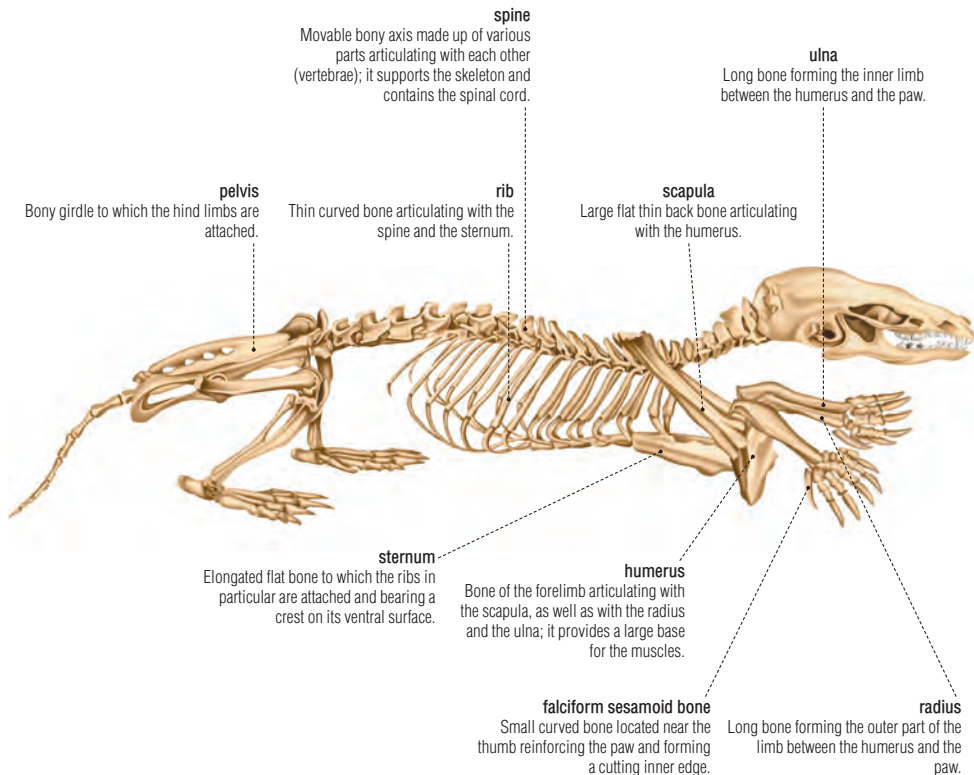
Insectivorous mammal (about 20 species) found in Eurasia and the Americas; it digs underground tunnels with its front limbs to reach its food.

## morphology of a mole





## skeleton of a mole





## examples of insectivorous mammals

**mole**

Insectivorous mammal (about 20 species) found in Eurasia and the Americas; it digs underground tunnels with its front limbs to reach its food.

**hedgehog**

Insectivorous mammal of Eurasia (about 10 species) with a body usually covered with stiff hairs or barbs, which stand on end when it rolls itself into a ball for protection.

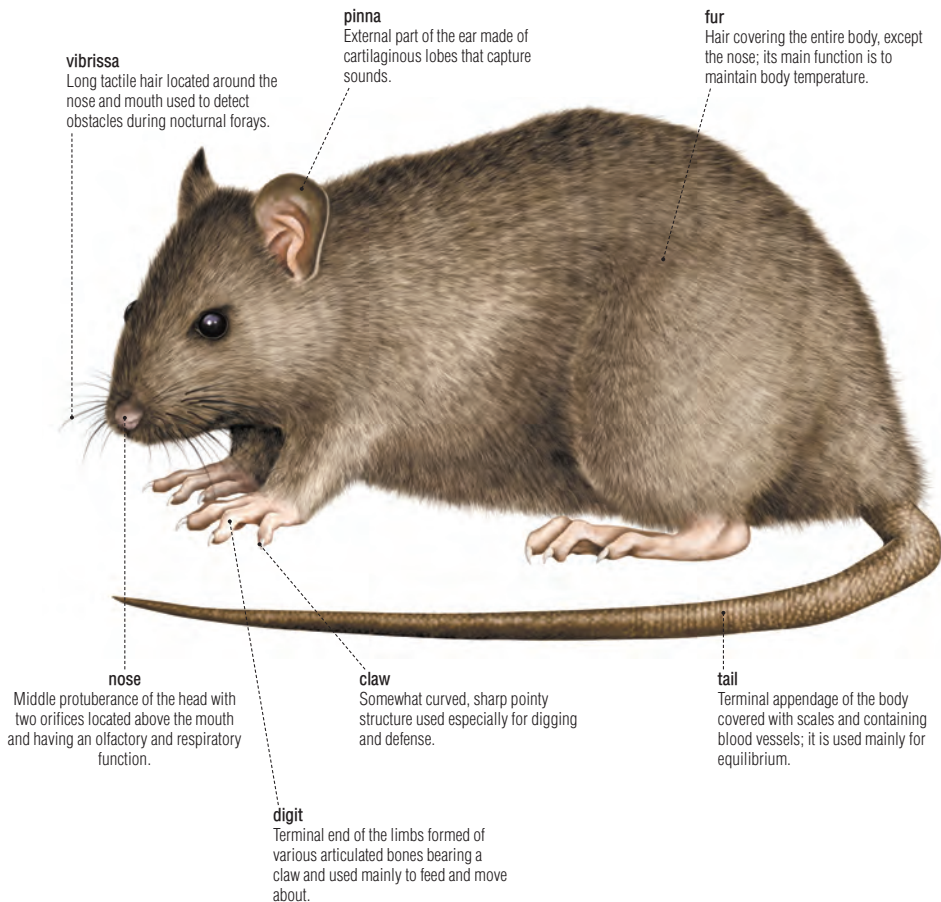
**shrew**

Widespread insectivorous mammal (about 200 species); it occasionally digs tunnels and emits a fetid secretion for protection.

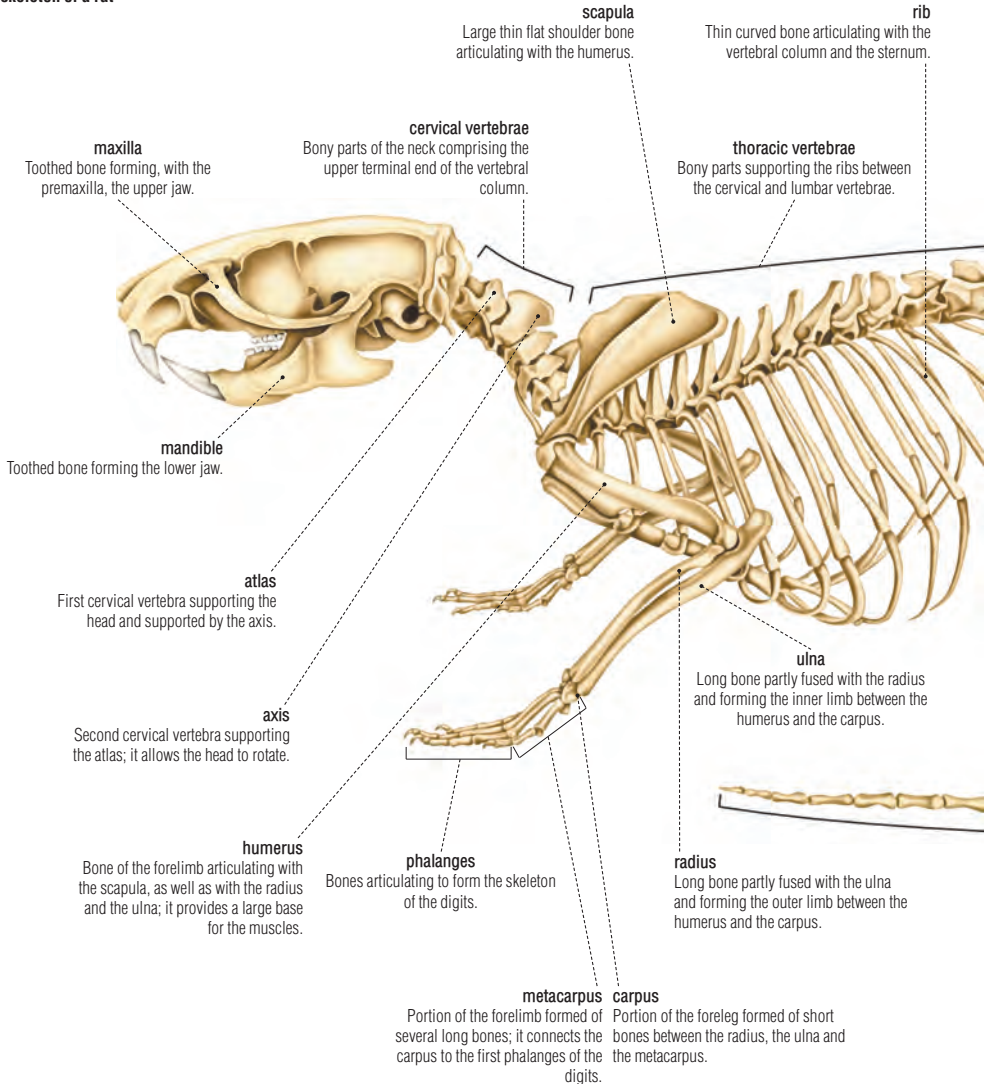
Herbivorous or omnivorous vertebrate (over 2,000 species) with four limbs, a body covered in hair and sharp incisors that grow constantly.

**morphology of a rat**

Rat: omnivorous gnawing mammal with a long tail; it is extremely voracious and prolific.



skeleton of a rat



**maxilla**  
Toothed bone forming, with the premaxilla, the upper jaw.

**mandible**  
Toothed bone forming the lower jaw.

**atlas**  
First cervical vertebra supporting the head and supported by the axis.

**axis**  
Second cervical vertebra supporting the atlas; it allows the head to rotate.

**humerus**  
Bone of the forelimb articulating with the scapula, as well as with the radius and the ulna; it provides a large base for the muscles.

**phalanges**  
Bones articulating to form the skeleton of the digits.

**metacarpus**  
Portion of the forelimb formed of several long bones; it connects the carpus to the first phalanges of the digits.

**scapula**  
Large thin flat shoulder bone articulating with the humerus.

**cervical vertebrae**  
Bony parts of the neck comprising the upper terminal end of the vertebral column.

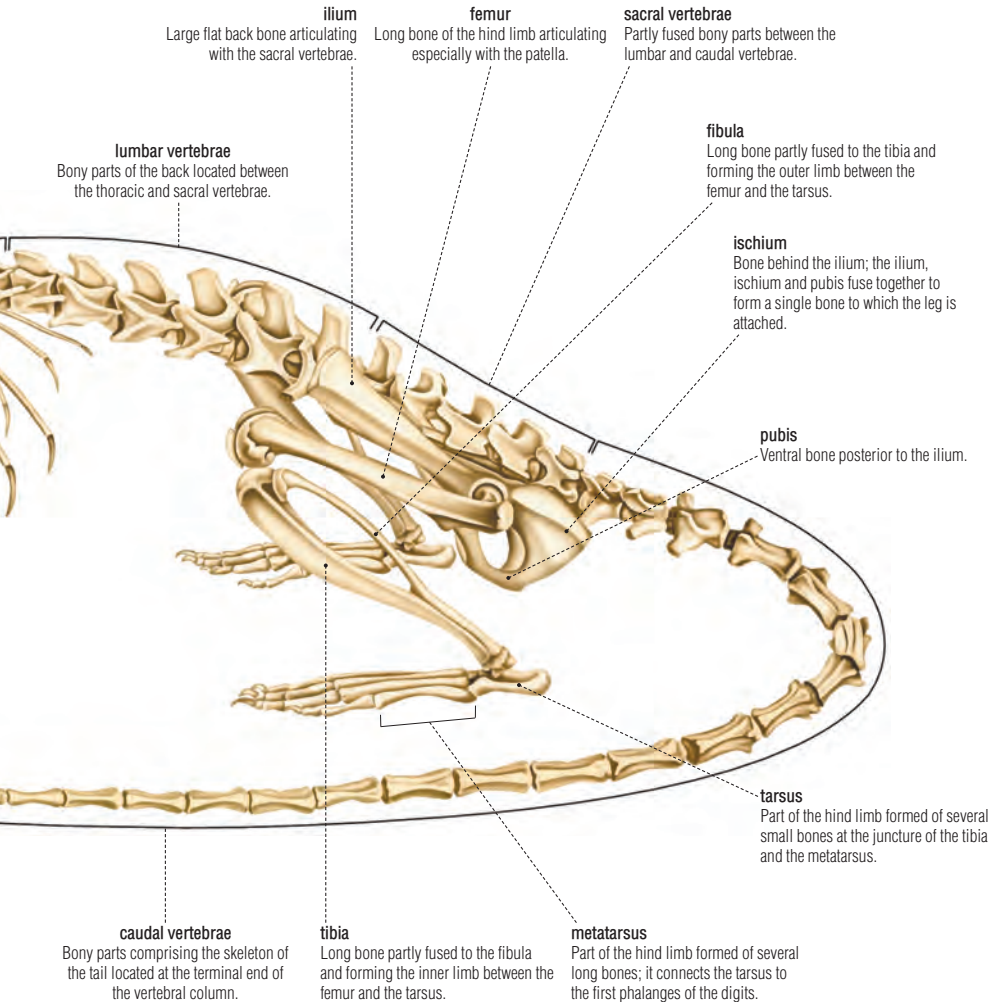
**thoracic vertebrae**  
Bony parts supporting the ribs between the cervical and lumbar vertebrae.

**rib**  
Thin curved bone articulating with the vertebral column and the sternum.

**ulna**  
Long bone partly fused with the radius and forming the inner limb between the humerus and the carpus.

**radius**  
Long bone partly fused with the ulna and forming the outer limb between the humerus and the carpus.

**carpus**  
Portion of the foreleg formed of short bones between the radius, the ulna and the metacarpus.



examples of rodents



**hamster**

Rodent of the Eurasian steppes sometimes domesticated and used for laboratory experiments; it stores its food in its cheek pouches.



**chipmunk**

Small, mainly vegetarian North American rodent found in hardwood forests and bushes.



**jerboa**

Rodent found in the deserts of Asia and Africa adapted for hopping and able to survive without drinking water.



**guinea pig**

Rodent originating in South America, sometimes domesticated but mainly used in laboratory experiments.



**field mouse**

Rodent found in woods and fields; it moves about by hopping and can cause serious crop damage.



**rat**

Omnivorous rodent characterized by its intelligence; it can transmit certain viruses and bacteria to humans. Some species are domesticated.

**squirrel**

Mostly vegetarian rodent found in woods and forests around the world, except in Australia; some squirrels move about by gliding from tree to tree.

**groundhog**

Rodent of the northern hemisphere prized for its fur; it hibernates six months a year and emits a high-pitched whistle when in danger.

**beaver**

Amphibious rodent found in Eurasia and North America prized for its fur; it uses branches to build lodges and dams in streams.

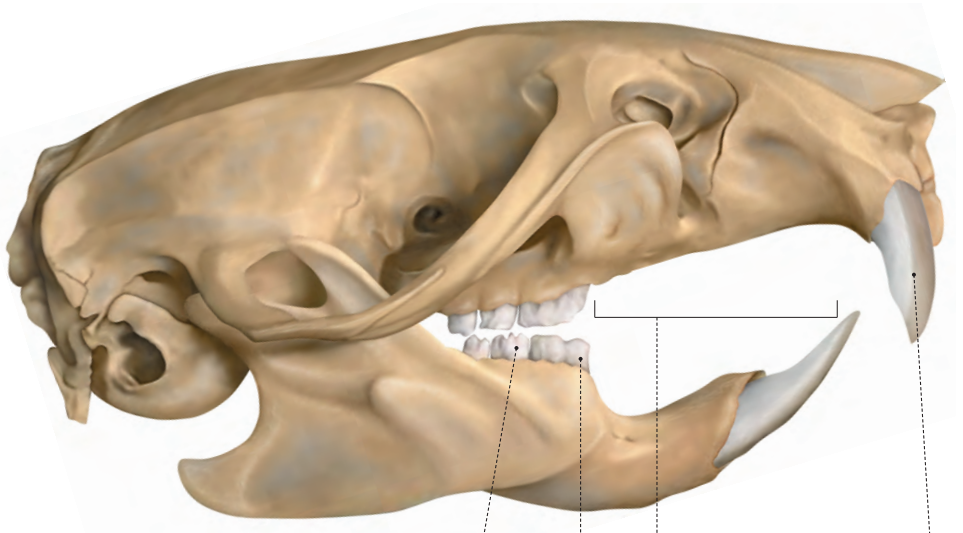
**porcupine**

Rodent found on land and in trees in warm and temperate regions; its body is covered with long sharp quills, which it raises to defend itself.

## rodent's and lagomorph's jaws

Unlike a rodent's jaws, those of a lagomorph have a second pair of (nonfunctional) incisors on the maxilla.

rodent's jaw: rat



**molar**

Large tooth with several roots; it is located at the back of the jaw behind the premolars and used to grind food.

**premolar**

Tooth usually with a single root; it is located behind the diastema and used for grinding.

**diastema**

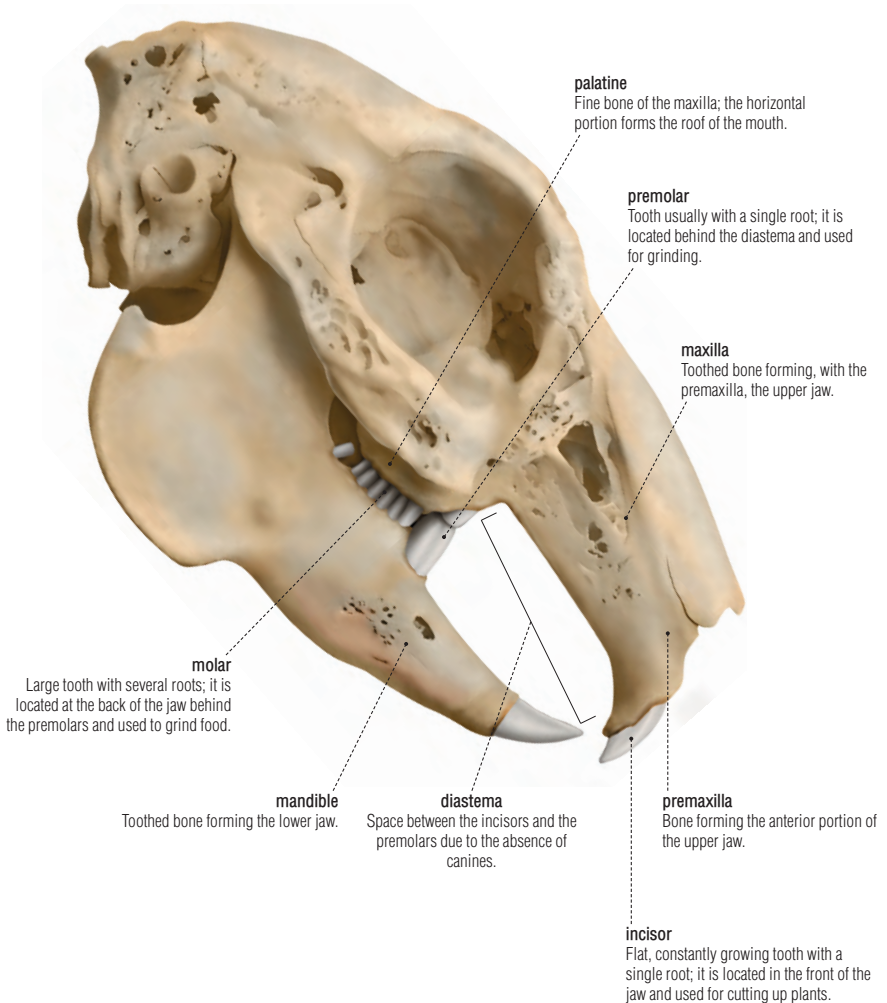
Large space between the incisors and the premolars due to the absence of canines.

**incisor**

Flat, constantly growing tooth with a single root; it is located in the front of the jaw and used for cutting up plants.



lagomorph's jaw: rabbit



## examples of lagomorphs

Lagomorphs: small four-legged herbivorous vertebrates (about 60 species) with dense fur, a short or absent tail and three pairs of incisors.

**rabbit**

Widespread and extremely prolific lagomorph living in the wild in burrows; it is also raised for its meat and fur.

**pika**

Tailless lagomorph living in the wild in the mountains of Central Asia and North America.

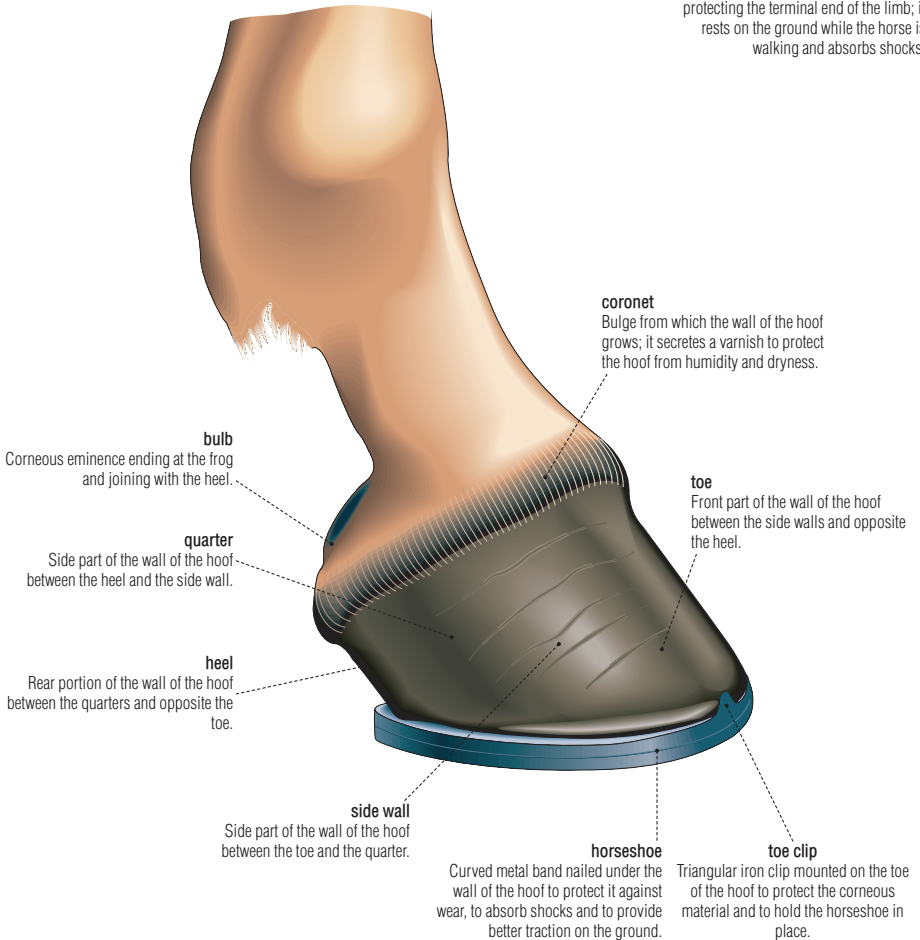
**hare**

Widespread lagomorph with strong hind limbs adapted for swift running; it lives in the wild and is valued especially for its meat.

Maned ungulate mammal domesticated for riding and for use as a draft animal.

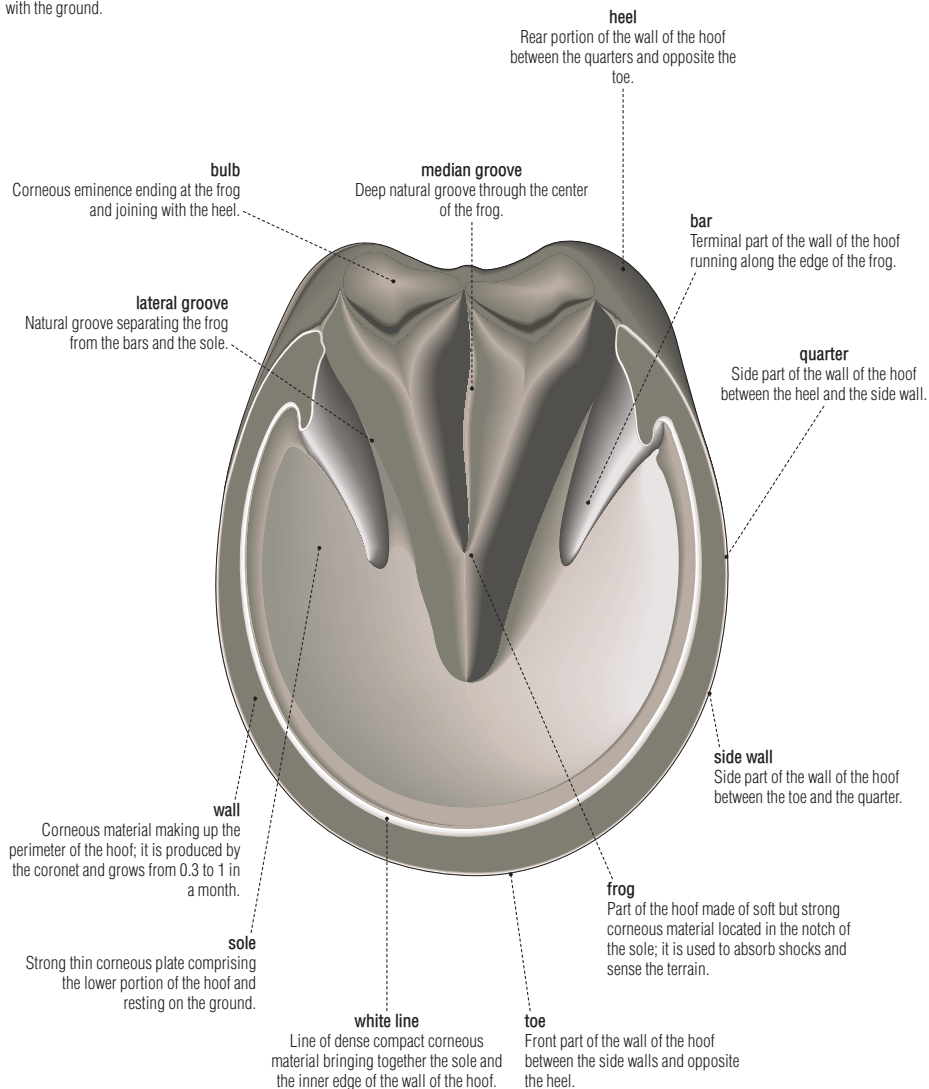
**hoof**

Thick corneous casing covering and protecting the terminal end of the limb; it rests on the ground while the horse is walking and absorbs shocks.



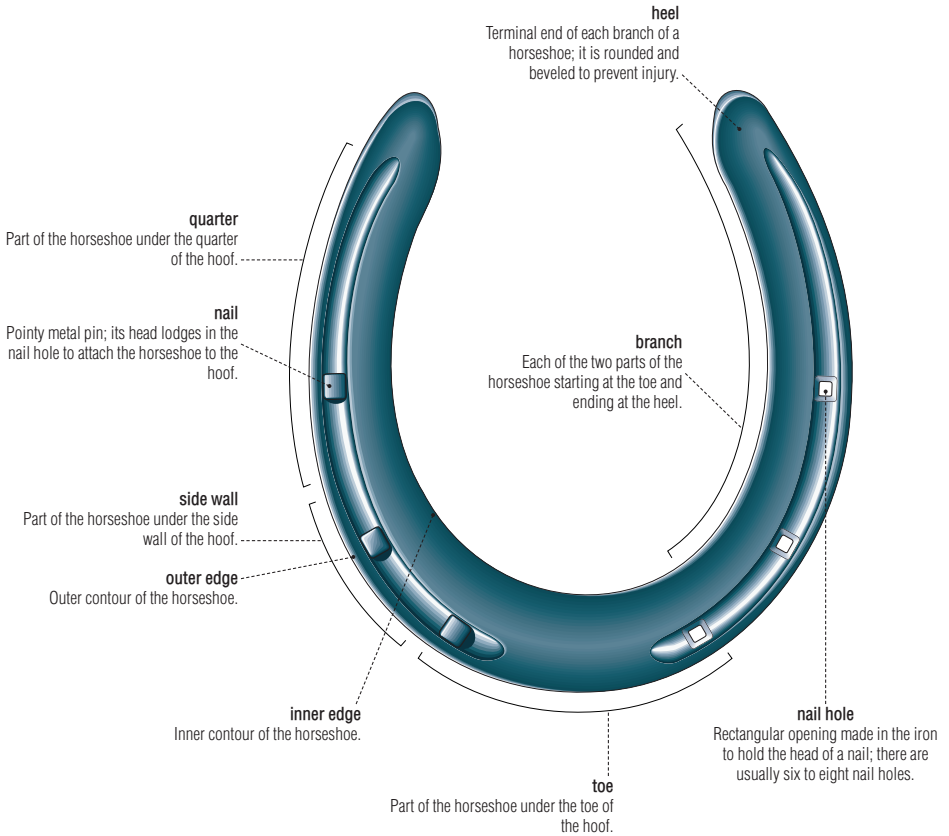
**plantar surface of the hoof**

Corneous lower surface of the hoof in contact with the ground.

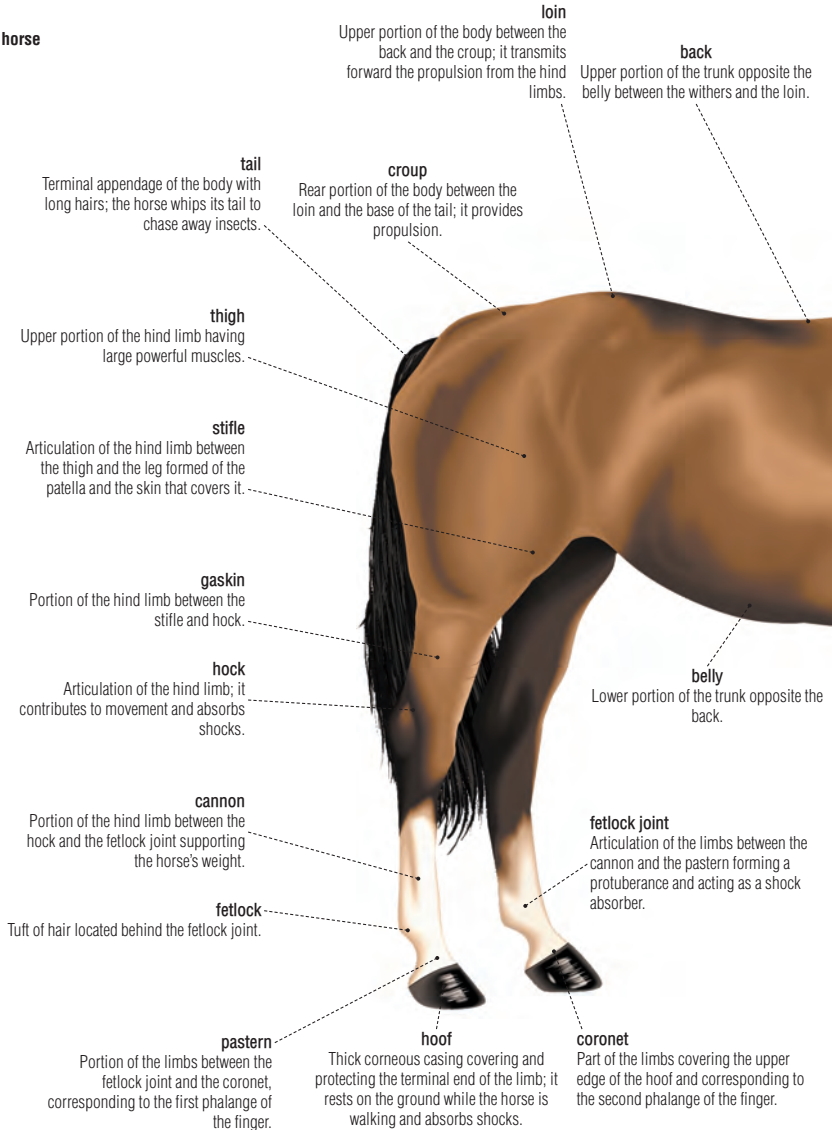


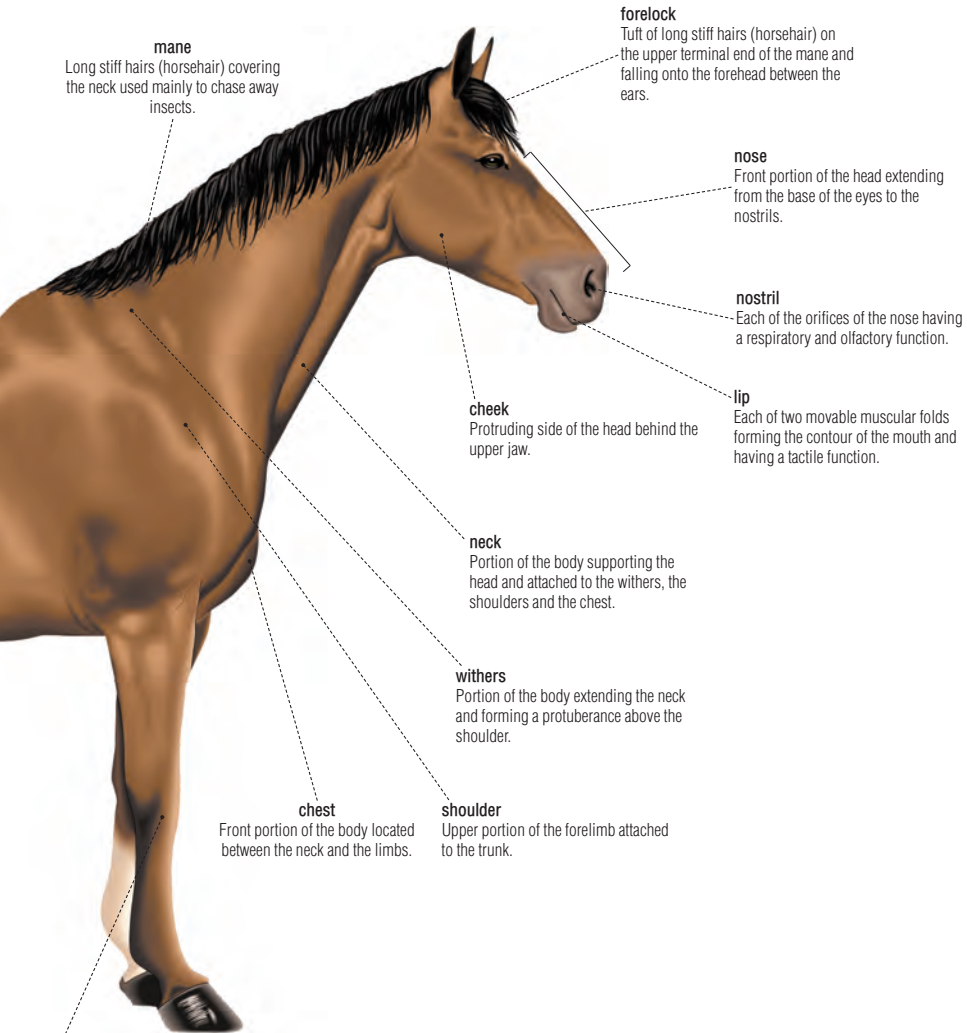
**horseshoe**

Curved metal band nailed under the wall of the hoof to protect it against wear, to absorb shocks and to provide better traction on the ground.



morphology of a horse





**mane**

Long stiff hairs (horsehair) covering the neck used mainly to chase away insects.

**forelock**

Tuft of long stiff hairs (horsehair) on the upper terminal end of the mane and falling onto the forehead between the ears.

**nose**

Front portion of the head extending from the base of the eyes to the nostrils.

**nostril**

Each of the orifices of the nose having a respiratory and olfactory function.

**lip**

Each of two movable muscular folds forming the contour of the mouth and having a tactile function.

**cheek**

Protruding side of the head behind the upper jaw.

**neck**

Portion of the body supporting the head and attached to the withers, the shoulders and the chest.

**withers**

Portion of the body extending the neck and forming a protuberance above the shoulder.

**chest**

Front portion of the body located between the neck and the limbs.

**shoulder**

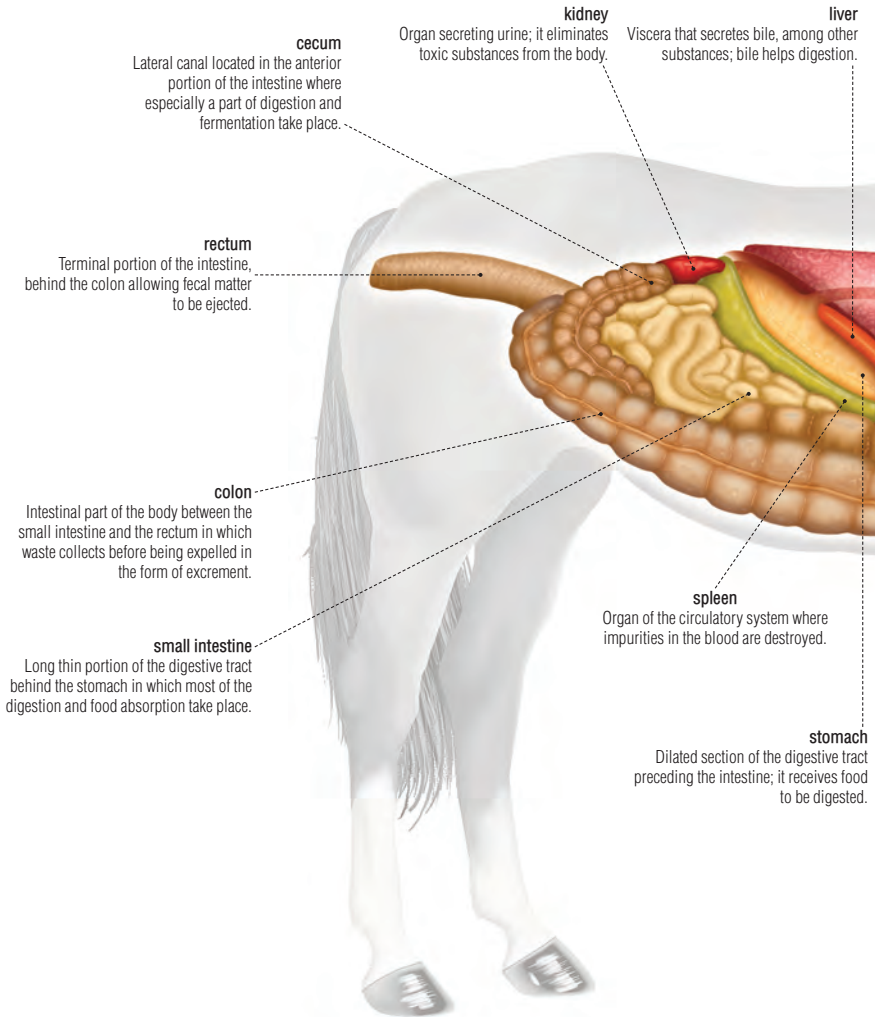
Upper portion of the forelimb attached to the trunk.

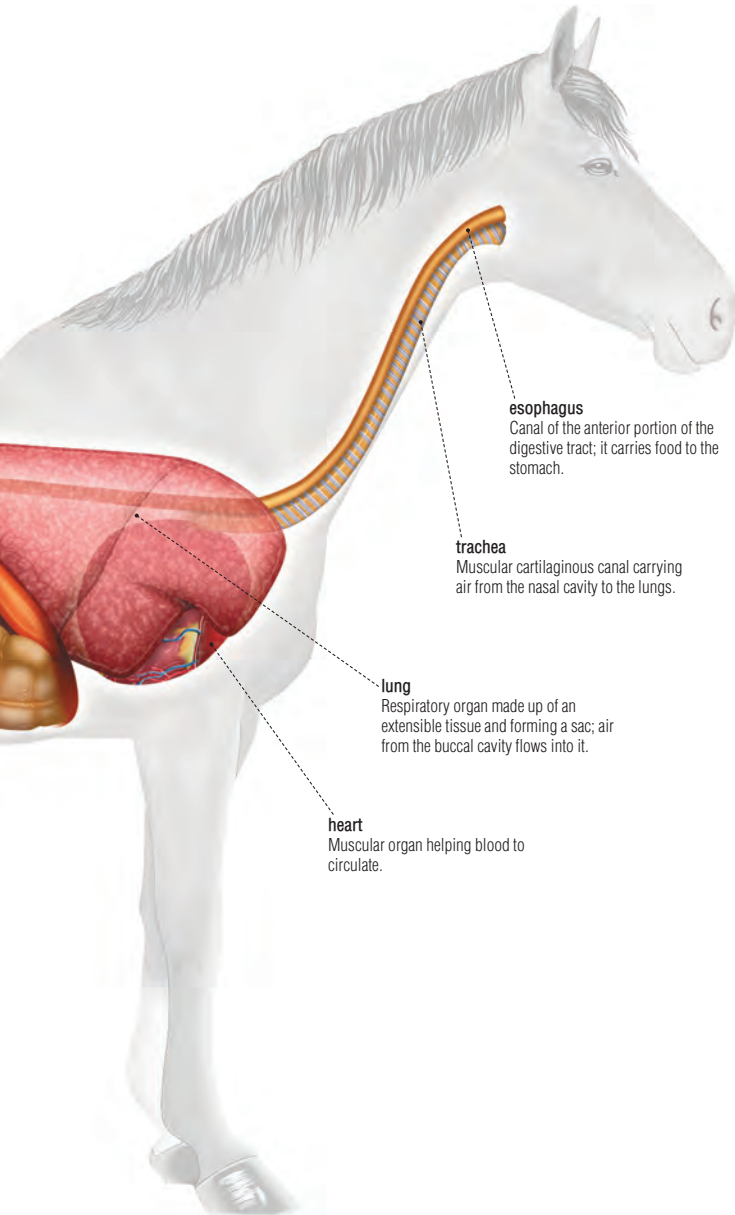
**knee**

Articulation of the forelimb located below the elbow between the forearm and the cannon; it contributes to movement and acts as a shock absorber.



anatomy of a horse





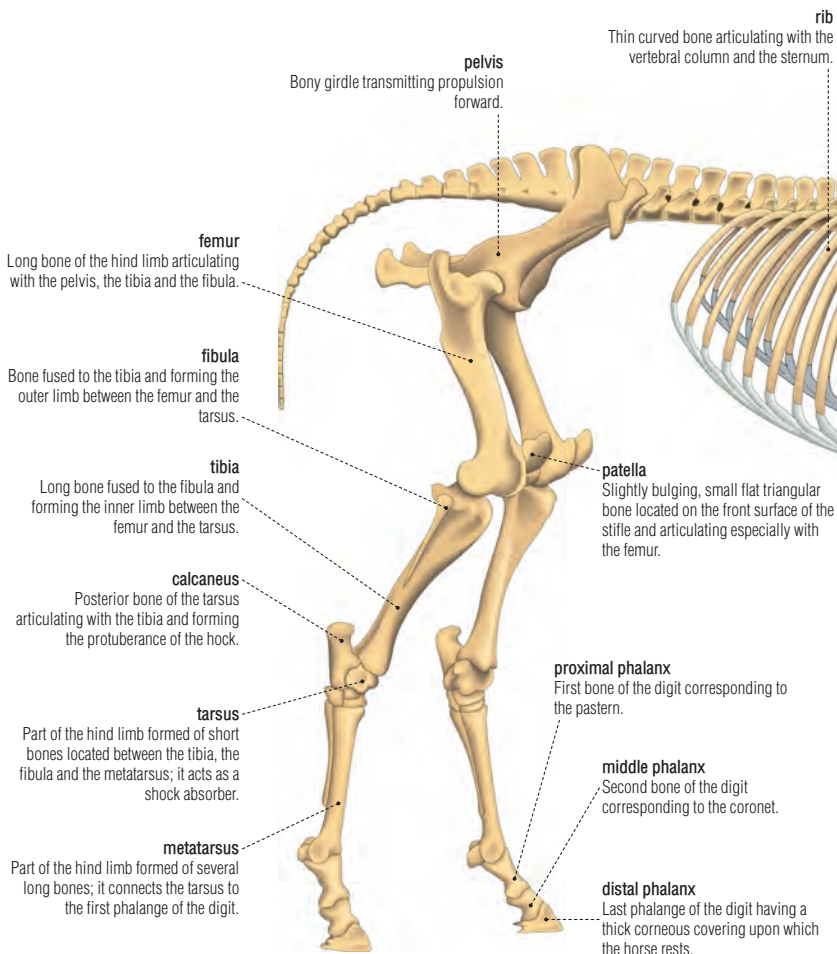
**esophagus**  
 Canal of the anterior portion of the digestive tract; it carries food to the stomach.

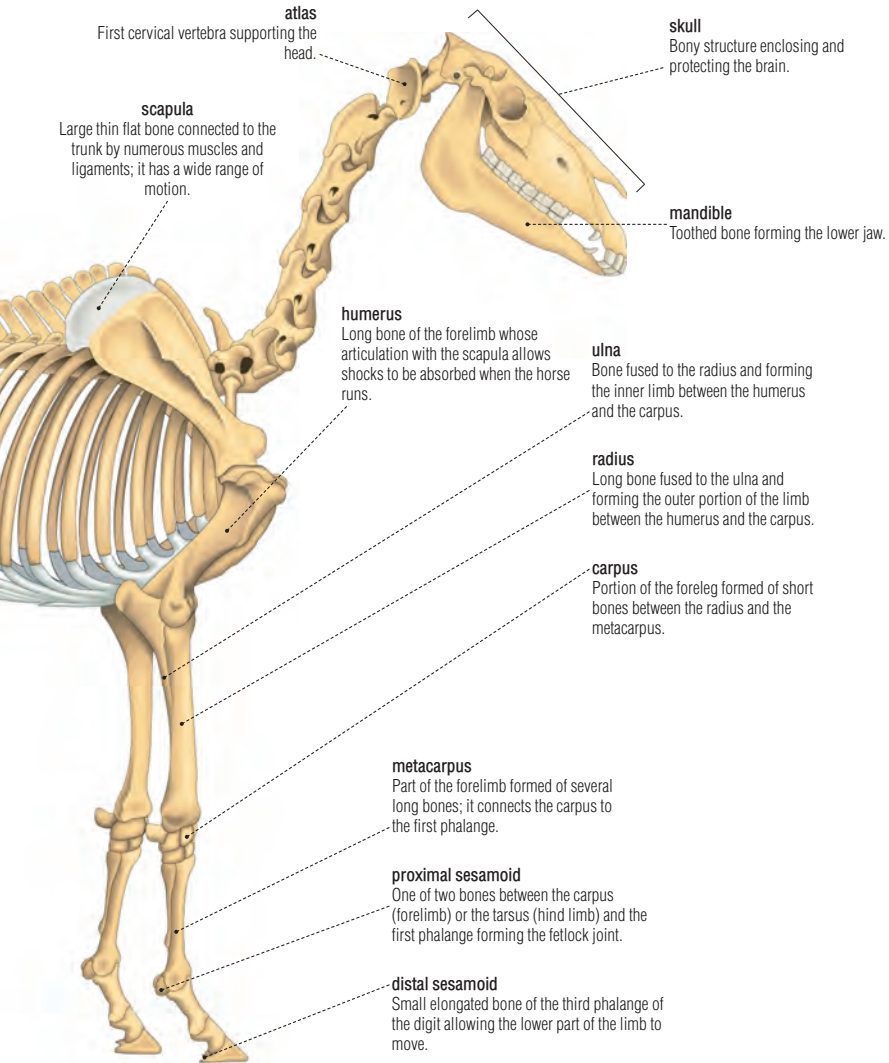
**trachea**  
 Muscular cartilaginous canal carrying air from the nasal cavity to the lungs.

**lung**  
 Respiratory organ made up of an extensible tissue and forming a sac; air from the buccal cavity flows into it.

**heart**  
 Muscular organ helping blood to circulate.

skeleton of a horse

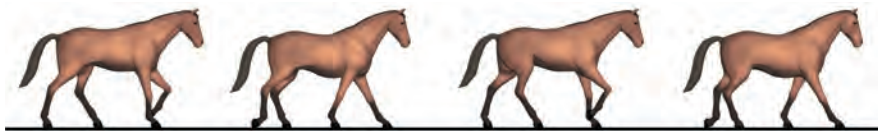




## horse

**gaits**

Natural or acquired means of locomotion used by a horse, based on limb movements. There are four principal gaits.

**walk**

Natural walking gait in four equal movements: each leg lifts and touches down diagonally in succession. This is a horse's slowest gait.

**trot**

Natural jumping gait between a walk and a gallop in two movements: both pairs of diagonal legs alternate in touching down, with a pause in between.

**pace**

Acquired jumping gait in two movements, extremely comfortable and faster than the trot; both pairs of lateral legs alternate in lifting.

**canter**

Natural gait performed in three unequal movements: both diagonal legs work together, while the other two work separately, with a pause in between.

Ungulate mammals can have an odd or even number of toes (from one to five); the number can vary for the forelimbs and the hind limbs.



**one-toed hoof**  
The horse, zebra and ass, for example, have one-toed hooves.



**two-toed hoof**  
The deer, giraffe, bull, sheep and camel are the principal animals with this kind of hoof.



**four-toed hoof**  
The pig, wild boar, hippopotamus and elephant are the principal animals with this kind of hoof.



**three-toed hoof**  
The rhinoceros, for example, has this kind of hoof.

examples of ungulate mammals

There are many species of ungulate mammals; some are wild, some are domesticated and some are both.



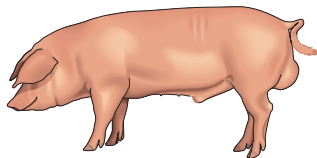
**peccary**

Wild ungulate found in the forests of the Americas having a dorsal gland that emits a nauseous secretion; it is prized for its hide.



**wild boar**

Wild ungulate found in forests and marshes with sharp canines that it uses to defend itself; it is hunted for its hide.



**pig**

Domestic omnivorous ungulate raised mainly for its meat and its hide.



**sheep**

Ungulate ruminant covered with a thick woolly coat domesticated for its milk, meat and wool.



**antelope**

Ungulate ruminant with hollow horns found throughout Africa and Asia; it runs very fast and is prized for its meat and hide.



**mouflon**

Extremely agile ungulate ruminant found in the wild in mountainous regions.



**ass**

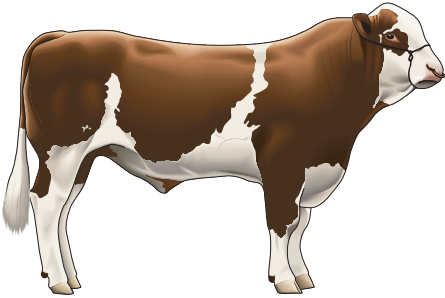
Wild maned ungulate originally from Africa domesticated as a pack animal.



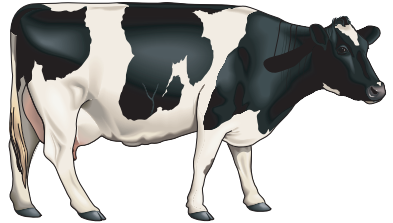
**mule**

Sterile male, a cross between an ass and a mare (female of the horse); it is very hardy and can carry heavy loads.





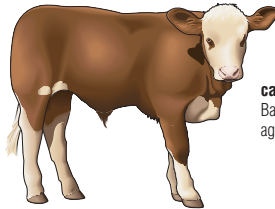
**ox**  
Castrated bovine (male of the cow) domesticated for its meat and sometimes used as a draft animal.



**cow**  
Ungulate ruminant with horns (female of the bull); it is raised for its milk and meat, and for reproduction.



**goat**  
Ungulate ruminant with hollow horns able to jump and climb; it is domesticated for its milk and meat.



**calf**  
Baby cow, male or female, up to the age of one year raised for its meat.



**zebra**  
Maned ungulate that runs very fast; it is found in herds in the forests and steppes of Africa.



**horse**  
Maned ungulate mammal domesticated for riding and for use as a draft animal.

examples of ungulate mammals



**caribou**

Ungulate ruminant found in cold regions of the northern hemisphere; it is raised in captivity by some peoples for its meat, hide and milk, and as a draft animal.



**white-tailed deer**

Wild ungulate ruminant of North America; it runs very fast and is highly prized as game.



**wapiti**

Wild ungulate ruminant of Canada; a good swimmer and runner, it is prized for its meat and antlers and is sometimes raised in captivity.



**buffalo**

Ungulate ruminant found in the tropical regions of Africa and Asia; it is wild or raised in captivity for its meat and milk, and as a draft animal.



**llama**

Ungulate ruminant found in the mountains of South America; it can be wild or domesticated and is highly prized for its wool.



**okapi**

Ungulate ruminant of Africa with an extensible and prehensile tongue; only the male has small horns.



**dromedary camel**

Single-humped ruminant ungulate of Africa adapted to arid climates; it is used especially as a pack animal and for riding.



**bactrian camel**

Two-humped ruminant ungulate of Asia adapted to arid climates; it is domesticated especially for its meat, milk and hide, and as a pack animal.



**bison**

Ungulate ruminant of North America and Europe, usually wild, sometimes raised for its meat.



**yak**

Ruminant ungulate of Central Asia domesticated in Tibet for its milk and its hide, and as a pack animal.



**moose**

Ruminant ungulate found in the cold regions of the northern hemisphere with wide hooves that allow it to wade through marshes and ponds.



**rhinoceros**

Ungulate found in the savannas and marshy areas of Africa and Asia with a one-horned or two-horned muzzle; it is threatened with extinction.



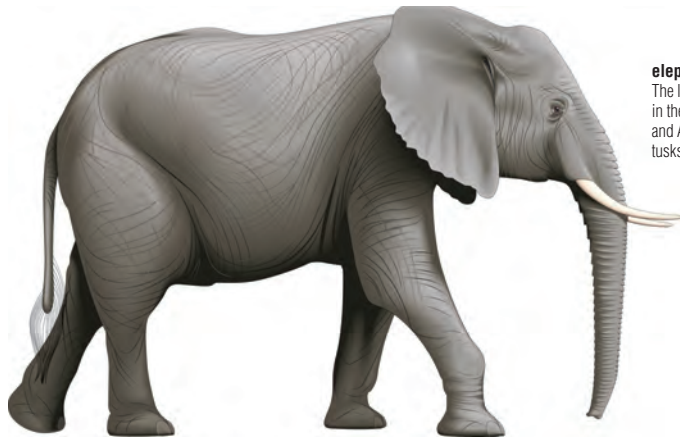
**giraffe**

Ruminant ungulate found in African savannas that can reach 23 feet in height; it has a prehensile tongue and small horns.



**hippopotamus**

Amphibious ungulate of Africa that can weigh up to 6 tons; it defends itself with its canine teeth, which grow constantly.



**elephant**

The largest land mammal today, found in the forests and savannas of Africa and Asia; it is hunted for its ivory tusks.

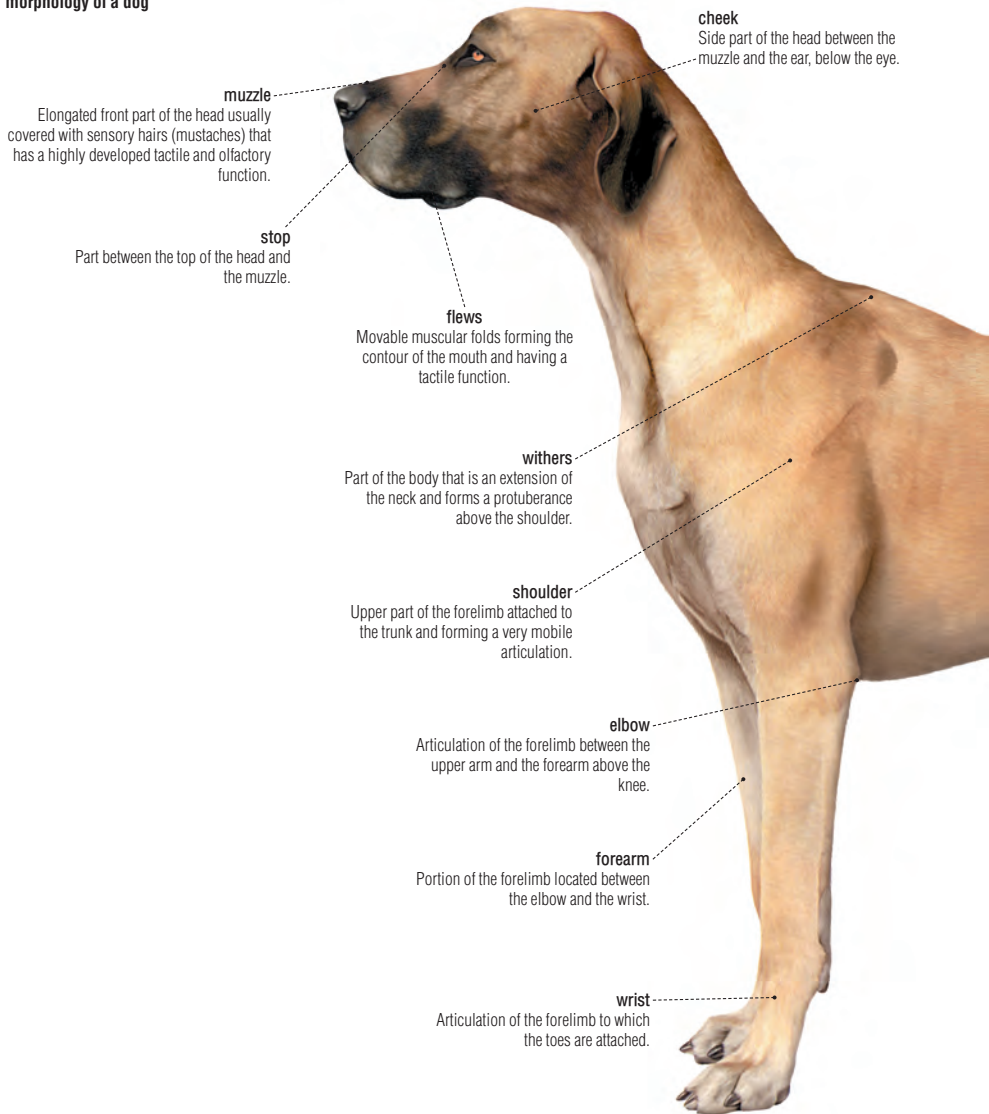
Carnivorous mammal with an excellent sense of smell; it has been domesticated since prehistoric times and trained to perform a number of tasks: guarding and protecting, detecting, carrying and hunting.

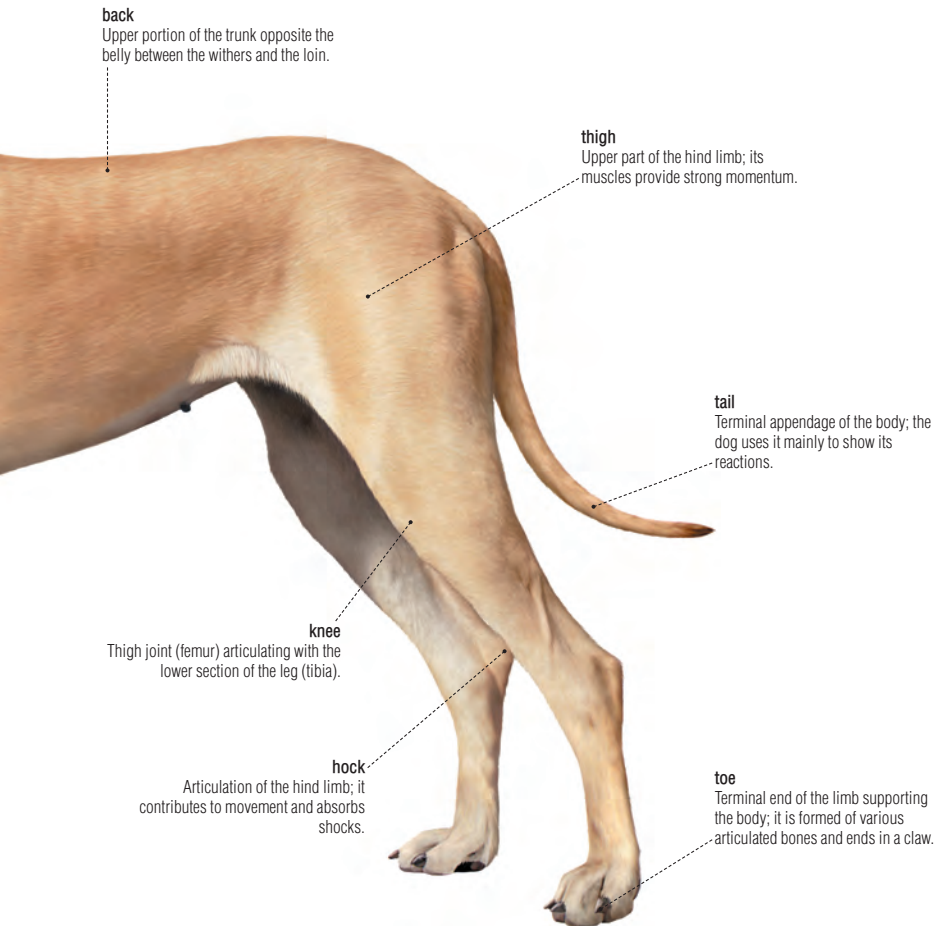
**dog's forepaw**

Articulated limb ending in four toes allowing the dog to move about, dig and scratch.



## morphology of a dog

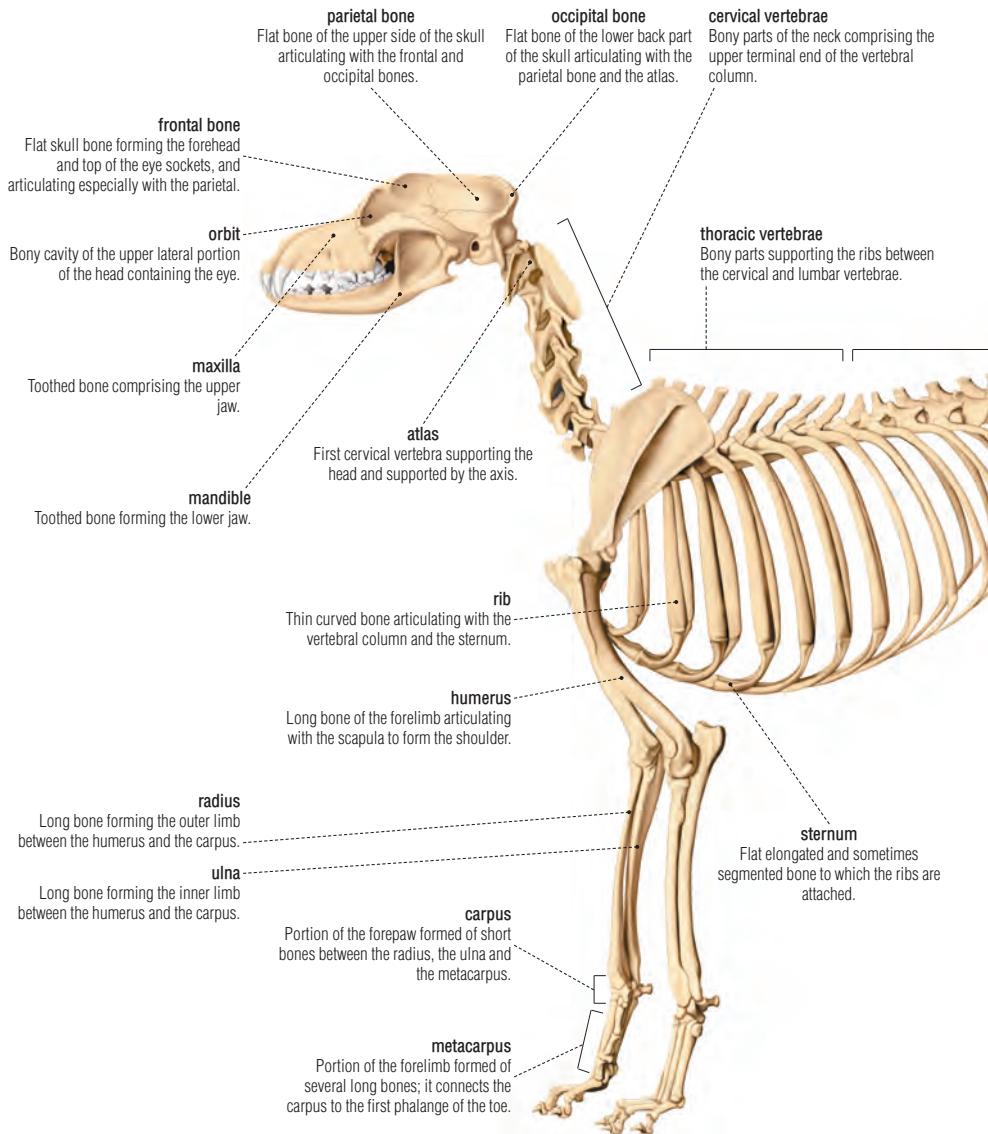


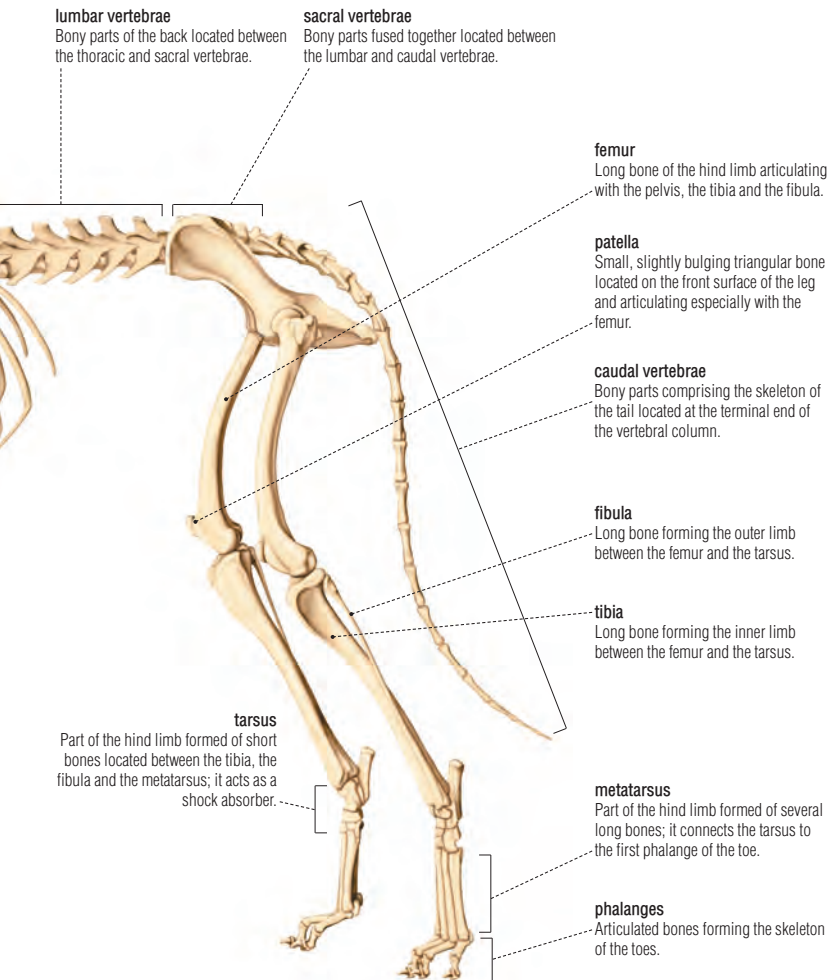




dog

## skeleton of a dog





## dog breeds

There are about 350 breeds of dog, classified into 10 groups according to their morphology and use.

**bulldog**

Extremely affectionate and playful pet with a muscular body; it becomes aggressive when its owner is attacked.

**schnauzer**

Strong energetic dog originally from Germany, used as a guard dog and also as a pet.

**poodle**

The most common pet in the world, usually very faithful and very fond of water; poodles are also used as circus performers.

**collie**

Scottish sheep dog and an affectionate and highly valued pet; the long-haired variety is more common than the short-haired variety.

**chow chow**

Pet originally from China, independent and reserved, it is also used as a guard dog.

**German shepherd**

The most common multipurpose dog in the world: sheep dog, guard dog, police dog (detection and search), guide dog for the blind and pet.

**greyhound**

Muscular streamlined dog; it is very swift and is used mainly for hunting and sports competitions.

**Saint Bernard**

Large, very muscular dog mainly used in mountain rescues.

**Great Dane**

Very tall pet and guard dog, originally from Germany; it is affectionate and well behaved.

**dalmatian**

Energetic and quite independent pet valued for its elegance; it also makes a good guard dog.

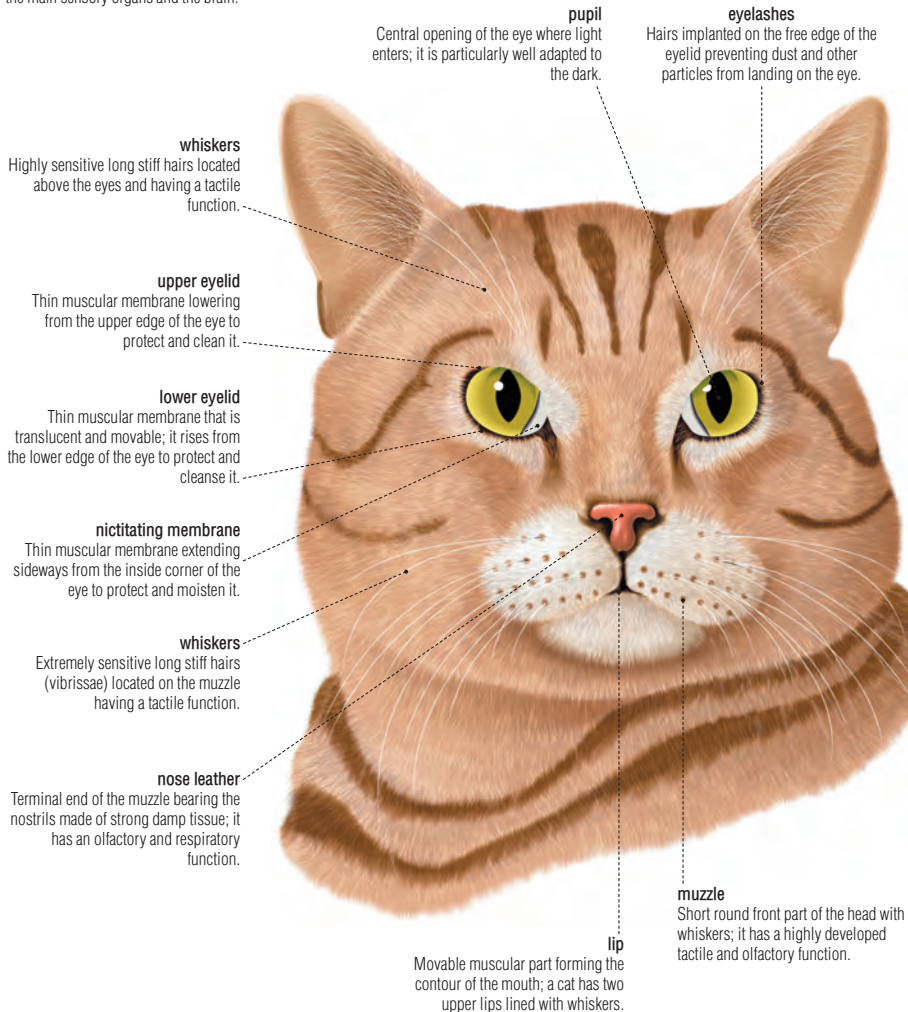


## cat

Carnivorous mammal with a supple muscular body and paws ending in retractable claws; it is a very common pet.

**cat's head**

Anterior portion of the body containing the main sensory organs and the brain.



## morphology of a cat

**eye**  
Organ of sight especially adapted to darkness; it mainly perceives light intensity, motion and certain colors.

**ear**  
Highly mobile organ of hearing, also contributing to equilibrium; cats have a highly developed sense of hearing.

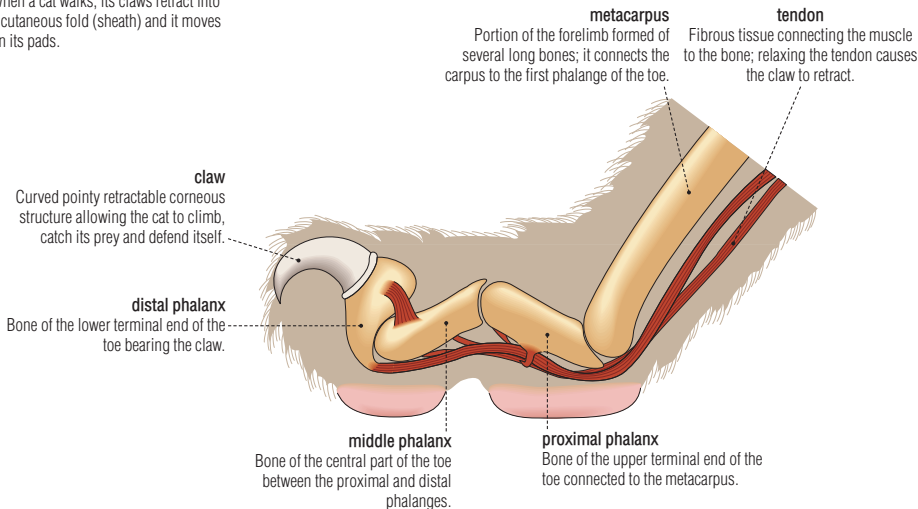
**tail**  
Terminal appendage of the body providing equilibrium when the cat jumps.

**fur**  
Hair covering the body, mainly for maintaining internal body temperature and providing protection from insect bites.



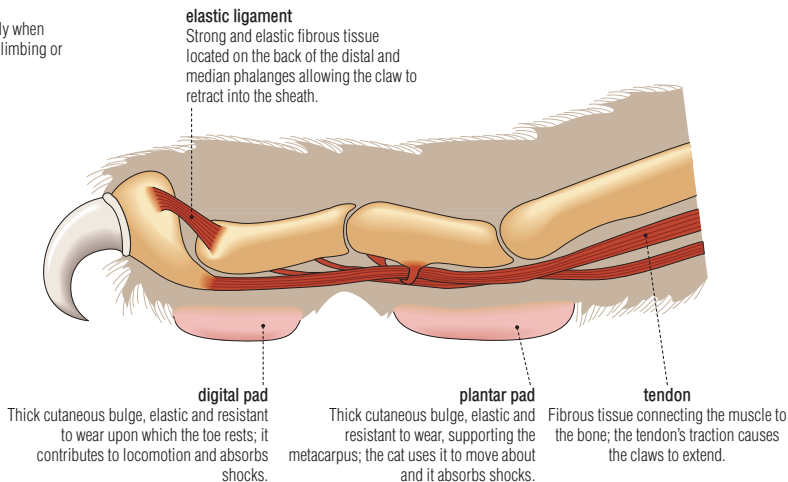
**retracted claw**

When a cat walks, its claws retract into a cutaneous fold (sheath) and it moves on its pads.



**extended claw**

A cat uses its claws only when necessary, mainly for climbing or killing its prey.





There are more than 30 officially recognized breeds of domestic cat, classified into three groups according to the length of their hair (short, medium-long or long).

**Siamese**

Slender cat originally from Thailand, playful and affectionate; it has a loud raucous meow.

**Abyssinian**

Svelte cat originally from Egypt or Ethiopia, docile and energetic; it has a melodious meow.

**Maine coon**

Sturdy cat, calm and affectionate, with a melodious meow; very popular in the U.S. but less common in Europe.

**Manx**

Tailless cat with hind limbs longer than its forelimbs.

**American shorthair**

Energetic and resilient cat that is in great demand in the U.S. and Japan.

**Persian**

Highly prized cat with silky fur, calm and affectionate; there are many varieties differentiated by the color of the fur and the eyes.



examples of carnivorous mammals

Carnivorous mammals (about 270 species) that have strong canines (fangs) and sharp molars (carnassials) adapted for eating flesh.



**weasel**

Very agile carnivorous mammal common in Eurasia; it is capable of attacking large prey (rats, voles, rabbits) in spite of its size.



**mink**

Carnivorous amphibious and mostly nocturnal mammal with webbed feet found in Eurasia and the Americas; it is hunted and raised in captivity for its highly prized fur.



**stone marten**

Mostly nocturnal carnivorous mammal of Eurasia; it is a good swimmer and climber and often catches fowl, domestic rabbits and rats.



**fox**

Very common carnivorous mammal living in a den and hunting at night (mostly rodents); its fur is highly prized.



**fennec**

Nocturnal carnivorous mammal found in the deserts of Arabia and North Africa; it is easily tamed and capable of going without water for long periods.



**mongoose**

Very agile carnivorous mammal of Africa and Asia; it is easily tamed and is used to destroy harmful pests (snakes, rats).

**badger**

Mostly nocturnal, carnivorous mammal of the northern hemisphere digging complex tunnels; its hairs are used to make hairbrushes and paintbrushes.

**marten**

Mostly nocturnal agile carnivorous mammal of Eurasia and North America prized for its silky fur; it is a good climber.

**river otter**

Widespread carnivorous amphibious and usually nocturnal mammal with webbed feet feeding mainly on fish and prized for its fur.

**raccoon**

Mostly nocturnal carnivorous mammal of the Americas.

**skunk**

Carnivorous mammal of the Americas, whose fur is prized; when threatened, it releases a nauseous and irritating secretion from its anal glands.



**hyena**

Carnivorous scavenger of Africa and Asia; it is the only animal that will attack a lion to steal its food.



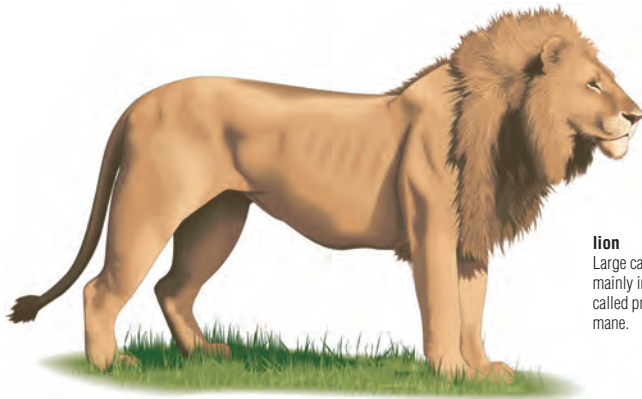
**lynx**

Very agile and powerful carnivorous mammal found in the forests of the northern hemisphere; it is a night hunter with piercing eyes and its fur is highly prized.



**cougar**

Carnivorous mammal of the Americas living in various habitats (mountains, forests); it hunts only at night and is famed for its ability to leap.



**lion**

Large carnivorous mammal common mainly in Africa that lives in groups called prides; only the male has a mane.



**cheetah**

Carnivorous mammal of Africa and the Middle East with nonretractable claws; it is the fastest of the land mammals, reaching speeds of 62 mph.



**leopard**

Carnivorous mammal of Africa and Asia with yellow fur and black spots; it mostly lives in trees and usually hunts at night.



**jaguar**

Carnivorous mammal of Central and South America with spotted fur; it is an excellent swimmer and hunts at night.



**tiger**

Large and very powerful carnivorous mammal of Asia; it hunts at night.





**wolf**

Nocturnal carnivorous mammal of Eurasia and North America; it lives in packs and hunts large mammals (deer).



**black bear**

Mostly nocturnal carnivorous mammal of North America; it is a good swimmer, is an excellent climber and feeds mainly on fruit and nuts.



**polar bear**

Carnivorous mammal of arctic regions; a good swimmer, it feeds mainly on seals and fish, and is the largest carnivorous land mammal.

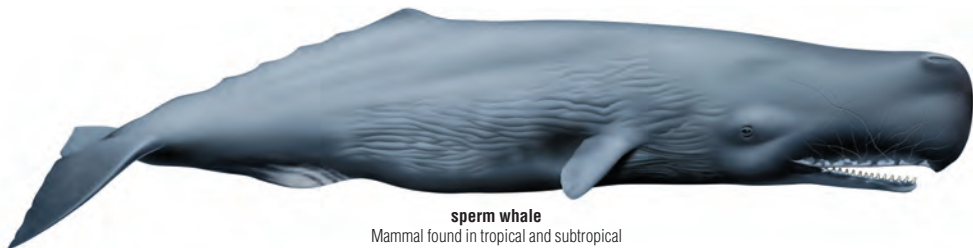
Marine mammals: many actively hunted species (more than 110 out of 116) are protected or are subject to hunting restrictions.

**killer whale**

Widespread swift aggressive marine mammal reaching up to 30 feet in length; it attacks mainly young whales and dolphins.

**northern right whale**

Marine mammal that can reach 100 feet in length and with a mouth lined with corneous plates (baleen); it was previously hunted especially for its oil and meat.

**sperm whale**

Mammal found in tropical and subtropical waters reaching up to 65 feet in length; hunted mainly for its meat and blubber, it is now a protected species.



**sea lion**

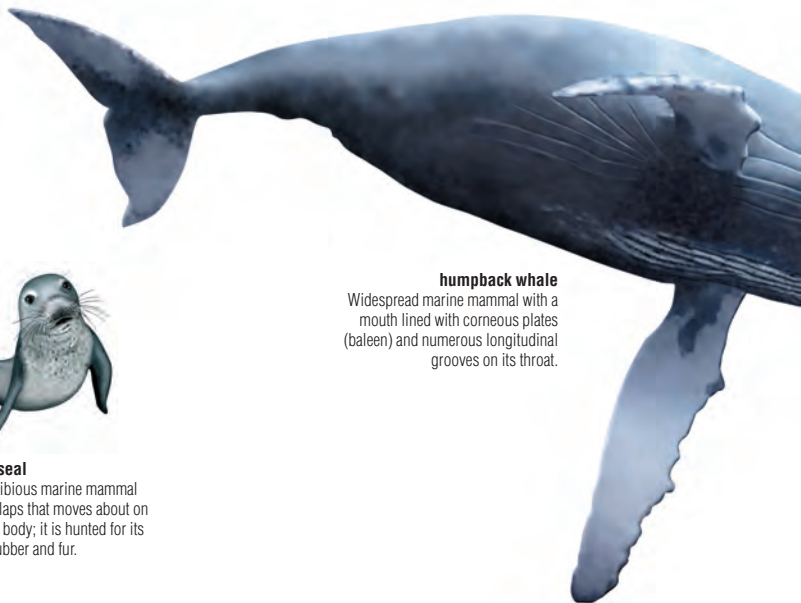
Amphibious marine mammal with external ear flaps that moves about on land with the help of its four limbs; it is hunted mainly for its fur.

**walrus**

Amphibious marine mammal of arctic regions; it is hunted for its hide, blubber and ivory tusks.

**seal**

Short-haired amphibious marine mammal lacking external ear flaps that moves about on land by dragging its body; it is hunted for its meat, blubber and fur.

**humpback whale**

Widespread marine mammal with a mouth lined with corneous plates (baleen) and numerous longitudinal grooves on its throat.

**porpoise**

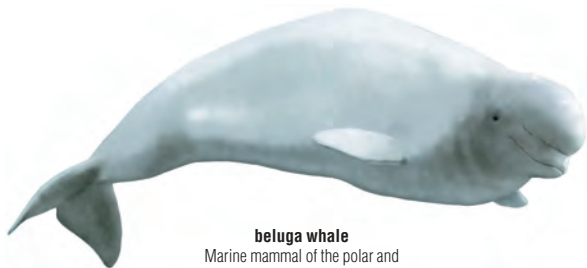
Mammal found in cold and temperate waters whose flesh is highly prized; it is a protected species.

**dolphin**

Mammal of warm and temperate waters famed for its intelligence; it is a swift swimmer (about 28 mph).

**narwhal**

Mammal of arctic waters; the male, whose spiraled tusk can reach 10 feet in length, is hunted for its ivory.

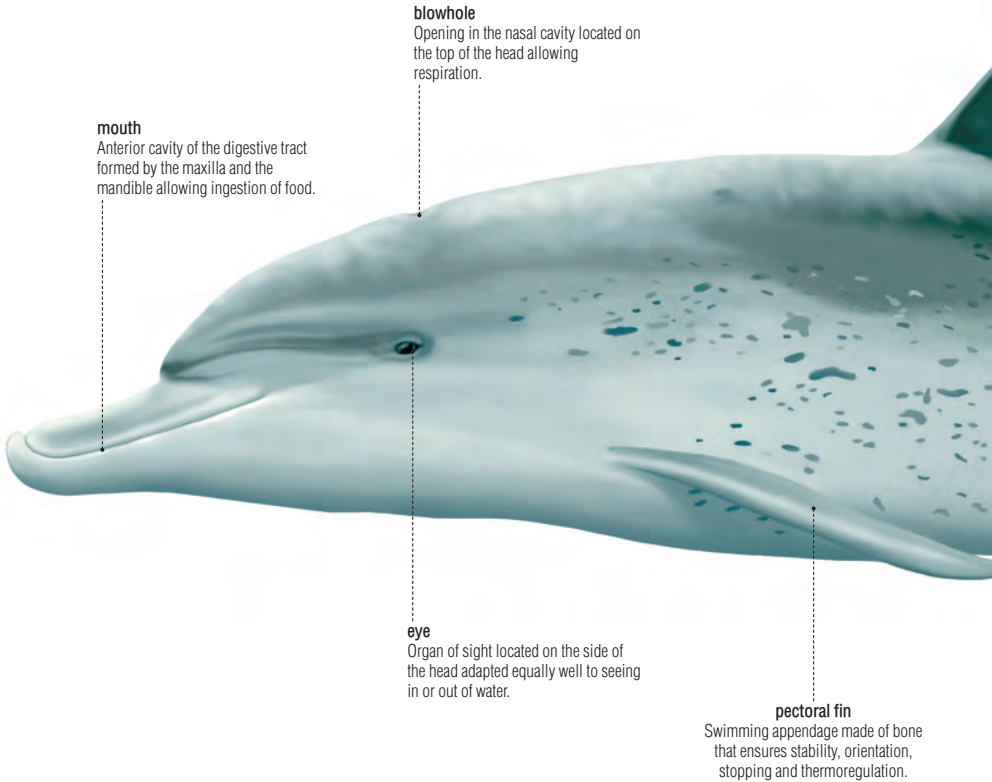
**beluga whale**

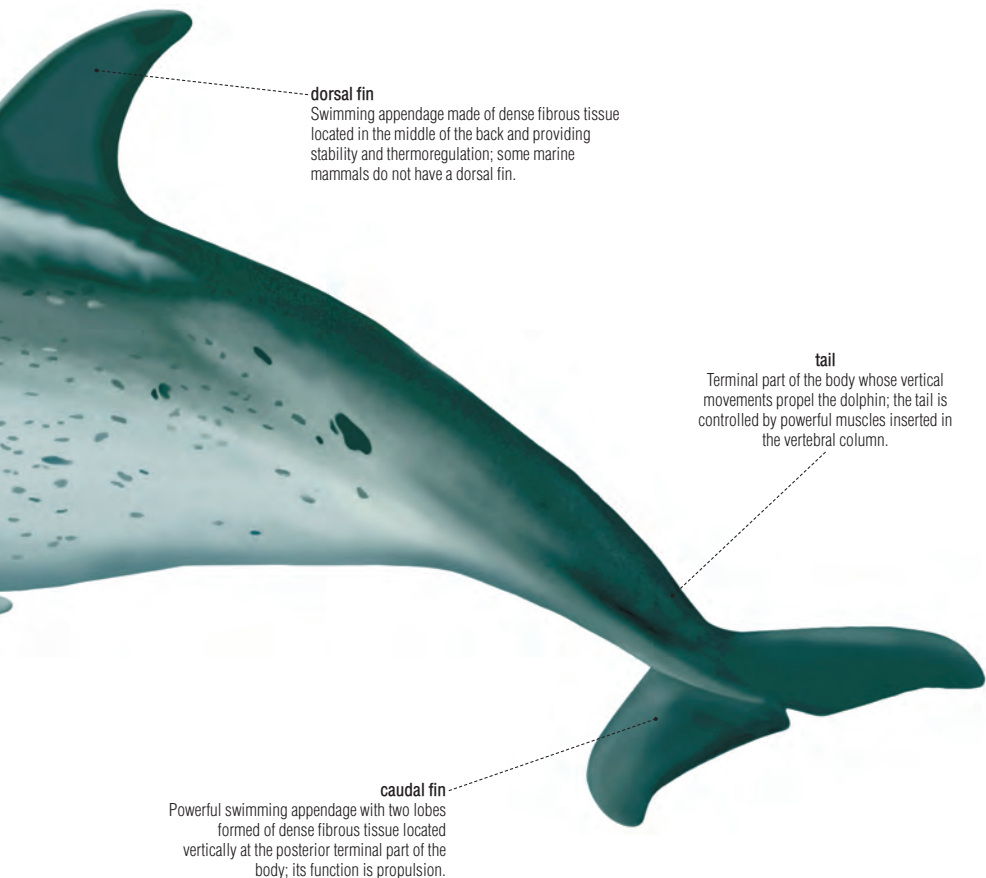
Marine mammal of the polar and subarctic regions emitting various whistles to communicate, hence its nickname "sea canary".

# dolphin

Marine mammal without hind limbs; it uses echoes of the sounds it emits (sonar) to orient itself and detect its prey.

## morphology of a dolphin



**dorsal fin**

Swimming appendage made of dense fibrous tissue located in the middle of the back and providing stability and thermoregulation; some marine mammals do not have a dorsal fin.

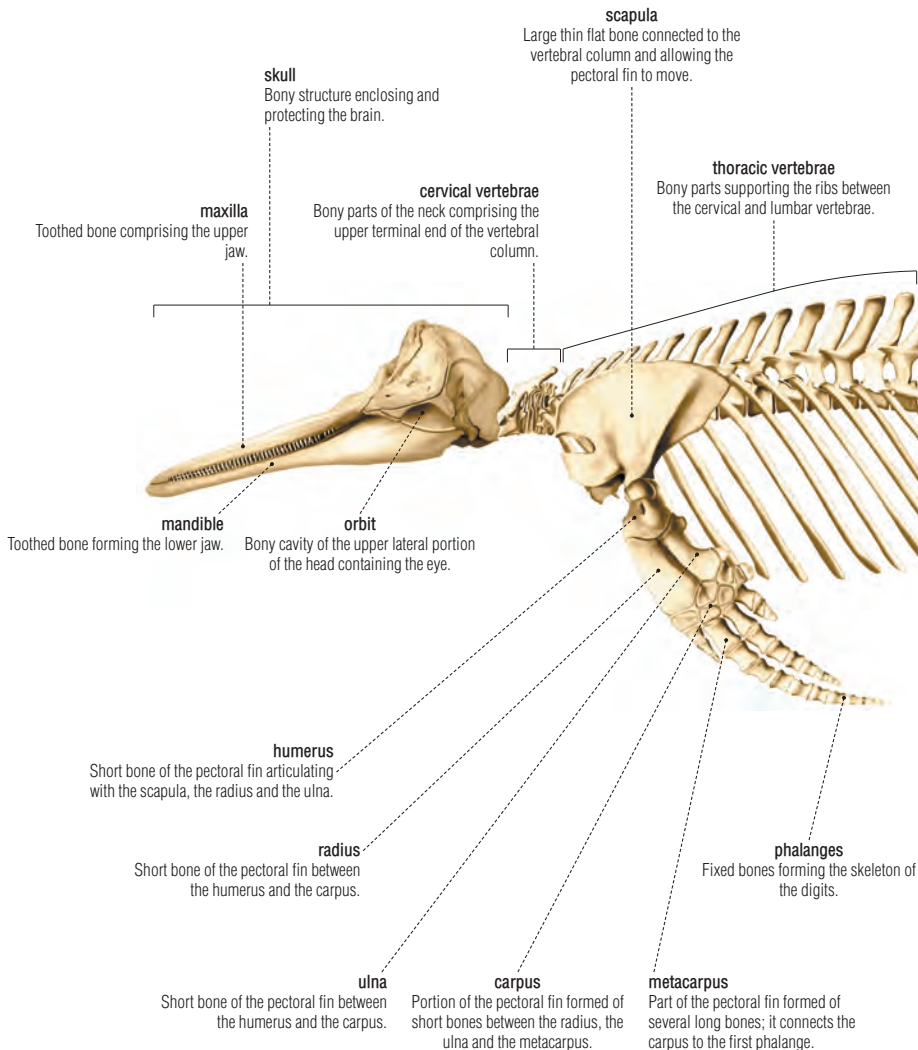
**tail**

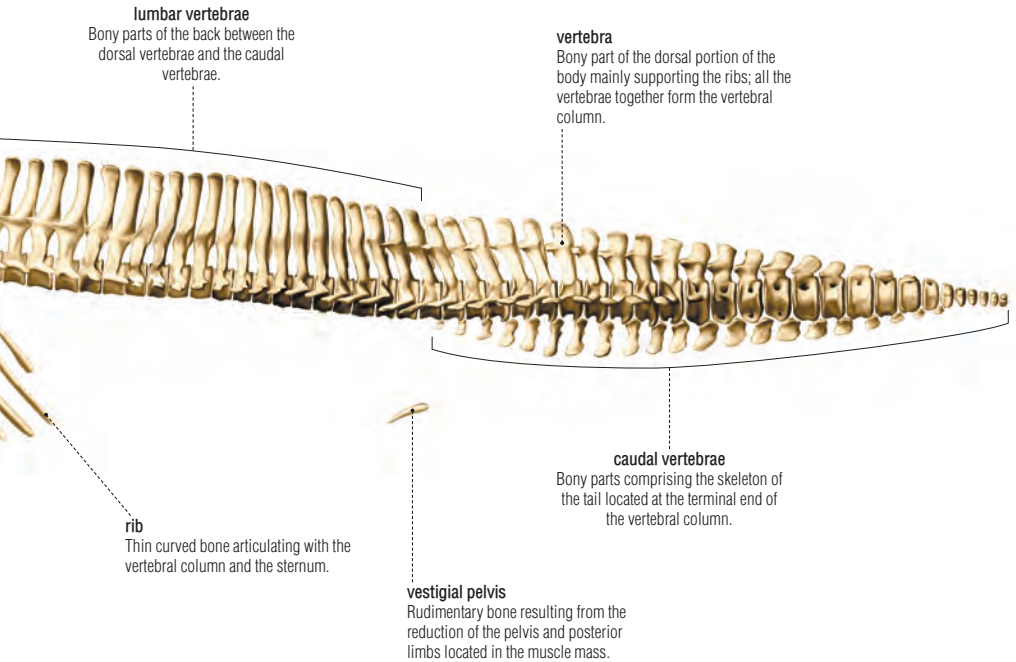
Terminal part of the body whose vertical movements propel the dolphin; the tail is controlled by powerful muscles inserted in the vertebral column.

**caudal fin**

Powerful swimming appendage with two lobes formed of dense fibrous tissue located vertically at the posterior terminal part of the body; its function is propulsion.

## skeleton of a dolphin

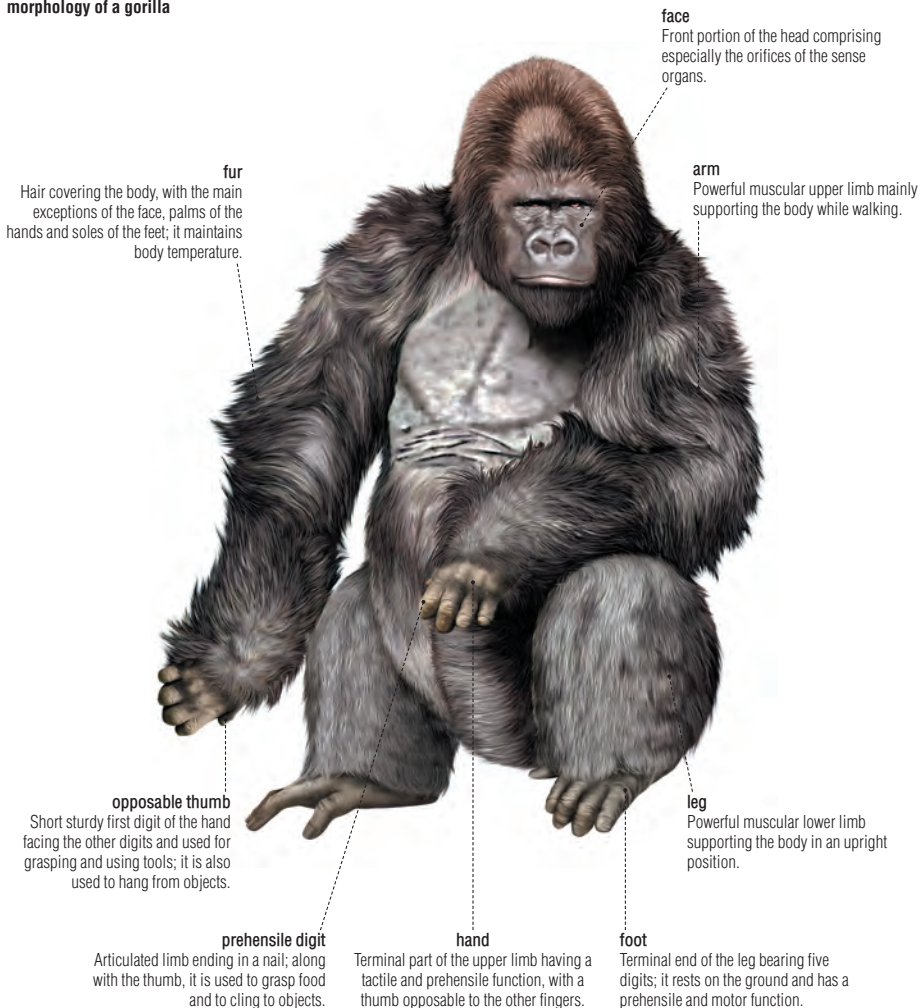




## gorilla

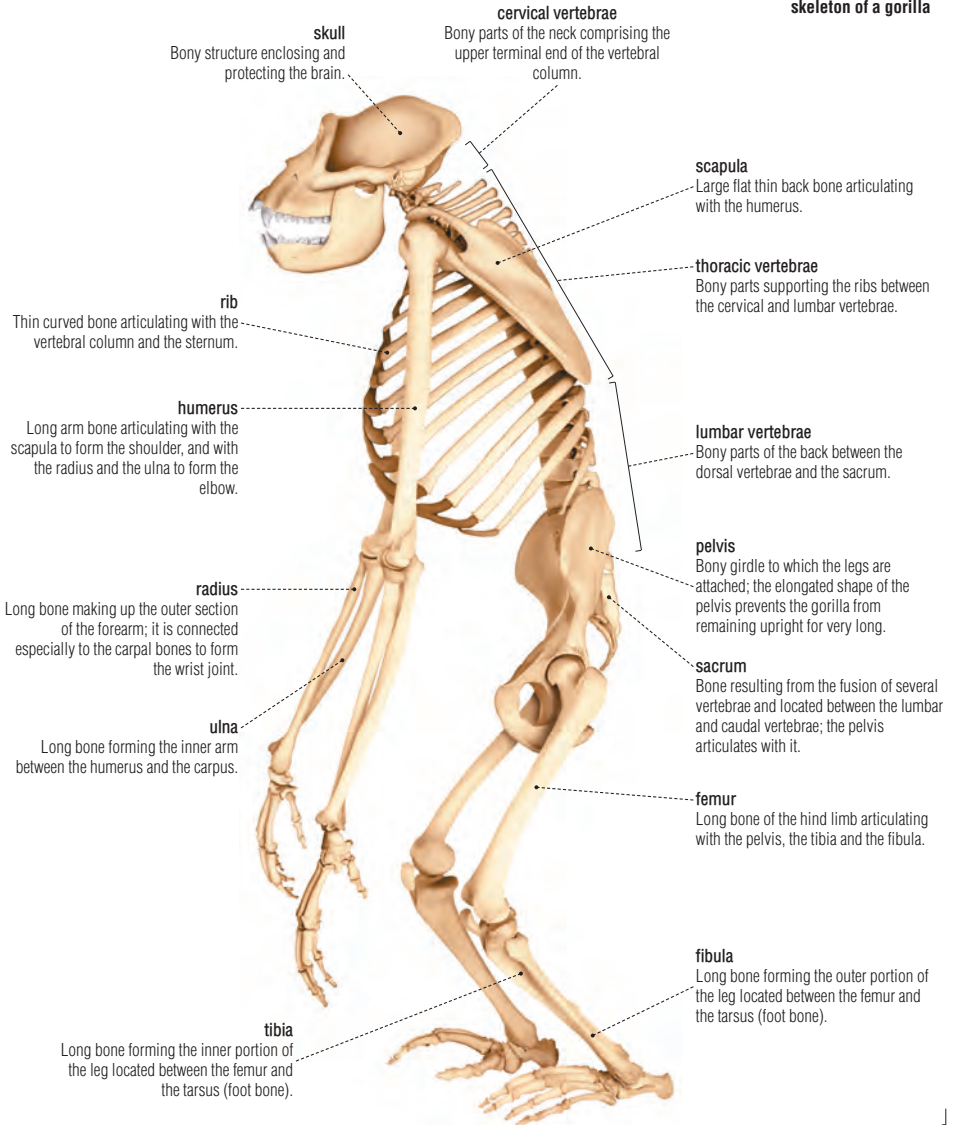
Mainly terrestrial vegetarian primate of the equatorial forests of Africa; the largest of the primates, it can reach 7 feet in height.

## morphology of a gorilla





## skeleton of a gorilla



## examples of primates

Many species are protected, especially because of deforestation (destruction of their habitat) and hunting.

**tamarin**

Small hopping primate of South America with elongated claws instead of nails that allow it to move about and to feed.

**baboon**

Mainly terrestrial African primate with colored ischial callosities and large cheek pouches in which it stores food.

**orangutan**

Primate found in Sumatra and Borneo with long powerful arms; it moves slowly and carefully between the trees in which it lives.

**macaque**

Common primate of Asia with a nonprehensile tail living on the ground and in trees; it is often used for laboratory experiments.

**marmoset**

Small South American primate with strong claws instead of nails that it uses to cling to the trees it lives in.

**lemur**

Tree-dwelling agile primate of Madagascar with a long tail; it is mainly nocturnal and feeds on insects and fruit.

**gibbon**

Tailless tree-dwelling primate of Asia; it swings from branch to branch with agility, using its hands as hooks.

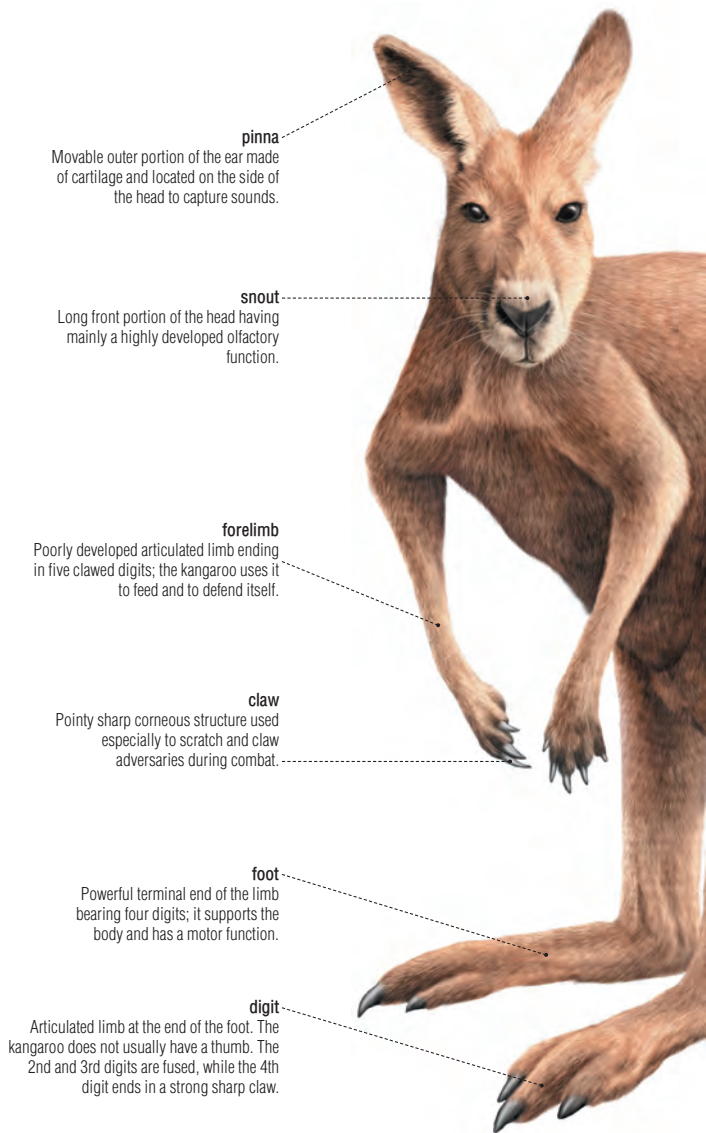
**chimpanzee**

Primate of equatorial Africa whose genetic makeup is very close to that of humans; it is used mainly in medical research.

## kangaroo

Herbivorous marsupial with a highly developed tail; it lives in groups in Australia and Tasmania and moves rapidly by leaping.

## morphology of a kangaroo

**pinna**

Movable outer portion of the ear made of cartilage and located on the side of the head to capture sounds.

**snout**

Long front portion of the head having mainly a highly developed olfactory function.

**forelimb**

Poorly developed articulated limb ending in five clawed digits; the kangaroo uses it to feed and to defend itself.

**claw**

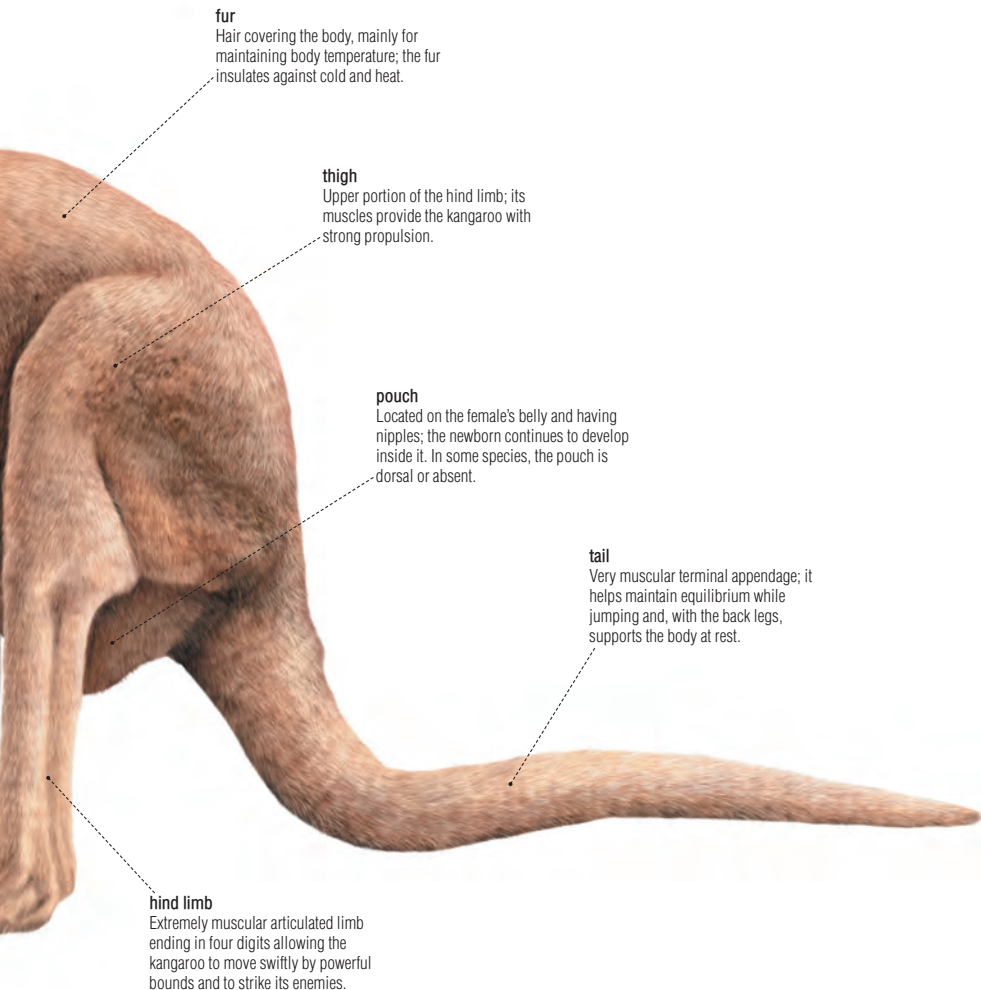
Pointy sharp corneous structure used especially to scratch and claw adversaries during combat.

**foot**

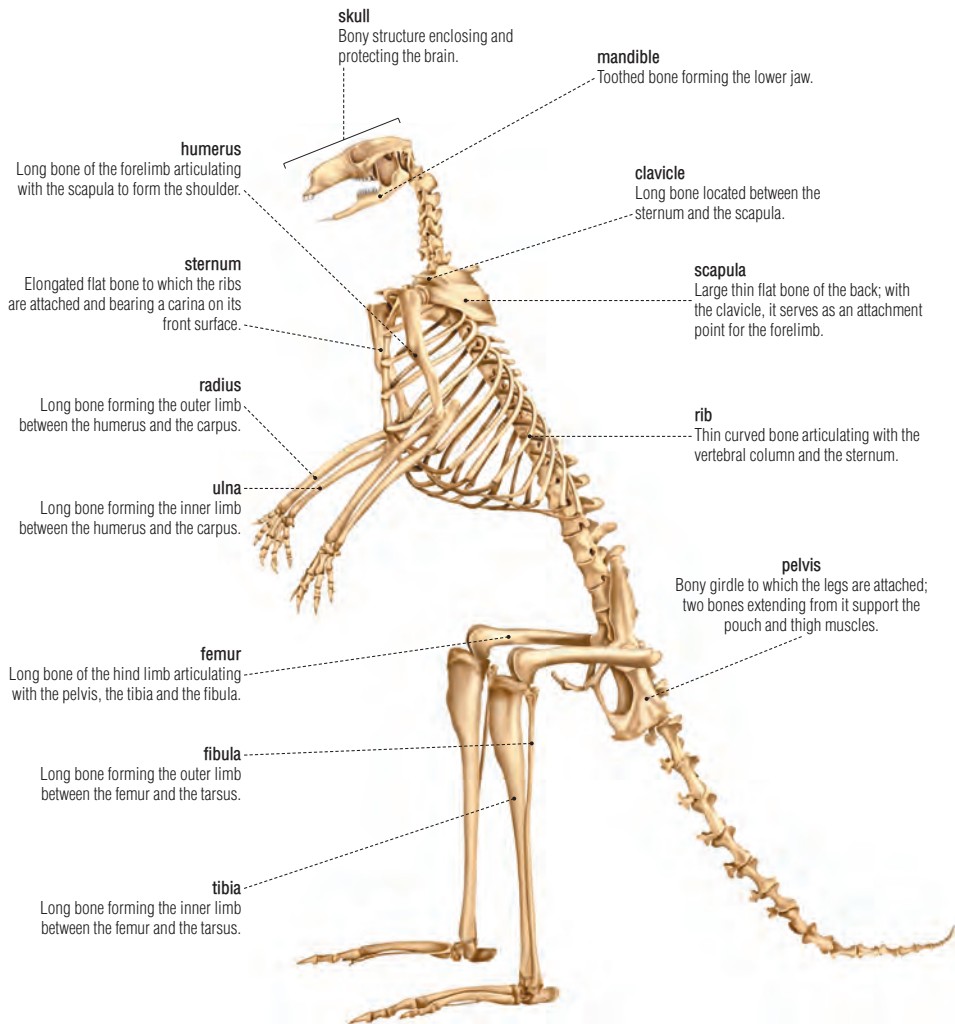
Powerful terminal end of the limb bearing four digits; it supports the body and has a motor function.

**digit**

Articulated limb at the end of the foot. The kangaroo does not usually have a thumb. The 2nd and 3rd digits are fused, while the 4th digit ends in a strong sharp claw.



## skeleton of a kangaroo





The 260 or so species live on land or in trees in Oceania and the Americas.



**Tasmanian devil**

Carnivorous scavenging nocturnal marsupial with powerful jaws that allow it to devour its prey whole (flesh, bones, fur, feathers).



**opossum**

Omnivorous nocturnal marsupial of the Americas and Australia without a pouch; its fur is highly prized.



**wallaby**

Marsupial closely related to the kangaroo and living in Australia, Tasmania and New Guinea; certain species are prized for their fur.

**kangaroo**

Herbivorous marsupial with a highly developed tail; it lives in groups in Australia and Tasmania and moves rapidly by leaping.



**koala**

Tailless nocturnal marsupial of Australia; this solitary tree-dweller lives in eucalyptus forests and feeds on the tree's leaves.

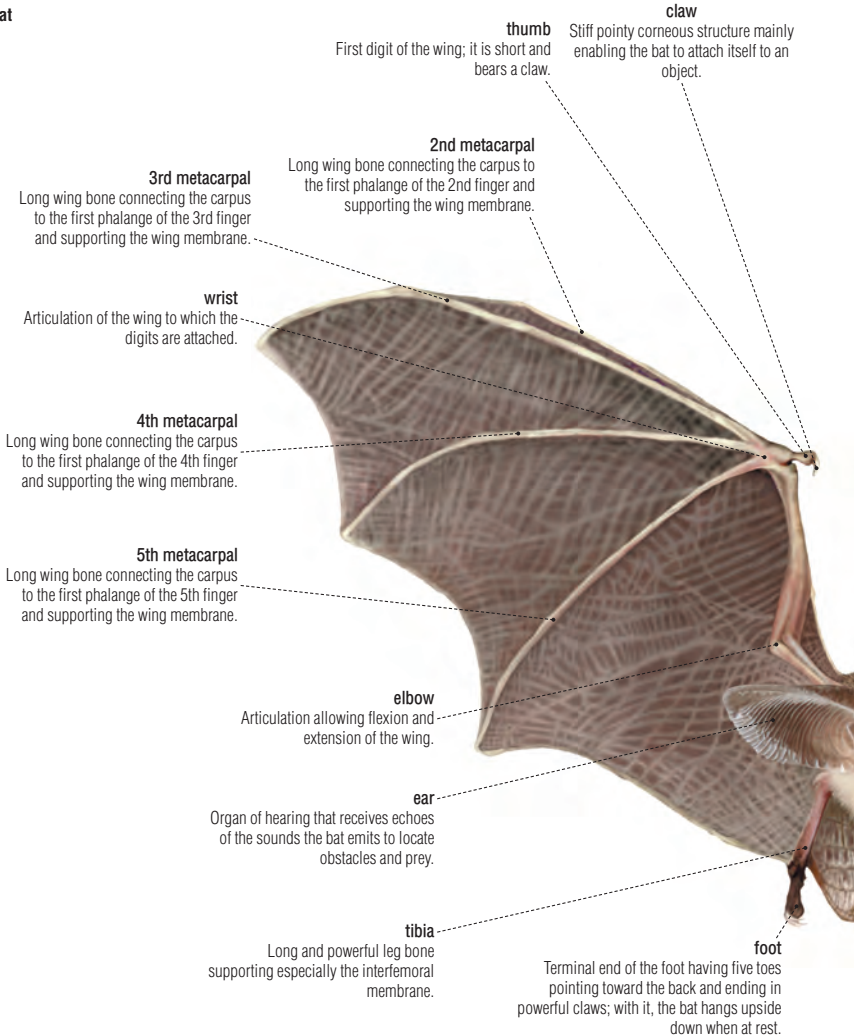


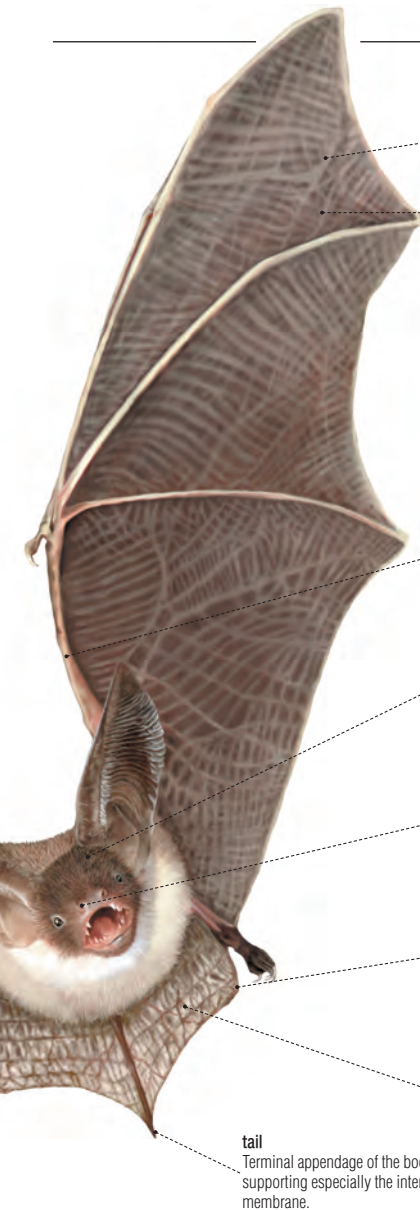


bat

Usually insectivorous nocturnal flying mammal using echoes of the sounds it produces (echolocation) to orient itself and to find its prey.

morphology of a bat





**blood vessels**

Channels in which blood circulates; they regulate the body's temperature.

**wing membrane**

Smooth fold of skin stretching between the digits of the wings and extending to the feet; it is used mainly for flight and thermoregulation.

**radius**

Long and powerful wing bone supporting the wing membrane.

**head**

Anterior portion of the body containing the main sensory organs and the brain.

**nose leaf**

External opening of the nasal cavity located above the mouth and having a highly developed olfactory function in particular.

**calcar**

Cartilaginous structure attached to the tarsus and supporting the interfemoral membrane.

**interfemoral membrane**

Fold of smooth skin between the legs and the tail; it provides stability when the bat is in flight and capturing prey.

**tail**

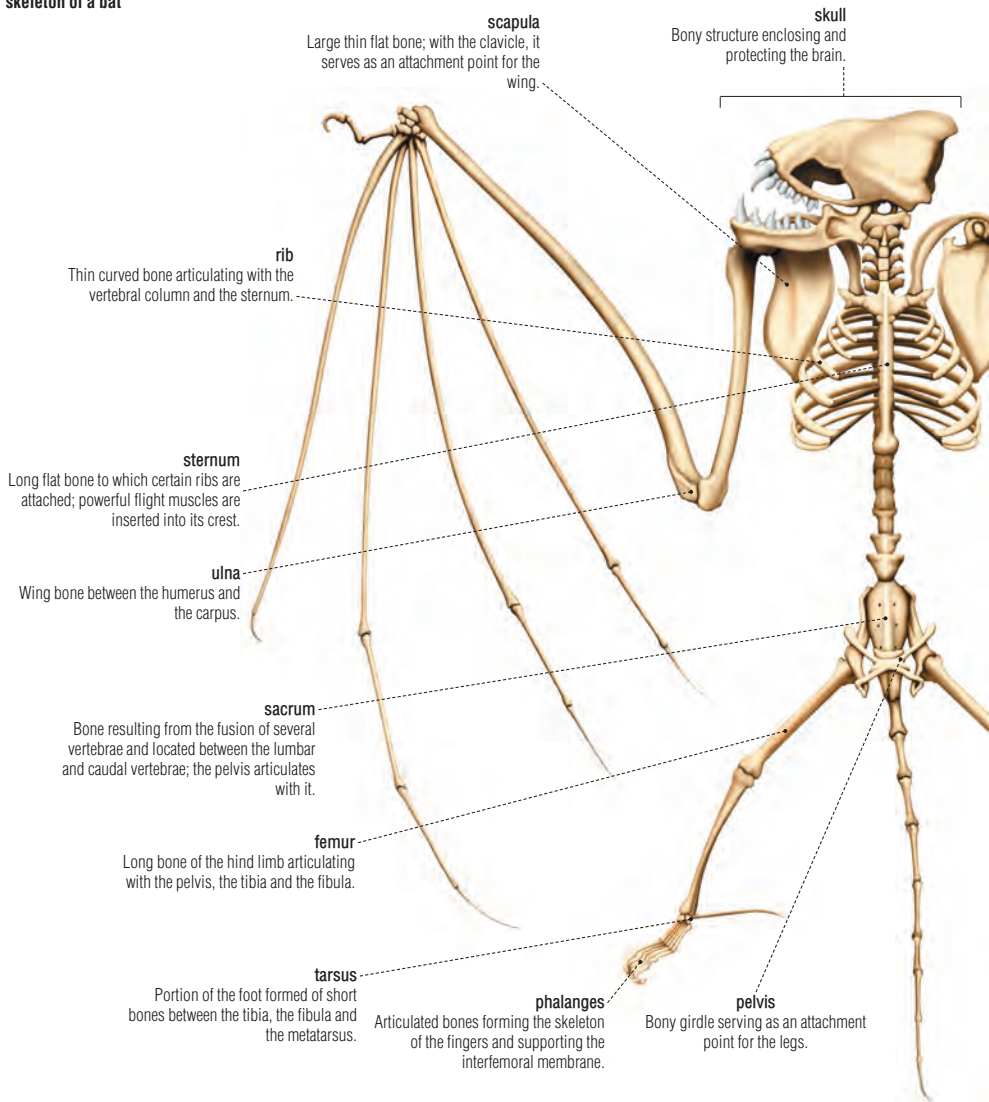
Terminal appendage of the body supporting especially the interfemoral membrane.

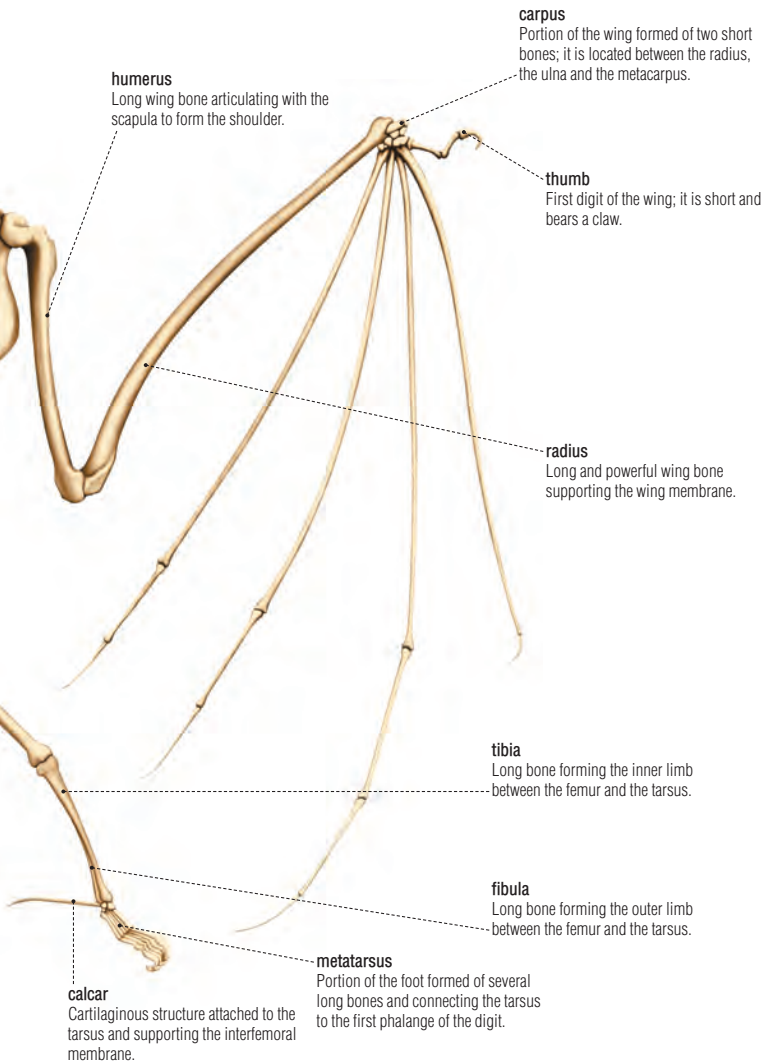


**wings**

Appendages of flight comprised of a cutaneous membrane supported by four very long fingers (only the thumb remains free); the bat folds its wings when resting.

**skeleton of a bat**





## examples of bats

Very widespread, some 900 species of bats live mainly in colonies, in trees or in caves.

**vampire bat**

Tailless flying mammal of Central and South America; it feeds off the blood of animals and birds.

**black flying fox**

One of the largest bats in the world, it lives in Australia, feeds on fruit and has a rudimentary tail; its wingspan can reach 5 feet.

**spear-nosed bat**

Omnivorous short-tailed flying mammal of Central and South America; it is one of the largest bats of the Americas (with a wingspan of almost 20 in).

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