

Chapter 1 : *Glaucus atlanticus* - Wikipedia

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General features Size range and diversity of structure Typical molluscan features have been substantially altered, or even lost, in many subgroups. Among the cephalopods the giant squids *Architeuthis*, the largest living invertebrates, attain a body length of eight metres more than 26 feet; with the tentacle arms extended, the total length reaches to 22 metres. Other cephalopods exceed a length of one metre. Many of the remaining molluscan classes show a large variation in size: Finally, gastropods of the family Entoconchidae, which are parasitic in echinoderm sea cucumbers, may reach a size of almost 1. In contrast, there are also minute members, less than one millimetre. Distribution and abundance The mollusks have adapted to all habitats except air. Although basically marine, bivalves and gastropods include freshwater species. Gastropods have also adapted to land, with thousands of species living a fully terrestrial existence. Found on rocky, sandy, and muddy substrata, mollusks burrow, crawl, become cemented to the surface, or are free-swimming. Mollusks are found worldwide, but there is a preponderance of some groups in certain areas of the world. The close association of many molluscan groups with their food source—whether by direct dependence on a specific food supply e. In general, cold-water regions support fewer species. Importance to humans Mollusks are of general importance within food chains and as members of ecosystems. Certain species are of direct or indirect commercial and even medical importance to humans. Many gastropod species, for example, are necessary intermediate hosts for parasitic flatworms class Trematoda, phylum Platyhelminthes, such as the species that cause schistosomiasis in humans. Most bivalves contribute to the organic turnover in the intertidal littoral zones of marine and fresh water because, as filter feeders, they filter up to 40 litres 10 gallons of water per hour. This filtering activity, however, may also seriously interfere with the various populations of invertebrate larvae plankton found suspended and free-swimming in the water. One species, the zebra mussel *Dreissena polymorpha*, is regarded as a particularly harmful exotic invader. Carried from Europe in ship ballast water, zebra mussels were taken to the Great Lakes in To date, they have caused millions of dollars in commercial damage by clogging the water pipes of power plants and cooling systems. They are driving many native freshwater bivalve species to extinction. Many gastropods, bivalves, and cephalopods are a source of food for many cultures and therefore play an important role in the fishing industries of many countries. Many shell-bearing molluscan species are also used to fabricate ornaments and are harvested for the pearl and mother-of-pearl industries. Natural history Reproduction and life cycles Mollusks are primarily of separate sexes, and the reproductive organs gonads are simple. Reproduction via an unfertilized gamete parthenogenesis is also found among gastropods of the subclass Prosobranchia. Most reproduction, however, is by sexual means. Eggs and sperm are released into the water by members of some primitive species, and fertilization occurs there. In prosobranch gastropods, water currents may cause a simple internal fertilization within the mantle cavity, or males may fertilize eggs internally using a muscular penis. Both male and female reproductive organs may be present in one individual hermaphroditism in some species, and various groups exhibit different adaptations to this body form. For example, in hermaphroditic bivalves and prosobranch gastropods, male and female gonads are functional at separate times and in rhythmic and consecutive patterns successive hermaphroditism. Conversely, male and female gonads are functional at the same time simultaneous hermaphroditism in solenogasters and many other gastropods. Fertilization by transfer of capsules containing sperm spermatophores typically occurs in cephalopods and some gastropods. In cephalopods, transfer of spermatophores is usually combined with copulation by a modified arm, or hectocotylus. Copulation in solenogasters, often by means of a special genital cone, may be supported by copulatory stylets. Various penis formations, in part with copulatory stylets, or darts, are widely found in gastropods. Eggs are deposited singly or in groups, generally on some hard surface and often within jelly masses or leathery capsules. Squids of the suborder Oegopsida and some gastropods have eggs that are suspended in the water. The eggs of cephalopods, on the other hand, possess a large amount of yolk, which

displaces the dividing cells and causes a characteristic type of development. Many mollusks develop into free-swimming larvae; these larvae are either feeding planktotrophic or nonfeeding lecithotrophic. The larva in primitive bivalves is a pericalymma test cell larva in which the embryo is protected below a covering test of cells provided with one to four girdles of cilia, at the apex of which is a sensory plate of ciliated cells. After the developing juvenile has grown out apically of the test which then is lost, the animal settles and develops into an adult. The test in other lecithotrophic larvae is restricted to a preoral girdle of ciliated cells the prototrochus and is called the trochophore larva. Trochophores are encountered in the development of many marine annelid species phylum Annelida. In more advanced mollusks such as in marine gastropods and bivalves, the trochophore larva develops into a veliger larva. In these generally planktotrophic larvae, the girdle of ciliated cells widens to form a velum that entraps food and also propels the microscopic mollusk through the water. As the larva continues to develop, the shell, mantle cavity, tentacles, and foot appear. After a specific amount of time, which varies according to species and environmental conditions, the larva loses the velum and metamorphoses into an adult. A substantial change in shell morphology usually marks the transition to adult form. Secondary newly evolved larvae have developed among some freshwater bivalves and some cephalopods. Maternal protection of the developing eggs brood is not unexceptional behaviour in solenogasters, bivalves, and certain gastropod adults. Direct development without a larval stage or the bearing of live young from a yolky egg, or both, are typical in cephalopods and most nonmarine and many marine gastropods. Many species go through two breeding seasons per year, whereas in some cephalopod species mating or egg laying appears to be rapidly followed by death effected by hormones. Habitats, feeding habits, and associations Caudofoveates subclass Chaetodermomorpha, class Aplacophora burrow in muddy sediments at depths of 10 to more than 7, metres 33 to 23, feet and consume microorganisms and loose organic material detritus. In contrast, solenogasters subclass Neomeniamorpha, class Aplacophora prey on some members of the class Cnidaria e. Chitons class Polyplacophora cling to hard bottoms of the intertidal zone, scraping algae from the rock surfaces by using their strong rasping teeth radula; several members of the polyplacophoran family Lepidopleuridae consume detritus found at depths down to 7, metres, and Hanleyidae as well as Hopaliidae even depend on animal food. The few extant members of the class Monoplacophora inhabit secondary hard bottoms at depths of to 6, metres and capture detritus by means of head appendages velum around the mouth. The scaphopods dwell in sand or sandy mud down to 7, metres and nourish themselves on protozoa, crustaceans, or small mollusks captured by the filamentous head tentacles captacula. Except for the carnivorous septibranch anomalodermata, all bivalves are ciliary suspension feeders, using food-sorting organs near the mouth labial palps and respiratory gills modified to assist in feeding ctenidia. Found in marine and fresh water, most bivalves burrow into sediments to depths of 10, metres or attach themselves to hard surfaces by means of tough threads secreted by the byssus gland in the foot. The members of some species may even bore into wood or rock. Cephalopods are generally carnivores, feeding on crustaceans and fishes, but some have adapted a microvorous diet of detritus and microscopic organisms and plants. Some cephalopods are offshore pelagic jet swimmers, moving from the surface to depths of 5, metres, while others dwell near the bottom benthic at depths of 8, metres. The greatest ecological diversity is shown by the gastropods. The marine members are found from the spring-tide line to deep-sea trenches 10, metres deep and inhabit nearly all possible habitats, even floating weeds. Both shelled and naked gastropods have pelagic members that spend their entire lives swimming in the water; others penetrate marine hot vents or interstices between sand grains. Some gastropods are parasitic, while others are predatory. Freshwater snails also are found in groundwaters and may inhabit hot springs. Widely distributed throughout all terrestrial habitats, various members of the gastropod order Stylommatophora are adapted to certain regions. Some littoral bivalves, such as Tridacna, as well as some sea slugs, such as Aeolidia, share an obligatory symbiosis with zooxanthellae a group of algae. Another metabolic association exists between certain bacteria and several bivalves and gastropods of deep-sea hot vents or other sulfide systems. There are several parasitic mollusks. Locomotion Mollusks have a wide range of locomotory patterns. Solenogasters and various smaller gastropods glide upon cilia that beat rapidly against a pathway of mucus secretions. This pattern of movement is supported or replaced in larger mollusks by the propulsive waves that run along the surface of the foot and are controlled by the actions of the

dorsoventral musculature Figure 1. Burrowing occurs as an interaction between musculature and the hydrostatic skeleton see below Internal features ; it is performed in caudofoveates and several sea slugs by the whole anterior body but is restricted to the foot in scaphopods, bivalves, and some specialized gastropods. Buoyancy floating and jet propulsion are found in cephalopods; floating is also known in gastropods, and swimming of a different kind is practiced by some opisthobranch and prosobranch gastropods as well as in scallops and related bivalves. Octopods use their arms to crawl or even to swim or float with the help of the body skin interconnecting the arms interbrachiate web. Some bivalve groups bore into hard surfaces by secreting strong chemicals that dissolve the substrate or by drilling, using the shell and radula. A sedentary sessile way of life has been adopted by many bivalves and some gastropods. Features of defense The external cover that extends over the mantle may consist of a hardened epithelial layer called a cuticle, separate calcareous plates, or a shell. Another defense includes the ability of most solenogasters and chitons to roll the body up. Chitons, neopilinids, and limpets can adhere firmly to the substrate by a powerful suction pad foot. Protection is also afforded if the animal is able to withdraw into its shell; a snail has the added advantage of having a hardened plate operculum on the foot that blocks the shell opening auricle once the animal has withdrawn. Burrowing by caudofoveates, scaphopods, many bivalves, and some gastropods also offers protection from predators. In many gastropods, slippery mucus is secreted from mantle extensions, or parapodia, as a defense against larger predators, such as sea stars starfish. In scaphopods, mucus is secreted against an aggressor from the anterior mantle. Certain molluscan subgroups secrete noxious chemicals either as a poisonous secretion of the salivary glands or as distasteful acids in mantle cells. Glandular secretions by solenogasters or the gastropod superfamily Eolidacea prevent the stinging nettle capsules nematocysts of cnidarians, when consumed, from expelling the stingers; moreover, some gastropods are able to store and then use the capsules in their own defense when attacked by a predator. For example, the ink in cephalopods, the luminous cloud secreted by some deep-sea squids, and the purple fluid from the sea hare *Aplysia* ; a gastropod of the subclass Opisthobranchia distract and confuse the predator and conceal the prey. Camouflage or frightening coloration are effective in protecting cuttlefishes , octopuses , and sea slugs, as well as other gastropods. As a result, molluscan form varies much among levels and subgroups Figure 1. External features The most obvious external molluscan features are the dorsal epidermis called the mantle or pallium , the foot , the head except in bivalves , and the mantle cavity. The mantle in caudofoveates and solenogasters is covered by cuticle that contains scales or minute, spinelike, hard bodies spicules , or both aplacophoran level. The chitons class Polyplacophora develop a series of eight articulating plates or valves often surrounded by a girdle of cuticle with spicules; in all other mollusks, the mantle secretes an initially homogeneous shell. The mantle and shell are laterally compressed in scaphopods and bivalves; in gastropods and cephalopods the head is free of the mantle and shell. In bivalves a dorsal hinge ligament joins two shell valves, which are further held together by two adductor muscles with attachment points on the inner aspect of each valve. The head, when present, has tentacles called captacula in scaphopods, labial palps in bivalves, head tentacles in gastropods, and arms in cephalopods. The primitive ciliary gliding surface with forward pedal and sole glands is reduced in caudofoveates and some gastropods, as well as in some bivalves, and it is narrowed to a ridged tract in solenogasters as well as some members of the placophore genus *Cryptoplax*.

*The curious mollusks [Marie M Jenkins] on [www.nxgvision.com](http://www.nxgvision.com) \*FREE\* shipping on qualifying offers. Discusses the physical characteristics and habits of various members of the mollusk family whose more than*

After all, is there any question that butterflies and moths are closely related? But a tiny snail and a carnivorous octopus? A giant squid and a sea scallop? A delicate oyster and a troublesome zebra mussel? Characteristics and Classification The common bond among all these species is the presence of a soft body. The phylum name Mollusca is, in fact, derived from the Latin mollis, meaning "soft. The shell itself is made largely of calcium carbonate. Another common feature of many mollusks is the presence of a foot, an unusual structure that takes different forms in different species. In clams, for example, the foot is a muscular extension that the creature uses to plow its way through mud and sand. In snails, it is flat and used for creeping. In squids and octopuses, the foot is divided into "arms," which the animals use to seize prey. The phylum Mollusca is divided into six distinct classes: Cephalopoda, which includes squids, cuttlefish, octopuses, and the chambered nautilus; Bivalvia, which includes oysters, clams, scallops, mussels, and teredos; Gastropoda, which includes snails, slugs, limpets, abalones, and conches; Scaphopoda, the tooth shells; Polyplacophora, chitons, the most primitive mollusk class; and Monoplacophora, represented by the living Neopilina and numerous extinct forms of the phylum. Squids, Octopuses, and Their Relatives The cephalopods which means "head-feet" in Greek include such striking creatures as squids and octopuses. These animals are so called because the foot, which is separated into a number of "arms," encircles the head. Unlike most other mollusks, living cephalopods generally do not develop shells. Instead, the mantle forms the outer part of the body. In some species, there is an inner skeleton. Numerous extinct forms of cephalopods resembled the living pearly nautilus in that they formed a coiled, chambered shell. All cephalopods dwell in the sea. They have arms, often called tentacles, that are equipped with suckers or hooks or both. Almost all cephalopods secrete an inklike fluid, which is stored in a special sac. When a cephalopod wishes to escape a pursuer, it squirts out the ink, making the water turbid and thus confusing the foe. Most cephalopods are capable of chameleon-like color changes as well. On their skin, specialized cells called chromatophores "color-bearers" contain different pigments. When these cells expand or contract, the color of the skin changes rapidly. Squids The champion swimmer of the cephalopods is the squid, a streamlined, spindle-shaped creature sometimes called the "arrow squid" for its ability to dart through the water. Two of the arms are longer than the rest; these longer appendages bear suckers and are used to seize and hold prey. The eyes have no lids, but otherwise look startlingly human. The siphon is located just behind the arms. The jet of water that spurts through the animal propels it swiftly backward. Ink is also discharged through this siphon. One of the most familiar species is the North American common squid, *Loligo pealei*, found primarily in the Mediterranean, in East Asian waters, and along the east coast of North America. Some fishermen use the creature as bait. In many parts of the world, this squid serves as human food. Another species, the flying squid *Ommastrephes bartrami*, has been compared to the flying fish. It often shoots out of the water, particularly when the weather is rough, and has been known to land on the decks of ships. One of the most formidable species is the giant squid, *Architeuthis princeps*. But in , scientists recovered an intact specimen of *Mesonychoteuthis hamiltoni*, dubbed "colossal squid," which exceeds by more than 10 percent the size of the largest known adult A. Octopuses Few dwellers of the deep stir the human imagination the way the octopus genus *Octopus* does. Many tales have been told of these creatures attacking hapless waders or divers. The foot of the octopus is divided into eight arms, the feature that gives rise to its name, which means "eight feet" in Greek. The animal has a parrotlike beak with which it rends its prey. Octopuses range from 2 inches to 30 feet 5 centimeters to 9 meters in arm-and-body length. The larger species, sometimes called "devilfish," may attain a weight of 77 pounds 35 kilograms. The octopus can crawl along the sea bottom on its arms. Sometimes the creature swims about by sucking water into the body and then squirting it out. Most octopuses are shy and retiring, passing their days hidden in crevices. At nightfall, they set out in search of prey. Stealthily, an octopus creeps up on some unsuspecting fish or crab. Once the powerful arms entwine the victim, there is no escape. With the approach of dawn, the

animal retreats to its lair. The octopus is itself the prey of eels, whales, and sharks. Humans dine on octopus in coastal areas of Europe, North America, in various parts of the Far East, and on the islands of the South Pacific. Cuttlefishes and Nautiluses A close relative of the squid is the common sepia, or cuttlefish, *Sepia officinalis*. This small creature, ranging from 6 to 10 inches 15 to 25 centimeters in length, secretes a calcareous inner shell known as cuttlebone. Another cuttlefish product is sepia, a pigment prepared from the deep brown fluid ink that the creature ejects as a defense mechanism. The pearly, or chambered, nautilus genus *Nautilus*, found in the South Pacific and the Indian Ocean, is a member of an ancient group of cephalopods. Its shell is spirally coiled and divided into compartments, each one a chamber in which the nautilus once lived at some stage of its growth; the animal resides in the outermost chamber. About 90 tentacles are set around the mouth. Although the tentacles lack suckers, they can nevertheless cling tenaciously to solid objects. The head can be withdrawn into the shell. A hood at the back of the head partly closes the opening. The female of the paper nautilus, or argonaut, *Argonauta argo* a form closely related to the octopus, secretes a spirally coiled and symmetrical white shell each year before mating. This delicate shell serves as an egg case; the argonaut can drop it at will. Clams and Other Bivalves Clams, oysters, mussels, and teredos belong to the class Bivalvia, or Lamellibranchia. They are called bivalves because their shells are divided into two parts, or valves. The inner surface of the shell is coated with a substance called nacre, or mother-of-pearl. This fine-grained layer may be white or may be as multihued as a rainbow. The two valves are joined by one or two muscles strong enough to hold the shell tightly closed; it is these muscles that are cut when a mussel or clam is opened. Some bivalves, such as clams, have a well-developed foot, which the animal extends beyond the shell to move from place to place. As adults, true oysters cannot move about; instead, they remain firmly attached to solid objects on the bottom of the sea. Bivalves lack a specially differentiated head. Some bivalves have two tubes, or siphons, through which water is drawn in and forced out. The incoming water contains tiny organisms that serve as food: Food is taken into the digestive canal by way of a mouth opening. Oxygen enters the blood through the two gills. Wastes are eliminated with the outgoing water. Oysters The true, or edible, oysters genus *Ostrea* lead sedentary lives attached to an underwater object. The shell is quite asymmetrical. The valve that is fastened to a submerged object is large and quite thick; the other one is smaller and thinner. True oysters occur in many parts of the world, but especially along the coasts of Europe, North America, and Japan. When the first European settlers came to North America, they found that Indian tribes along the coast depended on oysters for a considerable part of their diet. Evidently they had been eating these mollusks for generations, because large piles of oyster shells had collected around Indian towns and encampments. The first settlers and those who followed picked and dredged oysters from the shallow bays. It was long thought that the supply was inexhaustible. Increasing demand, however, led to overfishing in the late 19th century. It soon became necessary to supplement the natural supply by planting barren areas with young oysters, thus starting new beds. Today a considerable portion of the oyster supply in North America comes from privately owned beds. Oysters are also raised in Japan and in various European countries, particularly France and the Netherlands. Successful oyster cultivation requires a familiarity with the life cycle of these shellfish. The female of a typical species, such as *Ostrea virginica*, an oyster found along the eastern coast of North America, produces millions of eggs each year. The eggs are discharged into the water, where many are fertilized by sperm cells ejected by the males. A fertilized egg develops into a tiny larva, which swims about freely for a few days and then begins to develop a shell. Within a week, the creature is entirely enclosed. It drops to the bottom, where it becomes attached to a rock or other solid object. The spat, as the young oyster is called, grows rapidly and in time becomes a mature oyster. Despite the vast numbers of eggs produced by female oysters, the oyster population is not constantly on the increase. Many of the eggs are not fertilized; vast numbers of the little larvae are eaten by fish during their brief period of swimming.

*Get this from a library! The curious mollusks. [Marie M Jenkins] -- Discusses the physical characteristics and habits of various members of the mollusk family whose more than , species include sea slugs, pearl oysters, and squids.*

The following points highlight the fifteen interesting forms of Mollusca. The umbo is shifted at the anterior end. One peculiar feature in this genus is the presence of a single-hinge tooth in each shell valve. The mantle cavity is tubular and is formed by the fusion of the mantle lobes on the ventral side. The exhalant and inhalant siphons are small. There are a pair of elongated narrow gills in the mantle cavity. The foot is a highly muscular elongated organ which forms an efficient burrowing apparatus. The foot swells up very quickly by the inflow of blood during burrowing. It feeds on micro-organisms caught during respiratory water current. The two shell valves are slightly unequal in size. The right valve is larger, convex in shape and the soft parts lie within this valve. The outer surface of the valves exhibits radiating striations and the concentric lines of growth take a wavy course. The shell is beautifully sculptured. The hinge line between the shell valves is straight and is devoid of teeth. The foot is extremely reduced. It can swim by the activities of the shell valves. This sea-mussel is a sedentary bivalve Fig. The valves of the shell are broad and rounded at the posterior side, and the anterior end is narrower. The umbo is shifted to the anterior side. Both the siphons are present but the inhalant siphon is less developed. The foot is elongated. The byssus threads project from the ventral side between the valves. It is a bunch of proteinaceous silky threads, produced by the byssus gland of the foot. The interlamellar and interfilamentar junctions are absent and are represented by a bunch of cilia. This peculiar bivalve is well-known for causing tremendous damage to the ships and dock. It lives in holes made in the submerged portion of ship and wood. Because of its boring habit the body of *Teredo* has become extremely modified. The shell valves are very small and are situated in the anterior end of the body. The shell has a rough surface which acts as the cutting and boring machine. It has a very minute foot reduced into a sucker to adhere to the wall of the hole. The sucker projects through a small aperture left by the mantle lobes and the rest of the mantle lobes are united. The mouth is situated between the shell valves. The body proper and the inhalant and exhalant siphons are extremely elongated. The siphons are united at the anterior side, and the posterior portions are free. Just at the region of separation of the siphons there lie a pair of calcareous pallets which close the opening of the hole like a lid when the body and the siphons are withdrawn. It has the remarkable property of digesting the cellulose. *Aplasia* is a very peculiar gastropod and has almost a cosmopolitan distribution. It is recorded that it attains a size of about 1 m in length. The posterior pair is comparatively smaller and is called rhinophores. These are olfactory in function. The anterior pair of tentacles are longer in size and are called cephalic tentacles. The foot is broad and bears lateral projections, called parapodia, as the organs of swimming. The foot gives origin to a very short, distinct tail at the posterior end. The posterior part of the foot is usually adhesive. The mantle is extended upwards as a thin membrane and the shell is concealed by the mantle outgrowth. The shell is reduced to a small flattened piece which is internally placed. The mantle cavity opens to the right side of the body through a longitudinal slit. The ctenidium is visible along the opening of the mantle cavity. The floor of the mantle is provided with large subepithelial gland cells, called opaline glands. *Aplysia* is notable for discharging purple or milky fluid to the surrounding water to conceal itself from enemies. The nervous system is of ethynerous type, i. They are of bisexual forms producing both sperms and eggs. The gonoduct is single and opens to the exterior through a common genital opening. The anus is located posteriorly and is mid-dorsal in position. It is surrounded by a cirlet of anal gills which act as respiratory organs. The body of *Doris* comprises in a more or less ovoid mass with a convex warty dorsal side. The head bears a pair of rhinophores beset with calcareous spicules. The foot has a flat creeping sole. The digestive gland is an un-branched compact mass. The nervous system is of ethynerous type. The sexes are united and the gonopore is asymmetrically placed on the right side of the body. Like *Doris*, *Aeolis* is also a nudibranch and commonly called sea slug. It has an elongated shell-less body. It has two pairs of tentacles, the anterior pair are called cephalic tentacles and the posterior pair are designated as rhinophores Fig. The rhinophores are simple. The radular tooth is arch-like and is devoid of median notch. The cerata open

to the exterior through openings. *Aeolis* feeds on sea-anemones. The cnidoblasts of the anemones taken inside the body of *Aeolis* usually escape digestion and migrate to the tips of the cerata. These are called the cnidosacs which probably act as defensive organs. It is claimed by many that on proper irritation the cnidosacs discharge their contents towards the prey or enemies. But such a phenomenon is not witnessed by any worker. However, existence of cnidosacs in the body of *Aeolis* is a unique instance and the significance of cnidosacs in the body of *Aeolis* is not fully understood. This curious slug-like gastropod is placed under pulmonata. Like other gastropods two pairs of tentacles are present. It has an ovoid naked body. The foot has a very broad flat creeping sole. The mantle covers the dorsal side of the body and is beset with numerous warty tubercles. The true ctenidium and mantle are lacking. A pulmonary chamber is present in the posterior part of the body. The sac opens to the exterior through a small aperture pneumostome near the anal opening. *Patella* lives upon marine vegetation. The dorsal side of the body is enclosed by a roundish shell. The shell is raised into a conical elevation. The operculum is absent. The ventral side of the body is occupied by a broad creeping foot Fig. The foot is also employed as an adhering organ. The mantle is highly pigmented. The head bears a pair of large sensory tentacles and a pair of eyes. Between the foot and mantle, there exists a series of secondary branchiae. The primary gills are obliterated excepting a pair of vestiges. A pair of osphradia and a pair of oesophageal pouches are present. It has a single auricle. There are two kidneys, of which left one is smaller in size. Sex reversal is very common in *Patella*. *Spiratella* is a typical pteropod. Like all other forms, *Spiratella* leads pelagic life and swims by flapping the parapodia. The foot develops anteriorly into highly muscular wing-like projections, called parapodia Fig. The posterior part of the foot is greatly reduced.

*The Curious Mollusks The mollusks: a guide to their study, collection, and, mollusks have been important to humans since our earliest days initially, when humans were primarily interested.*

Chambered Nautilus Nautilus pompilius The curious-looking chambered nautilus, also known simply as the nautilus, is considered by many to be a living fossil. Nautilus pompilius is the largest and most common of about six species known to exist. Like the coelacanth, it has remained unchanged for over million years. During prehistoric times, there were about 10, different species of nautilus, but only a small handful are known to survive today. The nautilus is a mollusk and a member of the cephalopod family. It is closely related to other cephalopods such as the squid, cuttlefish, and octopus. Like most cephalopods, it can use jet propulsion to attain speeds of over two knots. This propels the nautilus in the opposite direction at high speeds. Nautilus shell cutaway showing chambers Clipart. The shell of the nautilus is comprised of many individual chambers. Each chamber is individually sealed and contains an amount of gas. This provides the animal with buoyancy. The nautilus can regulate its density by injecting or removing fluid into these chambers through a system of tubes. The nautilus has many more tentacles than its close cousins. Depending on the particular species, there can be up to 90 separate tentacles. The tentacles are arranged into two circles, and unlike those of other cephalopods, they have no suction cups. These tentacles are used to catch shrimp, fish and small crustaceans, which the animal crushes with its powerful beak. Nautiluses are active predators, but since their siphon system uses very little energy while swimming, they only need to eat about once a month. Their eyesight is very poor because their eyes contains no lenses. Instead, there is only a tiny hole to allow light into the eye. This system operates much like a pinhole camera. The nautilus is thought to rely mainly on its sense of smell when searching for food or looking for a mate. An adult nautilus can grow to about eight inches 20 centimeters in length. Chambered nautilus swimming in the dark Clipart. The eggs are usually attached to rocks in shallow water, hidden away from curious predators. These eggs require between eight and twelve months to fully develop. When a young nautilus first hatches from its egg, it is about an inch in diameter and has a shell with seven chambers. The young animal will drift and feed on plankton and other small prey as it grows. As it gets larger, it will add new chambers to its shell. Each new chamber will be a little larger than the last, allowing the opening of the shell to continually grow larger. The average life span of the nautilus is believed to be about 20 years, which is unusually long for a member of the cephalopod family. Nautiluses are found throughout the Pacific and Indian oceans, where they spend their daylight hours at depths of about 1, feet meters. At night they migrate to shallower waters to feed among the coral reefs. The shell of the nautilus cannot withstand the pressure of depths greater than 2, feet meters. Unfortunately, nautilus populations are on the decline due to the harvesting of their beautiful shells. Because of this, export of the shells has been banned in many countries throughout the world. You can help save this amazing animal by refusing to buy nautilus shells.

## Chapter 5 : Brainfood for the Curious: Short Talks at Lunchtime | The New York State Museum

*Many interesting occurrences can be seen in common 'mundane' mollusks. For example, the intestine of a bivalve actually runs through it's heart. An interesting bit of neutral selection if you ask me.*

Snail shells are classified as gastropods. The Gastropods are the largest class of mollusks, with over 60,000 species known to science. Gastropods are found in the marine, land and freshwater environments. Are two shells better than one? This class of mollusk is better known as clam shells. Befittingly named bivalves "bi" meaning two consist of two shell halves attached by a flexible corneous hinge. The class Bivalvia, or the Pelecypods are the second most populous class of mollusks. Bivalves are found in both the marine and freshwater environment. The Polyplacophora polly - placko - fora or Chitons kye tons are a primitive form of mollusk with eight shelly plates held together by a fleshy girdle. Chitons are only marine dwellers. Scaphopods are one of the most curious of marine mollusks. Some Scaphopods grow to be as large as a human hand or as small as a grain of rice. Yes, an octopus is a mollusk, but not all Cephalopods form a Nautilus-like shell. The most recognizable Cephalopod shell is the Nautilus. Two types of Nautilus from two different subclasses of Cephalopods are known -- the true Nautilus, and the Paper Nautilus. The Paper Nautilus shell is actually an egg case from the molluscan argonaut. The Aplacophora are worm-like mollusks from abysal depths of the ocean. This primitive form of mollusk inhabits very deep water. The Monoplacophora were once thought to be extinct. Deep sea research boats dropping trawl nets in hundreds of fathoms of water and began to discover living examples of this primitive form of mollusk.

## Chapter 6 : Monoplacophora - Wikipedia

*List of mollusks: Mollusks are soft-bodied invertebrates of the phylum Mollusca, usually wholly or partly enclosed in a calcium carbonate shell secreted by a soft mantle covering the body.*

## Chapter 7 : Chambered Nautilus - Deep Sea Creatures on Sea and Sky

*SCAPHOPODS: Scaphopods are one of the most curious of marine mollusks. Most look like a miniature elephants tusk, and in fact, one species is known as the Elephant's Tusk, Dentalium elephantium. Most look like a miniature elephants tusk, and in fact, one species is known as the Elephant's Tusk, Dentalium elephantium.*

## Chapter 8 : Urmollusker " Wikipedia

*Mollusk: Mollusk, any soft-bodied invertebrate of the phylum Mollusca, usually wholly or partly enclosed in a calcium carbonate shell secreted by a soft mantle covering the body.*

## Chapter 9 : Mollusks - Snails ( Gastropods ) ~ Marine Biology ~ New Jersey Scuba Diving

*Doris, popularly called 'sea-lemon', is a curious gastropod (Fig. B), where the shell and ctenidium are totally absent. The anus is located posteriorly and is mid-dorsal in position. It is surrounded by a cirlet of anal gills which act as respiratory organs.*