Hands On Learning
with Reading Museum Service

SHELLS Z15

Human beings have hard bones inside their body to support and protect the soft, fleshy bits. Some animals though, have a hard outer case to do the same job. Insects and molluscs both do this, as well as many other groups of animals.

Most shells that you find on the beach were made by molluscs. There are said to be about112,000 species within this group, including species of squid and octopus. True, octupuses and squid have soft, shell-less bodies, but they did have shells once, although over time they have evolved so that they no longer have them!

Shells are usually made of a substance called nacre. Mollusc blood is rich in dissolved calcium and this, in the form of calcium carbonate, is one of the basic chemicals of the shell. Nacre is continually deposited onto the inner surface of the animal's shell and forms the iridescent layer known as Mother of Pearl. Shells may grow over time as the animal inside adds nacre to the leading edge near the opening. This causes the shell to become longer and wider to better accommodate the growing animal inside.

All the shells in this box are from the warm Indian and Pacific Oceans. They are more colourful and strangely shaped than most of the shells that are found in the North Atlantic and around the coasts of Britain. When they had a living creature inside they would have been even more exotic. They are frequently encrusted with other shells and weed, and their flesh, which protrudes from the opening, is often brightly coloured and elaborately folded.

Giant Spider Conch (*Lambis truncata truncata*)



At least 65 species of conch are known to exist. Most are in the Indo-Pacific Oceans, while a few are found in the western Pacific and the Caribbean region. They are all herbivores (plant eaters), living mostly in shallow, sandy areas. Conches have long eye stalks (see the photograph, right, which shows the protruding eyes of another conch, *Strombus alatus*) and are active browsers in the shallow waters around coral reefs. Conches have a characteristic leaping motion when they move. They lay eggs in long, gelatinous strands. The Giant Spider Conch is common from the Red Sea to the Pacific Ocean.



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Arthritic Spider Conch (*Lambis chiragra arthritica*)



Spider conches have long fingers, although their purpose is debated. Some think they allow the spider conches to creep on the sand, around the reefs, without being dragged by underwater currents. The females have longer extensions than the male, which are angled upwards. Males of the species are generally much smaller, less knobby and with near horizontal spines. This example is probably from a male.

Unidentified Conch

This is probably a member of the Strombidae family. It has been well worn, possibly after being tossed about in sand and gravel after the animal died. Strombids have long eye stalks, a long and narrow aperture, and a siphonal canal with an indentation near the anterior end called a stromboid notch, through which the conch can extrude one of its eyes. They grow a flared lip upon reaching sexual maturity.



Right: A fighting Conch, with its eyes

Tiger Cowry (*Cypraea tigris*)



Cowry shells are found chiefly in tropical regions. The shell itself is almost always smooth and more or less egg-shaped, with a long, narrow, slit-like opening. Most varieties have a porcelain-like shine and many have colourful patterns.

The Tiger Cowry is probably the best known of all the cowries and the most variable in size, shape and colour. It is found throughout the Indian and Pacific Oceans. It can be seen under rocks or resting on soft corals during the day and foraging for food at night.

A Rapana Shell



It is not known exactly which species produced this shell. It shares many characteristics with *Rapana bezoar* and *Rapana venosa*, however the first of these has a cream interior and the latter has an orange interior, while this example is pink!

Rapana species are mostly found in the seas around Japan. *Rapana venosa*, however, has been introduced into other areas and has proved a major pest. All the Rapana species are predatory. *R. venosa* can open clams, oysters and other bivalve species (bivalves have two hinged shells) by smothering the shell and introducing its proboscis between the gaping shells, without any drilling. It has become a major pest of oyster beds in the Black Sea.

This example has itself been the object of attack. Areas of the outer surface have been scraped and drilled, probably by other predatory molluscs, although the damage may have occurred after the animal died.

Imperial Cone (*Conus Imperialis*)



The *Conus* group is one of the most popular with shell collectors as they are generally beautifully coloured and patterned. All members of the group are carnivorous, generally eating marine worms, small fish, and even other molluscs. They kill their prey by injecting poison with a harpoon shaped barb or tooth. Some species are able to catch fast-moving prey such as fish. Most of them are not harmful to humans, but a few species can cause death. The picture to the right shows a Geographic Cone (*Conus geographus)*. This *Conus* species is highly venomous and is known colloquially as the Cigarette Snail, in the belief that the victim will only have enough time to smoke a cigarette before perishing!



Conus imperialis is found in both the Indian Ocean and the Pacific. It is not one of the dramatically poisonous cones. It lives on the dead rubble of coral reefs and feeds on worms.

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Tulip Cone (*Conus tulipa*)

This has a thinner and lighter shell than the Imperial cone. However, the Tulip Cone is, along with the Textile and Geographic Cone, one of the most venomous member of the *Conus* group. Several human deaths have been attributed to encounters with tulip cones. Like the Geographic Cone, the Tulip Cone is a piscivore that is, it hunts and eats fish.



Right: A close-up of the harpoon barb of a Conus species.

Scorched Murex (*Chicoreus torrefactus*)

This is one of many species which belongs to the large Muricidae family. At least 1,000 species are known. The shell spire is usually ornamented with protective knobs, ribs, or spines. Most species are carnivorous, feeding on other molluscs and on barnacles.



Marlinspike Auger (*Terebra maculata*)



Augers are related to Cone shells since they also possess a harpoon-like radula and venom gland to capture worms. Their slender shells are designed for crawling along beneath the sand leaving a trail behind them. A few prefer drifting up-and-down sloping beaches with the surf while hunting, quickly burying themselves between waves at the water's edge.

Common Pacific Vase (*Vasum turbinellus*)

This is one of the most common Vase shells of the Pacific. It ranges from East Africa throughout the Indo-pacific to western Polynesia. In some regions it is abundant. It lives in the intertidal zone to a depth of about 3 metres. It remains hidden during the day under coral rocks and boulders and comes out at night to find food.



Miscellaneous Shells

These are for **you** to identify ...

