



MOLLUSKS AND THEIR SHELLS

Shells are the hard exteriors of living organisms and are formed for two main purposes. Firstly, they protect the organisms from predators and environmental stressors. Secondly, they provide rigidity and shape. One well-known group of animals that secrete shells is called mollusks.

There are eight classes of mollusks grouped according to the characteristics of their shells. Single-shelled organisms are called **Gastropods**. A snail is a gastropod, with a single shell that spirals outward and to one side as it grows. The coiling may be either to the left or right. The coiling can be indicative of paleoenvironmental conditions. Global temperature changes are said to be the reason for reversal of the coiling; therefore, some gastropods can be important in the field of geologic dating.



The shelled animals that are studied in this unit are called **Bivalvia** and include oysters, clams, scallops, and mussels. They have two valves that enclose the soft tissue of the mantle and other internal organs. The shells are hinged together.

Another well known class is the **Cephalopoda**, which include octopus, squids, and nautilus. Most cephalopods have a reduced shell or are shell-less. The nautilus is the only one with a completely developed shell. The squid and cuttlefish have a small internal shell, and the octopus completely lacks a shell.



There are five other classes of mollusks not as well known. They include Caudofoveata, Aplacophora, Monoplacophora, Polyplacophora, and Scaphopoda. **Caudofoveata** are shell-less wormlike mollusks that live in burrows on the deep-sea floor. The **Aplacophorans** also lack a shell and live in the depths of the ocean, physically attach to and or eat relatives of the jellyfish and coral. **Monoplacopharans** have a caplike shell and are less than 3 cm long, they are found in the ocean depths.

Polyplacophorans or chitons are flat long mollusks with a shell made of eight plates. Chitons live on rocky shorelines and graze on plants.

Scaphopods also known as tusk shells, and have a long tube-shaped shell tapered at one end and open on both ends. These mollusks burrow into the sand.

Mollusk shells are made from calcium that is extracted from the waters in which they live or from the food the mollusks eat. There are two common forms of calcium carbonate, aragonite and calcite. They differ in crystal shape, but their chemical formula is the same. The denser of the two forms, calcite, is found in the hard, outer shell of the oyster. Whether calcium carbonate becomes aragonite or calcite depends on the "seed" crystals growth pattern.



Many mollusk shells are lined with aragonite. Abalones and some oysters, including Louisiana oysters, are examples. The substance they produce is called "mother of pearl" or **nacre**. Nacre is what gives oysters and abalones the shine on the insides of their shells.