



Pre-Visit Science Information

While visiting **Bailey-Matthews National Shell Museum**, you and your students will have the opportunity to see beautiful, rare, and world-record sized shells, as well as the animals that make the shells, mollusks. In order to fully appreciate these shells, it is important for students to have some background information prior to your museum visit.

Step 1: Watch *Mollusks in Action*

The video, *Mollusks in Action*, is a very useful tool for conveying the necessary background information. We expect every student to have seen this film before arriving at the museum. It may be beneficial to give a general overview of what a shell is and what a mollusk is BEFORE viewing the movie. Have the students fill out the *Mollusks in Action* Study Guide as they watch the film.

Step 2: Provide a Content Overview

Each student should have at least a cursory understanding of the following science content before arriving at the museum in order to maximize the impact of all the exhibits and activities. Much of this information is also presented in the movie, so you will be reinforcing that knowledge base.

SHELLS AND MOLLUSKS

True shells are created by some types of mollusks and serve to protect the animal's soft body. **Mollusks** do not leave an old shell and create a new one; a mollusk has the same shell for its entire life. The forceful removal of a living mollusk from its shell causes massive injury and the animal would die.

Shells are created when a specialized area of the mantle (a soft tissue covering the major organs of the animal) secretes **calcium carbonate**, which the animal gets from its food and water. As the soft animal grows, it adds more shell to the outer edge of the existing shell to create a larger space in which to live. Many other animals may produce hard parts that wash up on the beach, including echinoderms (sea stars, sea urchins, sand dollars, etc.), arthropods (crabs, lobsters, shrimp, barnacles, insects, etc.), and cnidarians (jellyfish, corals, sea fans, etc.), but only the shells produced by mollusks are considered **true** shells.

TYPES OF MOLLUSKS

Mollusks are invertebrates (animals without a backbone) in the animal phylum Mollusca. This phylum includes seven classes of animals: class **Bivalvia** (the bivalves: clams, oysters, scallops, etc.), class **Gastropoda** (the gastropods: snails, slugs, conchs, whelks, etc.), class **Cephalopoda** (the cephalopods: squid, cuttlefish, nautilus, and octopus), as well as four other classes (Scaphopoda, Polyplacophora, Aplacophora, and Monoplacophora), which are not covered in the field trip. Most of the shells people find on the beach are formed by gastropods and bivalves, and these are the main focus of the museum exhibits.

Class Bivalvia

Mollusks that have a shell with two parts, or valves, are called bivalves. This group includes clams, oysters, scallops, mussels, etc. The animal lives between, and is permanently attached to, these valves. A flexible ligament that acts like a hinge connects the two valves. Bivalves are primarily sedentary or sessile and are usually filter feeders. Some species have a foot and are very mobile. Some species produce a **byssus** (a bundle of threads with waterproof glue on the ends), which attaches the animal to one place for its entire life.

Class Gastropoda

This group includes marine, freshwater, and terrestrial snails and slugs, including common garden snails and slugs; there are probably some gastropods in your backyard right now! The word gastropoda comes from the Greek language, meaning “stomach-foot”. When a gastropod is gliding along, it looks like it is traveling on its belly. More than three quarters of all mollusks are gastropods. Most gastropods have a single, coiled shell into which the animal can withdraw. Gastropods may burrow, crawl, swim, float, or be sessile. Gastropod feeding habits are extremely varied and include herbivores, carnivores, detritivores, and filter feeders.

Class Cephalopoda

Cephalopods are more intelligent, faster, and have better eyesight than other mollusks. The word cephalopoda in Greek means “head-foot” because their arms and head are the most visible. Nautilus, squid, cuttlefish, and octopus are cephalopods. The hard external shell that most mollusks depend on for protection is reduced or absent in this group. The nautilus is one of the few cephalopods that have an external shell present. Cephalopods move via jet propulsion in which water is forced through a siphon. Cephalopods are carnivorous.