

Atlantic City Aquarium
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Touch Tank Tales

Welcome to a unique, interactive experience for your students and you! Join us on the 1st floor of the aquarium and enter the world of crabs, sea stars, sea ur-

chins, and many of the other smaller inhabitants of the ocean. In our 750 gallon touch tank, your students will be invited to touch a variety of local invertebrates, as

well as other beach residents. So, come on in, and "Reach for the Stars!"



The Horseshoe Crab



Horseshoe crabs resemble spiders and scorpions. Unlike true crabs, Horseshoe Crabs are benthic or bottom-dwelling organisms that are most commonly found in the Gulf of Mexico and along the northern Atlantic coast of North America. They are arthropods, part of the largest group of all living animals. This group also includes insects, spiders, scorpions, and crabs.

Horseshoe crabs are not true crabs because they lack antennae and mandibles. Because of this, they are actually clos-

er in form to spiders and scorpions. Unlike true crabs, Horseshoe Crabs are benthic or bottom-dwelling organisms that are most commonly found in the Gulf of Mexico and along the northern Atlantic coast of North America. They are arthropods, part of the largest group of all living animals. This group also includes insects, spiders, scorpions, and crabs.

Horseshoe Crabs can grow up to approximately 22 inches and weigh up to 10 pounds. It molts its skin many times as it grows. The female is up to two-thirds of the size larger than the male.

The long tail of the Horseshoe Crab is not a weapon. It is used as a rudder for steering while moving, and for righting itself when it is flipped upside down.

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Special points of interest:

- Sea Stars can regenerate, or regrow, arms that are torn off by predators.
- Black Fingered Mud Crabs eat Periwinkles.
- The Japanese Shore Crab was first found in our area in 1988.
- Sea Stars cannot see. They have an eye spot at the end of each arm that can detect changes in light and dark.

The Tourist Who Wanted To Stay!

The

Japanese

The Japanese Shore Crab is a square-shaped crustacean with three spines on each side of its carapace. Typically, it lives in the intertidal or shallow subtidal zone, where water depth is only a couple of feet at low tide, and can often be found under rocks during low tide. It is native to the shores of the western North Pacific Ocean, and was first reported near Cape May, New



Jersey in 1988, where it was probably introduced via ballast water from a ship.

The Japanese shore crab is a voracious eater. An omnivore, it has an appetite for young clams, scallops, oysters, algae, and fish larvae. It can reach two to three inches in width.

Crabs Galore!

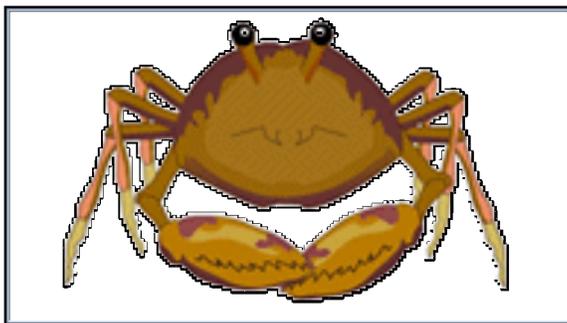
The Green Crab and The Spider Crab

The **Green Crab** is a small shore crab. Adults measure about three inches across. The color of the dorsal (top side) of the shell is a mottled, dark brown to dark green with small yellow patches. A distinguishing feature that can set Green Crabs apart from native crabs is the array of five evenly spaced triangular spines on either side of the eyes, on the front end of the shell. The three rounded lobes between its eyes may also be used to help identify the Green Crab.

The Green Crab is an omnivore, meaning that it can consume many different species of plants and animals. Its prey includes mussels, clams, snails, crabs, barnacles and algae.

Spider crab is the name of members of a family of crabs that look like spiders. Spider Crabs have a beak-shaped head, as well as thick, rounded bodies, and long, spindly legs. They are generally sluggish and move slowly. Most are scavengers, especially of dead flesh. Spider crabs range in size from 3/4 inch across, to the Giant Spider Crab found in deep waters off the coast of Japan, which may measure over 13 feet across.

Rock Crab



Rock Crabs are a common crab on the rocky inter-tidal shore. They are found along the coast of Newfoundland, Nova Scotia, New Brunswick and all the way down to Florida. Rock Crabs can grow as large as five inches wide and have an oval, fan-shaped carapace. Most crabs are scavengers and eat whatever they can get their claws on, from dead fish and seaweed to scallops and mussels, and these crabs are no different.

A Sea Star That Looks Good Enough to Eat... The Chocolate Chip Sea Star

Put your cookie sheet away! This is nothing for you to eat...it is a marine invertebrate called a Chocolate Chip Sea Star! Its name comes from the dark, brown, pointy horns found all over its body, which are used for protection. This sea star lives in the warm shallow water areas, seagrass beds and sandy areas of the Pacific and Indian Oceans.

Chocolate Chip Sea Stars do not have eyes, so they have to use their sense of

smell to hunt for food. Not being picky eaters, they feed on bacteria, sponges, and detritus or the waste products and remains of dead organisms. The sea star's mouth is on the underside of its body. Once it locates its prey, the star will cover it, and, then, it pushes out its stomach from inside the body and covers it. Stomach juices smother the prey, and tiny hairs called cilia move the remains inside the sea star's body.

These sea stars, and all sea stars, have tube feet that help them to move. By sucking water into its body, the sea star changes the water pressure within, and the tube feet react, moving the sea star.

The Forbes Common Sea Star

The Forbes Common Sea Star is found on rock, gravel, or sand bottoms from the Gulf of Maine to Texas. It has a radius of 5 1/8" and is tan, brown, and olive, with tones of orange, red, or pink. Like other sea stars, this species feeds on bivalves, specifically

mollusks. It everts its stomach through its mouth, slips it between the mollusk's valves, and secretes digestive juices which begin to consume the clam's soft tissues. The clam soon dies, its valves gape, and the sea star finishes its meal.



Chocolate Chip Sea Star (top),
and Forbes Common Sea Star
(bottom).

Periwinkles Beware of the Black Fingered Mud Crab!

Black Fingered Mud Crabs are found along the East Coast from Cape Cod to Florida. This small, shy crab prefers to live among sponge colonies, under rocks and debris along shorelines, among dense thickets of aquatic vegetation, as well as in shallow water habitats. This crab can be

easily recognized by its small size (two inches) and claws with black "fingers."

The Black Fingered Mud Crab is, like other crabs, a scavenger, but feeds particularly on periwinkles and barnacles. It is, however, es-

pecially fond of eating hermit crabs, which it pulls from the shell by seizing the hermit's protruding legs. Its powerful claws also efficiently crush the shells of bivalves such as clams and oysters.

The Channeled Whelk

The Channeled Whelk is a type of a type of marine snail native to the east coast of the United States, ranging from Massachusetts through eastern Florida. Channeled Whelks prefer shallow water on a sandy bottom. They are usually nocturnal, and are known to be aggressive predators. Their primary food is the clam, but they are known to even scavenge bait out of crab traps and lobster pots.

The shell of the whelk typically reaches five to eight in length. It is smooth and gener-



ally pear-shaped, with a large body whorl. Body color is typically a buff gray to light tan, with darker brown to brown-red vertical banding. The shell aperture is located on the right

side, with left-handed specimens being rare.

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Wampum crafted by Native Americans was made from the twisted central axis of channeled whelks and knobbed whelks. They were cut into elongated beads.

The Feather Blenny

The Feather Blenny is named for the feather-like appendages that stick out of the top of its head over its eyes. These fish can grow up to four inches, and are very aggressive. Feather Blennies live in

oyster beds and rocky shores of the western Atlantic Ocean from New Jersey to southern Florida. They are territorial predators, and eat small fish and crustaceans that venture too close to the oyster

shells where the blennies live.

The Atlantic Purple Sea Urchin

The Atlantic Purple Sea Urchin is found on rock and shell bottoms, among seaweeds, and in tidepools from Cape Cod to Florida. This species is the most intensively studied of all sea urchins. It is omnivorous, and will eat various algae, sponges, coral polyps, mussels,

sand dollars, and dead or dying urchins and other animals.

The Atlantic Purple Sea Urchin is two inches wide and $\frac{3}{4}$ inches high. Its spines are purplish-brown, reddish-gray, or sometimes nearly black, and its skin is blackish. These spines are longitudinally grooved,

cylindrical, pointed, and variable in size, with the longest spine near top being one inch long.



Hermit Crabs



The **Flat-Clawed Hermit Crab** is frequently found living in shells of moon snails and the larger whelks. It lives on sandy bottoms along open shores, as well as in brackish estuaries along the Atlantic coast of the United States, from Cape Cod to Florida.

The diet of this hermit crab is made up of algae, organic matter, and sometimes other hermit crabs. The adult Flat-Clawed Hermit Crab is about 1¼ inches long, one inch wide, and has a coloring of whitish or pale tan-gray.

The **Long-Clawed Hermit Crab**, the most common hermit crab in the Atlantic Ocean, is quite common in bays. It usually uses periwinkle, mud snail, or oyster drill shells as a home. The Long-Clawed Hermit's habitat is on sand, mud, rock, and weed bottoms, along open shores and in brackish estuar-

ies. They are 1/2" long and 3/8" wide, and live in snail shells. Their coloring ranges from Grayish to greenish-white, with pincers that are tannish-gray or tannish striped down middle, edged with white.



Something Fishy Going On...

The **Cunner** and the **Tautog** are fish that are part of the Wrasse family. The Cunner ranges from Canada to New Jersey, while the Tautog is found as far south as South Carolina. Both fish are found in Coastal waters near wrecks, piers, docks, and mussel beds.



The Cunner grows to 10" in length and is moderately slender. Its coloration ranges from reddish-brown above with a bluish or brown-

ish tinge, to mottled with blue, brown, and red. Some specimens are uniformly brown, while others are deep sepia.

The Tautog is dull-colored: mousy, chocolate-gray, deep dusky green, brownish, or dull black, with sides irregularly mottled with paler shades. It can grow three feet in length and weigh over 20 pounds.



Periwinkles

Periwinkles are widely distributed shore snails that are usually found on rocks, stones, or pilings between high- and low-tide marks. These small edible marine snails have thick, cone-shaped, whorled shells and are

found along the coasts of Europe and northeastern North America. The Periwinkle, being mainly herbivorous, feeds mostly on algae. The shell of the common Periwinkle is usually less than one inch long.

Horseshoe Crab Model Available

The Ecological Research & Development Group (ERDG), founded in 1995, is a 501(c)3 non-profit wildlife conservation organization whose primary focus is the conservation of the worlds four remaining horseshoe crab species.

Model Loan Program

They have a loan program that provides access to a horseshoe crab model for teachers and schools who may not have sufficient funds to purchase them. At present, this program is available to teachers in southern New Jersey. For more information, contact [Erik Mollenhauer](#) at the Educational Information and Resource Center, the Tuckerton Seaport (www.tuckertonseaport.org) or the Bayshore Discovery Project at <http://www.ajmeerwald.org/>.

Key Vocabulary

Aperture - the main (or only) opening in the shell of a gastropod or snail.

Appendages - body parts that extend from a body segment, including antennae, mouthparts, wings, legs, and parts of the tail.

Benthic - bottom-dwelling

Bivalve - aquatic mollusks with a laterally compressed body and a shell consisting of two valves, or movable pieces, hinged by an elastic ligament.

Book gills - a breathing organ in many arachnids containing folds of membrane like leaves of a book

Carapace - The thick shell that covers the back of the turtle, the crab, and other animals.

Cilia—tiny hairs

Detritus—waste products and remains of dead organisms

Everts - to turn an organ, or other body part, outward or inside out

Exoskeleton - hard outer shell

Gastropods - more commonly known as snails and slugs, they are the largest and most successful class of mollusks.

Intertidal - the region between the high tide mark and the low tide mark.

Omnivore - eats plants or animals

Subtidal - below the intertidal zone and thus permanently covered with seawater.

Whorl - a single, complete 360° turn in the spiral growth of a mollusk shell.

Internet Resources

<http://www.dnr.state.md.us/education/horseshoecrab/> - Horseshoe Crabs: A Living Fossil – Maryland Dept. of Natural Resources

<http://www.ocean.udel.edu/horseshoecrab/> - NOAA & University of Maryland Sea Grant Program

<http://sgnis.org/3drotate/index.html> - NOAA - Sea Grant – 3D viewer of Green Crab

<http://oceanlink.island.net/oinfo/intertidal/echino.html> - Echinoderm site

<http://oceanlink.island.net/ask/echino.html> - FAQ's about echinoderms

<http://www.baygateways.net/bayvideos.cfm> - a series of short videos of creatures that are found in the Chesapeake Bay area.

<http://www.sms.si.edu/irlfieldguide/InvertMain.htm>—Smithsonian Marine Station guide to invertebrates at Indian River lagoon, FL