

Some neat things to share with students while at the Beach

Slipper Shells (Boat Shells): There are two kinds of slipper shells, the Atlantic (brown marking and arched) and the Eastern white slipper (whiter and flatter). All slippers start as males (Protandry), but can change sex as they age or there is shortage of females (sequential hermaphrodites. When piled up, the large females are on the bottom and the smaller (younger) males are on top.

Bay Scallops: Are free-living and can swim, by rapidly opening and closing its shell. Some scallops can make an audible soft popping sound as they flap their shells underwater, leading Cape Codders to dub them "singing scallops". They have blue eyes lining the shell opening. The scallop family is unusual in that some members of the family are dioecious (males and females are separate), while other are simultaneous hermaphrodites (both sexes in the same individual) and a few are protoandrous hermaphrodites (males when young then switching to female). Age can often be inferred by annuli, the concentric rings of their shells.

Softshell Clams: Usually found 6-10 inches under the surface. They have paired siphons at the surface to filter up to a quart of water in an hour. They help us find them at low tide when they squirt. They are also called steamers, longnecks, or Ipswich clams

Quahog (hard shells): Have short siphons so they live right below the surface. At a fish market you can buy littlenecks (up 2.5 in), cherrystones (up to 3 in), and the largest are called quahogs or chowder clams. The Wampanoag people used the inner shell to make "wampum."

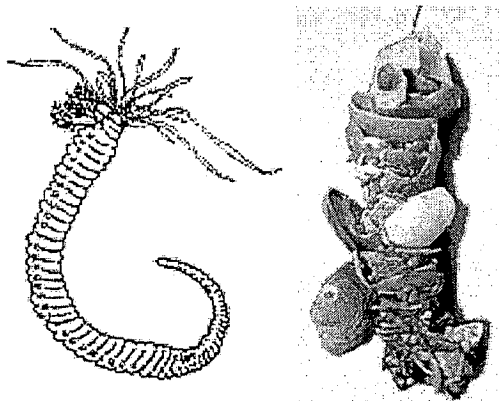
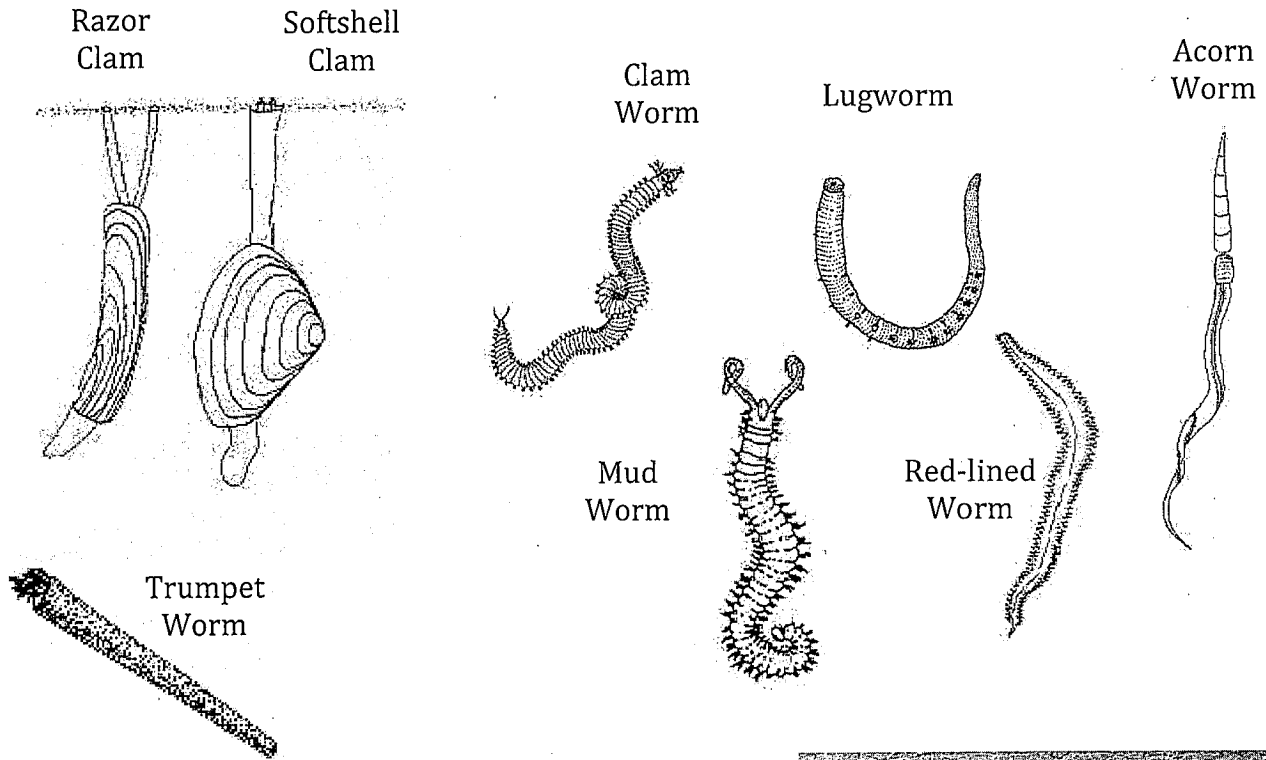
Oysters: It's said that oysters should only be eaten in months with "r's" in them. This was the result of early days when refrigerated shipping didn't exist. They are called a keystone species because their bed provide habitat for an amazing variety of marine life. They are protandric, which means that during their first year they spawn as males (releasing sperm into the water). As they grow larger over the next two or three years and develop greater energy reserves, they release eggs, as females. Bay oysters are usually prepared to spawn by the end of June.

Barnacles: There are three types of barnacles in this area: Bay Barnacles (small and flat), Rock Barnacles (larger and not flat), and Ivory Barnacles (color). They are true hermaphrodites. They all are "nothing more than a shrimp-like animal standing on its head in a limestone house kicking food into its mouth" (Louis Agassiz).

Ugly Stains on the Beach: A milky-white "stain" caused by sulfide-oxidizing bacteria. The white color is elemental sulfur converted by the bacteria from sulfides in peat. A reddish-purple "stain" is caused by a photosynthetic bacteria. The bacteria use sunlight and hydrogen sulfide (instead of water) to make carbohydrates.

Tidal Flats of CCSC

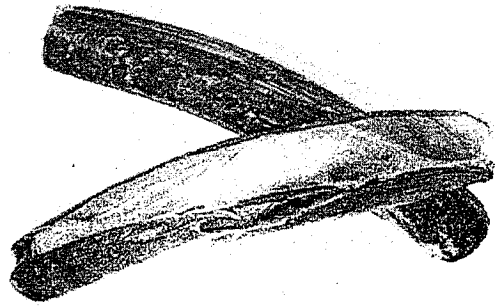
Twice each day at the beach of CCSC, water flows in and out with the tides, providing a tidal flat habitat for students to explore. Technically, this area is called a sand flat (coarse-grained sediment with grain size more than 0.1 mm) and not a mud flat (silt-sized sediment and found near a salt marsh). The flats are home to abundant phytoplankton, zooplankton, snails, oysters, clams, crustaceans, and worms. Many of the animals in this area filter-feed on plankton. Burrowing animals breathe through tubes to get oxygen from the surface. Evidence of other life is the tracks they leave as they travel the flats.



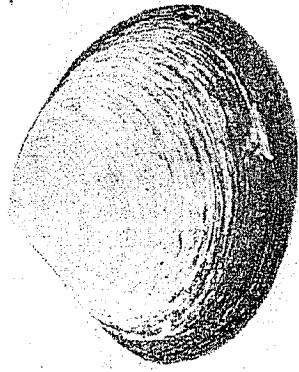
Decorator Worm
with attached material



Common Mollusks of CCSC



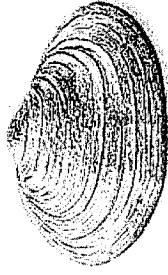
Razor Clam



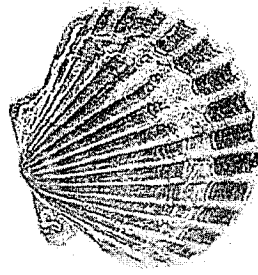
Surf Clam



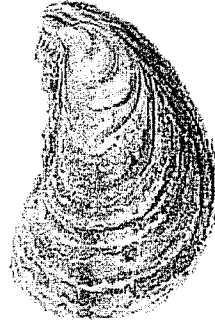
Quahog Clam



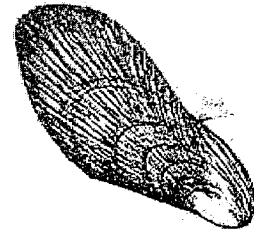
Soft Shell Clam



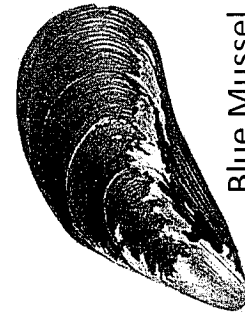
Bay Scallop



Wellfleet Oyster



Ribbed Mussel



Blue Mussel



Jingle Shell



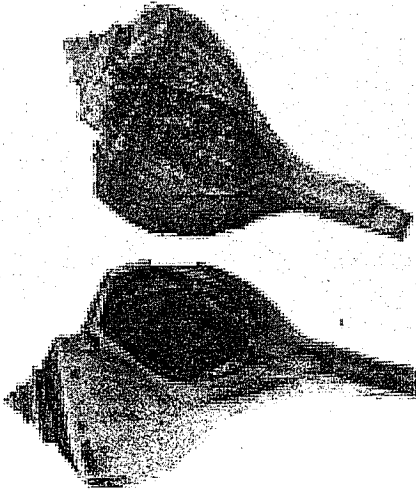
Transverse Ark



Gem Clam

Common Gastropods At CCSC (And Friends)

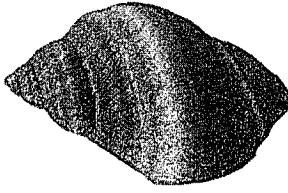
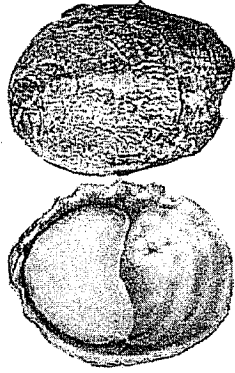
Channeled Whelk



Periwinkle



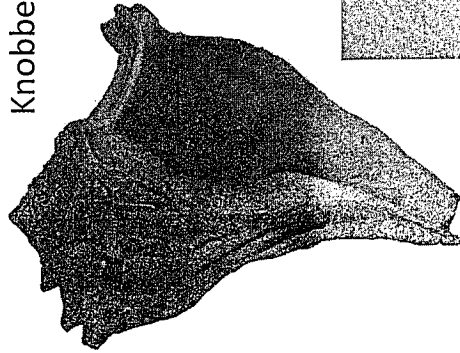
Slipper Shell



Oyster Drill

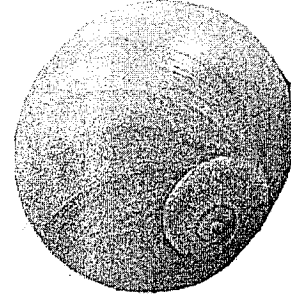


Knobbed Whelk

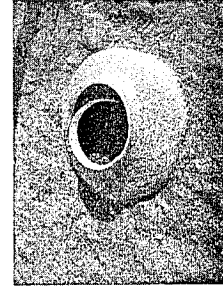


Dogwinkle

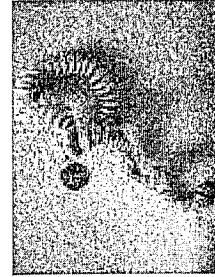
Waved Whelk



Moon Snail



Moon Snail Collar



Whelk Egg Case



Skate Egg Case

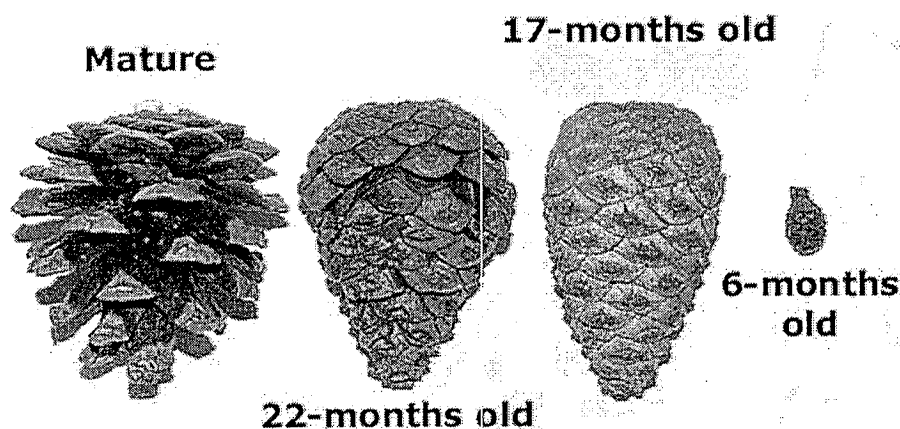
Evergreens of Cape Cod

Identifying evergreens is fun and easy, but the cones provide opportunities to explore a part of nature that is often ignored. Evergreens are monoecious; which means male and female reproductive structures occur on the same plant. Cedar trees are separate plants.

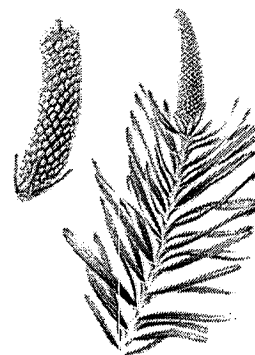
Upon reaching maturity, evergreens form male and female strobili (sing. strobilus). Male "cones" are usually 1-2 cm in diameter and vary in length. They are soft, form on the lower part of the tree, and fall off after dispersing the pollen. Usually they are found in clusters near the end of a branch. Colors can range from yellow to red.

Most female cones are larger, harder, and will usually be higher up on the tree. The "up" and "down" of cones help to cut down on self-pollination. The scales of the female cone are spirally about a central axis. Each scale has a sterile bract and two ovules. The ovules, when fertilized, will produce two winged seeds. The seeds are released at maturity, which varies a great deal depending on the type of tree.

Red Pine Female



Male "cone"



White Pine

Neat Notes:

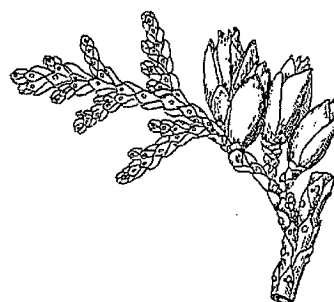
Atlantic White Cedar cones mature in one growing season.

Red Pine cones fall soon after opening and Pitch Pine cones stay on for years.

Easter Red Cedar makes the distinctive blue fruit - famous for elixirs and gin

White Pine cones mature in two years.

Hemlocks have "mast years" every two or tree years.



Atlantic
White Cedar

Evergreens of Cape Cod

Key

A. Leaves are needle-like and in bundles

1. Yes - go to B
2. No - go to E

B. Needles are in bundles of 5

1. Yes - this is a White Pine
2. No - go to C

C. Needles are in bundles of 3

1. Yes - this is Pitch Pine
2. No - go to D

D. Needles are in bundles of 2

1. Needles are dark-green and 4 - 6 inches long - this is Red Pine
2. Needles have a slight twist and are 1.5 - 3 inches long - this is a Scotch Pine
3. Needles are dark-green, stiff, and 3 - 5 inches long - this is Japanese Black Pine

E. Leaves tiny, overlapping scale-like

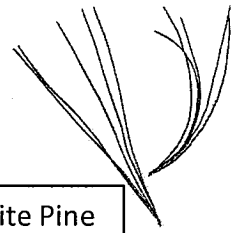
1. Yes - go to F
2. No - go to G

F. Sprays (small branches) are flattened

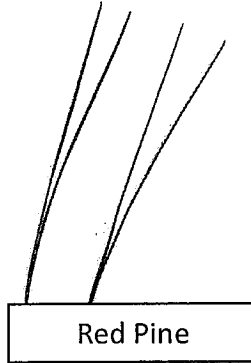
1. Yes - this a a White Cedar
2. No - this is a Red Cedar

G. Leaves are single in a double row along the branch with two white lines underneath

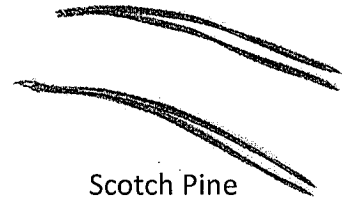
1. Yes - this is an Eastern Hemlock



White Pine



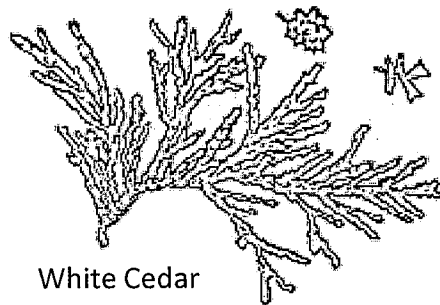
Red Pine



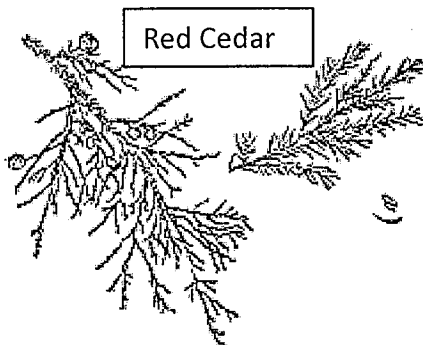
Scotch Pine



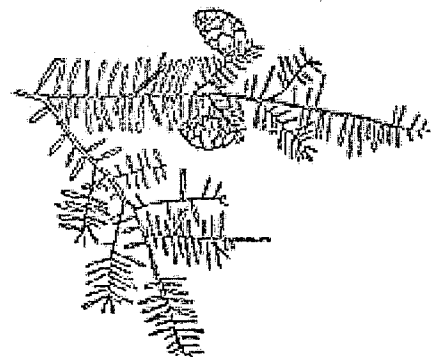
Pitch Pine



White Cedar



Red Cedar



Eastern Hemlock

Circle of Life

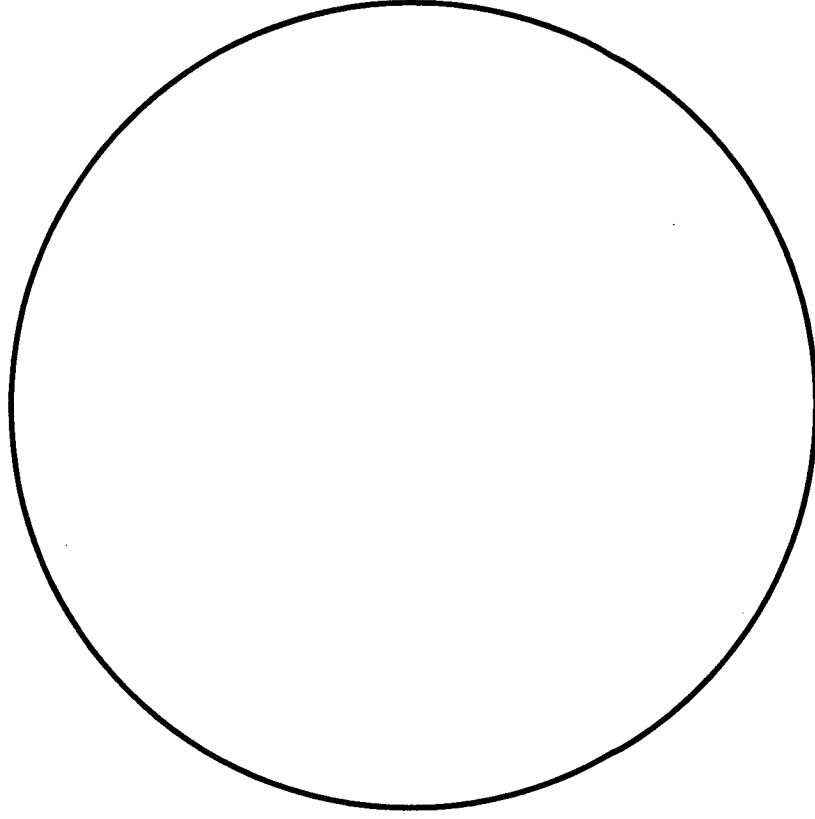
At Your Site:

Look for living organisms or evidence of living organisms within your circle. Decide on a symbol to use for each observation you make. Fill in your symbol in the key and write a short description. Draw your symbols in the circle to show where you observed the organism or evidence.

Symbol Key:

Your Location

Description



Beach Profile Data

