

This resource concept was originally developed by the College View "Trailblazers"

Instructor: Help us improve this resource by sending your feed back to:

Lonny Nelson
lonny@adventsource.org
402-802-8131



INSTRUCTOR BOOK

1. Find & check off at least one animal from each category (A-T):

A. Tunicate (Sea Squirt)



Sea Tulips



Vase Tunicate



Orange Sheath Tunicate



Colonial Tunicate



Salpidae (Salp)

Tunicate, also known as *Urochordata*, tunicata (and by the common names of urochordates, sea squirts, and sea pork) is the subphylum of a group of underwater saclike filter feeders with incurrent and excurrent siphons, that are members of the phylum Chordata. Most tunicates feed by filtering sea water through pharyngeal slits, but

some are sub-marine predators such as the *Megalodicopia hians*.

2a. Describe the swimming action of a sea jelly

Most jellyfish are passive drifters and slow swimmers, as their shape is not hydrodynamic. Instead, they move so as to create a current forcing the prey within reach of their tentacles. They do this by rhythmically opening and closing their bell-like body.

2b. Describe the method of an anemone capturing food

When small fish or other sea creatures swim by the sea anemone's tentacles, the tentacles will paralyze the creature with so-called stinging or nettle cells, which throw out barbed threads. The tentacles drag the paralyzed creature to the mouth in the center of the sea anemone.

2c. Describe the running of a crab

Crabs run sideways on the tips of their claws.

2d. Describe how a starfish digests a clam or oyster when it has such a small mouth opening?

They have two stomachs. One stomach is used for digestion, and the other stomach can be extended outward to engulf and digest prey. This feature allows the starfish to hunt prey that is much larger than its mouth would otherwise allow.

3., 4., & 5. Find a quiet area where your honor class can talk together and listen to you. **Use Supplement Resources.**

S. Hermit Crab



Clibanarius tricolor
(Blue-legged Hermit Crab)



Coenobita clypeatus
(Caribbean hermit crab)



Coenobita compressus
(Ecuadorian hermit crab)

Most species of hermit crabs have long soft abdomens which are protected from predators by the adaptation of carrying around a salvaged empty seashell, into which the whole crab's body can retract. Most frequently hermit crabs utilize the shells of sea snails, marine gastropod mollusks. The tip of the hermit crab's abdomen is adapted to clasp strongly onto the columella of the snail shell. As the hermit crab grows in size it has to find a larger shell and abandon the previous one. Hermit crabs live in the wild in colonies of 100 or more, and do not thrive in smaller numbers

B. Brittle Star or Serpent Star



Green brittle star
(*Ophiarachna sp.*)



reticulated brittle star
(*Ophionereis reticulata*)



Giant red brittlestar
Ophioderma sp.

Brittle stars are echinoderms, closely related to starfish. They crawl across the sea-floor using their flexible arms as "legs" for locomotion. The Brittle star generally have five long slender, whip-like arms which may reach up to 60 centimeters (2 feet) in length on the largest specimens. There are some 1,500 species of brittle stars living today, and they are largely found in deep waters more than 500 metres (1,650 feet) down.

C. Sea Urchin



Strongylocentrotus purpuratus



Paracentrotus lividus

Sea Urchins are small, spiny sea creatures of the class Echinoidea found in oceans all over the world. (The name urchin is an old name for the round spiny hedgehogs sea urchins resemble.) Their shell, which is also called the "test", is globular in shape and covered with spines. The size of an adult test is typically from 3 to 10 cm. Typical sea urchins have spines that are 1 to 3 cm in length, 1 to 2 mm thick, and not terribly sharp. Common colors include black and dull shades of green, olive, brown, purple, and red.

D. Limpet (Snail)



(Common Limpet)

The name Limpet is used for many kinds of mostly saltwater but also freshwater snails, specifically those that have a simple shell which is more or less broadly conical in shape, and which is either not coiled, or appears not to be coiled, in the *Patella vulgate* adult snail.

Thus the word "limpet" is an inexact term, which is fairly often

used as part of the common name of a wide variety of different marine and freshwater gastropod species, some of which have gills and some of which have a lung. The name is given on the basis of a limpet-like or "patelliform" shell, but the several groups of snails which have such a shell are not at all closely related to one another.

Q. Sea Cucumber



Trachythone elongate



Three-Rowed Sea Cucumber



Thymiosyca hilla

and leathery skin, which is found on the sea floor worldwide. It is so named because of its cucumber-like shape. Like all echinoderms, sea cucumbers have an endoskeleton just below the skin, but this can actually be absent in some species

The sea cucumber is an echinoderm of the class Holothuroidea, with an elongated body

R. Tube Worm



Giant tube worm

Canalipalpata. Other groups also called tube worms include members of the phylum Phoronida (horseshoe worms).

The name tube worm may refer to any of a number of unrelated tube-dwelling worm-like invertebrates. These include chiefly various polychaetes, specifically the family Siboglinidae (beard worms), Serpulidae, and related families of the order

O. Bryozoa colony (Moss animal)



Reteporella grimaldii
Costazia costazi

Schizobrachiella sanguinea



Bryozoans are tiny colonial animals that generally build stony skeletons of calcium carbonate, superficially similar to coral. They are also known as moss animals (which is the literal Greek translation) or sea mats. They generally prefer warm, tropical waters but are known to occur worldwide. There are about 5,000 living species, with several times that number of fossil forms known.

P. Barnacle



Poli's Stellate Barnacle

White Acorn Barnacle)



(Rock Barnacle)

A barnacle is a type of arthropod belonging to infraclass *Cirripedia* in the subphylum *Crustacea*, and is hence distantly related to crabs and lobsters. Around 1,220 barnacle species are currently known. The name "Cirripedia" is Latin, meaning "curl-footed".

E. Sea Star



Red-knobbed Starfish

Sunflower Starfish



Starfish belong to the class Asteroidea. They typically have five or more "arms" which radiate from an indistinct disk (pentaradial symmetry). Starfish do not rely on a jointed, movable skeleton for support and locomotion (although they are protected by their skeleton), but instead possess a hydraulic water vascular system that aids in locomotion. The water vascular system has many projections called tube feet on the bottom side of the starfish's arms which function in locomotion and aid with feeding.

F. Mussel or Clamworm



Common Clam Worm

Ragworm)

Clamworms are predominantly marine organisms that may occasionally swim upstream to rivers and even climb to land (for example *Lycastopsis catarractarum*). They are commonly found in all water depths, foraging in seaweeds, hiding under rocks or burrowing in sand or mud. Nereids are mainly omnivorous but many are active carnivores.

G. Sea Jelly



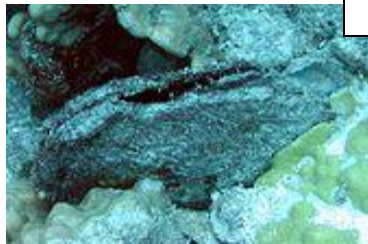
Stinging Sea Nettle



Crystal Jellyfish

Jellyfish are marine invertebrates belonging to the class Scyphozoa of the phylum Cnidaria. They can be found in every ocean in the world and in some fresh waters. They are found drifting in the ocean either by themselves or in great schools. Each has a bell-shaped hollow body with tentacles used for catching food.

H. Oyster



The common name oyster is used for a number of different groups of bivalve mollusks, most of which live in marine habitats or brackish water. The shell consists of two usually highly calcified valves which surround a soft body. Gills filter plankton from the water, and strong adductor muscles are used to hold the shell closed. Some of the groups known as oysters, also known as mullusks (true oysters), are highly prized as food, both raw and cooked. Other groups also called oysters, such as pearl oysters, are not widely eaten. True (edible) oysters are incapable of making gem-quality pearls.

M. Amphipod (Sand Flea)



Hyperia macrocephala



(Skeleton shrimp)

Amphipoda (amphipods) is an order of animals that includes over 7,000 described species of small, shrimp-like crustaceans. Most amphipods are marine; although a small number of species are limnic or terrestrial. Marine amphipods may be pelagic (living in the water column) or benthic (living on the ocean bottom). Pelagic amphipods are eaten by seabirds, fish, and marine mammals. Terrestrial amphipods such as sand fleas can often be seen amongst sand and pebbles or on beaches.

N. Sponge



Cloud Sponge Fire Sponge

The sponges or poriferans (from Latin porus "pore" and ferre "to bear") are animals of the phylum Porifera. Porifera translates to "Pore-bearer". They are primitive, sessile, mostly marine, water dwelling filter feeders that pump water through their bodies to filter out particles of food matter. Sponges represent the simplest of animals. With no true tissues (parazoa), they lack muscles, nerves, and internal organs. There are over 5,000 modern species of sponges known, and they can be found attached to surfaces anywhere down to 29,000 feet.

L. Sand Dollar



Keyhole sand dollar

Pea Urchin

Sand dollars are in the Echinoid (Echinoderms) class of marine animals. When they are living, they are covered with a suit of moveable spines that encompass the entire shell. Like its close relative the sea urchin, the sand dollar has a set of five pores arranged in a petal pattern. The pores are used to move sea water into its internal water-vascular system, which allows the creature to move. Sand dollars live beyond mean low water on top of or just beneath the surface of sandy or muddy areas. The spines on the somewhat flattened underside of the animal allow it to burrow or to slowly creep through the sand. Fine, hair-like cilia cover the tiny spines. Tubefeet or podia that line the food grooves, move food to the mouth opening which is in the center of the star shaped grooves on the underside of the animal called the oral surface. Its food consists of crustacean larvae, small copepods, detritus, diatoms, algae and organic particles that end up in the sandy bottom. On the ocean bottom, sand dollars are frequently found together.

I. Coral



Cavernous Star Coral

Orange cup coral



Brain Coral

Corals are skeletal remains of marine organisms from the class Anthozoa and exist as small sea anemone-like polyps, typically in colonies of many identical individuals. The group includes

the important reef builders that are found in tropical oceans, which secrete calcium carbonate to form a hard skeleton. Over thousands of generations, the polyps lay down a skeleton that is characteristic of their species. A head of coral grows by asexual reproduction of the individual polyps. Corals also breed sexually by spawning, with corals of the same species releasing gametes simultaneously over a period of one to several nights around a full moon. Although corals can catch plankton using stinging cells on their tentacles, these animals obtain most of their nutrients from symbiotic unicellular algae called zooxanthellae. Consequently, most corals depend on sunlight and grow in clear and shallow water, typically at depths shallower than 60 m (200 ft).

J. Ghost Crab



Common Ghost Crab



Yellow Crab

Ghost crabs, also called sand crabs, are crabs of the genus *Ocypode*, common shore crabs in many countries. In the eastern United States, *Ocypode quadrata* is frequently seen scurrying along beaches between sunset and dawn. These crabs are called ghosts because of their ability to disappear from sight almost instantly, scuttling at speeds up to 10 miles per hour, while making sharp directional changes. These creatures have two black eyes, with sharp 360° vision which they use to see flying insects and catch them in mid air. The ghost crab, however, cannot see directly up, so it must burrow into the ground to prevent birds from catching it. The ghost crab tunnels down four feet into the ground at a 45° angle, creating 1-2 inch wide holes, which speckle the beach. At dusk, these crabs will sprint to the ocean in order to obtain oxygen from the water which washes over their gills, and in June, females will release their eggs into the ocean. Ghost crabs hibernate during the winter, holding their breath for six months, by storing oxygen in sacs near the gills. They can also have a natural filter system which gathers oxygen from the air humans breathe, enough to survive for one year without entering into water.

K. Anemone (Sea Flower)



Urticina piscivora
(Fish-eating anemone)



Family *Hormathiidae*
(Fly-trap Anemone)



Anthopleura sola
(Sunburst Anemone)

Sea anemones are a group of water dwelling, predatory animals of the order Actiniaria; they are named after the anemone, a terrestrial flower. As cnidarians, sea anemones are closely related to corals, jellyfish, tube-dwelling anemones and Hydra.

c. Chiton



Tonicella lineata (Lined Chiton)



Acanthopleura (Spiny Chiton)

Chitons live attached to rocks in shallow water. The Chiton feeds mainly on plants of the sea, removing the plant with its radula (rough tongue). They glide using a massive foot. Their back is covered with eight heavy armor-like dorsal plates.