



GLOSSARY

ADAPTATION	Modification of an organism in order to survive within its habitat.
BENTHOS	The substrate at the bottom of a body of water; the adjectival form of benthos is benthic.
BIODIVERSITY	The richness, abundance and variety of life across all trophic levels of which all ecological systems, including the planet earth, are comprised.
BIVALVE	A Mollusk having two shell hinged together. e.g. clam, oyster and mussel.
BLADE	The leaf-like part of a seaweed.
BRACKISH	Water that has more salt than fresh water but not as much as seawater.
BYSSAL THREAD	Tough threads of protein secreted by a gland in the foot of the mussel and used to attach it to rocks, piers etc.
CAMOUFLAGE	Method of hiding in which organisms blend in with their surroundings.
CANOPY	The top layer of the kelp forest where fronds float on the surface.
CARAPACE	In crustaceans, a hard portion of the exoskeleton that covers the fused head and thorax.
CARNIVORE	An animal that consumes other living animals.
COMMUNITY	A group of plants or animals living in the same area and depending on one another for survival.
CONSUMER	An organism that gets its nutrients by eating other organisms.
CRUSTACEAN	An animal with a hard outside shell, antennae, mandibles and compound eyes. e.g. crabs, shrimps and barnacles.
DECOMPOSER	An organism that breaks down organic material and releases simple substances usable by other living things. Examples of decomposers are bacteria and fungi.
DEPOSIT FEEDER	An animal that feeds by ingesting substrate and filtering out the small organic particles on the substrate.
DETRITIVORE	An animal that eats detritus.
DETRITUS	Dead plant and animal material.
DIATOM	A type of microscopic, one-celled photosynthetic organism. All diatoms are surrounded by a silica shell and most are a golden brown in color.
ECHOLOCATION	The use of echoes to navigate or locate prey; sonar used by toothed whales.
ECOLOGY	The study of relationships between organisms and their environment.

EDGE COMMUNITY	A productive area where land and sea interface. This community, because of its proximity to land, receives huge inputs of sediment, nutrients and freshwater, which in turn supports a diversity of plants and animals.
ENDANGERED	An organism that is threatened with extinction.
ENVIRONMENT	The sum of all physical and biological factors that affect an organism.
ESTUARY	A semi-enclosed body of water where salt water and fresh water meet and mix.
EXOSKELETON	A hard encasement deposited on the surface of an animal, such as the outer covering of arthropods that provides protection from abrasion, predation, desiccation, etc.
FILTER FEEDER	An animal which extracts food particles by straining the water. Examples of filter feeders are clams, oysters, sponges and some fish.
FOOD CHAIN	A sequence of living organisms in an ecosystem in which members of one level feed on those in the level below and in turn are eaten by those in the level above them.
FOOD WEB	An assemblage of organisms in an ecosystem, including plants, herbivores and carnivores, which shows the relationship of "who eats whom."
FOOT	The wide, flat or wedge-shaped muscle of mollusks used for crawling, adhering and/or digging.
HABITAT	The particular area in which an organism normally lives.
HERBIVORE	An animal that eats plants.
INVERTEBRATE	An animal without a backbone.
MANTLE	An outer sheet of fleshy tissue (in mollusks) secreting the shell and forming the chamber to enclose the internal organs.
MOLLUSK	The second largest Phylum of animals. Mollusks have soft bodies, a foot, visceral mass, and a mantle. Most also have a shell made of calcium carbonate. Snails, clams, slugs, squid and octopus are examples of mollusks.
MUDFLAT	The salty soil area of land between the lowest low and highest low tide that is flooded with sea water daily and upon which very few plants grow.
NEAP TIDES	Low amplitude tides that occur during quarter moons, when the moon's pull is at a right angle in relation to the pull of the sun.
NEKTON	Swimming animals of open water, the adjectival form of nekton is nektonic.
NEMATOCYST	In cnidarians, stinging capsules used in defense and gathering food.
NERITIC ZONE	The area of the open water that lies over the continental shelf and where there are commonly interactions with seafloor organisms.

OCEANIC ZONE	The area that encompasses the open water that lies beyond the continental shelf.
OMNIVORE	An organism that eats both plant and animal material.
PELAGIC	Living or occurring in the open ocean.
PHOTIC ZONE	Upper sunlight portion of the water column. The depth of the photic zone in the ocean ranges from 30 to 200 meters.
PHYTOPLANKTON	Algae, usually microscopic, which freely drift in the sunlit portions of the water column.
PLANKTON	Drifting aquatic plants and animals; the adjectival form of plankton is planktonic, and a planktonic organism is called a plankter.
POLLUTION	Harmful impact on the environment resulting from human activities.
PREDATOR	An animal that captures other animals for food.
PREY	An animal caught for food.
PRODUCER	An organism that makes its own food; an example of a producer is a green plant.
SALINITY	The amount of salt in the water. Measured in parts per thousand.
SALT MARSH	Salt-water wetland between terrestrial and marine ecosystems; salt marshes can also be seasonal or tidal wetlands.
SCAVENGER	An organism that is an opportunistic feeder; scavengers usually include dead and decaying animal flesh in their diets.
SIPHONOPHORES	A siphonophore is a relative of jellies. It is a translucent chain of specialized parts, each of which carries out a unique function. Siphonophores can reach lengths of up to 95 feet or more!
SIPHONS	The feeding tubes used by some bivalves (clams and oysters) to filter plankton.
SPECIES	A population of plants or animals that are able to produce viable offspring with each other and not with other species.
SPRING TIDES	Occurs every two weeks near the times of either the full or new moon. These are high amplitude tides that occur when the sun, moon, and the earth are lined up.
STIPE	The stem-like part of a kelp plant.
SYMMETRY	Correspondence in size, form, and arrangement of parts.
TENTACLE	A slender, flexible appendage.
TIDES	The daily rise and fall of the sea level along a shore, occurs twice a day on our local shores.
TUBE FEET	In echinoderms, hollow appendages filled with water and operated by the water-vascular system. Used for attachment, movement and the capture of water.
TUBERCLE	Small, round bumps that increase the surface area of the skin.
UPLAND	Ground that is elevated above the lowlands, marshlands, or rivers.
VERTEBRATE	An animal with a backbone. The back bone can be made of bone or of cartilage like in some fish (sharks and rays).

WETLANDS	Areas that periodically have waterlogged soils, support plants adapted to wet soil, and are covered or occasionally submerged by water.
ZOOPLANKTON	Animal plankton.

PRE-VISIT ACTIVITIES

You may want to ask your librarian to set aside ecology or marine science books for your class, or ask students to bring books and magazines from home to share.

ANIMAL ADAPTATIONS

Have your class research and discuss how marine animals protect themselves from their predators or what adaptations they have to become better predators. Have the class team up in small groups and be responsible for researching one phylum. Within each group, each student can choose one animal from this phylum. They can use books or any other resources to put together a report.

SCIENTIFIC CLASSIFICATION

Demonstrate the meaning of scientific classification by having students categorize inanimate objects according to their own framework. You could use fruit, or something ordinary such as different kinds of nails (wood, standard, aluminum, galvanized, ringed, headless), to each small group. Have them categorize and then share their results with each other to start a general discussion on classification. Do we need it? Is any one type of classification better than another? Is there a benefit to sticking to one standardized system of classification?

Activities/Curriculum links:

<https://coast.noaa.gov/estuaries/curriculum/>

<http://www.waquoitbayreserve.org/research-monitoring/salt-marsh-carbon-project/teachers/>

POST-VISIT ACTIVITIES

WEB OF LIFE

Have the students stand in a circle. Ask the students about the habitat they just saw (this will work for any habitat). Ask them where in that habitat all energy begins, (sun).

- Hand the student who answered correctly a ball of yarn.
- Ask what uses the sun's energy to create food (plants). Have them name a plant they saw.
- Have the student with the ball of yarn (still hanging on to the end of the string) toss the ball itself over to the "plant" student.
- Ask, "Who uses plants for energy?" And continue this discussion using herbivores, carnivores, decomposers, and of course, humans,

- With each completed step, students continue to toss the yarn to each other around the circle, creating a complex and interrelated food web.
- Now pick a random student. Because of hunters, or pollution, or loss of habitat (several reasons apply), the component he or she represents has died and must sit down. As he does so, he inadvertently creates a tug on the yarn, thus affecting other aspects of the web of life. Every student, then, who feels a tug on the yarn they are holding is affected in some way by the death of that one individual, and must sit down and tug on their own yarn.

Eventually, all students will be seated and you can discuss the results

ACTIVITY: Creative Classification

Objective:

To create an animal by using physical characteristics to categorize that animal in a classification system.

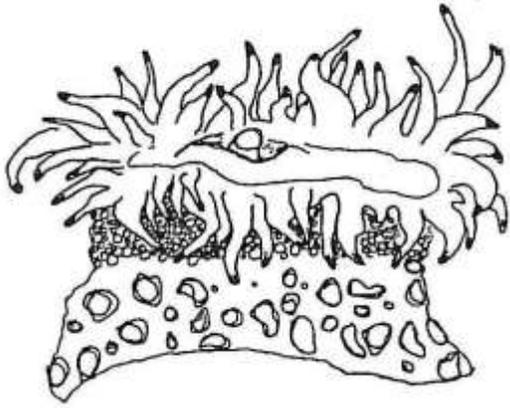
You will need

- Clay
- Paper
- Markers

Procedure:

1. Each student chooses a phylum, class, order, and family in the animal kingdom after which to model their animal. Write down main characteristics. You may want to limit choices.
2. Separate clay into medium sized balls.
3. Give time to design an imaginary animal following the main characteristics of the chosen phylum, class, order and family.
4. Name animal with an original genus species name. Genus is a larger group for similar species. Species category is for organisms with similar structures.
5. Compare “new critters” to the others in the same families.
6. Discuss differences between animal characteristics, habitats, and diets that create *biodiversity*.

NOTE: *You may change this lesson by asking the students to create an animal based on the physical parameters of a given habitat. They can use the same materials and assign their critter a genus & species name as before!*



Anthropura
Elegantissima

TURN YOUR CLASSROOM INTO A BAY

Put blue paper around the classroom and have the students draw in various plants and fish, or have them cut out pictures of marine creatures to put on the blue paper. Let them put some benthic invertebrates on the bottom and plankton on the top!

MOBILES

Let the kids make mobiles of the fish they saw. Take a hanger, some string, some cut-out drawings or pictures of fish and have fun! Attach the fish to the string. Then attach the string at varying lengths to the hanger. Be creative, use pictures of plankton and benthic critters. Possibly take two copies of the fish, glue the edges together, and stuff with some already used paper (recycle it!) and have a 3-D mobile. Older groups can make mobiles in the form of a food chain.

WRITING THANK YOU LETTERS

Write letters to the instructors and/or your class sponsor to tell them about the trip. When we receive letters and pictures back from the kids our instructors remember what a thrill it is to be teachers. The sponsors also enjoy getting direct feedback from the class and teacher to reinforce that they are making a difference for kids learning science. Please include the day, date and time of your trip so we can try to remember your group a little better.

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