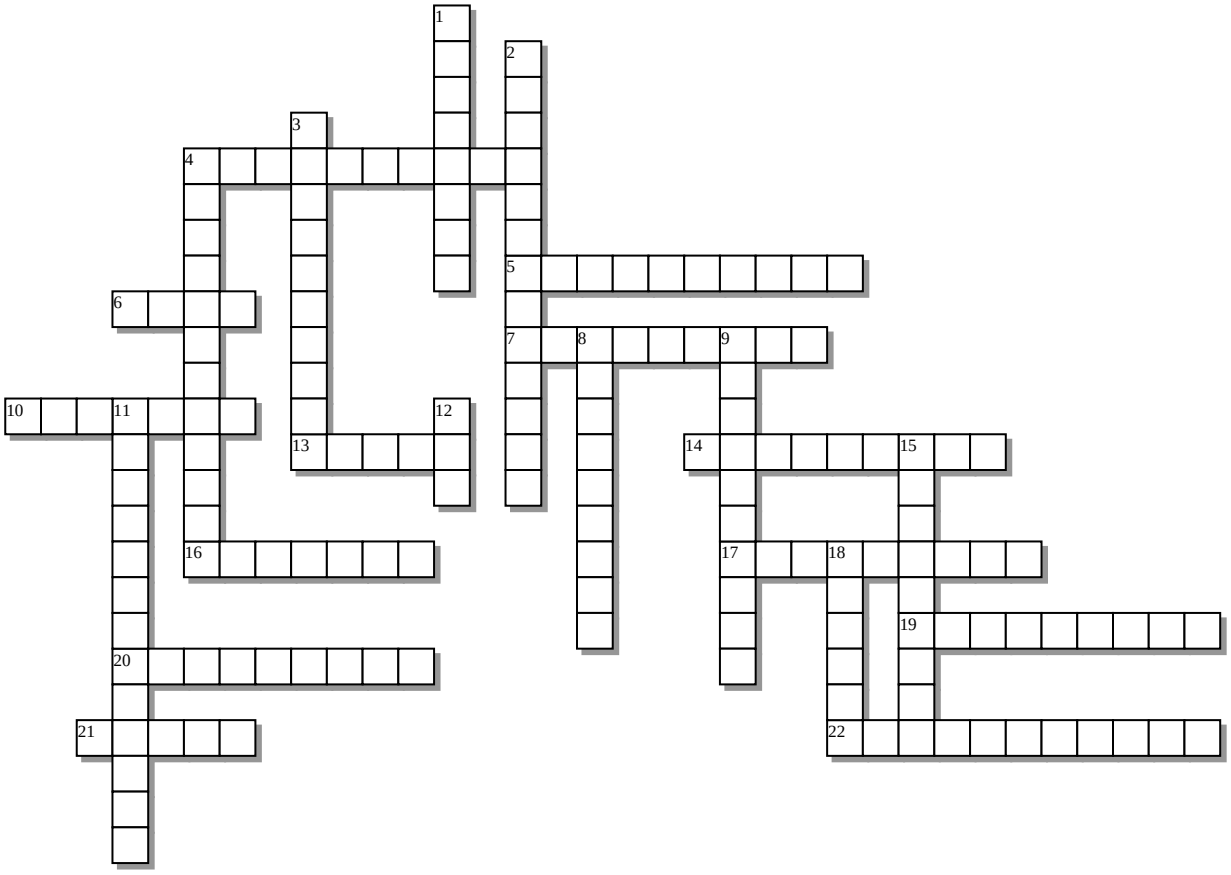
It's a Mutual Thing [ME]

Grades: 3-5
Time: 45 minutes to 1 hour

Goal: To demonstrate the uniqueness of species to adapt symbiotic relationships with each other.

Objectives:
Students will be able to: identify and describe symbiotic relationships in the estuarine ecosystem; define mutualism, commensalism, and parasitism and give examples of each; and understand how predator/prey relationships function through symbiotic relationships.

Directions: Using the clues provided, fill in the crossword puzzle about ecosystem interactions.



Across:

4 - An adaptation that allows the animal to blend in with its environment to avoid being detected.

5 - Symbiosis where one organism benefits while the other is harmed.

6 - An animal hunted for food.

7 - The relationships between groups of populations.

10 - A place an organism lives.

13 - The place or function of a given organism within its ecosystem. Ecological N_ _ _ _

14 - The part of the earth and its atmosphere in which living organisms exist.

16 - The resemblance of an animal species to another species or to natural objects.

17 - The variety, or number of kinds of species. Species D_____

19 - A long term relationship between two or more different species.

20 - Competitive _____ Theory: All organisms exist in competition for available resources.

21 - A regional ecosystem characterized by distinct types of vegetation, animals. Determined by temperature and rainfall.

22 - The interaction between organisms or species, in which the fitness of one is lowered by the presence of another.

Down:

1 - An organism that lives by preying on other organisms.

2 - Competition: Over resources between different species.

3 - Groups of similar individuals who tend to mate with each other in a limited geographic area.

4 - Symbiosis where one organism benefits and the other doesn't benefit, or suffer harm.

8 - Symbiosis where both species benefit.

9 - Organism with unique DNA and cells

11 - Competition: The same species compete for resources.

12 - Food _ _ _ :A complex network of many interconnected food chains and feeding interactions.

15 - The relationships of populations with each other and their environment.

18 - A species that have been introduced to an ecosystem that are not endemic to the area. (non-native) E_ _ _ _ _

Key Words:

Symbiosis Mutualism Commensalism
Parasitism

Background Information:

Adapted from Oregon Institute of Marine Biology

When we think of species interactions, we usually think of them in terms of predator and prey. There are exceptions to this rule, whereby species create symbiotic relationships with one another. That is, at least one organism benefits from the relationship by using the other organism as a niche or habitat for its own needs. Symbiotic relationships can be further classified into three categories: mutualism, commensalism, and parasitism, each described below.

Mutualism is when each organism benefits from the symbiotic relationship, taking from the other what it needs to survive, without harm. A common example from the marine biome is the anemone and clownfish/anemonefish. In this symbiotic relationship, the anemone provides protection from predators and gains nutrients from the fish's waste. The clownfish will gather bits of food the anemone does not take into its body and will clean the anemone of any algae that might hinder it from feeding properly. Another, more local, example is the mutualism between cleaner shrimp and sea bass. Sea bass can acquire a few parasites while near the mouths of rivers. Cleaner shrimp provide a means for the sea bass to rid themselves of the parasites while benefiting from the nutrition they provide.

Commensalism, the second category, is when one organism benefits from the symbiotic relationship and the other organism neither benefits nor is harmed. A great example from the marine ecosystem is barnacles and scallops. Barnacles will attach themselves to hard surfaces, sometimes mollusks or even sea turtle shells. Being attached, they can easily suspension feed in the water column without harming the organism they are attached to. The other organism receives no benefit from having a barnacle attached but is not affected by the attachment.

The third category is parasitism, a symbiotic relationship most noted for the harm one organism emits onto another. A very common example is the tapeworm, which can infect humans by feeding on digestive material in the intestines, stopping the host organism from getting the vital nutrients it needs to survive. They can infect fish and other organisms as well. Another example of parasitism is leeches to a pufferfish. Both organisms can be found in coastal waters, in bays or lagoons. Leeches will attach themselves to the bodies of the pufferfish and, like mosquitos, feed on the host's blood supply. Over time, the pufferfish becomes too weak to sustain the leeches and they will fall off in order to find new host organisms.