Species interactions

Species can have many different types of interactions with each other, some interactions help both species, some help just one of the species, and some can be negative for one or both of the species. All of these interactions are needed to maintain balance in an ecosystem. **Symbiosis** means "to live together," and happens when two species have a close relationship with each other. Interactions that fall under the category of symbiosis are mutualism, parasitism, and commensalism.

Parasitism is an interaction that harms one species and benefits the other species. Most species are also hosts to one or more parasites. Some parasites live on the surface of their host. Others live inside their host. Some parasites kill their host, but most do not. It's easy to see why. If a parasite kills its host, the parasite is also likely to die. Instead, parasites usually cause relatively minor damage to their host. Other types of interactions that harm one species and benefit the other are **predation** (where a predator eats its prey) and **herbivory** (where the consumer eats a plant species).

Competition is an interaction that harms both species. Two species are competing for a limited resource. This reduces the fitness of one or both of the species. For example, hyenas chase away vultures that are trying to eat the remains of the same zebra.

Mutualism is a type of interaction where both species benefit each other. For example, bees and flowers have a mutualistic relationship. The flowers need to bees to pollinate them so their seeds can be fertilized. Bees need flowers to make honey for their hives.

Commensalism is an interaction that benefits one species and does not affect the other species at all. For example, while cattle graze in fields they unintentionally stir up insects that were resting in the grass. Cattle egrets follow the cows' paths and eat these insects. The egrets benefit because cows help them find food. The cows are not benefitted or harmed by the egrets. Or hermit crabs use the shells of dead snails for homes.

Use the following symbols to describe the interactions between organisms in each type of species interaction. (The first type of interaction—parasitism—has been filled-in as an example)

        + = organism benefits
        - = organism is harmed
        0 = organism neither benefits nor is harmed (neutral)

Interaction	Organism #1	Organism #2
Parasitism	+	-
Predation		
Competition		
Mutualism		
Commensalism		

Read through each scenario and determine whether it is a case of parasitism, predation, competition, mutualism, commensalism. Explain the reasoning behind each choice.

1. **Goby fish and shrimp**: The nearly blind shrimp and the fish spend most of their time together. The shrimp maintains a burrow in the sand in which both the fish and shrimp live. When a predator comes near, the fish touches the shrimp with its tail as a warning. Then, both fish and shrimp retreat to the burrow until the predator is gone. The shrimp gets a warning of approaching danger while the fish gets a safe retreat and a place to lay its eggs.

   Interaction: _____

2. **Clown fish and sea anemone:** The clown fish is immune to the stinging tentacles of the sea anemone. By hiding in the sea anemone, the clown fish is protected from predators.

   Interaction: _____

3. **Tapeworm and dog:** The tapeworm attaches to the intestinal wall of the dog and takes nutrients consumed by the dog.

   Interaction: _____

4. **Ant and acacia tree:** The ant burrows into a thorn of the acacia tree to live and eat sugar secreted by the tree. The ants benefit the tree by attacking predators.

   Interaction: _____

5. **Cleaner fish and shark:** The cleaner fish feeds on parasites in the shark's mouth and gills.

   Interaction: _____

6. **Tick and cow:** The tick burrows into the cow's skin to suck blood.

   Interaction: _____

7. **Komodo dragon and water buffalo:** The komodo dragon bites a water buffalo to inject it with venom. About 1 week later, the water buffalo dies of poisoning and is eaten by the komodo dragon.

   Interaction: _____

8. **Tigers and golden jackals:** Lone golden jackals often follow tigers to feed on the tiger's kills once the tiger has finished eating.