Vocabulary:

* Predation –
* Predator –
* Prey -
* Herbivory -
* Competition -
* Symbiosis –
* Parasitism –
* Mutualism –
* Commensalism –

**Relationships and Symbiosis**

1. Most species do not exist as a population. Interdependence drives most organisms to interact with other species as they search for food, find suitable shelter and stay away from predators. Each type of organism will have a different place within its community, but some species have long term and highly impactful relationships with other species. Let’s take an example that is common to most people in the classroom, humans and dogs.

Dogs and humans are two species that have a long-term relationship. Around 40,000 years ago, humans and wolves started interacting. Scientists believe that humans allowed wolves to scavenge for scraps around their campsite because of their ability to give warning about impending danger. Eventually humans and dogs formed a relationship. This relationship allowed humans to utilize dogs to perform tasks and for dogs to have food and shelter.

Using the space below, find a different long-term relationship that exists in the world between two organisms. Explain how the relationship relates to the two major organisms involved.

1. There are six major types of relationships that can exist within a community. These relationships are not always as beneficial as the human and dog example above.

Listed below, we have all six types of relationships. Without looking ahead or looking up any information, discuss with your group members these relationships. You may not fully understand (or even have any clue about) some of these terms, but do your best to try.

Cut out the symbols on the last page of this packet and indicate if the relationship is positive or negative for the species involved. If the relationship is positive for a species, place a check mark. If the relationship is negative, place an “X” mark. If the relationship has no effect on a species place a hyphen mark. **DO NOT AFFIX YOUR MARKERS TO THE PAPER!** We may be changing these markers down when we get more information.

|  |  |  |
| --- | --- | --- |
| **Name of Relationship** | **Species #1** | **Species #2** |
| Predation |  |  |
| Herbivory |  |  |
| Competition |  |  |
| Parasitism |  |  |
| Commensalism |  |  |
| Mutualism |  |  |

New we are going to give you the basic definition to each type of relationship. Once you have read the definitions, I would like to you rethink the chart that you have made above. Make any changes that you deem necessary to the chart.

**Predation** – When one organism kills than consumes all or a part of another organism. *Example: Lions will kill and eat zebras*.

**Herbivory** – When one organism kills than consumes all or part of a plant. *Example: when a squirrel consumes a peach.*

**Competition** – When two species have to divide a particular resource within a common area. *Example: When both Blue Jays and Cardinals share a bird feeder.*

**Parasitism** – When one organism lives off or exploits another organism in order to survive. *Example: A leech will attach and consume blood from a fish.*

**Commensalism** – When an organism unintentionally benefits another organism. *Example: Large herds of water buffalo will often stir up small organisms in tall grass. Egrets are birds that will travel with the buffalo and hunt the organisms when they run away.*

**Mutualism** – When both organisms provide something that is beneficial for the other organism. *Example:*  *Clownfish can live inside of an anemone. This attracts other fish to the anemone which are eaten.*

1. Predation is one of the most common relationships that exist in the wild. Predation is when one organism eat all or part of another organism.

However, for predation to work, there needs to be two organisms that are involved. **Predators** are organisms that are actively searching out and hunting other organisms. **Prey** are organisms that are the ones that are being sought and hunted.

Predators will use the adaptions they have to hunt organisms, while prey will use the adaptations they have to stay away from predators. This is why predators will commonly hunt the organism that are easiest to catch. Often prey organisms that are hunted are going to be the old, young, sick or injured.

Prey organisms will use one of several strategies to avoid being hunted. Speed/agility, false spots or markings, mimicking deadly animals, camouflage and using chemicals to defend themselves are all strategies to avoid being eaten.

Use the chart below to find prey organisms for each of the types of defenses that are listed above. Use your book or the internet to look up these prey organisms.

|  |  |  |
| --- | --- | --- |
| Type of Prey Defense | Organism | How The Defense Works |
| Speed/Agility |  |  |
| False Spots or Markings |  |  |
| Mimicry |  |  |
| Camouflage |  |  |
| Chemical Defenses |  |  |

1. There is very little difference between predation and **herbivory**. The root concept of the two types of interactions are the same. One organism is trying to consume all or part of another organism. The key difference in herbivory is that the organism that is being consumed is a plant.

While many organisms have the ability to defend themselves, as listed in part 3, plants must find new strategies to defend themselves. Their lack of movement limits the amount that they can avoid predators.

Listed below are some plants that defend themselves in interesting ways. Do some basic research on them and see if you can figure out how they defend themselves.

|  |  |
| --- | --- |
| Type of Plant | How Does It Defend Itself? |
| Poison Oak |  |
| Rose Bush |  |
| Acacia Trees |  |

1. If you asked the general public, competition is generally seen as a good thing! Most people relate competition to a scenario where two individuals, teams or businesses will work against each other. The best in each group will come to the surface because each group will have to be their best to win.

**Competition** in the wild is not as nice of an idea. This mainly has to do with the fact that when organisms compete, they have to compete over a resource. Food, water, shelter, access to feeding areas and many other resources fall under the umbrella of competition. When these resources are divided, both species lose.

To demonstrate competition, your teacher will do a brief activity with you.

1. You teacher is going to spread out eight M&Ms on a plate. You will be given a fork. You may utilize the fork in any way that you want to harvest as many M&Ms as you can in 30 seconds. **USING YOUR HANDS IS NOT ALLOWED.** Record your results in the data table below.

|  |  |  |
| --- | --- | --- |
| Number of People Involved | Starting Number of M&Ms | Number of M&Ms Harvested |
|  |  |  |

1. You will be given the same scenario and the same amount of M&Ms, however, you will be under a small amount of competition with a partner. Try to harvest as many M&Ms as possible while a partner does the same.

|  |  |  |
| --- | --- | --- |
| Number of People Involved | Starting Number of M&Ms | Number of M&Ms Harvested |
|  |  |  |

1. Finally you will be given the same scenario, but the competition for M&Ms will increase. You will perform the same experiment, however you will be competing with three other partners.

|  |  |  |
| --- | --- | --- |
| Number of People Involved | Starting Number of M&Ms | Number of M&Ms Harvested |
|  |  |  |

Use the space below to answer questions about competition.

1. When competition increased, did your individual harvest increase or decrease? Back up your answer with data.
2. How was competition demonstrated in the activity?
3. Give an example of how competition could be detrimental to multiple species in the wild.
4. **Symbiosis** is a close relationship between two different species that are in close proximity. There are three different types of symbiosis.

**Parasitism** is when one organism lives off or exploits another organism in order to survive. This is often seen in the wild to create a habitats, reproductive sites or new food sources for a wide variety of organisms. Liver flukes are organisms that can live inside of the ducts of a hosts liver. While there, the liver fluke will absorb nutrients and create eggs that can be shed by the host.

**Commensalism** is when an organism unintentionally benefits another organism. We often find commensalism when one organism finds a way to create a new ecosystem based off of the lifestyle of another species. Orchids are flowers that grow on trees. The utilize the debris built up in the intersections between branches as space to grow. Growing in trees benefits them because they can have more access to the available sunlight.

**Mutualism** is when both organisms provide something that is beneficial for the other organism. Often times mutualistic organisms will be more successful through cooperation. Plover birds are known to go into the mouths of crocodiles, While this is dangerous for most organisms, the Plover Bird cleans the teeth of the crocodile. The bird gets a meal, while the crocodile ensures that it’s teeth are clean.

You will be working in groups of 4 to create a class demo of the symbiotic relationships we worked on so far The demos should clearly show what type of relationship is being demonstrated. These demos should be quick and demonstrate each type of symbiosis.

You can use whatever props or people you need to get your point across. One quick catch, you are not allowed to act like any animals in your sketch. You must use real world human situations to demonstrate the types of symbiosis.

|  |  |  |
| --- | --- | --- |
| Image result for check mark | Image result for x |  |
| Image result for check mark | Image result for x |  |
| Image result for check mark | Image result for x |  |
| Image result for check mark | Image result for x |  |
| Image result for check mark | Image result for x |  |
| Image result for check mark | Image result for x |  |