*** All assignments are to be completed digitally (answers on word documents, photo, video) and emailed to me at jjennings@tusd.net or if you chose to do so, pick up a hard copy at the school on Friday, May 8th between 9am -- 4:30pm. See page 2 below for all pickup and return dates for the rest of the year.

# Distance Learning Assignments for Weeks 4&5 May 11 – May 22

## Ecosystems Teacher: Joe Jennings Subject: 7th Science

1. **Watch** 3 videos on organism interactions and **Create a 1-paragraph response** on how organisms interact with each other and give examples (video links below)

https://www.youtube.com/watch?v=9YGLYz0iCLw

https://www.youtube.com/watch?v=vMG-LWyNcAs&list=PLtXf78zN40CKKw3dQz8l--nSCuY3BoX-e

https://www.youtube.com/watch?v=_EO4Mi2Wysk

2. **Create your own food web** must incorporate at least with 12 or more organisms including plants and animals. (to open the PDF—put mouse pointer on PDF, right click, open with Adobe Acrobat) (examples below)


sample food web 1.pdf


sample food web 2.pdf

3. **Research and Complete the graphic organizer** on Environmental Effects from Human and Natural Disasters (to open the PDF—put mouse pointer on PDF, right click, open with Adobe Acrobat)


graphic organizer for environmental e

4.**Research and Report** (2 page minimum) **Topic : Great Pacific Garbage Patch**

- What is it? - How was it created? - Why should you care?

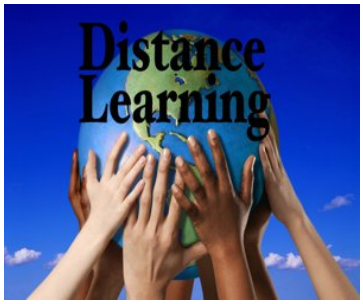
- Possible solutions to this environmental problem?

Questions on assignments or clarifications? (or just want to say "Hello") join in the Zoom video conference meetings daily (Mon-Fri) from 11 - 12am (click link & join)

*** Join Zoom Meeting Meeting ID: 115 968 720 Password: 672098

https://zoom.us/j/115968720?pwd=WG9XT2o0dGFYNExUWk9tRmJWbVJKdz09

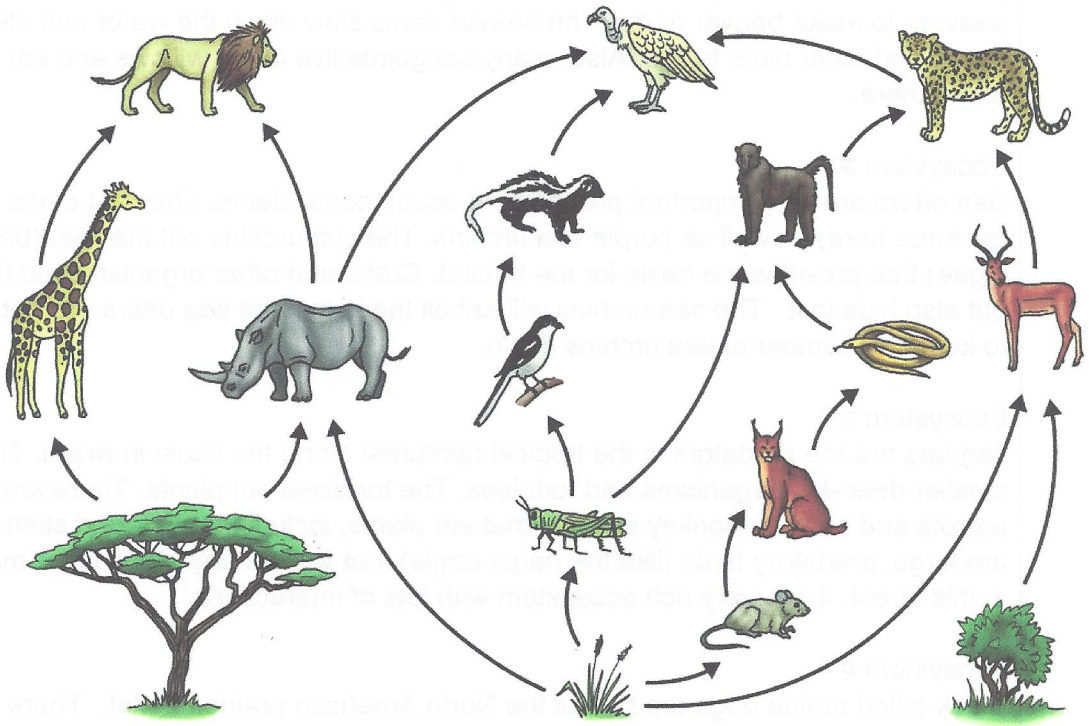
or just email questions to me jjennings@tusd.net between 1:00 to 3:00




# Distance Learning Calendar 2020 for Students

| When | What |
|---|---|
| Thursday, April 9, 2020 | School Sites to Distribute Work to Students – Week #1 |
| Friday, April 10 – Friday, April 17 | SPRING BREAK |
| Monday, April 20, 2020 | Daily Teacher Office Hours to begin – |
| | *Continues Throughout Duration of Distance Learning |
| | Week #1 of Distance Learning for Students |
| Friday, April 24, 2020 | School Sites to Distribute Work to Students – Week #2 - #3 |
| Monday, April 27, 2020 | Week #2 of Distance Learning for Students |
| Monday, May 4, 2020 | Week #3 of Distance Learning for Students |
| Friday, May 8, 2020 | School Sites to Distribute Work to Students – Week #4 and #5 |
| | Student Work Collection Weeks #1 and 2 – Due to School Sites |
| Friday, May 15, 2020 | Student Work Collection – Weeks #3 and 4 – Due to School Sites |
| Friday, May 22, 2020 | Last Day of the 2019-2020 School Year |

**Food Web 1:**



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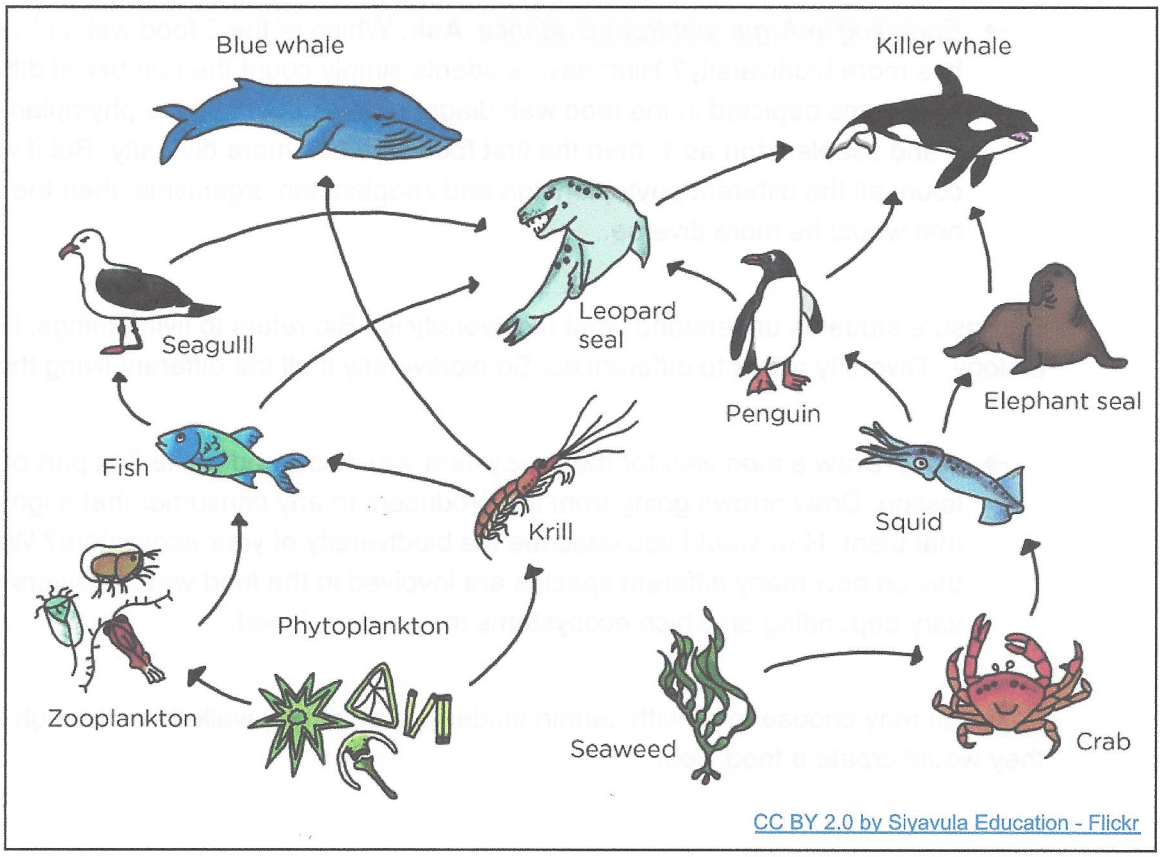
**Food Web 2:**

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| | Negative Effects | Positive Effects | How long before ecosystem regains balance |
|---|---|---|---|
| Forrest Fire | | | |
| Floods | | | |
| Gold Mining | | | |
| Land Clearing for Building Construction | | | |
| Earthquake | | | |
| Nuclear Power and Accidents | | | |
| Storms | | | |
| Invasive Species (Human Caused) | | | |

Question Prompt: What is the biggest difference between natural disasters and human-made disasters?

# Ecological organism interactions

"No man is an island." This saying is also true for organisms in an ecosystem. **No organism exists in isolation**. Individual organisms live together in an ecosystem and depend on one another. In fact, they have many different types of interactions with each other, and many of these interactions are critical for their survival.

So what do these interactions look like in an ecosystem? One category of interactions describes the different ways organisms obtain their food and energy. Some organisms can make their own food, and other organisms have to get their food by eating other organisms. An organism that must obtain their nutrients by eating (consuming) other organisms is called a **consumer**, or a **heterotroph**. While there are a lot of fancy words related to the sciences, one of the great things is that many of them are based on Latin or Greek roots. For example, heterotroph becomes easier to remember when you realize that in Greek, "hetero" means "other" and "troph" means food; in other words, heterotrophs eat other organisms to get their food. They then use the energy and materials in that food to grow, reproduce and carry out all of their life activities. All animals, all fungi, and some kinds of bacteria are heterotrophs and consumers. .

Some consumers are **predators**; they hunt, catch, kill, and eat other animals, the prey. The **prey** animal tries to avoid being eaten by hiding, fleeing, or defending itself using various adaptations and strategies. These could be the camouflage of an octopus or a fawn, the fast speed of a jackrabbit or impala, or the sting of a bee or spines of a sea urchin. If the prey is not successful, it becomes a meal and energy source for the predator. If the prey is successful and eludes its predator, the predator must expend precious energy to continue the hunt elsewhere. Predators can also be prey, depending on what part of the food chain you are looking at. For example, a trout acts as a predator when it eats insects, but it is prey when it is eaten by a bear. It all depends on the specific

details of the interaction. Ecologists use other specific names that describe what type of food a consumer eats: **carnivores** and **herbivores** are meat eaters and plant eaters, respectively. **Omnivores** eat both animals and plants. Once again, knowing the Latin root helps a lot:  "vor" means "to eat or devour," as in "voracious." Put "-vore" at the end of a scientific term for a kind of food, and you have described what an organism eats. For example, an **insectivore** is a carnivore that eats insects, and a **frugivore** is an herbivore that eats fruit. This may seem like a lot of terminology, but it helps scientists communicate and immediately understand a lot about a particular type of organism by using the precise terms.

Not all organisms need to eat others for food and energy. Some organisms have the amazing ability to make (produce) their own energy-rich food molecules from sunlight and simple chemicals.  Organisms that make their own food by using sunlight or chemical energy to convert simple inorganic molecules into complex, energy-rich organic molecules like glucose are called **producers** or **autotrophs**. And here's another quick Greek lesson: "auto" means "self" and "troph" still means "food." So autotrophs are self-feeding; they make their own food. Plants, algae, and microscopic organisms such as phytoplankton and some bacteria, make energy-rich molecules (in other words, their food) from sunlight, water, and carbon dioxide during the process called **photosynthesis** ("photo" means "light, and "synthesis" means "to make" – photosynthesizers are using sunlight to make food). Some producers are **chemosynthesizers** (using chemicals to make food) rather than photosynthesizers; instead of using sunlight as the source of energy to make energy-rich molecules, these bacteria and their relatives use simple chemicals as their source of energy. Chemosynthesizers live in places with no sunlight, such as along oceanic vents at great depths on the ocean floor.

No matter how long you or a giraffe stands out in the sun, you will never be able to make food by just soaking up the sunshine; you will never be

able to photosynthesize. You'll just get sunburned and thirsty and will still need to go eat another organism if you are hungry. Producers use the food that they make and the chemical energy it contains to meet their own needs for building-block molecules and energy so that they can do things such as grow, move, and reproduce. When a consumer comes along and eats a producer, the consumer gets the building-block molecules and the chemical energy that is in the producer's body. All other life depends on the energy-rich food molecules made by producers – either directly by eating producers, or indirectly by eating organisms that have eaten producers. Not surprisingly, ecologists also have terms that describe where in the food chain a particular consumer operates. A **primary consumer** eats producers (e.g., a caterpillar eating a leaf); a **secondary consumer** eats primary consumers (e.g., a robin eating the caterpillar). And it can go even further: a **tertiary consumer** eats secondary consumers (e.g., a hawk eating the robin). A single individual animal can act as a different type of consumer depending on what it is eating. When a bear eats berries, for example, it is being a primary consumer, but when it eats a fish, it might be a secondary or a tertiary consumer, depending on what the fish ate!

All organisms play a part in the web of life and every living thing will die at some point. This is where **scavengers**, **detritivores** (which eat detritus or parts of dead things), and **decomposers** come in. They all play a critical role that often goes unnoticed when observing the workings of an ecosystem. They break down carcasses, body parts and waste products, returning to the ecosystem the nutrients and minerals stored in them. This interaction is critical for our health and health of the entire planet; without them we would be literally buried in dead stuff. Crabs, insects, fungi and bacteria are examples of these important clean-up specialists.

Another category of interactions between organisms has to do with close, usually long-term interaction between different types of

organisms. These interactions are called symbiosis. The impacts of **symbiosis** can be positive, negative, or neutral for the individuals involved. Organisms often provide resources or services to each other; the interaction is mutually beneficial. These "win-win" symbiotic interactions are known as **mutualism (+ +)**. For example, ants living in a tree may protect the tree from an organism that would like to make the tree its next meal, and at the same time the tree provides a safe home for the ants. Symbiotic relationships are not always positive for both participants. Sometimes there are definite losers. In **parasitism (+ -)**, for example, the parasite benefits and the host is harmed, such as when a tick sucks blood out of a dog. **Predation (+ -)** is another winner-loser relationship but it is not symbiosis. The predator benefits and the prey is harmed lethally, but it is a short-term interaction. In parasitism, the parasite does not usually kill its host, but just feeds on it for a long time while it is living.

Other symbiotic interactions, called **commensalism (+ 0)**, are beneficial for one organism, but do not affect the other in a positive or a negative way. The interaction is seemingly neutral for one of the organisms. For example, a barnacle attached to a whale is able to travel thousands of miles collecting and filtering food from the moving water. The whale doesn't seem to be affected by the little hitchhikers. But then again, maybe those little hitchhikers are actually creating a tiny amount of additional drag as the whale moves through the water and therefore the whale has to expend just a little bit of additional energy. If so, that would be a negative impact for the whale. Often, further research reveals that what was originally thought to be neutral for one participant and therefore an example of commensalism, actually has a very subtle positive or negative impact, so the classification is no longer commensalism, but rather mutualism or parasitism. Is a bird nest on a tree limb commensalism, or is there some slight advantage or disadvantage for the tree in having the nest there? It is possible to come up with plausible explanations either way; only detailed research could provide the necessary information to answer the question.

**Competition** is an interesting example of interactions. When two organisms compete or fight for the same limited resource such as food, shelter, a mate, or sunlight, there is usually a winner and a loser **(+ -)**, but if the competitors fight literally to the death and kill each other, the interaction has become negative for both **(- -)**. Competition is also an interesting example because it is just as likely to be **intraspecific** as **interspecific** (language alert: the prefix “intra” means “within” and the prefix “inter” means "between"). An intraspecific interaction occurs within a species (e.g., two bull elephant seals competing for a harem of females or two English ivy plants competing for space and sunlight), and an interspecific interaction occurs between members of different species.

In summary, there are many different kinds of interactions between organisms in an ecosystem and it is not unusual for any particular organism to wear many hats and play multiple roles at different times. For example, we humans are consumers and predators when we hunt, kill, and eat other animals such as a fish or a deer, or when we eat chicken we have purchased at the grocery store or a restaurant. We also have many mutualistic relationships with other organisms, such as our pets. Competition also occurs between humans for resources, even mates! Interactions between organisms, including humans, are the nature of life and have tremendous impact on the functioning and health of ecosystems.