**Food chains**

       [Food Chain Game](https://www.brainpop.com/games/foodchaingame/)



The transfer of energy from one organism to another

**All** living things (plant*s,*animals, bacteria, etc.) need energy to live, and all living things get this energy from food.    A ***food chain*** shows how energy and nutrients are transferred from one organism to another in the form of food.  This food must then be turned into the energy the organism needs to live by a process called **respiration**. A food chain shows the transfer of energy from one organism to another. The arrows point to the organism that *receives* the energy. These arrows are called **strands**.

Plants, algae and some types of bacteria *make their own food* using the sun's energy to combine carbon dioxide (CO2) and water into a food called glucose.  They are called ***producers*** because they produce or make their own food. Organisms that get their energy from consuming other organisms are called ***consumers***.
    Organisms that consume producers are called **primary consumers**.  Organisms that consume primary consumers are called **secondary consumers.**Organisms that consume secondary consumers are called **tertiary consumers**, and so on.

Some organisms consume by absorbing food (ex. fungi and bacteria).  Some organisms consume by eating with special adaptations called mouths (and sometimes teeth or beaks).  Organisms that *eat* plants are called **herbivores** (herb = plant, vore = to eat) Cows and deer are herbivores, as are many insects. They are *also* primary consumers (because they eat producers).
    Organisms that eat other animals are called **carnivores** (carne = meat, vore = to eat). Owls are carnivores because they eat rodents and birds.  Some insects are carnivores. If a carnivore eats an herbivore, it is also called a secondary consumer. Depending on what organism it eats, a carnivore may also be a secondary, tertiary, quaternary (and so on) consumer.   Owls and shrews are both carnivores.  Because the owl eats the shrew, this is an example of a tertiary consumer eating a secondary consumer.
    Organisms that eat both plants and animals are called **omnivores**. People are omnivores, and so are rats, racoons, & skunks. So... is an omnivore a primary, secondary or tertiary consumer?  Well, it depends on what it's eating at the moment.  If it's eating grass, it is a primary consumer.  But when it's eating a rabbit, it's a secondary consumer.  And when it eats a salmon (that eats insects and crustaceans), it's a tertiary consumer. But, usually, we rank them at the highest level of consumption on average.  So a deer will always be a primary consumer, and an owl can be a 5th level consumer.
    Organisms that break down dead or decaying organisms for their food are a special kind of consumer called **detritivores** and **decomposers**.  All detritivores are decomposers because they both consume dead organisms.  But not all decomposers are detritivores.  **Detritivores** (detrit = wear down into bits, vore = to eat; have mouths and *eat* dead bits of plants and animals. Some examples include worms and certain insects (pill bugs, millipedes). **Decomposers** that don't have mouths to eat with, break down or digest dead organisms using special enzymes and then absorb the nutrients (like a sponge absorbs water). Some examples of decomposers include fungi and bacteria.
[*Click*[*here*](http://www.sheppardsoftware.com/content/animals/kidscorner/foodchain/producersconsumers.htm)*to go to a website that explains the parts of a food chain*]
*[See if you can tell the difference between a producer, consumer and decomposer in*[*this game*](http://www.sheppardsoftware.com/content/animals/kidscorner/games/producersconsumersgame.htm)*.]*

Remember: Each consumer in the food chain gets their energy in the form of food by eating another organism - *except*producers, which make their own food.
When you draw a food chain, you then *always* begin with a producer.  Don't forget, the arrows should point to the organism doing the consuming because the energy is transferred into that organism.  See the picture above  for an example.

**Food Webs**

[Fun with Food Webs](http://www.harcourtschool.com/activity/food/food_menu.html)

A ***food web*** is composed of interconnecting food chains.

Because organisms in a habitat generally eat more than one thing, the energy produced in plants connects with several organisms living together.  For example, an owl eats many types of rodents, including rats, voles, shrews and birds.  Since shrews eat insects, and rats and birds are omnivores, you can see that the food chains become interconnected and more complex.

You can learn about energy transfer of the organisms in different habitats when you click on the food web picture on the left AND you may click on [this link](http://www.harcourtschool.com/activity/food/food_menu.html) to play with more food webs

**Energy Pyramid**

[Energy Pyramid Game](http://www.quia.com/cz/9119.html?AP_rand=869480541)



1.   Each stage/level of the pyramid is called a "trophic level,"  or the position an organism occupies in a food chain.  Each trophic level is shared by organisms that occupy the same position in a food chain.
2. As you go up the trophic pyramid, the total number of organisms at the next level decreases from the previous level.
3. The trophic pyramid shows that some, but not all, energy is transferred from one trophic level to the next.
   a. Organisms use energy to grow and move (Metabolic activity = all the things your cells do to help you live).
   b. 90% of the food an organism makes (in the case of a producer) or consumes (in the case of a consumer) is changed back into energy that is used by that organism to live.  The remaining 10% of the food is used to grow (or make biomass), SO the next organism that eats it only receives 10% of the original energy.  For example, calories is a measure of food energy.   A plant might make 100 calories of its own food by photosynthesis.  It will use 90 calories to live and 10% to grow.  When an herbivore eats that plant, it will only get 10 of the original calories that the plant made.  That herbivore will use 9 of those 10 calories for its own metabolism.  If a carnivore eats that herbivore, it will receive only 1 of those calories from the original 10 that the herbivore got. Because energy is lost as you go up the trophic pyramid, there are fewer numbers of consumers as you go up the pyramid.
4.  Trophic levels
    a. The bottom level of the trophic pyramid is made up of the **producers**.  Producers are organisms that make their own food.  These include plants and algae that use the energy of the sun to make their own food.  It also includes certain types of bacteria that use chemicals (instead of the sun) to make their own food.  These bacteria live near underwater volcanoes that are so deep in the ocean that no sunlight can penetrate and they live in total darkness.
    b. **Primary consumers** - All consumers get their energy by consuming other organisms.  Organisms that consume producers are called *primary* consumers, because they get their food from organisms in the first trophic level (producers).
    c. **Secondary consumers**are consumers that consume primary consumers.
    d. **Tertiary consumers** are consumers that consume secondary consumers, and so on....**.\***
5. You can also have higher trophic levels (fourth and fifth) depending on the food chain you are looking at.  For example,
algae --- plankton ----small fish ----large fish-----human----shark   (or shark--- human!)  *(You might see that the arrows are missing.  That's because I can't figure out how to make them and I don't have time right now!!! I hope you remember by now how to make the arrows.  Remember that each arrow is called a****strand****)*
6.  **Omnivores** are organisms that eat producers and other consumers.  Because we are talking about the transfer of energy to different trophic levels, an omnivore is a primary consumer when it is eating a producer and a secondary consumer when it is eating a primary consumer and a tertiary consumer when it is eating a secondary consumer, and so on.  When putting the organism on a trophic pyramid, we place it on the *highest* trophic level that they are consuming at.
7. **Detritivores and decomposers** can also be primary, secondary, and tertiary consumers depending on which level of the trophic pyramid they are eating from.  Decomposers include bacteria and fungi and detritivores.  Bacteria and fungi consume by absorbing their food, while detritivores such as worms get their energy by *eating* dead and decaying organisms.  A worm that eats a dead plant is a primary consumer, while a worm that eats a dead deer is a secondary consumer.  On a trophic pyramid, we put place the decomposers along the side of the pyramid (as seen in your homework and notes).

**\*  Did you ever wonder what the 4th level is called?   Quaternary!!  What about the levels after that????
5th: quinary
6th: senary
7th: septenary
8th: octonary
9th: nonary
10th: denary**

authored from maggie's science connection