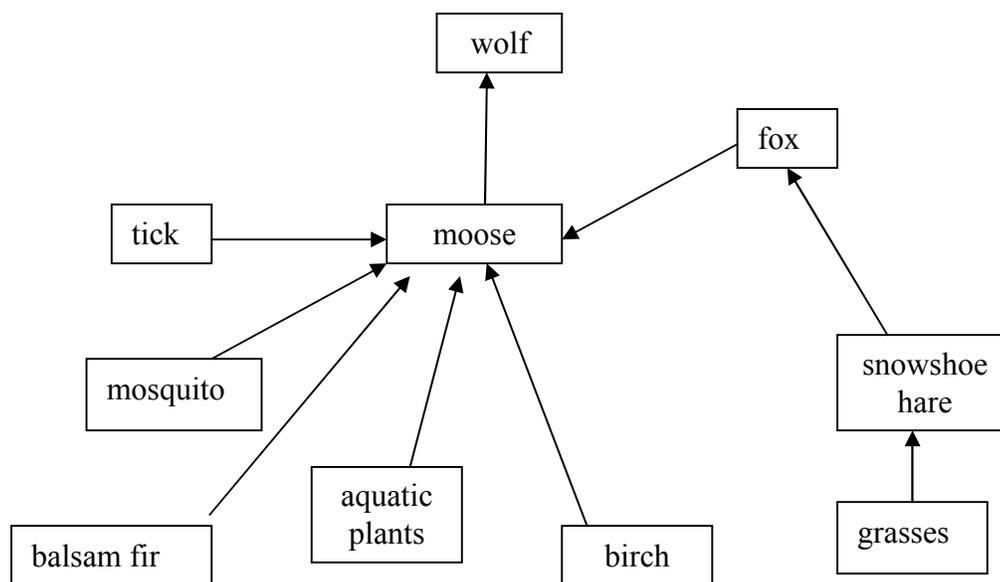


Food Web Question and Answer Exercise Answer Key

1. A food chain is a model that shows a linear pathway through which food is transferred from producers to primary consumers to consumers at higher trophic levels. It differs from a food web, as it is linear, while a food web shows non-linear connections between different food chains in a community.
2. Food chains are limited in length because the laws of thermodynamics limit the amount of energy that can be transferred from one trophic level to the next. Some energy is lost to the environment as heat with each consecutive transfer. Additionally, some of the food energy in each trophic level is lost to decomposers as indigestible waste.
3.
 - a) The following organisms in the food web are producers: *algae, wheat, and grass*. Producers are also known as *autotrophs or first trophic level*.
 - b) A *minnow or paramecium* is an example of an aquatic herbivore in the food web. A *rabbit or field mouse* is an example of a terrestrial herbivore.
 - c) Water spiders are classified as *secondary* consumers and occupy the *third* trophic level.
 - d) Field mice are classified as *primary* consumers and occupy the *second* trophic level.
 - e) The highest trophic level the bass could occupy is the *sixth* trophic level.
 - f) The snake population in this community has been decreasing due to loss of habitat. As a result, the weasel population will *increase* and the field mouse population will *decrease*.
4.
 - a)



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- b) First trophic level: balsam fir, birch, grass, aquatic plants
Second trophic level: moose, snowshoe hare
Third trophic level: fox, wolf, tick, mosquito
Fourth trophic level: fox
- c) As shown in the food web, wolves consume only moose. As a result, a decrease in the moose population would have a direct effect on their number. Conversely, foxes rely on both moose and snowshoe hares for food. Thus, they would have increased their consumption of the hares, allowing their population to remain stable.
- d) Approximately 35 kJ of energy would be available to a wolf that consumes the moose.
- e) Some possible answers include: over-predation by the wolf population, blood loss from a heavy tick infestation, loss of appetite due to a very hot summer, decreased food supply during a harsh winter, disease, introduction of another predator to the island, toxic effects of pollution, over-hunting, etc. (In reality, scientists believe that the first three reasons led to the decline in the moose population.)