

Name: _____

2-4

Ecosystems

ENERGY MOVEMENT

This unit looks at how energy moves within an ecosystem from the sun, to plants, all the way up to the top predator through things called food chains and food webs.



Before looking at this movement there are some important terms to understand.

Activity 1: Definitions

There are many terms that are used to describe the biotic factors in an environment. Defining some of them here is important for later work in this unit.

Go to <http://www.mrhodges.net> and click activity 1 link “Definitions”. The link is to wikipedia.org; enter each word and summarise the first sentence or two of the **Biological** definition.

Producer-

example of a producer:

Consumer-

example of a consumer:

example of a decomposer:

Predation-

example of predation:

Parasitism-

example of parasitism:

Symbiosis-

example of symbiosis:

Competition-

example of competition:

Cooperation-

example of cooperation:

FOOD CHAINS

All energy in the Kazan Uplands ecosystem originally comes from the sun* and is made available to consumers such as squirrels and bears through the work of producers such as plants, algae and bacteria.

If we were to follow the flow of energy from the sun to a bear and write down all of the species that energy goes through it would look like what we call a *food chain*.

A food chain is a way of showing the relationships that exist between animals, plants and micro organisms. Each step along the way is called a *trophic level*.

One thing to keep in mind is that **only 10% of the energy from gets transferred from one trophic level to the next**. The other 90% is used by the plant or animal to move grow and reproduce. As a result there are less individuals of a species the further along a food chain you go.

For example:

Food chains always start with a producer. A producer brings energy into an ecosystem by absorbing the sun's energy and carbon dioxide and making it into food using *photosynthesis*.

Producers are the first trophic level.

An example of a producer is “Lily of the Valley”.

1st Trophic Level Lily of the Valley >>

After energy has been added to an ecosystem by producers it moves into consumers when they eat those producers. This is the second trophic level.

An example of a consumer at the second trophic level is an aphid.

1st Trophic Level Lily of the Valley >> 2nd Trophic Level Aphid »

Consumers can then be eaten by other consumers. This will be the third and fourth etc. trophic levels.

An example of a consumer at the third trophic level is a ladybug.

1st Trophic Level Lily of the Valley >> 2nd Trophic Level Aphid >> 3rd Trophic Level Ladybug

These different trophic levels have been shown in what is called a food chain. A full food chain is shown below.

1st Trophic Level Lily of the Valley >> 2nd Trophic Level Aphid >> 3rd Trophic Level Ladybug

>> 4th Trophic Level Tanger >> 5th Trophic Level Weasel >> 6th Trophic Level Black Bear

All food chains only have a single wildlife species at each level.

ACTIVITY 2- Food Chains

Go to <http://www.mrhodges.net> and click Activity 2 link “Wildlife of the Canadian Shield” link.

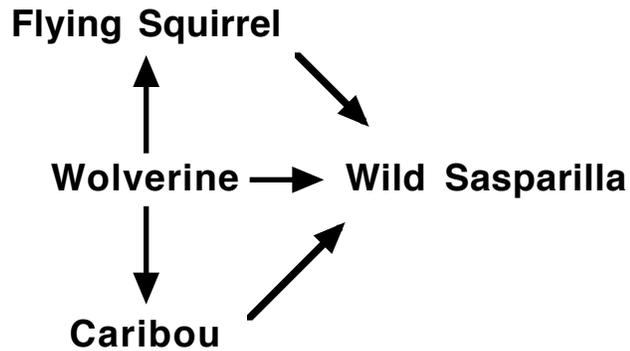
1. Use the information from the wildlife species to construct 2 food chains.

Each food chain must have at least 4 trophic levels. (Hint: Pick a carnivore like the black bear and work backwards by reading the information about their diet.).

FOOD WEBS

A food web is a diagram that shows the interconnections between the wildlife species in an ecosystem and as its name implies it looks like a spider web with many interconnected branches. A way to view a food web is as a collection of interconnected food chains.

e.g.



1. Look at the wildlife of the Canadian Shield page and construct a food web for the Kazan Uplands.

The web must have at least:
10 wildlife species
20 interconnecting arrows

2. From your food web what wildlife species has the most arrows coming to it or leaving from it?

3. What do you think would happen to the ecosystem if this species were to die out?