

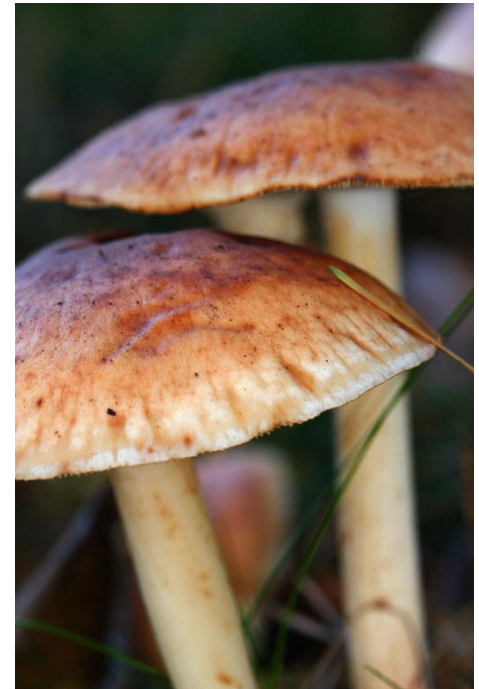
Energy Flow in Ecosystems

A photograph of a small, fluffy yellow chick standing in a vast, green field. The chick is positioned in the center of the frame, looking towards the right. The field is filled with tall grass, and the background is a soft, out-of-focus green. The entire image is framed by a black border.

Each organism has a role in the movement of energy through the ecosystem.

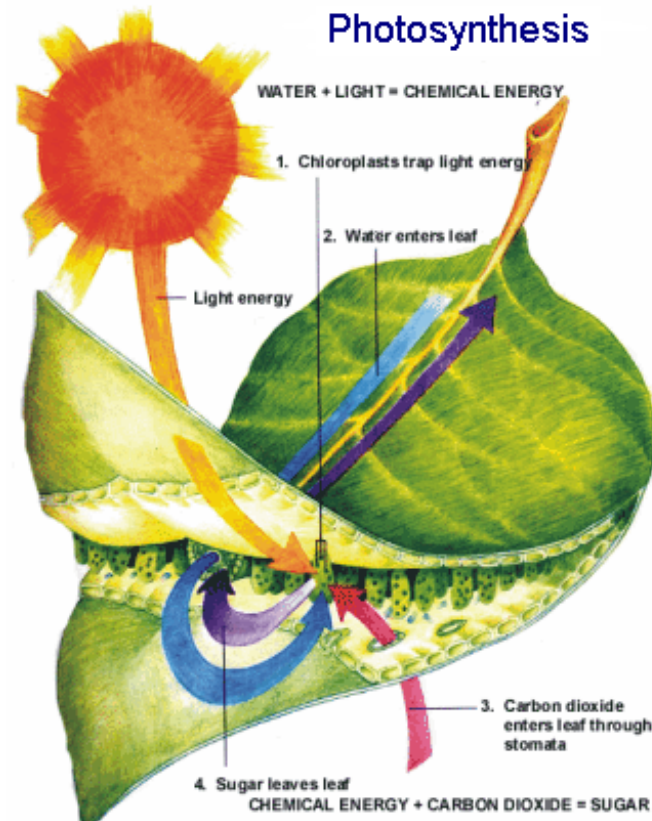
An organism's energy role is determined by how it gets its energy and how it interacts with living things in its ecosystem.

An organism's energy role in an ecosystem may be that of a producer, consumer, or decomposer.



Energy first enters most ecosystems as sunlight.

Organisms such as plants, algae, and some bacteria capture the energy of sunlight and store it as an energy source through the process of photosynthesis.



Carbon dioxide + Water + Sunlight → Glucose + Oxygen

An organism that can make its own food is a producer.
Producers are the source of ***all*** food in an ecosystem.



1. What substances are needed for photosynthesis?

What substances are produced?

2. What would happen if you put a large piece of cardboard over an area of grass for about a week?

3. If you were a producer, what attributes would you possess?

4. If you could come up with a book or movie title for either photosynthesis or the role of a producer (autotroph), what would it be?

An organism that obtains energy by feeding on other organisms is a consumer.

Consumers depend on the producers for food and energy.



Consumers are classified by what they eat.

Consumers that eat only plants are called herbivores.

Caterpillars, cattle, and deer are herbivores.



Consumers that only eat animals are called carnivores.

Lions, spiders, and snakes are examples of carnivores.

Some carnivores are scavengers that feed on the bodies of dead organisms.

Vultures, hyenias, and catfish are examples of scavengers.



Consumers that eat both plants and animals are called omnivores.

Crows, goats, and most humans are examples of omnivores.



Organisms that break down waste and dead organisms and return the raw materials to the environment are called decomposers.

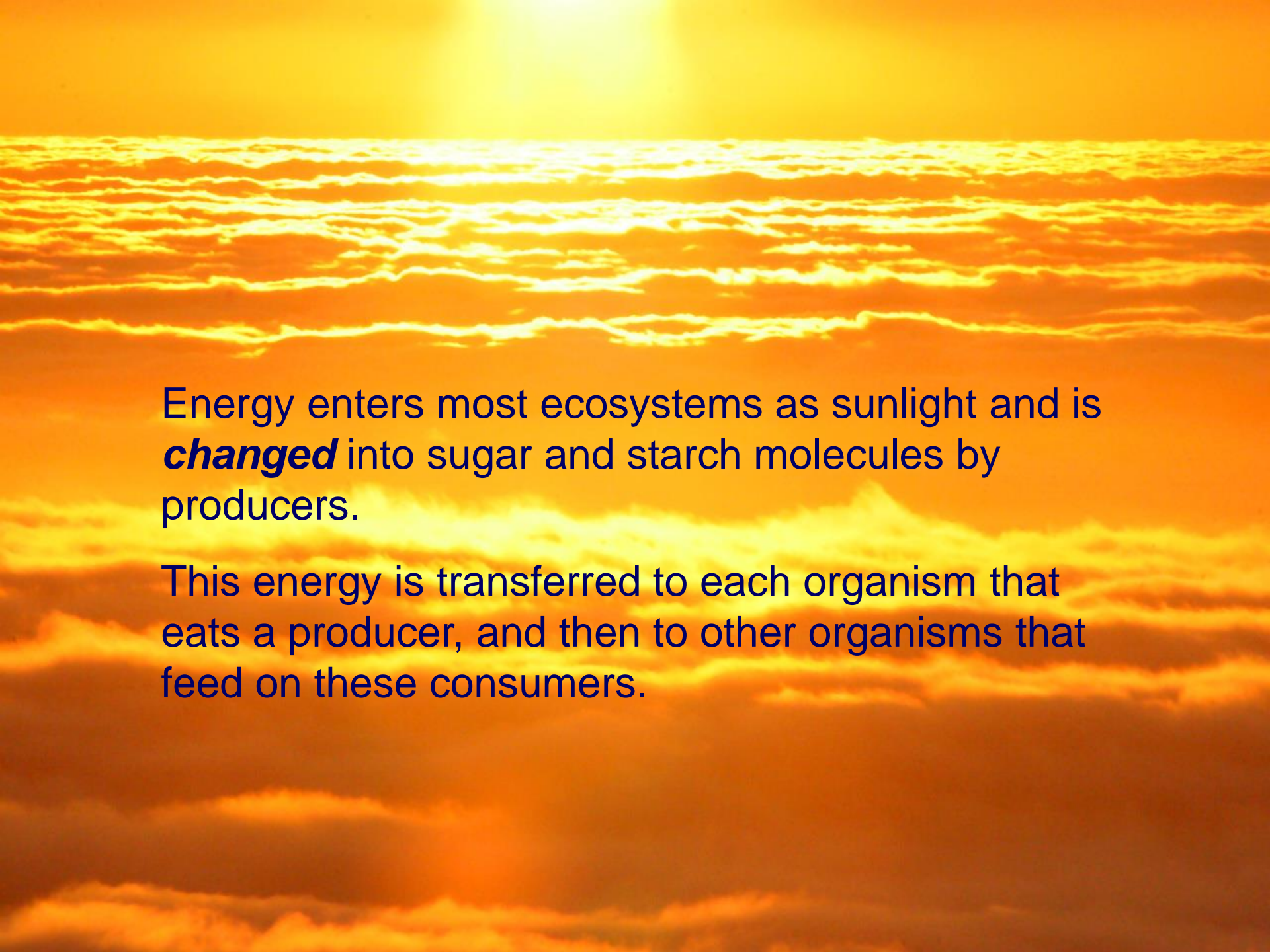
Two major groups of decomposers are bacteria and fungi.

Molds and mushrooms are examples of fungi.

While obtaining energy for their own needs, decomposers return simple molecules to the environment.



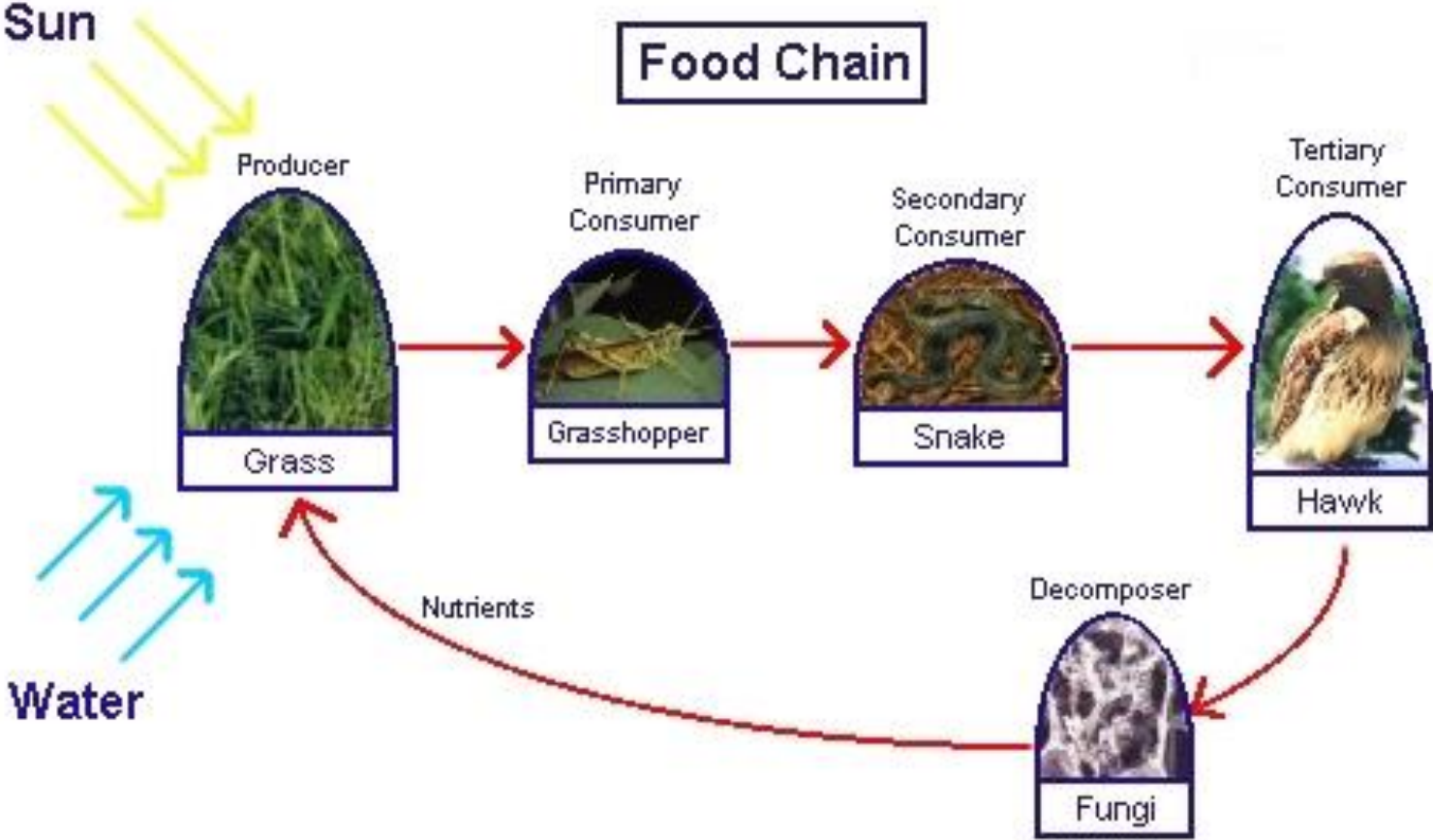
1. Name three organisms that are consumers.
Name two organisms that are decomposers.
2. Compare and contrast herbivores and carnivores.
3. Which would you rather be – a producer, consumer, or decomposer? Why?
4. If each of these roles in an ecosystem (producers, consumers, and decomposers) had jobs in the real world, what would it be? Why?



Energy enters most ecosystems as sunlight and is ***changed*** into sugar and starch molecules by producers.

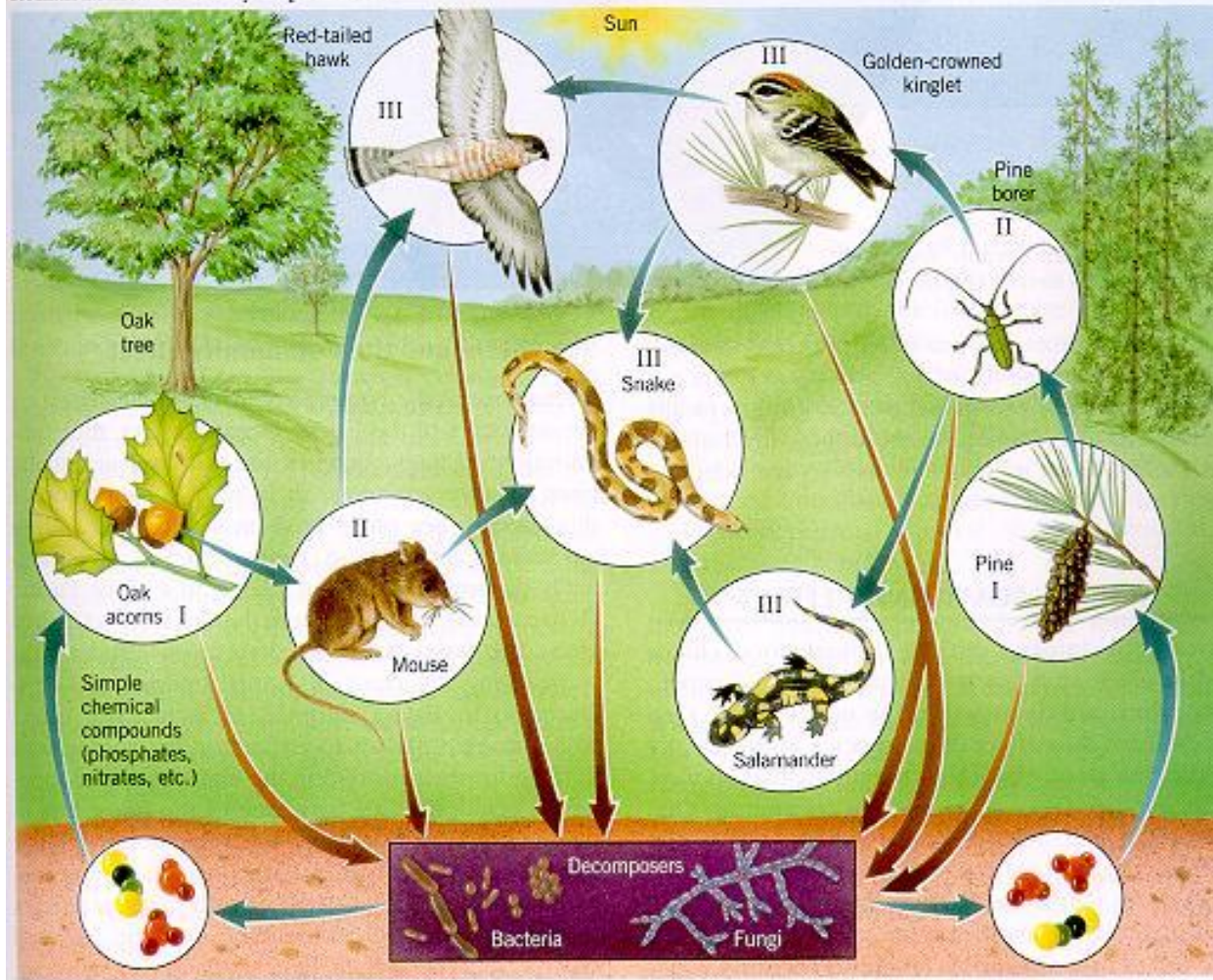
This energy is transferred to each organism that eats a producer, and then to other organisms that feed on these consumers.

A food chain is a series of events in which one organism eats another and receives energy.



A food web consists of many overlapping food chains in an ecosystem.

FIGURE 6.3 Food webs: (a) a typical terrestrial food web. Roman numerals identify trophic levels.



1. What is the first organism in a food chain and why?
2. What is the source of energy for most ecosystems?
3. Draw a simple food chain (other than example given) and label each organism as a producer, first-level consumer, and second-level consumer.
4. Why are food webs a more realistic way of portraying ecosystems than food chains?
5. Due to an environmental catastrophe, all the plankton in the salt water biome of the world has been eliminated. Knowing that plankton is a producer for the majority of first-level consumers, how would this affect your food web as a human?
6. Come up with a song title to describe any level of the food chain or food web.

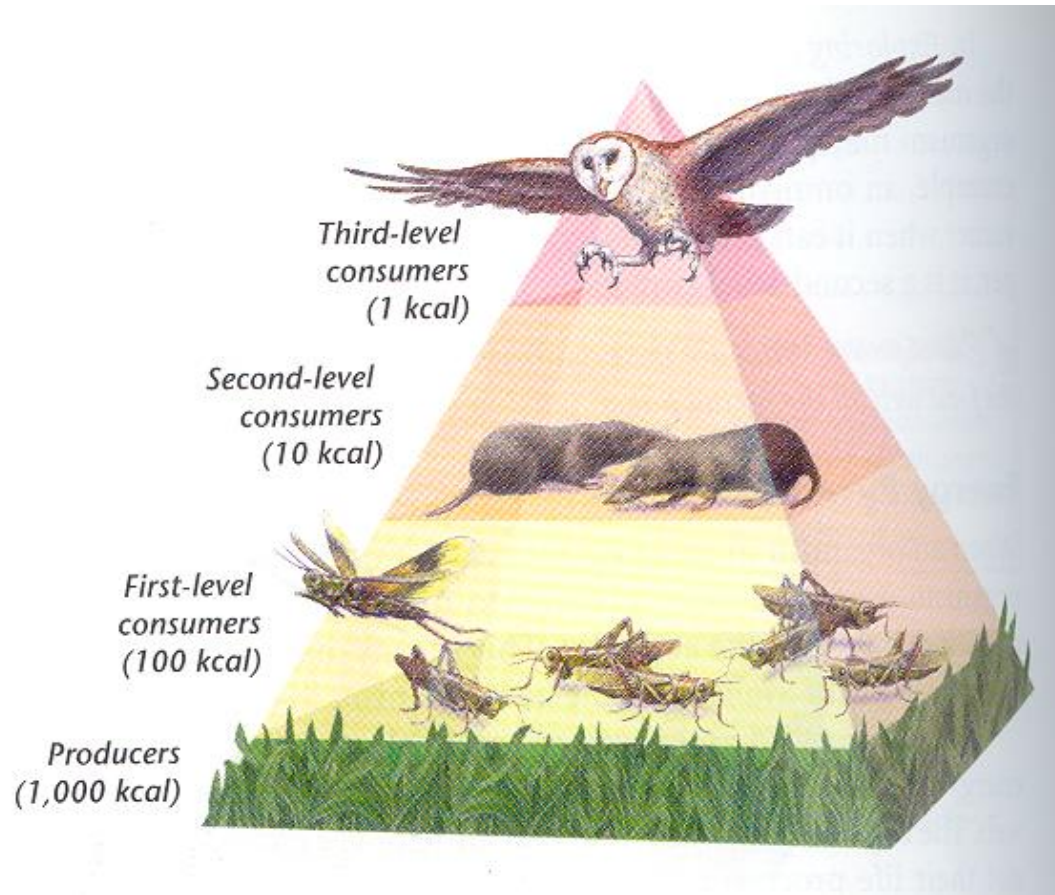
When an organism in an ecosystem eats, it obtains energy.

The organism uses some of that energy to move, grow, reproduce, and carry out life's activities.

As a result, only **some** of the energy is available to the next organism in the food web.



A diagram called an energy pyramid shows the amount of energy that moves from one feeding level to another in a food web.

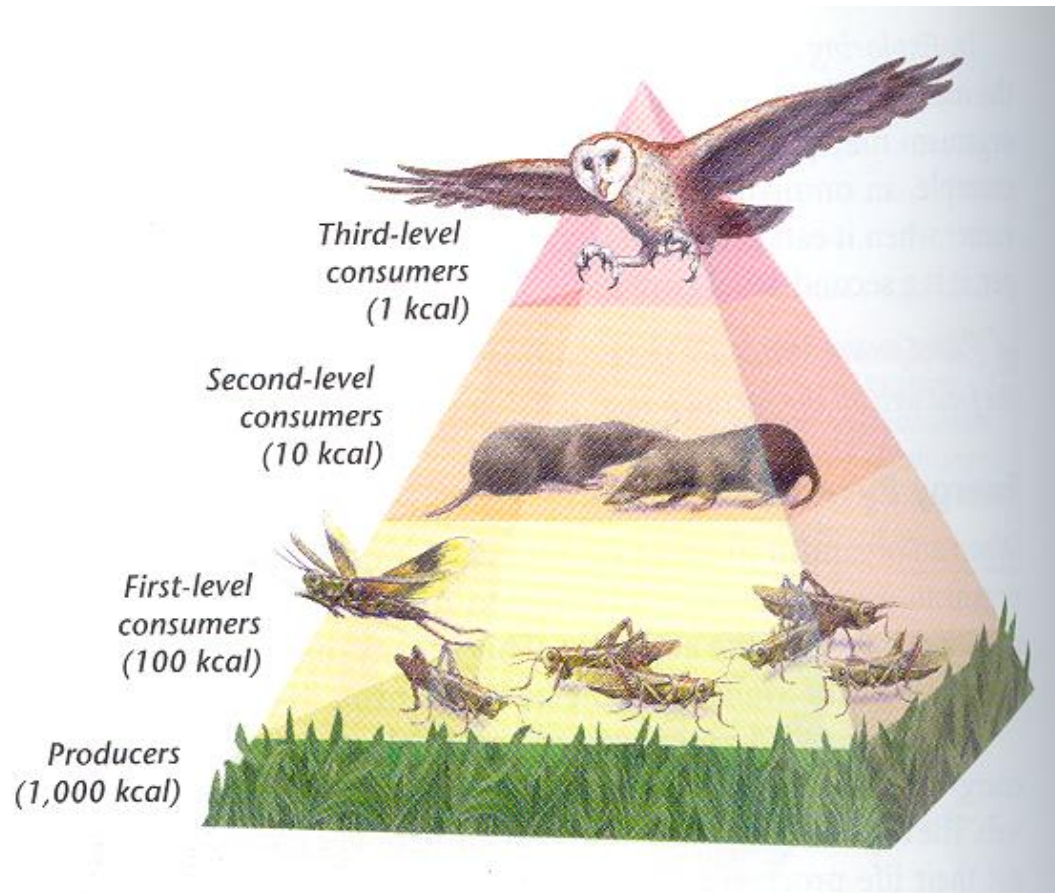


The most energy is available at the producer level.

At each level in the pyramid, there is less available energy than at the level below.

An organism needs 90% of its energy for life functions or is lost as heat to the environment.

Therefore, only 10% of energy at one level is transferred to the next higher level.



1. What is the purpose of an energy pyramid?
2. Use your knowledge of food chains and the energy pyramid to explain why the number of mice in a grassland ecosystem is greater than the number of hawks.
3. Reviewing the levels of the energy pyramids, what position would you want? Why?
4. Using the poetic element “alliteration”, describe an energy level in the energy pyramid.

The End ... ?