



ENERGY FLOW DIAGRAM

The sun gives off electromagnetic radiation that is converted into two useful forms of energy:

THERMAL ENERGY

Thermal energy increases the vibration of electrons resulting in heat. It can also be re-radiated back to space. Thermal energy warms the earth, heats the atmosphere, drives the water cycle and produces air and water currents.

CHEMICAL ENERGY

Chemical Energy: Some special molecules convert light energy into chemical energy by storing it in their chemical bonds (e.g., photosynthetic pigments absorb light energy and convert and store it in the chemical bonds of sugar).

Producers: Most of the energy produced by the plants is lost as heat energy. The remaining energy is stored as chemical energy in the bonds of organic molecules. This is the energy available to the herbivores and the decomposers when the plants are eaten.

First level consumers consume energy stored in plants. Most of the energy consumed is used for maintenance, growth and reproduction. The energy not respired (approximately 10%) is the stored biomass available to next level of the food chain.

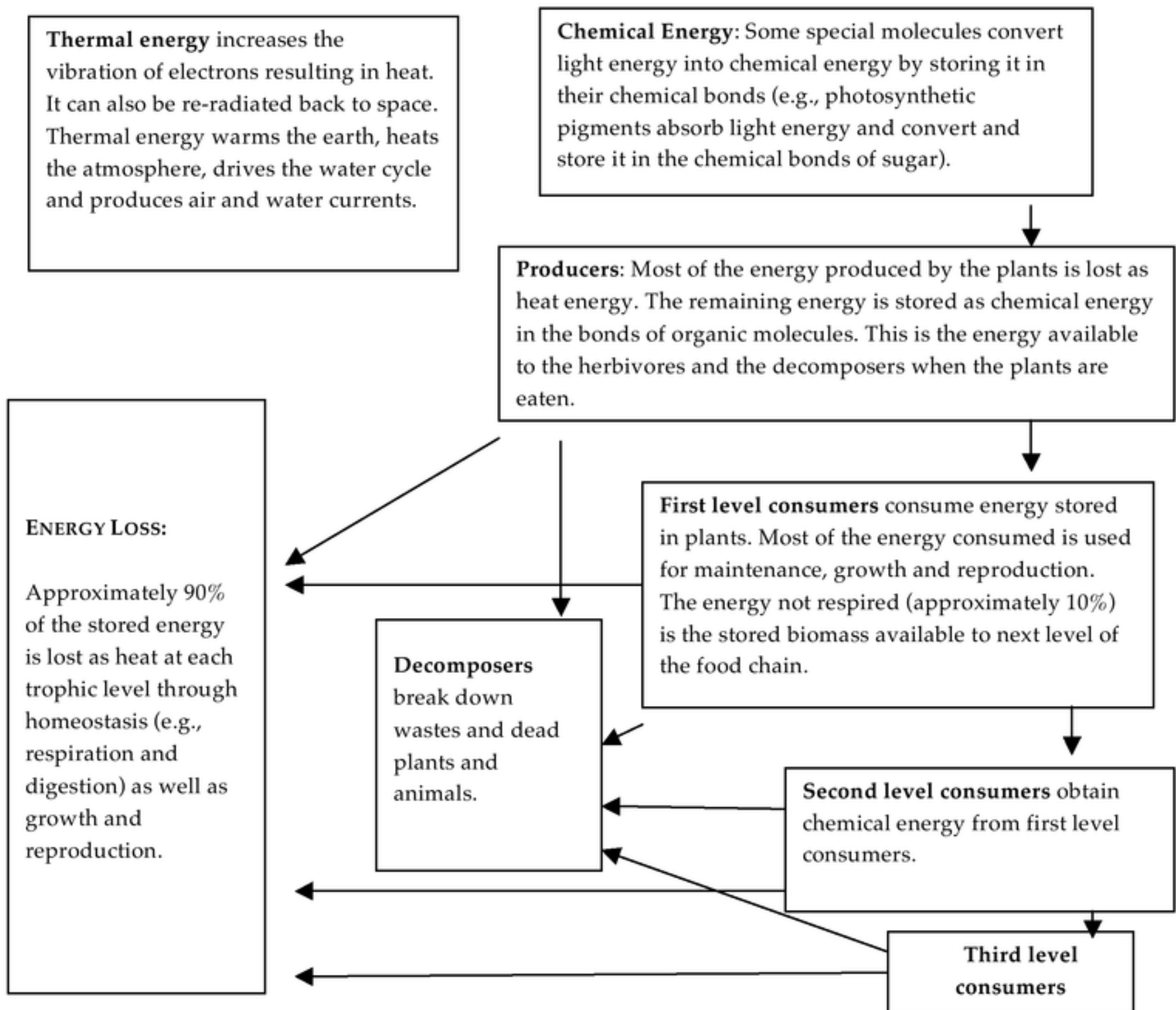
Second level consumers obtain chemical energy from first level consumers.

Third level consumers

Decomposers break down wastes and dead plants and animals.

ENERGY LOSS:

Approximately 90% of the stored energy is lost as heat at each trophic level through homeostasis (e.g., respiration and digestion) as well as growth and reproduction.



STUDENT CHALLENGE: Identify at least two marine organisms for each of the major groups: producers, each level of consumers, and decomposers.

PASSING ON THE ENERGY

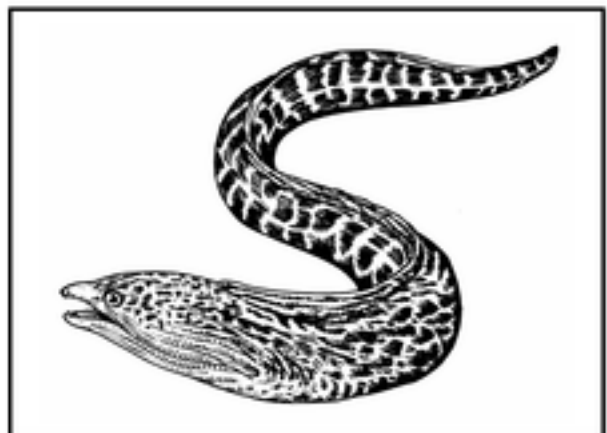
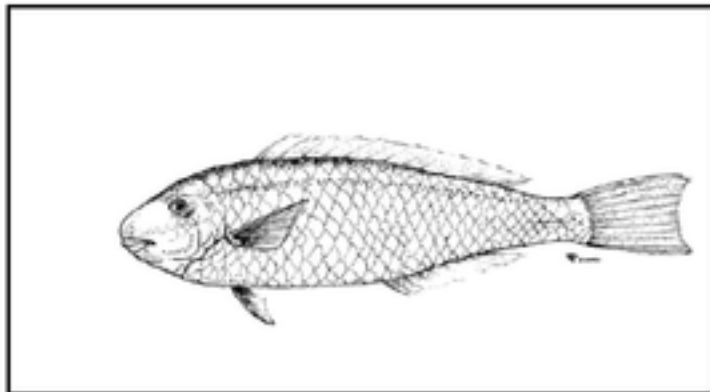
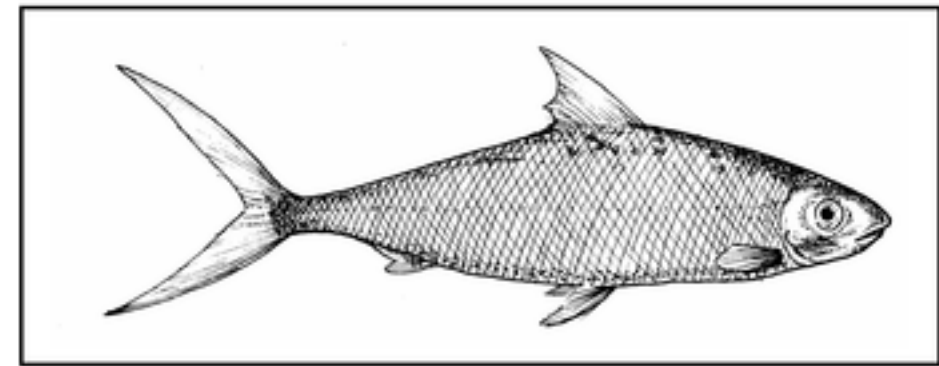
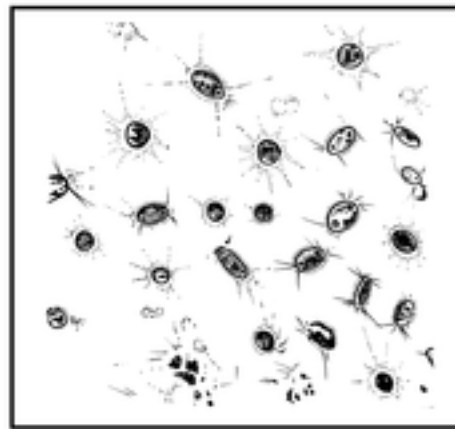
LEARNING LOG - 3

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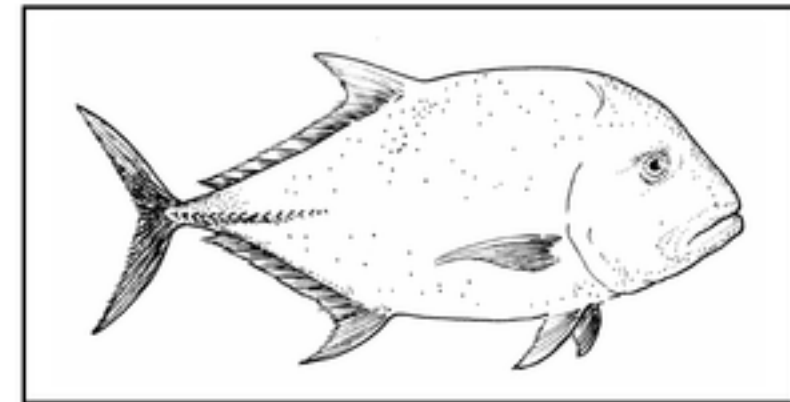
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- Use a solid arrow → to show the direction of the flow of energy from one organism to another in the coral reef food web.
- Use a dashed arrow ---> to show the flow of "Used Energy" for each organism.



Used Energy

% of energy used for cellular respiration at each level in the food web = ____



PASSING ON THE ENERGY**LEARNING LOG - 3**

1. Explain how energy moves through the coral reef food web.
2. Describe the role of photosynthesis in the flow of energy.
3. Describe the role of cellular respiration in the flow of energy.
4. Write a math statement that explains the percentage of energy used for cellular respiration and the percentage of energy passed on to each level in the food chain.

