

**MINISTRY OF EDUCATION**  
**SECONDARY ENGAGEMENT PROGRAMME**  
**GRADE 8**  
**INTEGRATED SCIENCE**

**Week 7**

**Lesson 1**

**Topic:** Feeding Relationships

**Sub-topic:** The role of organisms in the environment

**Objectives:** After reading the handout, students will describe how energy flows in an ecosystem.

**Content**

**How energy is passed on from one organism to another?**

Within the food chain, energy can be passed and transferred from one organism to another.

Energy and nutrients are passed around through the food chain when one organism eats another organism. Any energy remaining in a dead organism is consumed by decomposers. Nutrients can be cycled through an ecosystem but energy is simply lost over time. Each time one organism eats another organism, a transfer of energy occurs. Producers use energy from the sun and create the nutrients consumers take in, when they consume the producers, and use as energy.

The cycle of energy is based on the flow of energy through different trophic levels in an ecosystem ..... At the first trophic level, primary producers use solar energy to produce organic material through photosynthesis. The herbivores at the second trophic level, use the plants as food which gives them energy.

During the transfer of organic food energy from one trophic level to the next higher level, only about ten percent of the transferred energy is stored as flesh.

### How much energy is transferred or passed on?

The amount of available energy decreases from one trophic level to the next. The reason for this is that only around 10 percent of the energy is passed on to the next trophic level. It is released as heat energy during respiration.

### Where does the other 90% of the energy go?

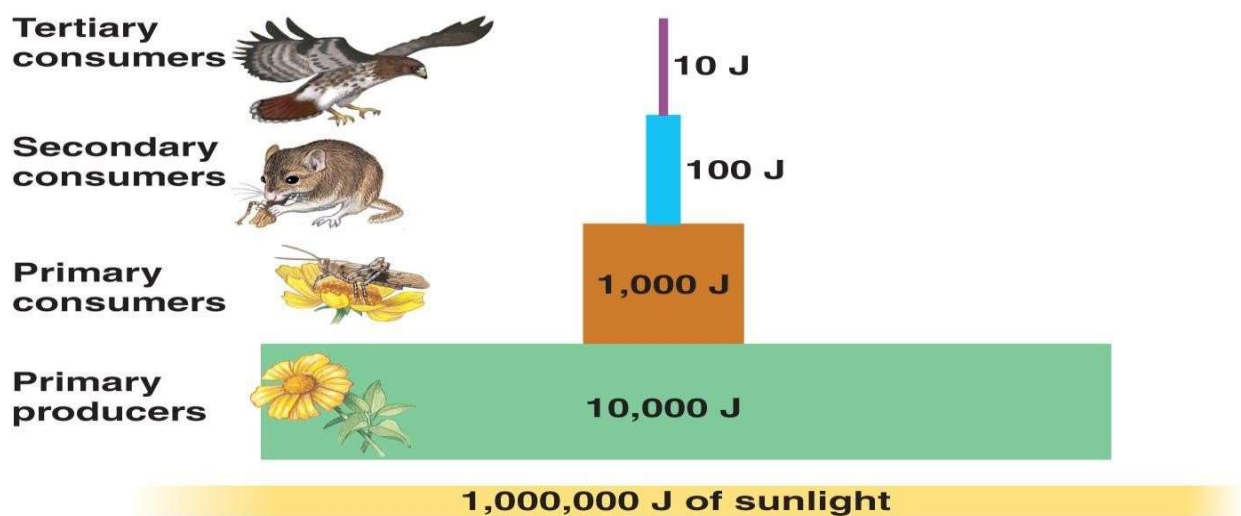
Most of this energy is used to carry on the plant's life activities. The rest of the energy is passed on as food to the next level of the food chain. The figure at the left shows energy flow in a simple food chain. Notice that at each level of the food chain, about 90% of the energy is lost in the form of heat.

### Which trophic level has the most energy?

Since the source of energy is the sun, the trophic level representing producers (plants) contains the most energy.

### Which trophic level has the least amount of energy?

It follows that the carnivores (secondary consumers) that feed on herbivores and detritivores and those that eat other carnivores (tertiary consumers) have the lowest amount of energy available to them.



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**The figure above shows the decrease in energy as you move down the food chain (from producers to tertiary consumers)**

### **Home work**

1. With the aid of a food chain describe how energy flows from the highest to the lowest.
2. Give reasons why the energy level decrease as you move down a food chain.

### **References**

1. [https://en.wikipedia.org/wiki/Ecological\\_efficiency](https://en.wikipedia.org/wiki/Ecological_efficiency)
2. [https://www.google.com/search?q=how+energy+is+passed+on+from+one+organism+to+another&sxsrf=ALeKk01NtbMUaSYuVkJLdcHwmyPMKJvu0Q:1600199508159&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiaoPa9-vrAhWEY98KHR-4AGoQ\\_AUoAXoECA0QAw&biw=1600&bih=740#imgrc=vjnVu\\_o0\\_1Bv5M&imgdii=MhHMTXu\\_YiLmOM](https://www.google.com/search?q=how+energy+is+passed+on+from+one+organism+to+another&sxsrf=ALeKk01NtbMUaSYuVkJLdcHwmyPMKJvu0Q:1600199508159&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiaoPa9-vrAhWEY98KHR-4AGoQ_AUoAXoECA0QAw&biw=1600&bih=740#imgrc=vjnVu_o0_1Bv5M&imgdii=MhHMTXu_YiLmOM)