Energy Flow Through an Ecosystem

Food Chains, Food Webs, Energy Pyramids
Energy for life begins with the SUN
• **Green** plants use raw materials and light from the sun to make **glucose**.

  ![Photosynthesis Diagram](image)

• ENERGY is stored in the molecules of **glucose**.
PRODUCERS can make glucose during photosynthesis
Producers keep and use most of the energy they make for themselves.
Producers use **cellular respiration** to supply the energy for their life functions.
The energy that is not used by producers can be passed on to organisms that cannot make their own energy.
CONSUMERS: Organisms that cannot make their own energy. heterotrophs
Consumers that eat producers to get energy:

• Are **herbivores** (plant-eaters)

• Are called **first order or primary consumers**
Most of the energy the primary consumer gets from the producer is used by the consumer.
Some of the energy moves into the atmosphere as heat.
Energy (in the primary consumer) that is not lost to the atmosphere or used by the consumer itself can be passed on. This energy is available for another consumer.
A consumer that eats other consumers for energy:

- Is called a secondary or second order consumer
- May be a carnivore or a omnivore
- May be a predator
- May be a scavenger
Most of the energy the secondary consumer gets (from the primary consumer) is used by the secondary consumer.
Some of the energy is lost as heat, but some energy is stored and can passed on to the next consumer.
A consumer that eats a consumer that already ate a consumer:

- Is called a **third order** or **tertiary consumer**
- May be a **carnivore** or a **omnivore**
- May be a **predator**
- May be a **scavenger**
Consumers that eat producers & other consumers

- Are called omnivores
- Omnivores eat plants and animals
Decomposers are consumers!

They consume (eat) dead plants & animals and decomposes them - reduces them to simpler forms of matter.

Primary Decomposers: Fungi & Bacteria
• Organisms that are able to break down large molecules into smaller parts
• Decomposers return the nutrients that are in a living thing to the soil
• Consumers that hunt & kill other consumers are called **predators**.

The animals that are hunted & killed are called **prey**.
Consumers that eat other consumers that have already died are called scavengers.
FOOD CHAIN

energy → producer → primary consumer → secondary consumer → tertiary consumer

sun → grass → grasshopper → shrew → owl

producer

start
The transfer of energy from sun to producer to primary consumer to secondary consumer to tertiary consumer can be shown in a **FOOD CHAIN**.
Another way of showing the transfer of energy in an ecosystem is the **ENERGY PYRAMID**.
Energy pyramids show

• That the amount of available energy decreases down the food chain
Energy pyramids show

• It takes a large number of producers to support a smaller number of primary consumers
• It takes a large number of primary consumers to support a smaller number of secondary consumers
Energy Pyramid

- Producers (Low Energy, Large Population)
- Primary Consumers (High Energy, Small Population)
- Secondary Consumers
- Tertiary Consumers (Lowest Energy, Highest Population)
Food Webs:

- Are interconnected **food chains**
- They show the feeding relationships in an ecosystem.
Food Web
Why is a food web a better way of describing the path of food in an ecosystem?