

# The Flow of Energy

Name: ..... Date: .....

Energy is the fundamental force that drives all life on Earth. 🌍 In an ecosystem, energy is constantly moving, or **flowing**, from one living thing to another. This flow of energy starts with the sun, the ultimate source of energy for most of our planet's ecosystems.

Organisms that can make their own food, like plants and algae, are called **producers**. They capture the sun's energy through a process called **photosynthesis**. This process transforms light energy into chemical energy, which is stored in the food they create. Some organisms, like *deep-sea bacteria*, are also producers, but they use **chemosynthesis**—creating food using energy from chemical reactions instead of sunlight.

Next in the energy flow are **consumers**, organisms that get their energy by eating other living things. There are different types of consumers:

- **Herbivores** eat only plants (producers).
- **Carnivores** eat only other animals.
- **Omnivores** eat both plants and animals.

As energy moves from producers to consumers, some of it is used by the organisms for their life processes (like movement and growth) and some is lost as heat. **This means that as you go up the food chain, less and less energy is available.**

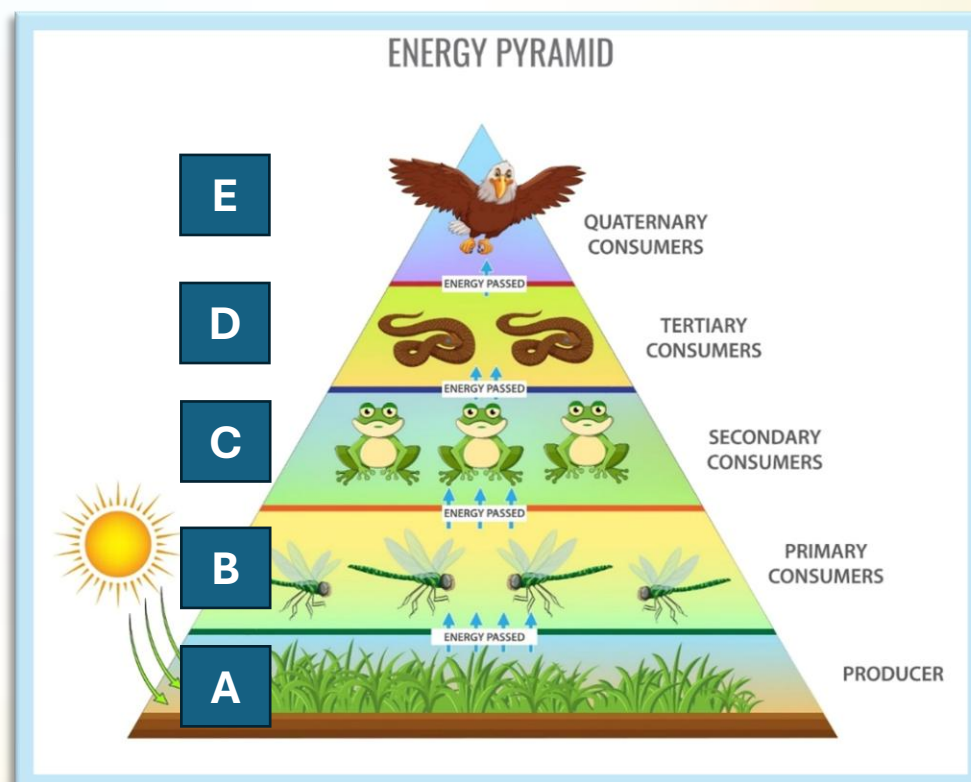
The journey of energy doesn't end with consumers.



When organisms die, **decomposers** (like bacteria and mushrooms) step in. They break down dead matter, returning essential nutrients to the soil. This process, called **nutrient cycling**, is vital for new life to grow and for the whole ecosystem to function. Without decomposers, dead plants and animals would pile up, and the soil would lose its ability to support new life.

To visualize how energy flows, we use models like food chains, food webs, and energy pyramids.

- A **food chain** is a simple, linear model that shows a **single path** of energy flow (e.g., grass → rabbit → fox).
- A **food web** is a more complex model that shows how **multiple food chains** are interconnected in an ecosystem.
- An **energy pyramid** shows the **amount of energy at each trophic level**, with producers at the bottom (holding the most energy) and top predators at the top (holding the least).



## **I. Multiple Choice Questions**

**Choose the best answer for each question.**

- 1. What would happen if decomposers disappeared from ecosystems?**
  - a) Water sources would increase as decomposers are no longer needed.
  - b) Animals would become the primary decomposers in ecosystems.
  - c) Nutrient cycling would stop, and dead matter would accumulate.
  - d) Plants would grow faster without decomposers around.
  
- 2. According to the Law of Conservation of Energy, energy cannot be created or destroyed. How does energy move in an ecosystem with producers like deep-sea bacteria?**
  - a) Energy only moves through sunlight, not through chemical reactions.
  - b) Energy is destroyed during chemosynthesis and not passed on.
  - c) Energy is transformed into food by producers and passed to consumers.
  - d) Energy is created by bacteria and passed to consumers.
  
- 3. Which of the following best describes how energy flows in an ecosystem?**
  - a) producers → consumers → decomposers → sunlight
  - b) sunlight → producers → consumers → decomposers
  - c) sunlight → decomposers → producers → consumers
  - d) sunlight → consumers → producers → decomposers
  
- 4. Raccoons feed on birds, mammals, insects, crayfish, wild grains, and fruit. What type of consumers are raccoons classified as?**
  - a) carnivores
  - b) detritivores
  - c) omnivores
  - d) herbivores





**5. Which statement is NOT true about decomposers?**

- a) they recycle nutrients back into the soil
- b) they include detritivores
- c) they carry out chemosynthesis
- d) they feed on dead organisms

**6. Which of these statements are TRUE about mushrooms? (Select all that apply)**

- a) Mushrooms are classified as producers.
- b) Mushrooms create energy in the soil.
- c) Mushrooms recycle nutrients in the ecosystem.
- d) Mushrooms feed only on animals.
- e) Mushrooms feed only on plants.
- f) Mushrooms are classified as decomposers.

**7. What is the first consumer in this food chain: algae → fish → seal → shark?**

- a) shark
- b) fish
- c) seal
- d) algae

**8. What do herbivores represent in a food chain?**

- a) the producers that make their own food
- b) the consumers that feed on the producers
- c) the consumers that feed on other consumers
- d) the consumers occupying the first trophic level in the pyramid



9. Which organism would have the least amount of energy available to it in this food chain: grass → grasshopper → rabbit → hawk?

- a) the grass
- b) the hawk
- c) the rabbit
- d) the grasshopper

10. What is the role of the lizard in this food web? (Select all that apply)

- a) producer
- b) second consumer
- c) herbivore
- d) carnivore
- e) first consumer
- f) third consumer

## **II. Fill-in-the-Blank Questions**

**Fill in the blank with the correct term.**

11. Organisms that make their own food using sunlight or chemicals are classified as \_\_\_\_\_.

12. A(n) \_\_\_\_\_ is an organism that gets energy by consuming other living things.

13. The antelope is a \_\_\_\_\_ that feeds on grass. The lion is a \_\_\_\_\_ that feeds on the antelope. The antelope belongs to the \_\_\_\_\_ trophic level, while the lion belongs to the \_\_\_\_\_ trophic level.



14. A(n) \_\_\_\_\_ is a group of interconnected food chains in an ecosystem.
15. As energy transfers from the mouse to the snake, the amount of usable energy \_\_\_\_\_.
16. In the energy pyramid, the organisms that make their own food are located at trophic level \_\_\_\_\_, while those that receive the least amount of energy are at trophic level(s) \_\_\_\_\_.
17. A \_\_\_\_\_ is a model that shows how \_\_\_\_\_ flows in an ecosystem through feeding relationships.
18. In this energy pyramid, 7,000 units of energy are available to the buffalo grass. This means that \_\_\_\_\_ units will be available to the prairie dog.
19. A (n) \_\_\_\_\_ is a model that shows the amount of energy at each trophic level in an ecosystem.
20. During \_\_\_\_\_, organisms like deep-sea bacteria use chemical energy to produce their own food.
21. Venus flytraps can make their own food through photosynthesis, so they are \_\_\_\_\_. However, they also catch and eat insects, making them \_\_\_\_\_ as well.
22. Plants get \_\_\_\_\_ from the sun and turn it into another form through \_\_\_\_\_, so they are considered \_\_\_\_\_.



### **III. Short Answer Questions**

**Answer the following questions in complete sentences.**

**23. How does energy flow in an ecosystem?**

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**24. Explain the difference between a food chain and a food web.**

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**25. What does an energy pyramid show, and why does the amount of energy decrease at each level?**

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## Answer Key

1	c) Nutrient cycling would stop, and dead matter would accumulate.
2	c) Energy is transformed into food by producers and passed to consumers.
3	b) sunlight → producers → consumers → decomposers
4	c) omnivores
5	c) they carry out chemosynthesis
6	c) Mushrooms recycle nutrients in the ecosystem. and f) Mushrooms are classified as decomposers.
7	b) fish
8	b) the consumers that feed on the producers
9	b) the hawk
10	d) carnivore and b) second consumer
11	producers
12	consumer
13	herbivore, carnivore, second, third
14	food web
15	decreases
16	A, E
17	food chain, energy
18	700
19	energy pyramid
20	chemosynthesis
21	21. producers, consumers
22	22. energy, photosynthesis, producers
23	23. Energy flows in an ecosystem when one organism eats another, with the process beginning with producers (plants, algae) capturing energy from the sun.





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A food chain is a simple, straight-line model showing a single path of energy transfer (e.g., grass → rabbit → fox). A food web is a more complex model that shows multiple interconnected food chains in an ecosystem, representing a more realistic view of feeding relationships.

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An energy pyramid is a model that shows the amount of energy at each trophic level. The energy decreases at each level because organisms use most of the energy they consume for their own life processes (like movement and staying warm), with only about 10% of the energy being transferred to the next trophic level.

