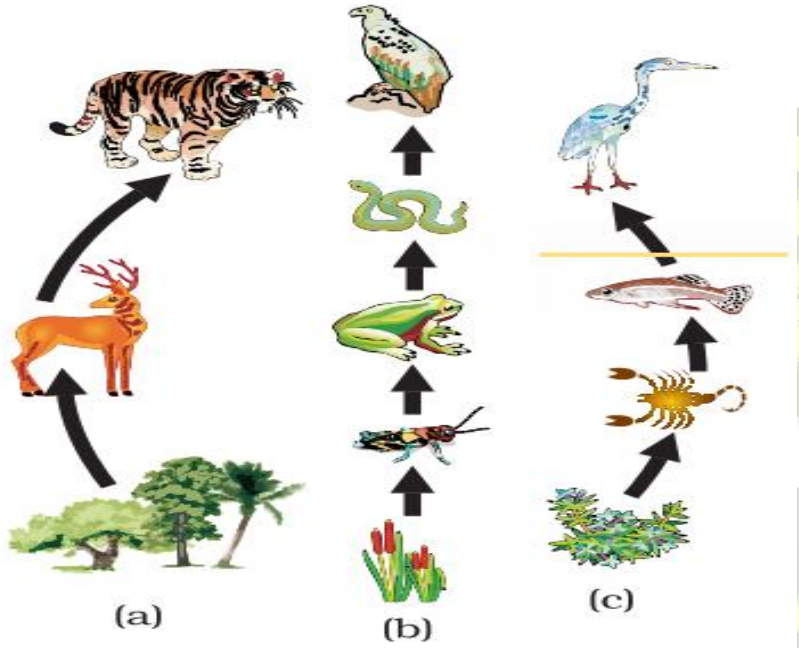
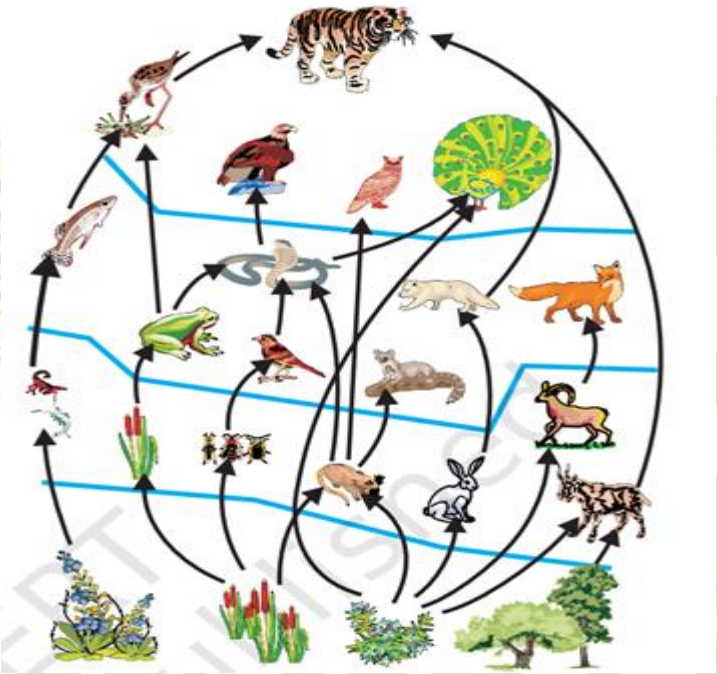
Our Environment

- **What is an ecosystem?**
  - An ecosystem is a community of living organisms (biotic components) interacting with their non-living environment (abiotic components).
  - Examples: gardens, forests, ponds, lakes.
  - Can be natural (forests) or human-made (gardens).
- **Components of an ecosystem:**
  - **Biotic:** plants, animals, microorganisms, human beings.
  - **Abiotic:** temperature, rainfall, wind, soil, minerals.
- **How do organisms obtain food in an ecosystem?**
  - **Producers:**
    - Make their own food through photosynthesis (e.g., plants, some bacteria).
  - **Consumers:**
    - Depend on producers for food (directly or indirectly).
    - Herbivores (eat plants), carnivores (eat animals), omnivores (eat both), parasites (live on other organisms).
  - **Decomposers:**
    - Break down dead organisms and waste, returning nutrients to the soil (e.g., bacteria, fungi).
- **Importance of decomposers:**
  - Essential for nutrient recycling.
  - Without them, dead matter would accumulate, and the soil wouldn't be replenished.

Food Chains and Webs



- **Food Chain:**
  - A sequence of organisms where each one serves as a source of food for the next.
  - Represents the flow of energy and nutrients in an ecosystem.
- **Trophic Levels:**
  - Each step in a food chain is called a trophic level.
  - Producers (plants) are at the first trophic level.
  - Consumers occupy higher trophic levels:
    - Primary consumers (herbivores) eat producers.
    - Secondary consumers (carnivores) eat primary consumers.
    - Tertiary consumers (larger carnivores) eat secondary consumers.
- **Energy Flow in Food Chains:**
  - Energy flows unidirectionally from the sun to producers and then to consumers.
  - Only about 10% of energy is transferred from one trophic level to the next.
  - Most energy is lost as heat or used for life processes.
  - This limits the length of food chains to usually 3-4 steps.
- **Food Webs:**
  - In reality, ecosystems have interconnected food chains forming a food web.
  - Organisms often eat more than one type of food, creating a complex network of feeding relationships.



- **Biological Magnification:**
  - Harmful chemicals (like pesticides) can enter the food chain and accumulate in organisms.
  - The concentration of these chemicals increases at each trophic level.
  - Humans, being at the top of the food chain, can accumulate the highest concentrations of these harmful substances.

How Our Activities Affect the Environment

- **Humans are part of the environment:**
  - Environmental changes affect us.
  - Our actions also impact the environment (e.g., pollution).
- **Ozone Layer Depletion:**
  - **Ozone Layer:** A protective layer in the atmosphere made of ozone (O3).
  - **Importance:** Shields Earth from harmful ultraviolet (UV) radiation from the sun.
  - **UV Radiation Effects:** Can cause skin cancer and damage other organisms.
  - **Ozone Formation:**
    - UV radiation splits oxygen (O2) molecules.
    - Free oxygen atoms (O) combine with O2 to form ozone (O3).
  - **Ozone Depletion:**
    - Caused by human-made chemicals like chlorofluorocarbons (CFCs).
    - CFCs were used in refrigerators and fire extinguishers.
  - **International Efforts:**
    - The UN Environment Programme (UNEP) led efforts to reduce CFC production.
    - CFC-free refrigerators are now mandatory globally.

This section highlights the impact of human activities on the ozone layer, a critical component of our atmosphere. It also shows how international cooperation can help address environmental problems.

Managing the Garbage We Produce

- **Waste Generation:**
  - We produce a lot of waste in our daily lives.
  - This includes things like food scraps, packaging, and old products.
- **Biodegradable vs. Non-biodegradable:**
  - **Biodegradable:** Substances that can be broken down by natural processes (e.g., food scraps, paper).
  - **Non-biodegradable:** Substances that cannot be broken down easily (e.g., plastics, some metals).
    - These can persist in the environment for a long time and cause harm.
- **The Problem of Garbage:**
  - Garbage accumulates in towns, cities, and tourist areas.
  - This poses a challenge for waste management.
- **Factors Contributing to Increased Waste:**
  - Improved lifestyles lead to more consumption and waste.
  - Increased use of disposable products.
  - Changes in packaging, with more non-biodegradable materials.
- **Impact on the Environment:**
  - Non-biodegradable waste can pollute the environment (land, water, air).
  - It can harm wildlife and ecosystems.
  - It can also affect human health.

This section emphasizes the growing problem of waste generation and the importance of understanding the difference between biodegradable and non-biodegradable materials. It also highlights the need for responsible waste management practices to minimize our impact on the environment.

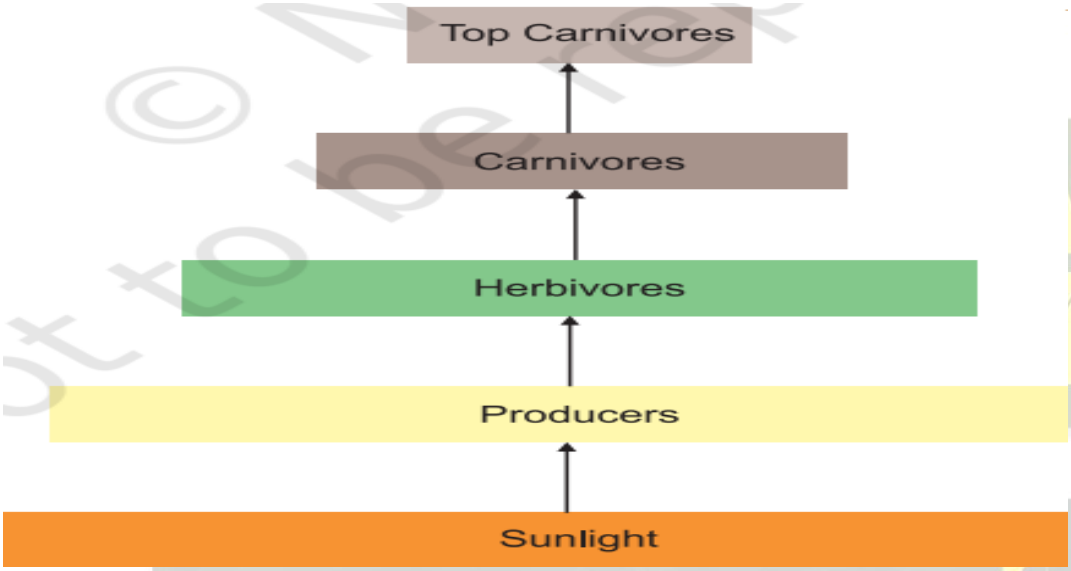


Diagram showing flow of energy in an ecosystem