

CHARACTERISTICS OF LIFE



Biotic Factors

Living components
plants and animals



Abiotic Factors

Non-living components
temperature, precipitation, humidity,
wind, nutrient availability, soil, sunlight

-Biology -
The study of life!!!



All living things are made up of cells

- basic building blocks of all life

2 Types of cells

Prokaryotic

- ✓ no nucleus
- ✓ have DNA
- ✓ small
- ✓ simple

Ex. bacteria

Eukaryotic

- ✓ have a nucleus
- ✓ larger
- ✓ more complex

Ex. protist, fungi, plants, animals



All living things reproduce

2 Types of reproduction

Asexual

- no exchange of DNA
- only has 1 parent
- cells split forming 2 identical offspring
- no genetic variation
- also called **mitosis**

Sexual

- combination of both parents DNA
- requires **both** male and female
- more genetic variation
- **Meiosis**



Living things are based on a Universal Genetic Code

- all living organisms have DNA
- all DNA is made of the same chemicals



Living things grow and develop

- **Growth**- gets bigger by mitosis
- **Develop**- characteristics that develop during your lifetime



Living things maintain a stable internal environment

- **Homeostasis**- keeping the internal environment stable (temperature, blood pressure, pH of blood)
- **Metabolism** maintains homeostasis



Living things respond to their environment

- detect and respond to changes (**stimulus**) in their environment
- senses are used to detect change

Examples

Stimulus	Response
cool breeze	goosebumps, shivering
hunger	stomach growls
light (plant)	phototropism (plant grows towards it)



Living things change over time

- evolution
- adapt to their environment if they already have the necessary traits
- proof: DNA, fossil record



Living things have a life span

Born → Live → Die

CHARACTERISTICS OF LIFE

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Living things obtain and use materials and energy

- must make or eat some type of food to make energy in the form of ATP to function

Energy=ATP

Metabolism- all of the processes that keep you alive

Examples

- respiration
- healing
- digestion
- excretion
- circulation

How Organisms Eat: 2 ways to obtain energy

Autotroph (producer)

Heterotroph (consumer)

- make their own food through photosynthesis

Photosynthesis- process by which plants and some other organisms use light energy to convert water and carbon dioxide into oxygen and high-energy carbohydrates such as sugars and starches

Photosynthesis equation



- ✓ needs light and chlorophyll
- ✓ plants, algae, some protists, and some bacteria

Chemotroph (producer)

- organisms that make their own food by using a chemical found in their environment

Chemosynthesis- process by which some organisms, such as certain bacteria, use chemical energy to produce carbohydrates

- ✓ some bacteria
- ✓ use sulfur or nitrogen

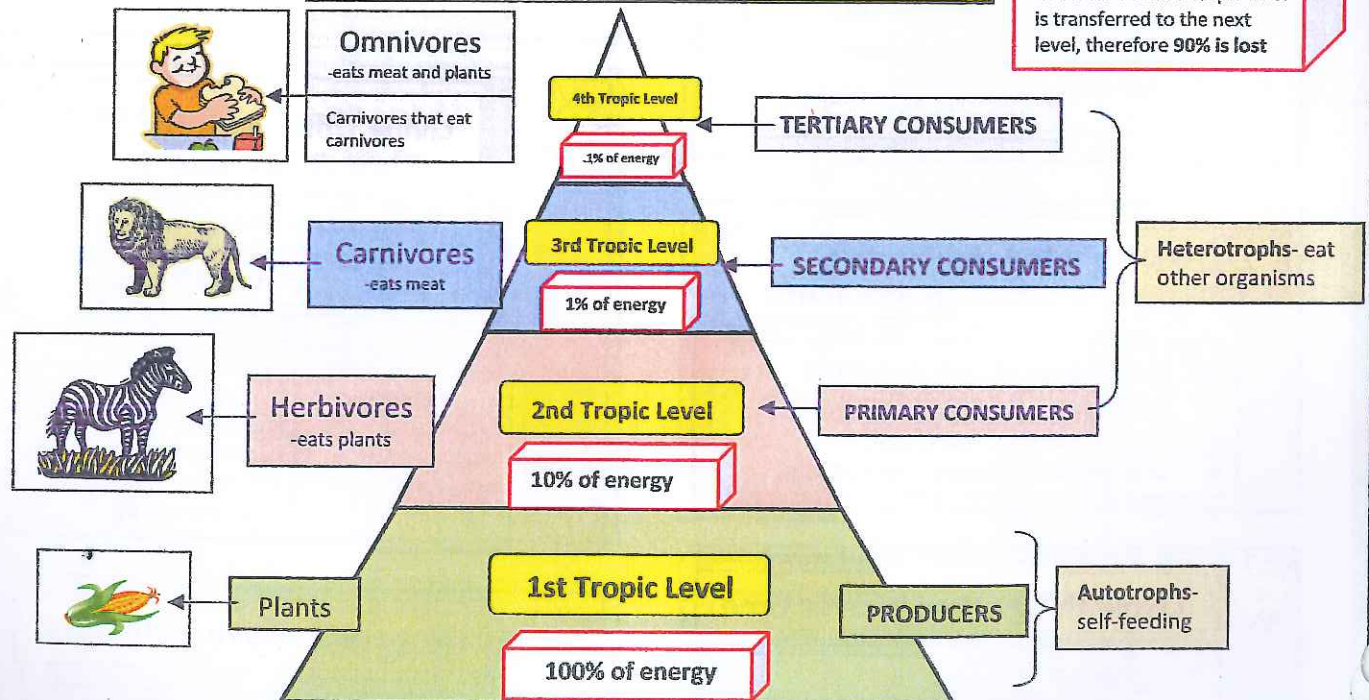
- eat other organisms

5 types of Heterotrophs

1. **Herbivores**- eat plants
2. **Carnivores**- eat other animals
3. **Omnivores**- eat both plants and animals
4. **Decomposers**- break down dead organisms into a liquid form (fungi and bacteria)
5. **Parasites**- live in or on another organism (tapeworms, ticks, fleas)

ENERGY PYRAMID

Amount of energy available at each trophic (feeding) level



Only 10% of energy available within 1 trophic level is transferred to the next level, therefore 90% is lost

Food Chain- steps in an ecosystem in which organisms transfer energy by eating and being eaten

Ex. algae → minnow → trout

Food Web- many food chains or network of complex interaction formed by the feeding relationship among the various organisms in an ecosystem

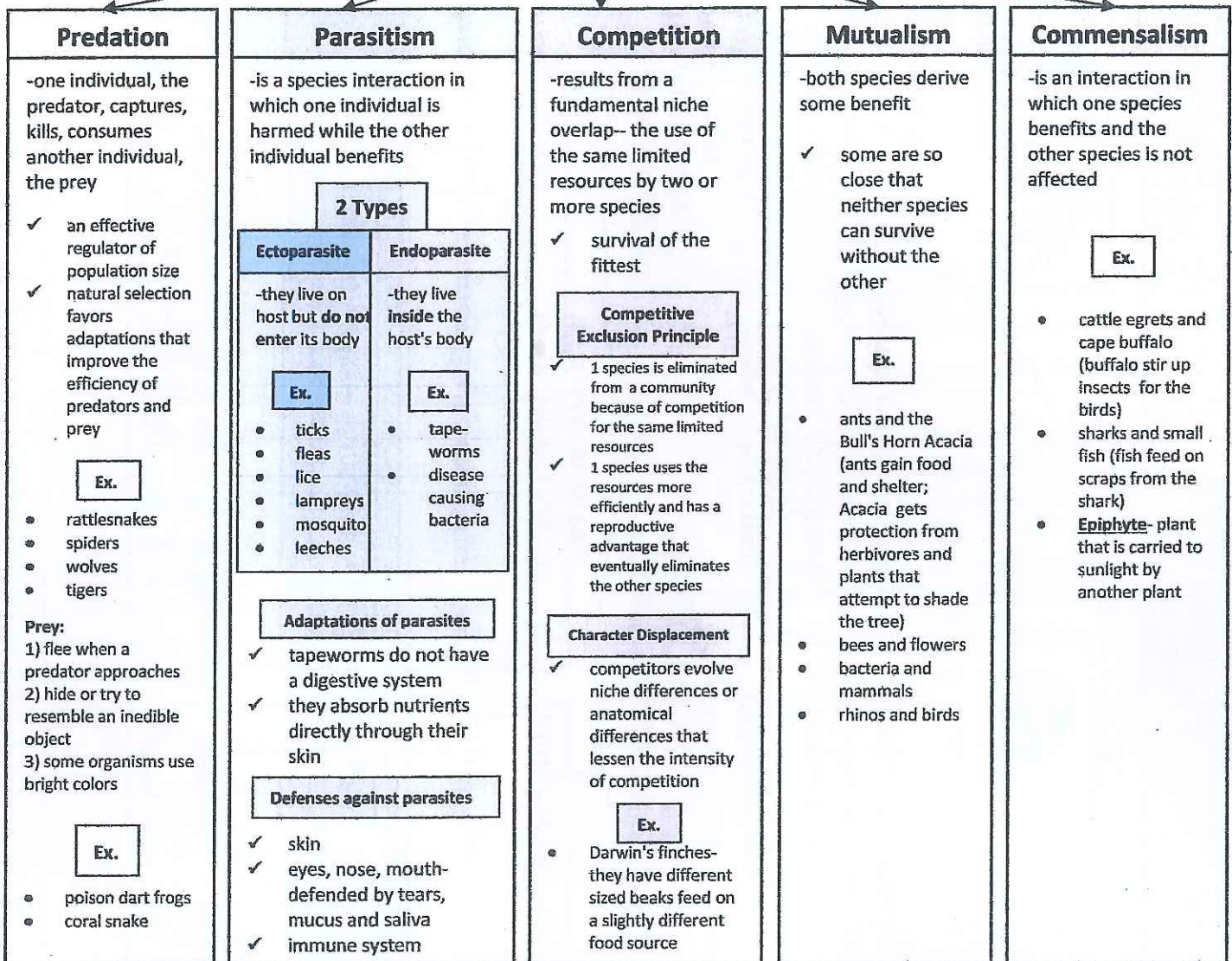
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Community interactions between living organisms

Symbiosis- relationship between different species living in close association with one another

5 Types of Symbiosis



Protection from predators

Mimicry

-a harmless species resembles a poisonous/ venomous or distasteful species

- ✓ the harmless animal is protected because it is often mistaken to be dangerous

Ex.

- Scarlet king snake(mimic)/Coral snake
- Monarch butterfly/ Viceroy butterfly(mimic)

Physical Defense

-plant herbivore interactions (form of predation)-- through natural selection, plants have evolved adaptations that protect them from being eaten

Ex.

- sharp thorns, spines, sticky hairs,
- tough leaves

Secondary Compounds

-chemicals made by plants that are poisonous, irritating or bad tasting

Ex.

- **nicotine**- toxic to insects (found in tobacco)
- **poison ivy**- produce an irritating chemical that causes a rash on most people

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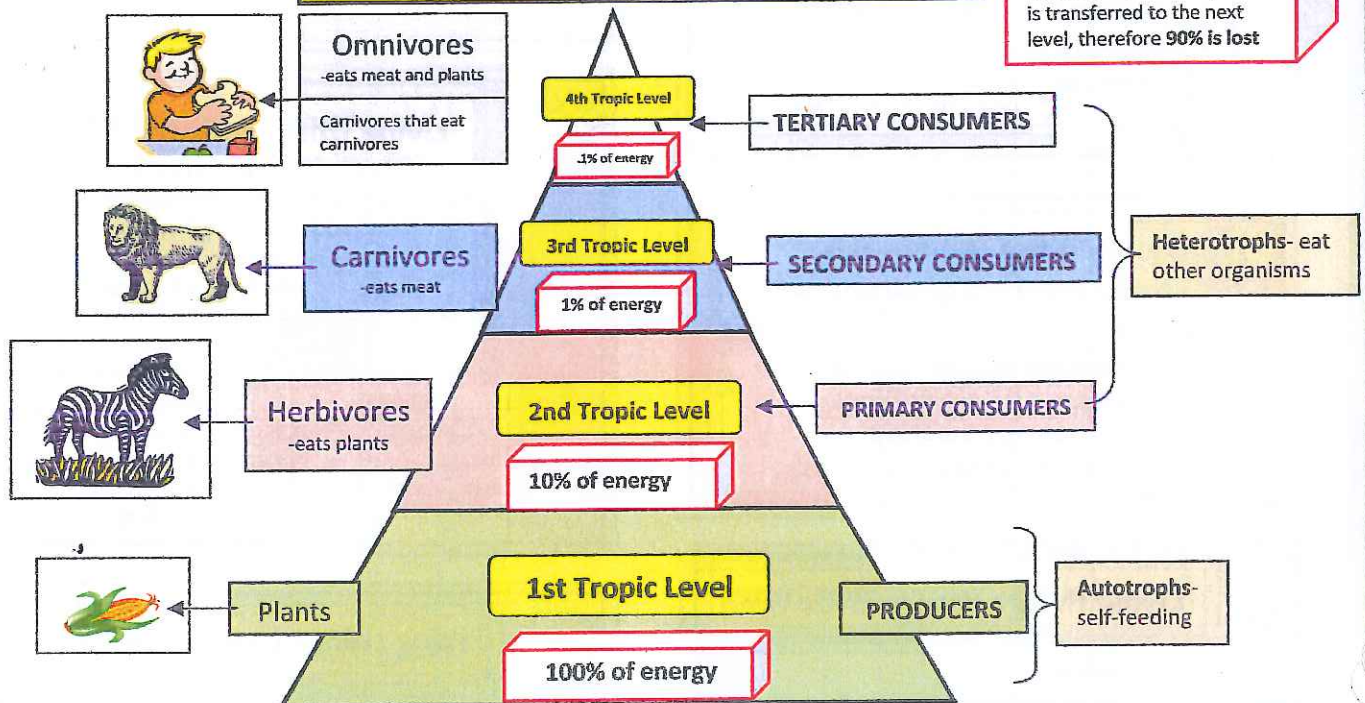
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