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Taxonomy

The science of naming
org

Scientific Names

Know

- *Homo sapiens*

- *Canis lupus*

- *Felis domesticus*

- *Pan pan*

Why binomial nomenclature?

- Much easier than a 10+ word name under old "binomial system"

Same name for two things, where you

- Less confusion
- Binomial = SCIENTIFIC NAME

All organisms classified into a hierarchy

hierarchy

- Kingdom (broadest)
- Phylum
- Class
- Order
- Family
- Genus
- Species (most specific)

The 6 kingdoms

- Prokaryotes (used to be 1 kingdom, Monera)
 - Archaea
 - Eubacteria
- Eukaryotes
 - Fungi
 - Protista
 - Animalia
 - Plantae

Overview of the 3 Kingdoms

■ Archaeobacteria

- Unicellular
- Live in extreme environments
- Prokaryotic

■ Eubacteria

- Unicellular
- Prokaryotic
- "Normal"

Overview of the Kingdoms

■ Protista

– Eukaryotic

- Unicellular or colonial
- Lots of different life cycles

■ Fungi

- Cell walls made of chitin
- Eukaryotic
- Multicellular
- External heterotrophs

Overview of the Kingdoms

■ Plantae

- Eukaryotic & Multicellular
- Cell wall (mainly cellulose)
- Autotrophic

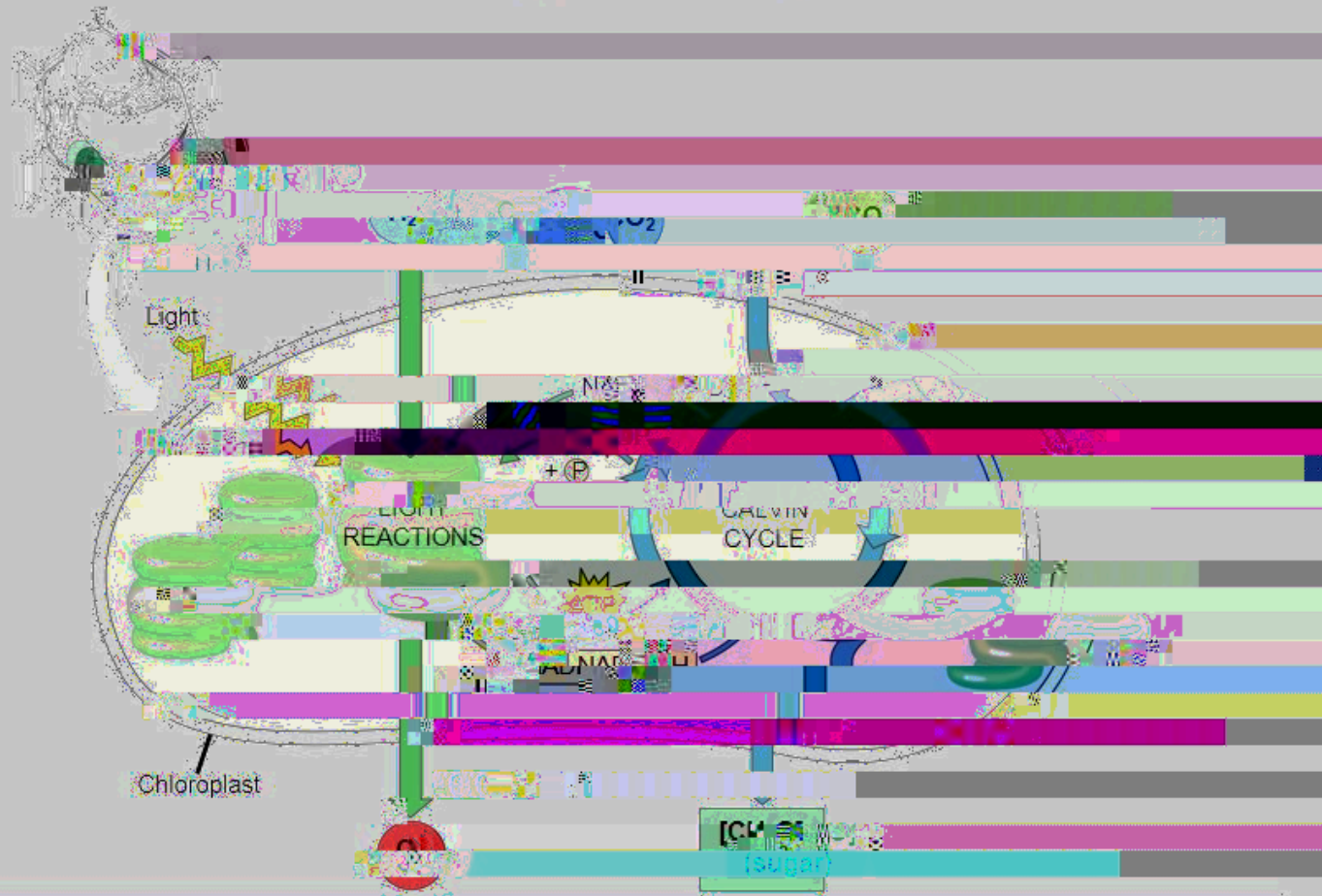
■ Animalia

- Eukaryotic & Multicellular
- No cell walls
- Intraoral heterotrophs

Plant Characteristics

- Multicellular
- Autotrophic (photosynthesis)
- Chlorophyll *a* and *b* in thylakoid membranes
- Surrounded by cell walls containing cellulose (polysaccharide)
- Store reserve food (starch)

An overview of photosynthesis



2 Stages of Photosynthesis

1. Light reactions: sunlight is converted to chemical energy

- Occurs in the grana
- Split H_2O = releases O_2 and H^+ and forms $NADPH$

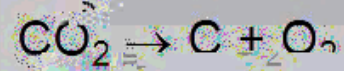
2. Calvin cycle: sugar is made using energy gathered during light reactions

- Occurs in the stroma
- Forms sugar from CO_2 and H_2O using ATP and $NADPH$ from light reactions

- Current model for photosynthesis equation:

$$\text{CO}_2 + \text{H}_2\text{O} + \text{Light energy} \rightarrow (\text{CH}_2\text{O}) + \text{O}_2$$

- The equation proposed by hypothesis is that water and carbon dioxide were the first inputs:



- Then added to water:

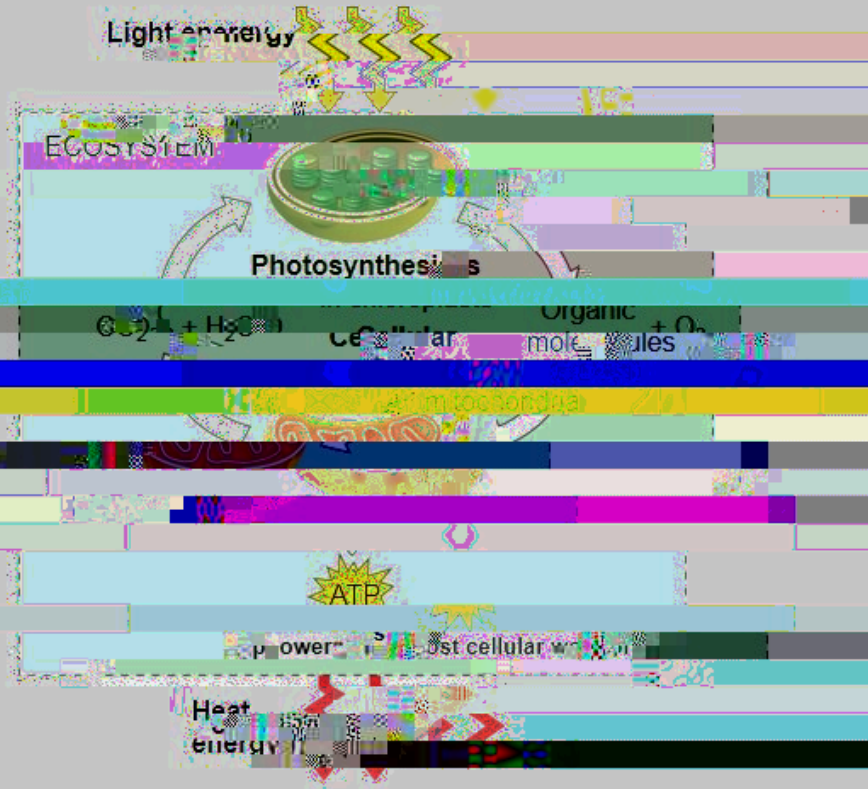


- If correct, this theory is that the oxygen that we breathe today is released from carbon dioxide.

Photosynthesis requires energy

- Energy

- Flows into an ecosystem as sunlight and leaves as heat



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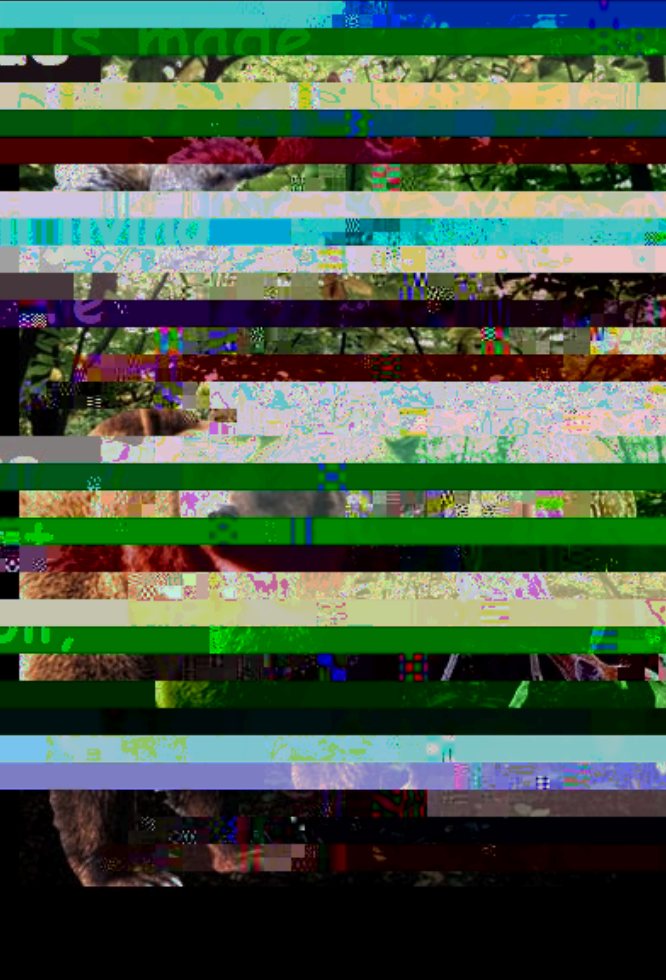


WHAT DO

WEAN BY ENVIRONMENT

The environment that an organism lives in is made up of, two factors

- **Biotic factors** - living organisms that influence the growth, survival and reproduction of other organisms on Earth
- **Abiotic factors** - non-living parts of the environment (i.e. temperature, humidity, light, moisture, pH, salinity, etc.)



Organism is a single individual or
multicellular form exhibiting all of
the characteristics of life as an individual

- The lowest level of organization



Corbis

POPULATION

✓ a group of organisms of one species living in the same place at the same time that interact

✓ Produce territories
- compete with each other for resources (food, mates, shelter, etc.)

Ecosystem - biological community and the abiotic factors with which it interacts (marine + terrestrial)



Habitat & Niche

A niche is determined by the tolerance limits of an organism, or limiting factor

Limiting factor - any biotic or abiotic factor that restricts the existence of organisms in a specific environment.

Feeding Relationships

There are 3 main types of feeding relationships:

1. Producer → Consumer
2. Predator → Prey
3. Parasite → Host

Feeding Relationships

Producers

Autotrophs (plants),
they trap energy
from the sun

- Bottom of the food chain



Feeding relationships

CONSUMERS

1. Primary consumers

- **Autotrophs**
- **Herbivores**

• Secondary consumers

- **Prey animals**
- **Carnivores**

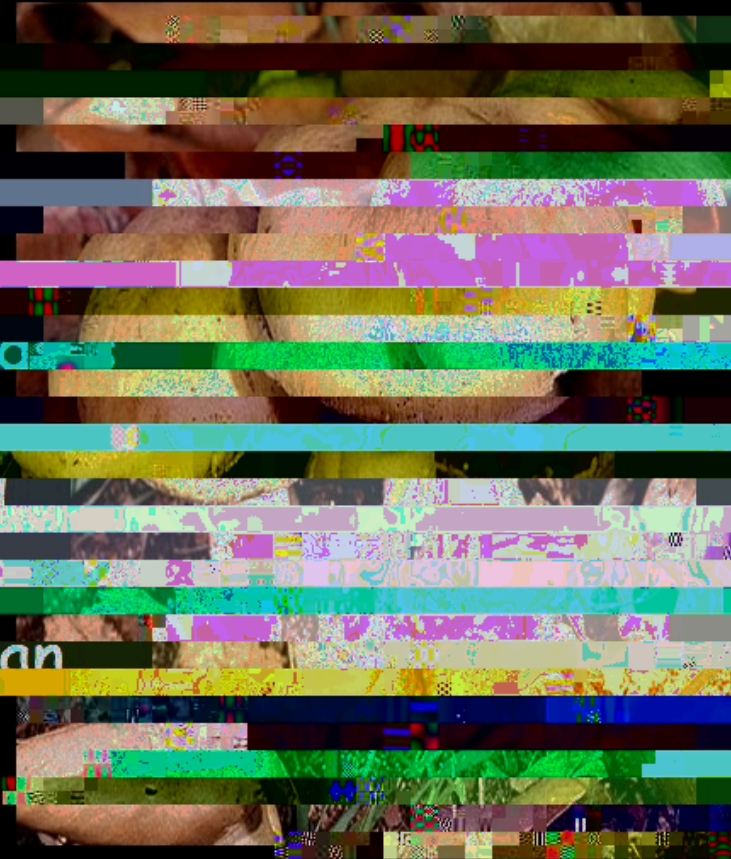


Feeding Relationships

Consumers

Decomposers

- Break down the complex compounds of dead animals and decaying plants and animals into simpler molecules that can be absorbed



Trophic Levels

E

Tertiary

Consumers - top

predators

N

Secondary consumers -

small carnivores

E

R

Primary consumers - herbivores

G

y

Producers - Autotrophs

