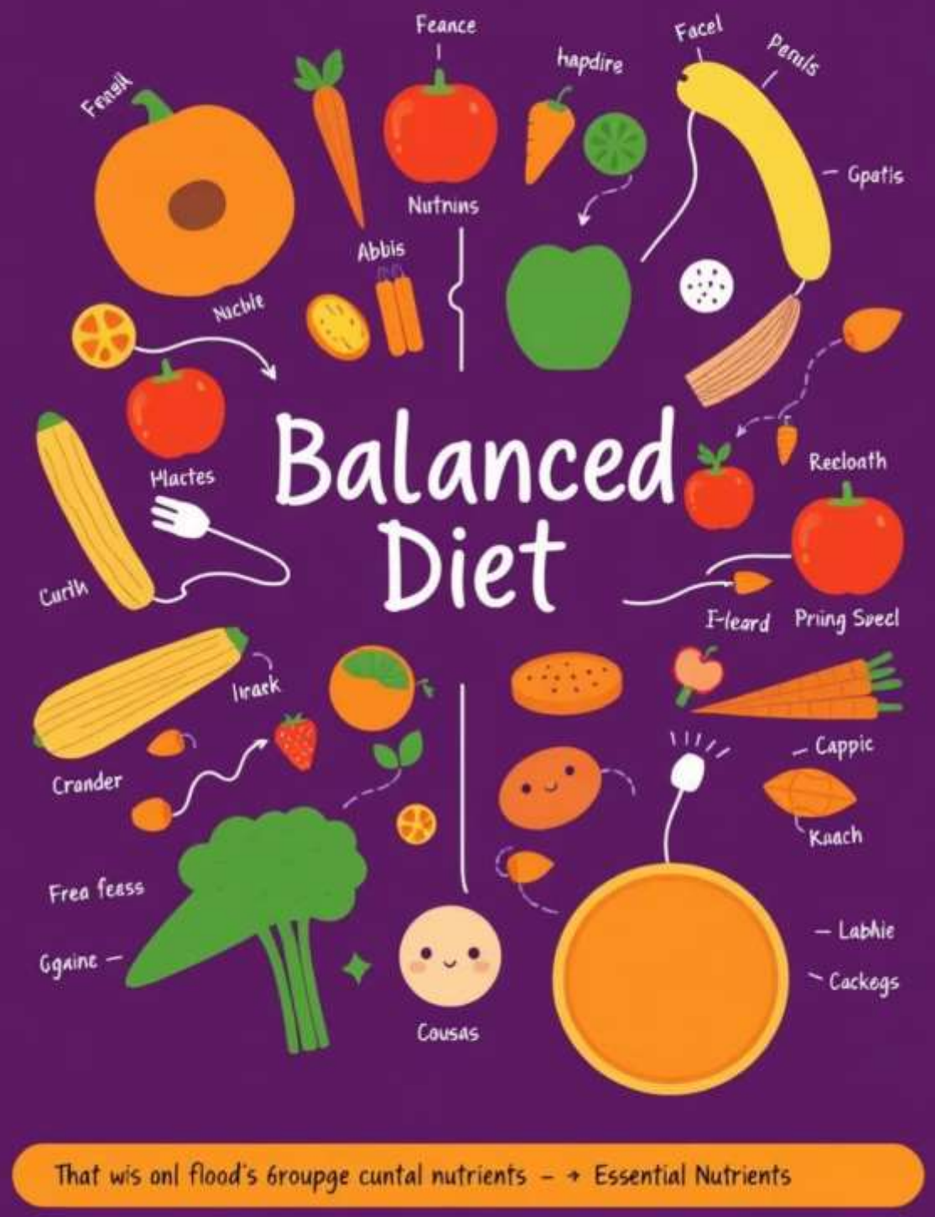
# Nutrition in Plants: Why All Organisms Need Food

Understanding the fundamental role of food and nutrients for life on Earth.




# The Basics: Food & Nutrients

## All organisms need food

Food contains essential nutrients.

## Key Nutrients

Carbohydrates, proteins, fats, vitamins, minerals.

## Nutrients are vital

Necessary for body functions.

# Why Organisms Need Nutrients

## Body Building & Growth

Nutrients help animals grow.

Plants use simple materials for growth.

## Repair Damaged Parts

Nutrients fix animal body parts.

## Energy for Activities

Nutrients power daily life.

All life depends on plants for food, directly or indirectly.

# Plants as Producers (Autotrophs)

## Self-Sufficient

Plants make their own food.

## Earth's Producers

Plants are primary food source.

## Raw Materials

$CO_2$, water, sunlight, minerals.

## Nutrient Creation

Carbohydrates, proteins, fats, vitamins.

# Photosynthesis: Food-Making Process

## Definition

Plants make food via photosynthesis.

## Location

Mainly in green leaves, "food factories."

## Key Pigment

Chlorophyll absorbs sunlight.

## Process Equation

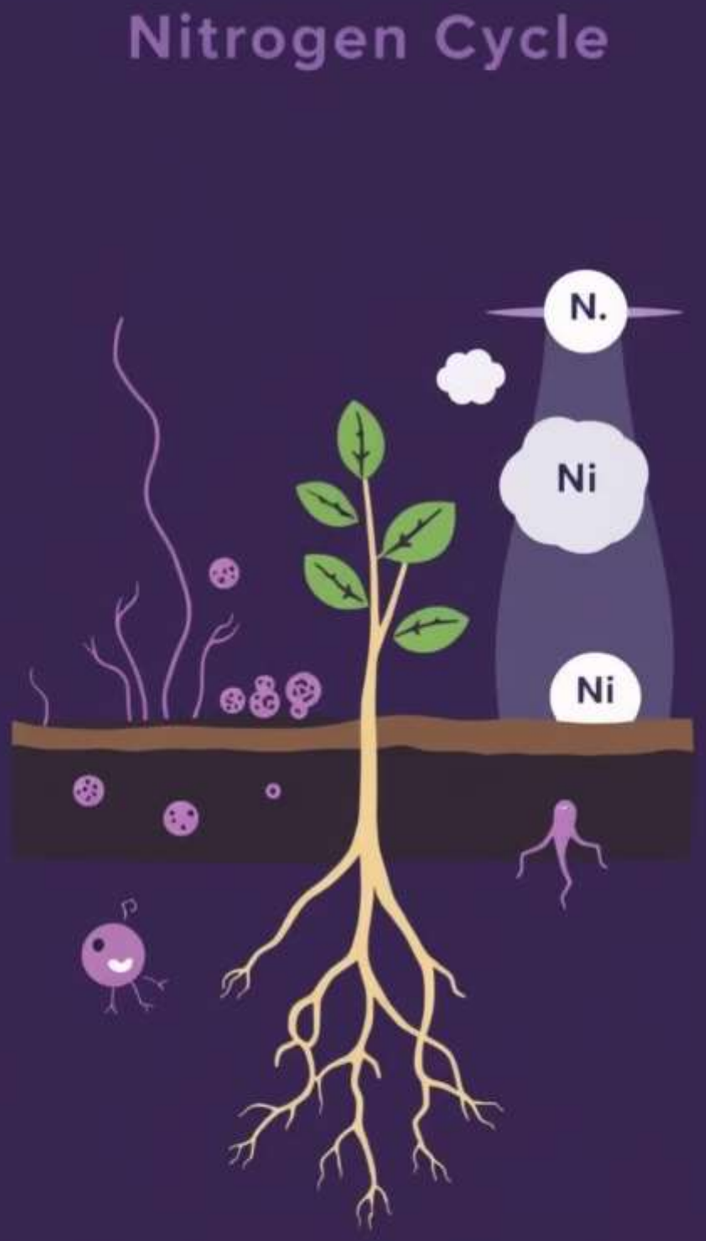
CO2 + Water --(Sunlight, Chlorophyll)--> Food + Oxygen

## Importance

Food for plant energy, oxygen for animals.

## Meaning

"Photo" light, "synthesis" combine.




# Food Conversion & Nitrogen's Role

## Carbohydrate Production

Primary product of photosynthesis.

## Conversion

Carbohydrates become fats, proteins.

## Nitrogen Needed

Essential for protein conversion.

Sources: atmospheric, soil, fertilizers, bacteria.

# Heterotrophic Nutrition in Plants (Part 1)

## Parasitic Plants

Example: Cuscuta (Amarbel).

No chlorophyll, absorbs host nutrients.

## Insectivorous Plants

Example: Pitcher plant.

Traps and digests insects for nutrients.

# Heterotrophic Nutrition in Plants (Part 2)

## Saprotrophic Nutrition

Feed on dead, decaying matter.

## Examples

Fungi, mushrooms, molds.

## Nutrient Absorption

Secrete digestive juices, absorb solution.

## Reproduction

Spores travel, germinate on moist surfaces.

# Symbiotic Relationships in Plants

## Fungi & Trees

Fungi provide water, trees provide nutrients.

## Lichens

Alga (food) + Fungus (shelter, water).

## Rhizobium & Legumes

Bacteria fix nitrogen, plant provides home.

# Summary & Key Takeaways

- All organisms need nutrients for growth, repair, energy.
- Plants are autotrophs, make food via photosynthesis.
- Photosynthesis produces carbohydrates, oxygen.
- Nitrogen crucial for plant protein conversion.
- Some plants are heterotrophic: parasitic, insectivorous, saprotrophic.
- Symbiotic relationships enhance nutrient availability.