


The ultimate source of energy is  **SUN**

Autotrophs → use sun's energy to produce their own food

Examples: trees, plants, algae, bacteria

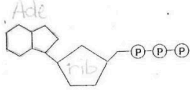
Heterotrophs → must consume food

Examples: humans, animals, fungi

The energy used by cells is called ATP
(adenosine triphosphate)

3 parts:

1. adenine
2. ribose sugar
3. 3 phosphates



Energy is stored in the bond between the 2nd and 3rd phosphate group.

ATP → ADP + P + energy

What molecule is made when the energy is released from the ATP?
ADP

CELL ENERGY

Photosynthesis

$$6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{light}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$$

Carbon dioxide + water → glucose + oxygen

What kind of organisms carry out photosynthesis? Autotrophs

- They have **pigments** = light absorbing molecules
- Ex. chlorophyll

Where does photosynthesis take place?
chloroplasts

Light Reactions (light-dependent reactions)

Where does it happen? thylakoid membrane of grana

What goes in? light, water, ADP, NADP⁺

What comes out? O₂, ATP, electron carriers (NADPH)

Calvin Cycle (light-independent reactions)

Where does it happen? stroma

What goes in? CO₂, ATP, electron carriers (NADPH)

What comes out? glucose (C₆H₁₂O₆), ADP, NADP⁺

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Examples:

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Where does photosynthesis take place? . 11-