

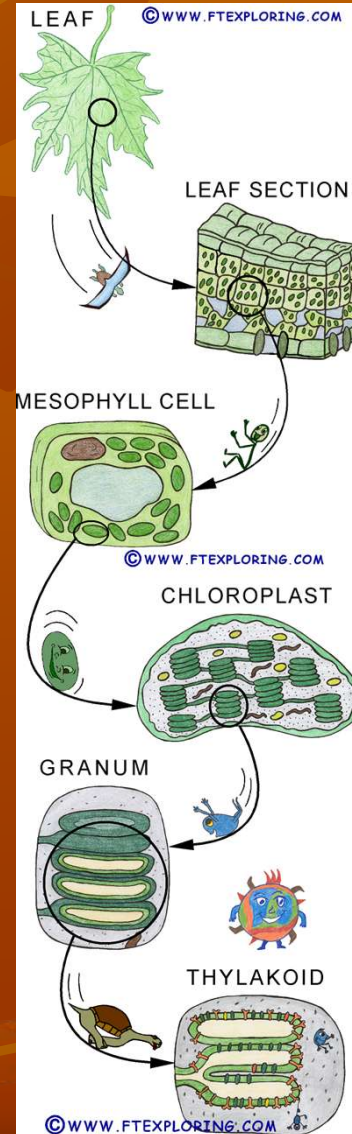
Photosynthesis and Respiration

Photosynthesis

- Plants use CO₂, H₂O & sunlight to make O₂ & glucose (energy)
- $6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{light}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
- Carbondioxide + water $\xrightarrow{\text{light}}$ glucose + oxygen
- ATP is chemical energy!!!!!!!!!!!!

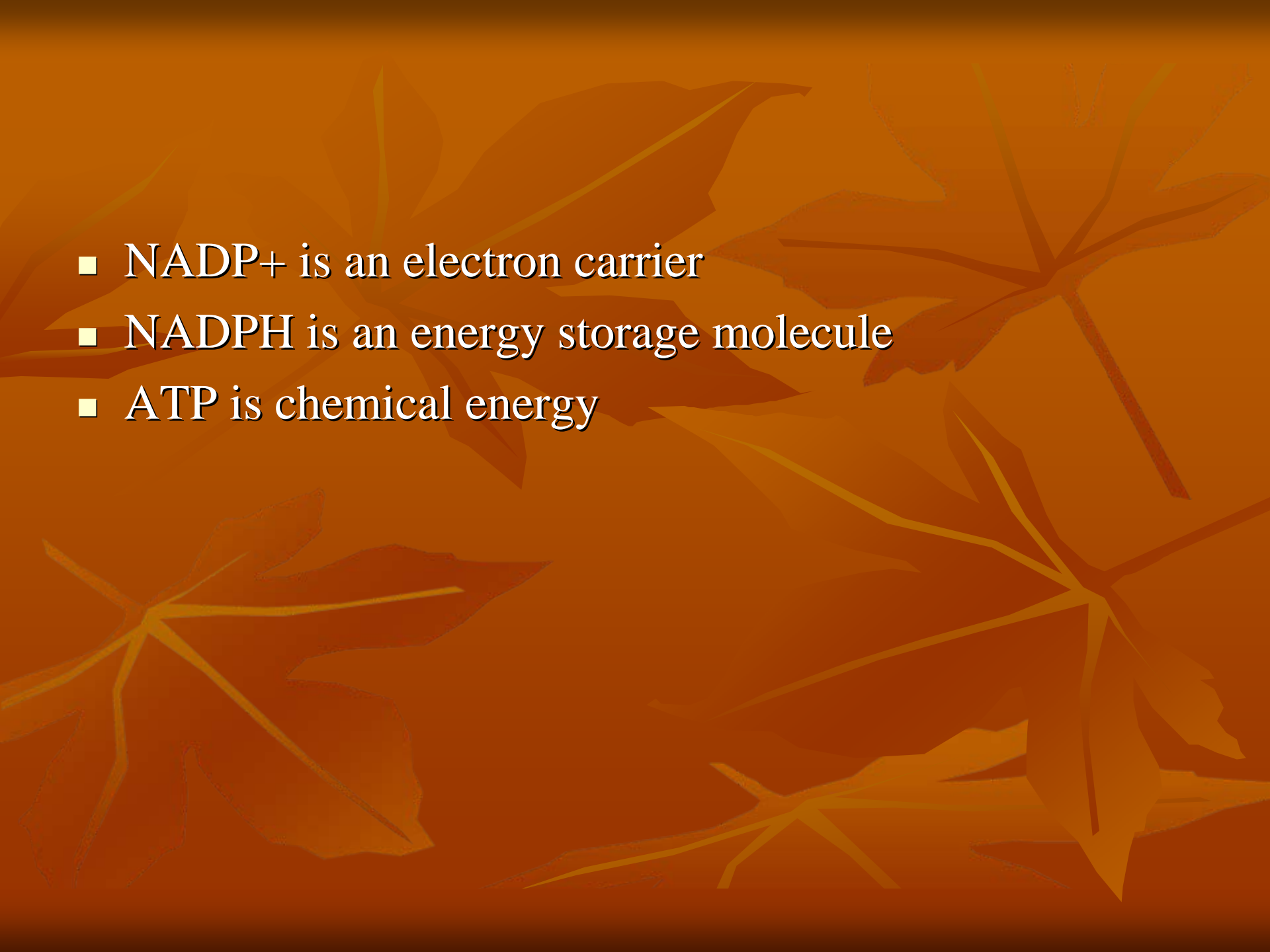
Photosynthesis Plant Parts

- Thylakoid = flat & sack like
- Grana = stacks of thylakoids
- Stroma = fluid filled space outside of grana. Site of light independent reaction

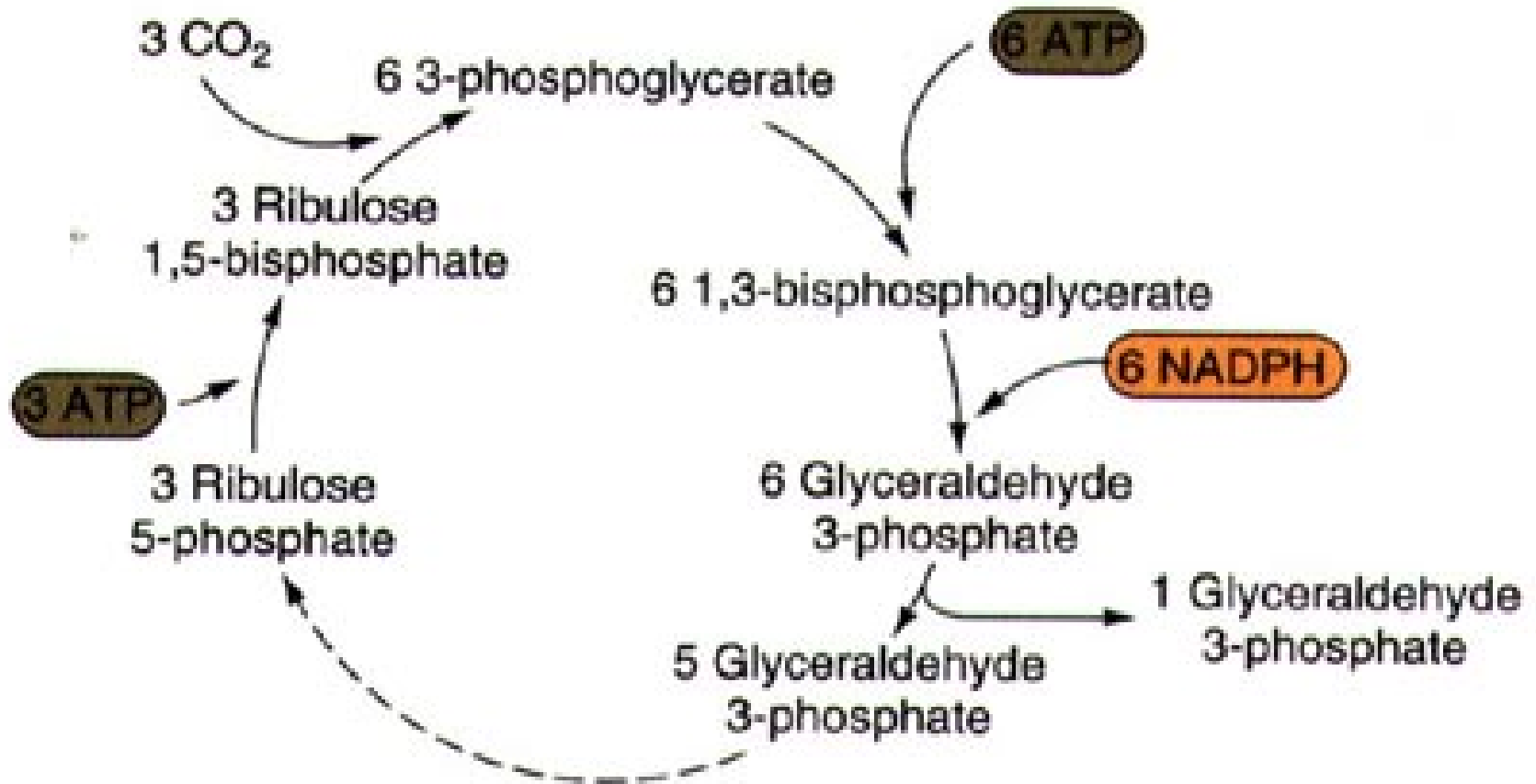


Phase I: Light Dependent Reaction

- Electrons move from inside the thylakoid to outside
- A water molecule is split in to H_2 & O_2
- The electron is transferred to $NADP^+$ which will then make NADPH
- When protons (H^+) move through the thylakoid membrane ADP is turned in to ATP

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- NADP^+ is an electron carrier
 - NADPH is an energy storage molecule
 - ATP is chemical energy

Phase II: Dark Reaction (the Calvin Cycle)



Two Other Pathways

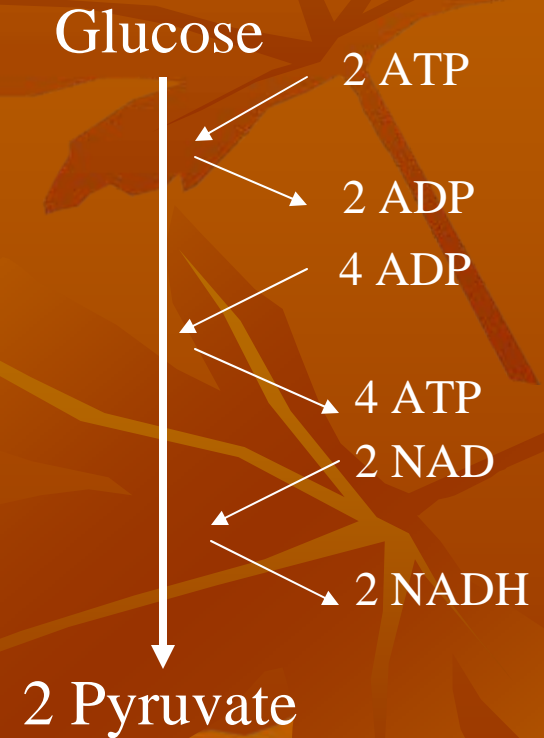
- C4 = for plants such as corn and sugar cane to avoid the lose of water
- CAM = for water conserving plants such as cacti and pinapple

Respiration

- Animals use glucose and oxygen to make carbon dioxide, water and energy
- $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{energy}$
- glucose + oxygen \rightarrow Carbondioxide + water +energy

Glycolysis

- An anaerobic process (oxygen is not required) this has in cytoplasm
- Takes place in the cytoplasm



The Krebs Cycle

- Aerobic Respiration (must have Oxygen)
- Pyruvate goes to Mitochondria
- Pyruvate breaks down to CO₂
- Net gain is 6 CO₂, 2 ATP, 8 NADH, 2 FADH

Electron Transport

- Final step to break down glucose
 - Most ATP made here
 - NADH & FADH₂ convert to ADP to ATP
 - Electrons move along a transport chain
 - Formation of H₂O
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- **Net gain = 36 ATP**

Anaerobic Respiration

- Fermentation:
 - In the cytoplasm and regenerates the cell's supply of NAD and a small amount of ATP
- Lactic acid fermentation:
 - Converts pyruvate to lactic acid
 - Muscles produce it when O₂ is in low supply
 - Lactic acid builds up muscles fatigue and become sore
- Alcohol fermentation:
 - Occurs in yeast and some bacteria
 - Pyruvate is converted to ethyl alcohol and CO₂