Photosynthesis

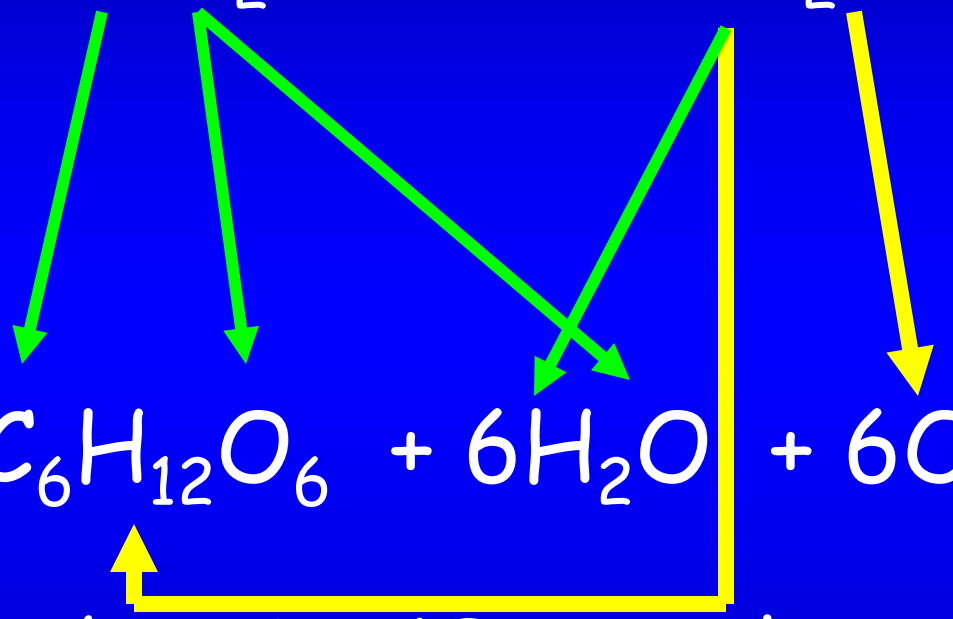
Chapter 8 Sections 2 & 3

Objectives: Chapter 8-3

- A) Identify how atoms are rearranged in PSN
- B) Identify the two parts of the chloroplast and the colors they absorb and reflect
- C) Compare the two phases of PSN
- D) Summarize the steps of the light-dependent reaction
- E) Summarize the steps of the light independent reaction
- F) Summarize Photosynthesis

Obj. A) Identify how atoms are rearranged in Photosynthesis…

Reactants $6\ CO_2 + 12\ H_2O$

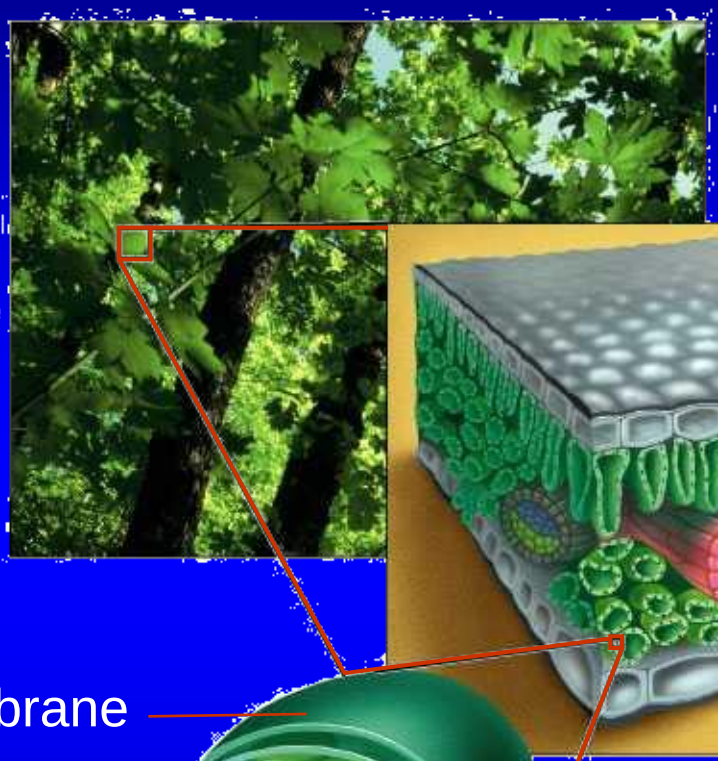


Products $C_6H_{12}O_6 + 6H_2O + 6O_2$

What is the carbon in CO_2 used to make?

Final Equation $6\ CO_2 + 6\ H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

Obj. B) Identify the two parts of the chloroplast and the colors they absorb and reflect



internal leaf structure

chloroplasts

outer membrane

inner membrane

Thylakoid PSN membranes

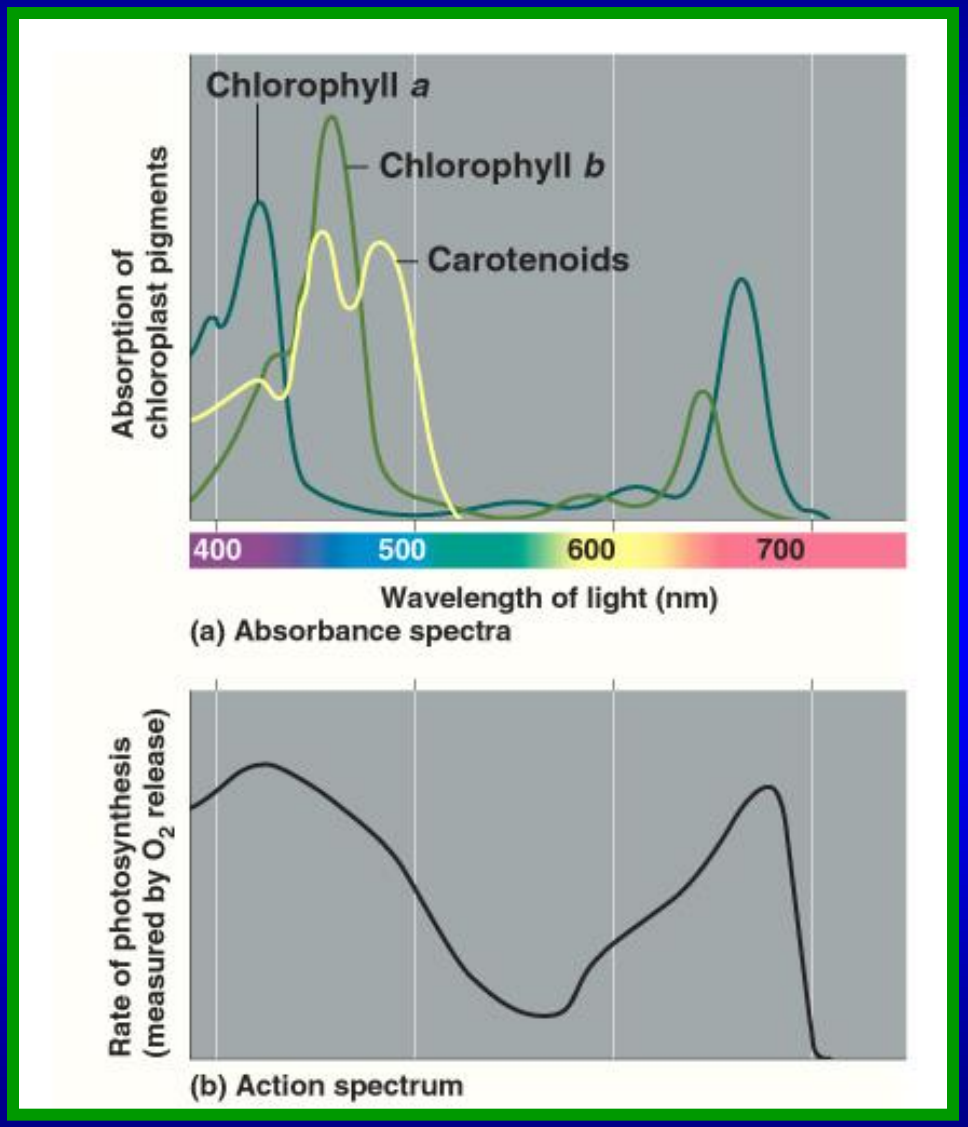
Stroma= Spaces between thylakoids

Granum = Stack of thylakoids

Obj. B) Identify the two parts of the chloroplast and the colors they absorb and reflect

What wavelengths of light do you think plants use the least in photosynthesis?

Green

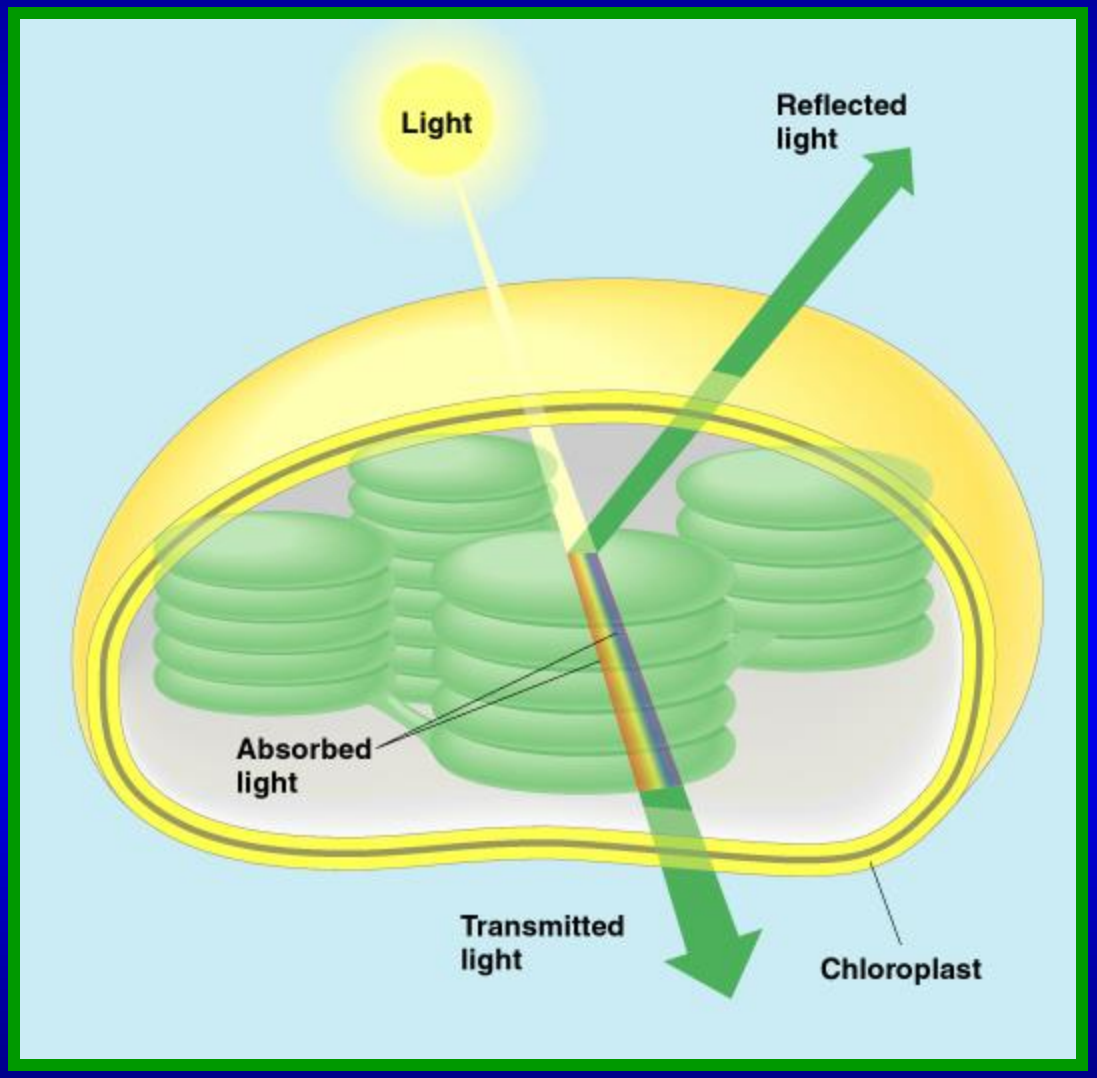


Obj. B) Identify the two parts of the chloroplast and the colors they absorb and reflect

Photosystems use some wavelengths of light but reflect others…

What two colors are absorbed best?

Red and Blue



Photosynthesis

D) Summarize the steps of the light-dependent reaction

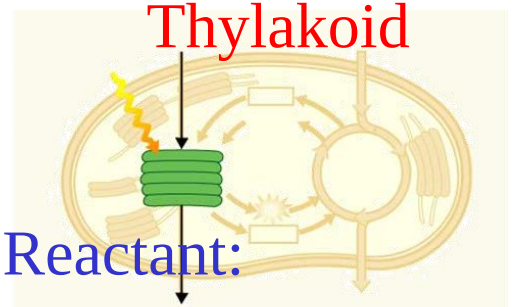
Analyze the diagram and identify the following: Where, 2 things it starts with, & 3 things it ends with?

The Sun!!

Where does the energy come from that sustains all life?

Where?

Thylakoid



Reactant:

1. Sun &Water

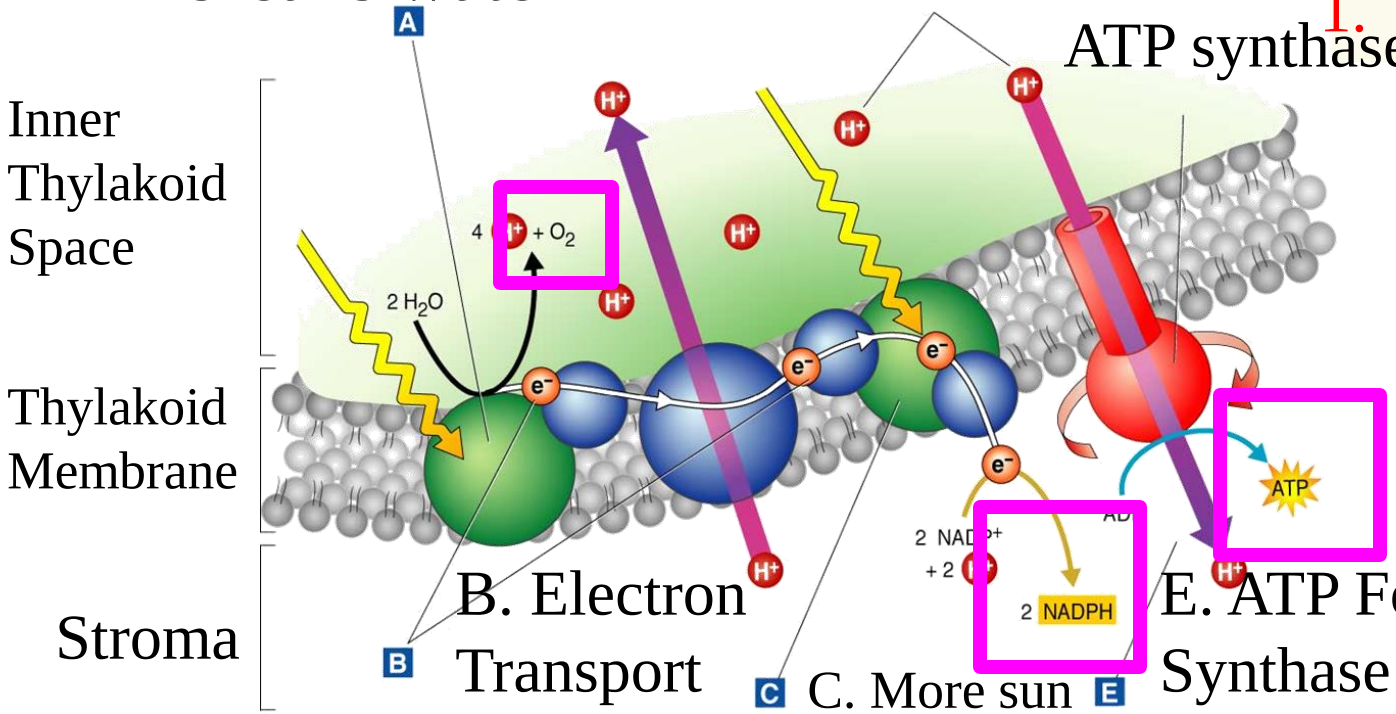
Products

1. Oxygen
2. NADPH – electron carrier
3. ATP

A. Photosystem II – Energized by sun, breaks water

D. Hydrogen Ion Movement

ATP synthase



B. Electron Transport Chain

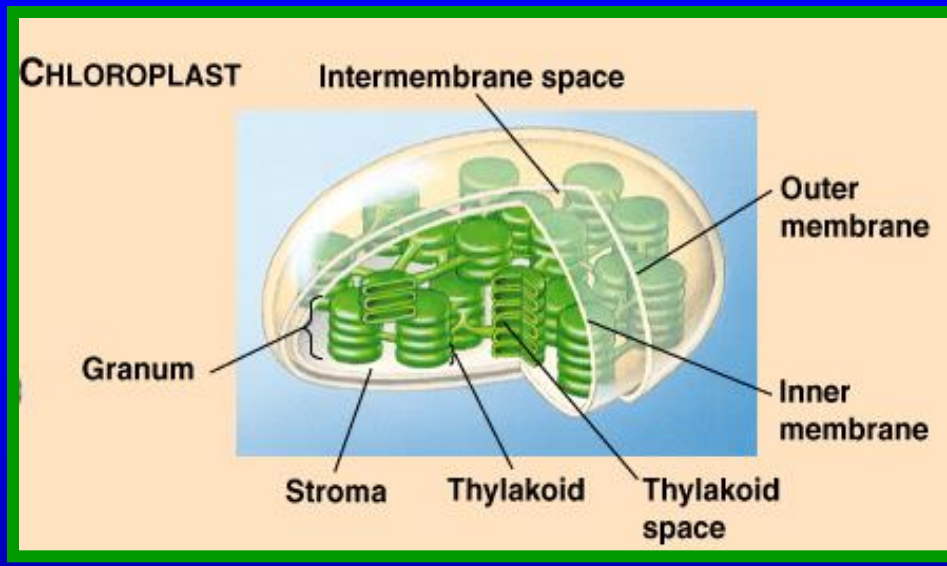
C. More sun Photosystem I

E. ATP Formation – ATP Synthase spins, adds P to ADP

Obj. C) Compare the two stages of photosynthesis…

Light Dependent Reactions

- Where? Thylakoid membrane
- Starts with?
  - Water and Sunlight
- What is produced?
  - O_2
  - ATP
  - Electron Carrier - NADPH

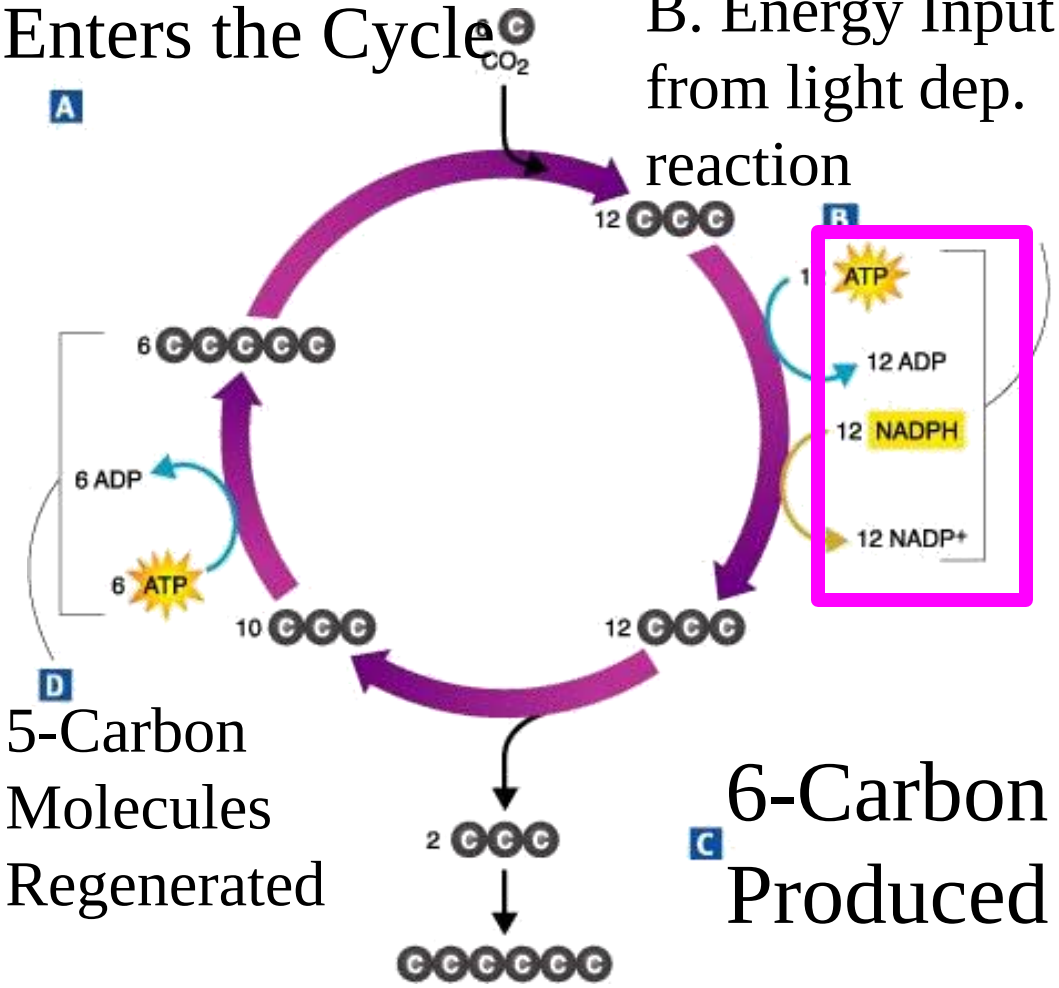


Photosynthesis

D) Summarize the steps of the light-independent reaction

Analyze the diagram and identify the following: Where, 3 things it starts with, & 1 things it ends with?

CO_2 Enters the Cycle



B. Energy Input – from light dep. reaction

5-Carbon Molecules Regenerated

6-Carbon Sugar Produced

Sugars and other compounds

Where

1. Chloroplast - Stroma

Starts with

1. CO_2
2. ATP
3. NADPH

Product

1. Sugar

Obj. B) Compare the two stages of photosynthesis.

Light Independent Reactions

AKA Calvin Cycle

- Where?

  Stroma

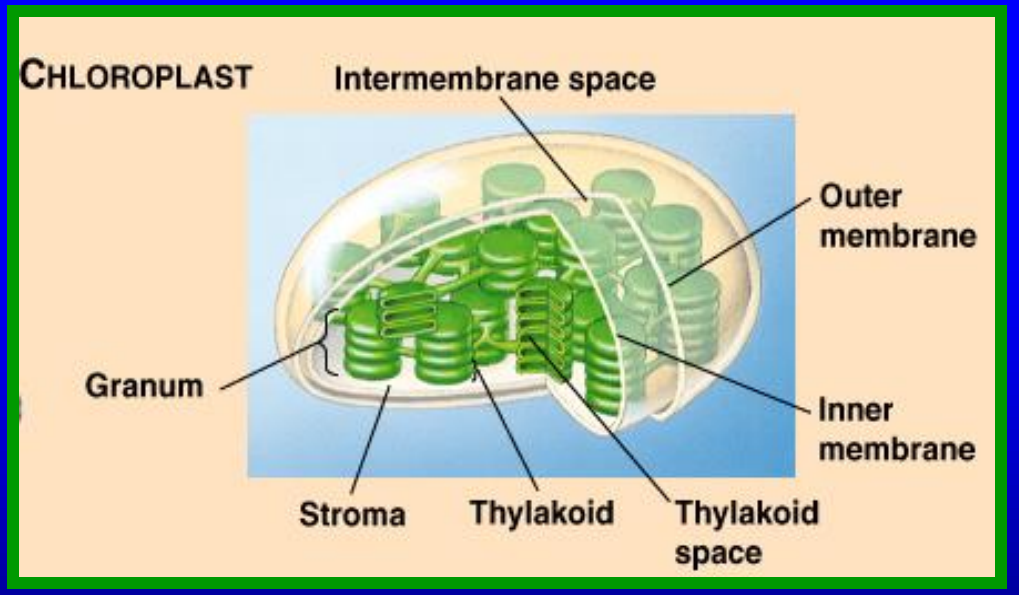
Starts with?

ATP and NADPH from Light Dep.

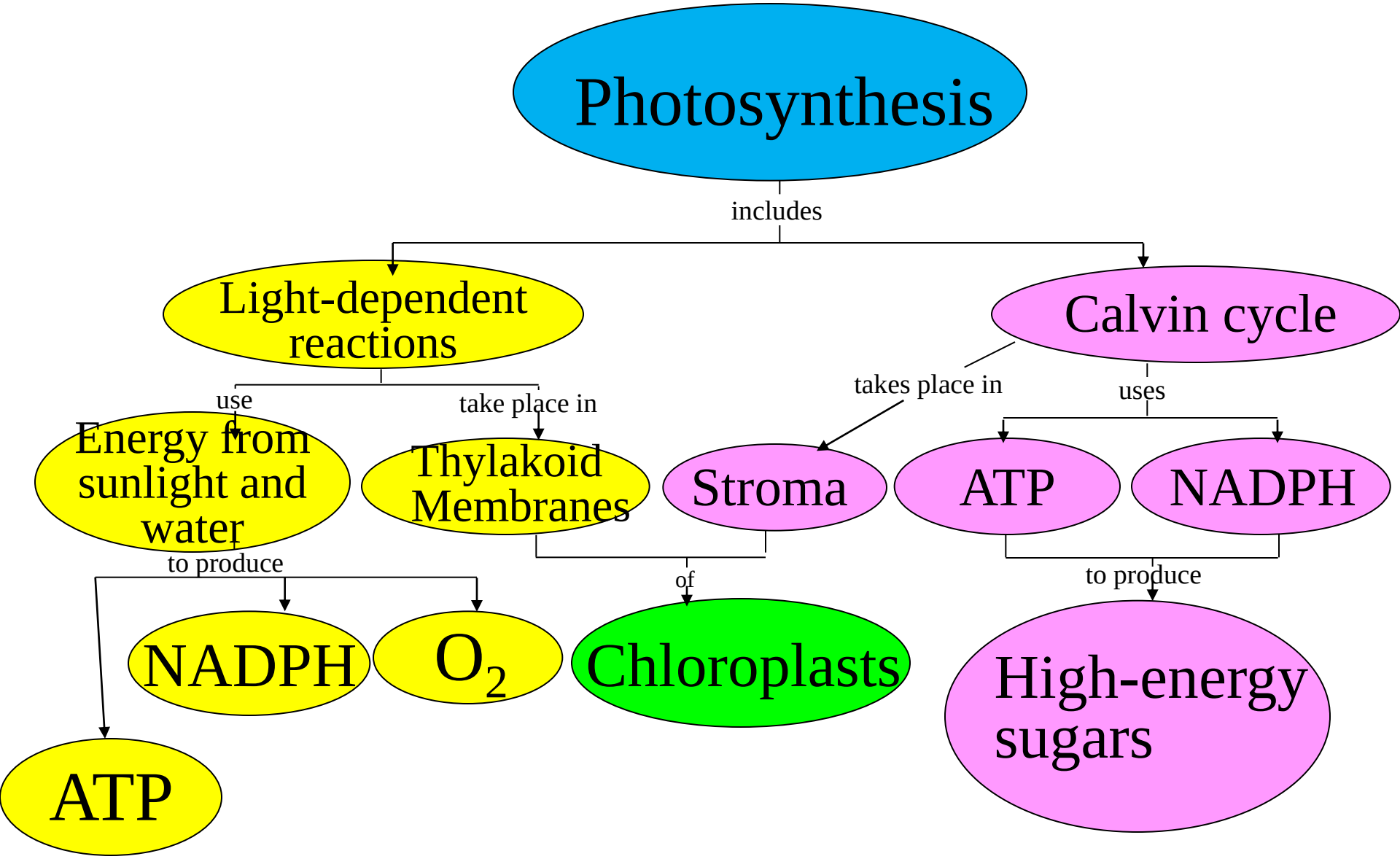
CO_2 is "fixed" into

What is produced?

sugars!



Obj. E) Summarize Photosynthesis



Understanding Check

- 1) What is produced from the Calvin Cycle?
- 2) Where does the light dependent reaction and the Calvin cycle occur?
- 3) Identify the three things produced from the light dependent reaction.
- 4) What is produced from the carbon dioxide during photosynthesis?