

Exercise walk-through

3.4

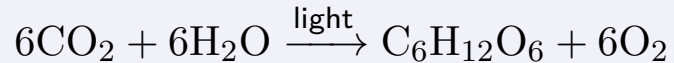
Photosynthesis

AP Biology

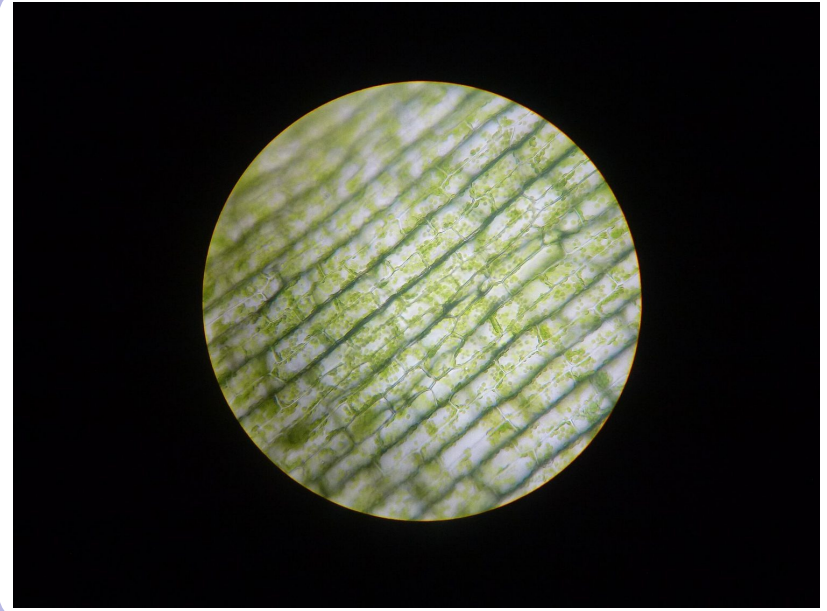
Photosynthesis

In the **chloroplast**, light energy becomes sugar:

Overall

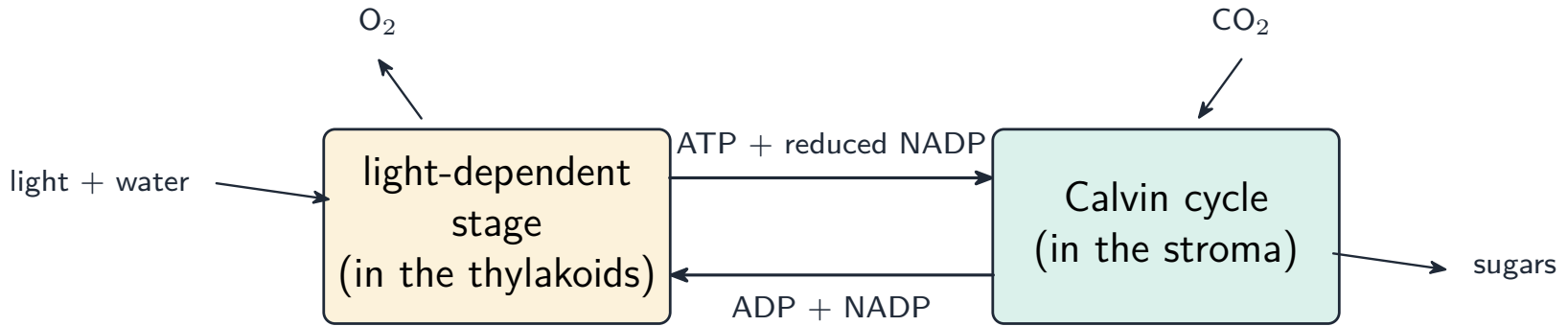


- **light reactions** – thylakoid: split H_2O , make O_2
- **Calvin cycle** – stroma: fix CO_2 into sugar



Chloroplasts capture light and fix carbon

The two stages of photosynthesis are linked



The two stages of photosynthesis are linked by ATP and NADPH

Exercises 2.1-2.3

2.1 Write the overall equation for photosynthesis.

[2]

2.2 Where do the light reactions occur?

[1]

2.3 What gas is released by the light reactions?

[1]

Exercises 2.1·2.3

2.1 Write the overall equation for photosynthesis.

[2]

2.1

- $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$ (with light)

2.2 Where do the light reactions occur?

[1]

2.2

- In the thylakoid membranes of the chloroplast

2.3 What gas is released by the light reactions?

[1]

2.3

- Oxygen

Exercise 3.1

3.1 The Calvin cycle uses ATP and NADPH to make

[1]

☐

A oxygen

B sugar (glucose)

C water

D light

Exercise 3.1

3.1 The Calvin cycle uses ATP and NADPH to make

[1]

☐

A oxygen

B sugar (glucose)

C water

D light

3.1 B

- sugar (glucose)

Exercise 3.2 (a)

3.2 A plant is photosynthesizing.

(a) State the inputs and outputs of the light reactions.

[2]

Exercise 3.2 (a)

3.2 A plant is photosynthesizing.

(a) State the inputs and outputs of the light reactions.

[2]

(a)

- Inputs: light and water; outputs: oxygen, ATP, and NADPH

Exercise 3.2 (b)

3.2 A plant is photosynthesizing.

(b) Explain how the two stages of photosynthesis are connected.

[2]

Exercise 3.2 (b)

3.2 A plant is photosynthesizing.

(b) Explain how the two stages of photosynthesis are connected.

[2]

(b)

- The light reactions produce the ATP and NADPH that power the Calvin cycle to fix CO_2 into sugar

Exercise 3.3

3.3 Explain why the release of oxygen comes from the splitting of water, not from carbon dioxide. [2]

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3.3

- The light reactions split water molecules, and the oxygen atoms released come from that water (not from CO_2 , whose carbon and oxygen go into sugar)