

# 13 The chloroplast – Part 1

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Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

## Vocabulary

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*Write each word three times.*

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| English        | Write it 3 times (English) |
|----------------|----------------------------|
| Photosynthesis | _____                      |
| chloroplast    | _____                      |
| thylakoids     | _____                      |
| stroma         | _____                      |
| Calvin cycle   | _____                      |

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## Recall

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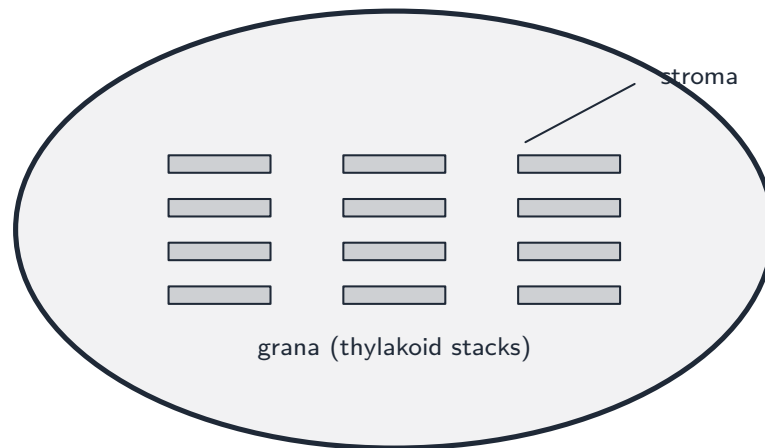
**Photosynthesis** – making food from light – happens inside the **chloroplast**. Its structure suits its two stages.

## New ideas

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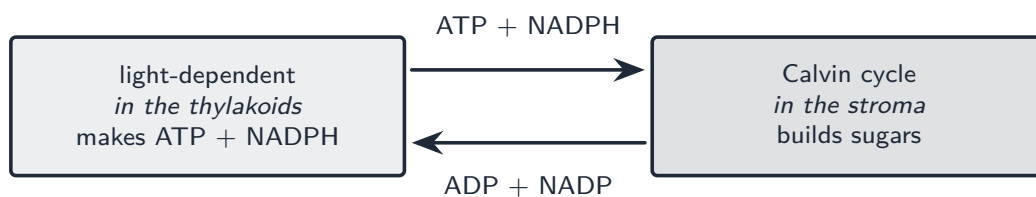
Read these first, then do the Practice.

## ■ 1 Inside a chloroplast



- flat sacs called **thylakoids** stack into grana – the site of the first stage;
- the fluid around them is the **stroma** – the site of the second stage.

## ■ 2 The two stages



- the **light-dependent** stage (in the thylakoids) uses light to make ATP and reduced NADP;
- the **Calvin cycle** (in the stroma) uses these to build sugars from carbon dioxide.

**Watch out:** the light-dependent stage is in the *thylakoids* (it needs light, makes ATP + reduced NADP); the Calvin cycle is in the *stroma* (it uses those to build sugars from CO<sub>2</sub>). Don't swap the locations.

## Practice

Try these in order.

**13.1** Inside which structure does *photosynthesis* happen?

[1]

**13.2** What is a stack of *thylakoids* called? [1]

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**13.3** What is the fluid around the thylakoids called? [1]

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**13.4** Which stage happens in the thylakoids – light-dependent or the Calvin cycle? [1]

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**13.5** What does the *Calvin cycle* build, and from what gas? [1]

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**13.6 Challenge.** The Calvin cycle does not directly use light, yet it stops within minutes in the dark. Explain why. [2]

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