

6 Rate and leaf structure – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
rate	速率	_____	_____	_____
light intensity	光照强度	_____	_____	_____
temperature	温度	_____	_____	_____
limiting factor	限制因素	_____	_____	_____
adapted	适应	_____	_____	_____
palisade	栅栏	_____	_____	_____
chloroplasts	叶绿体	_____	_____	_____
spongy	海绵	_____	_____	_____
air spaces	气腔	_____	_____	_____
stomata	气孔	_____	_____	_____
guard cells	保卫细胞	_____	_____	_____

Recall

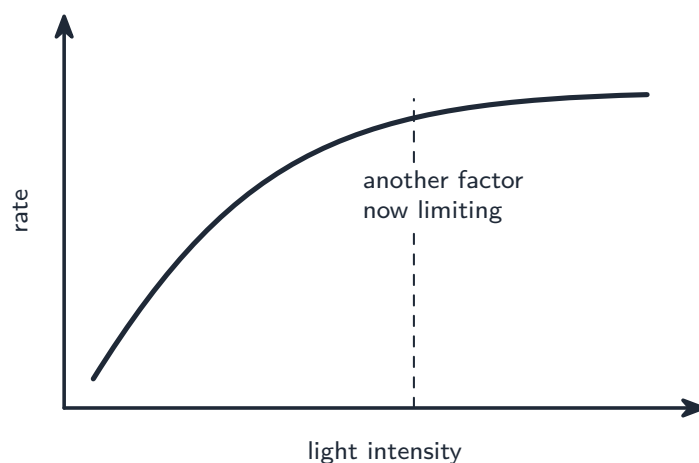
Photosynthesis goes faster or slower depending on the conditions, and the leaf is well built for the job.

New ideas

Read these first, then do the Practice.

■ 1 Rate and limiting factors

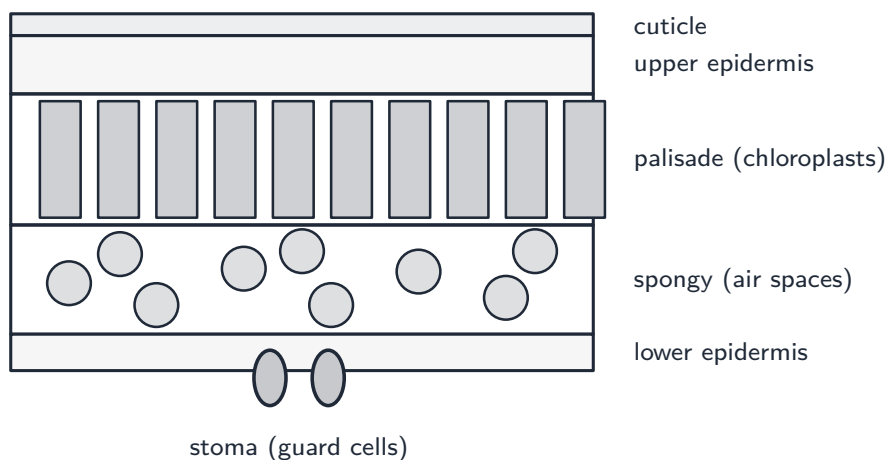
Three things change the **rate** 速率 of photosynthesis: **light intensity** 光照强度, carbon dioxide level and **temperature** 温度.



At any moment, the factor in shortest supply holds back the rate — the **limiting factor** 限制因素. More light speeds things up until carbon dioxide or temperature becomes limiting.

■ 2 Leaf structure

A leaf is **adapted** 适应 for photosynthesis — broad and thin, to catch light and let gases reach every cell:



- the **palisade** 栅栏 cells near the top are packed with **chloroplasts** 叶绿体;

- the **spongy** 海绵 layer has **air spaces** 气腔 so gases move easily;
- tiny holes called **stomata** 气孔 (opened by **guard cells** 保卫细胞) let carbon dioxide in and oxygen out.

Watch out: on a rate–light graph the line **levels off** when something *else* (carbon dioxide or temperature) becomes the **limiting factor** — adding more light then does nothing. A leaf is broad and thin to catch light and let gases reach every cell.

Practice

Try these in order.

6.6 Name three factors that affect the rate of photosynthesis. [3]

6.7 What is a *limiting factor*? [1]

6.8 Which cells in the leaf do most of the photosynthesis, and why? [2]

6.9 What is the job of the stomata? [1]

6.10 Why is a leaf broad and thin? [2]

6.11 Challenge. On a bright, warm day a greenhouse grower wants faster photosynthesis. Suggest one thing they could add to the air, and explain why it helps. [2]