

12 Aerobic respiration – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English

Write it 3 times (English)

Aerobic

glycolysis

mitochondria

respiratory sub-
strate

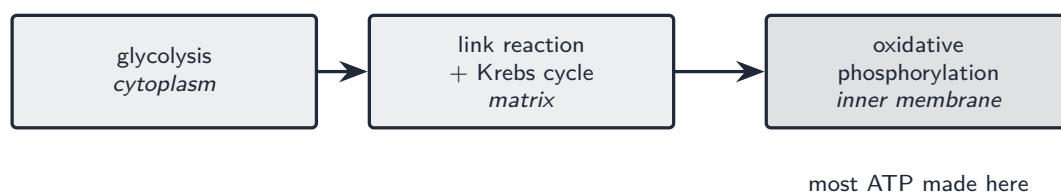
Recall

Aerobic respiration (with oxygen) releases a lot of energy from glucose. It happens in four stages, each in a set place in the cell.

New ideas

Read these first, then do the Practice.

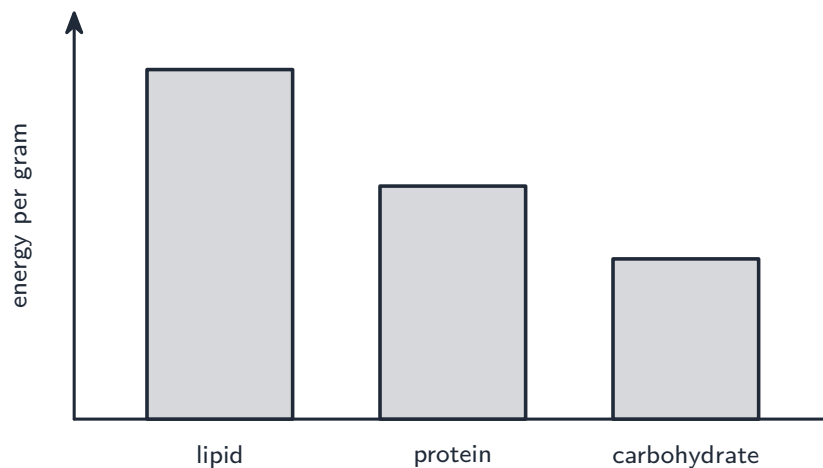
■ 1 The four stages



- **glycolysis** happens in the cytoplasm;
- the link reaction and Krebs cycle happen in the **mitochondria** matrix;

- oxidative phosphorylation on the inner membrane makes the most ATP.

■ 2 Respiratory substrates



A **respiratory substrate** is a molecule broken down for energy. Per gram, lipids release the most, then proteins, then carbohydrates.

Watch out: each stage has its place – glycolysis in the *cytoplasm*, the link reaction and Krebs cycle in the mitochondrial *matrix*, and oxidative phosphorylation on the *inner membrane* (which makes the most ATP).

Practice

Try these in order.

12.6 Does *aerobic* respiration use oxygen? [1]

12.7 Where does *glycolysis* happen? [1]

12.8 Which stage makes the most ATP? [1]

12.9 Which respiratory substrate releases the most energy per gram? [1]

12.10 What is a *respiratory substrate*?

[1]

12.11 Challenge. A muscle cell has very many mitochondria, each with a heavily folded inner membrane. Explain how these features help it make a lot of ATP.

[2]
