

3.5 Cellular Respiration

Name: _____ Class: _____ Date: _____ **Total: 13 marks**

KEY WORDS electron transport chain 电子传递链 • cellular respiration 细胞呼吸
• glycolysis 糖酵解 • krebs cycle 克雷布斯循环 • fermentation 发酵

Objective

Build the skills to answer exam questions on **cellular respiration**.

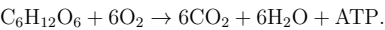
You must be able to:

- write the overall equation
- name the three stages (**glycolysis** 糖酵解, **Krebs cycle** 克雷布斯循环, **electron transport chain** 电子传递链)
- state where most ATP is made and the role of oxygen

1 Worked examples

Study these first. Each one shows the method for a question type used later — follow the steps and you can do the Practice and Exam-style questions yourself.

■ The overall reaction



Cells break down glucose with oxygen to release energy as ATP.

■ The three stages

- **Glycolysis** (cytoplasm) — splits glucose into pyruvate, makes a little ATP.
- **Krebs cycle** (mitochondrial matrix) — releases CO₂, makes electron carriers.
- **Electron transport chain** (inner mitochondrial membrane) — makes **most** of the ATP.

■ Oxygen's role

Oxygen is the **final electron acceptor** in the electron transport chain, forming water. Without it, the chain stops and little ATP is made.

■ A worked link

Most ATP comes from the electron transport chain, powered by electrons carried from glycolysis and the Krebs cycle, using a proton gradient across the inner membrane.

2 Practice

Now apply the methods above.

2.1 Write the overall equation for cellular respiration. [2]

2.2 Name the three stages of respiration. [3]

2.3 What is the role of oxygen in respiration? [1]

3 Exam-style questions

3.1 Most of the ATP in cellular respiration is made in the [1]

A	B
C	D

A glycolysis stage

B Krebs cycle

C electron transport chain

D cytoplasm

3.2 A cell is respiring aerobically.

(a) State where glycolysis occurs and its main product. [2]

(b) Explain what happens to ATP production if oxygen runs out. [2]

3.3 Explain the relationship between photosynthesis and respiration in terms of their reactants and products. [2]