

7.7 Common Ancestry

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS common ancestor 共同祖先

Objective

Build the skills to answer exam questions on **common ancestry**.

You must be able to:

- explain evidence for a **common ancestor** 共同祖先 of all life
- cite shared features (DNA, ribosomes, ATP, the genetic code)
- interpret shared traits as descent from a common ancestor

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.

■ Shared core features

All living things share fundamental features, pointing to a **common ancestor**:

- **DNA/RNA** as genetic material;
- the **same genetic code** (codons);
- **ribosomes** that make proteins;
- **ATP** as energy currency.

■ Why this is evidence

It would be a huge coincidence for unrelated origins to share the **same code** and machinery. The simplest explanation is that all life **descended** from a shared ancestor that already had them.

■ Nested similarities

More closely related groups share **more** features (and more similar DNA), forming a nested pattern that maps onto a tree of descent.

■ A worked reasoning

Because a bacterium and a human both use the same genetic code and ribosomes, they most likely inherited these from a distant common ancestor.

2 Practice

Now apply the methods above.

2.1 Name two features shared by all living things. [2]

2.2 What does sharing the same genetic code suggest? [1]

2.3 Do more closely related species share more or fewer features? [1]

3 Exam-style questions

3.1 The universal genetic code is evidence that all organisms [1]

- | | |
|---|---|
| A | B |
| C | D |
- A** evolved separately
B share a common ancestor
C are identical
D cannot be related

3.2 A student notes that bacteria and humans both use ATP and ribosomes.

(a) Explain how this supports common ancestry. [2]

(b) State one other shared feature. [1]

3.3 Explain why the pattern of “more related organisms share more features” fits descent from common ancestors. [2]