

Extinction

4.6.3.6 · Inheritance, variation and evolution · revision notes

A species is extinct when no individuals of that species remain alive. You need the factors that can cause extinction and to apply them to examples in 'suggest why' and data questions.

Key facts

- Extinct = no individuals of the species remain alive
- Catastrophic events: massive volcanic eruptions, collisions with asteroids
- Causes: changes to the environment over geological time; new predators; new diseases; new, more successful competitors; a catastrophic event
- Little variation or rapid change → greater risk of extinction

Notes

What extinction is

- A species is **extinct** when there are **no remaining individuals** of that species still alive.
- Extinction is permanent: the species and its alleles are lost for ever.
- Fossils show that very many species that once lived are now extinct.

Causes of extinction

- Changes to the environment** over geological time, such as changes in climate. If a species cannot survive in the new conditions, it dies out.
- New predators**, e.g. animals brought to an island by humans that eat native animals or their eggs.
- New diseases**: if no individuals are resistant, the whole population can be killed.
- New, more successful competitors** that take the food, space or other resources the species needs.
- A single **catastrophic event**, such as a massive **volcanic eruption** or a **collision with an asteroid**. An asteroid collision is thought to have contributed to the extinction of the dinosaurs.

Which species are most at risk

- Species with **little genetic variation**: there may be no individuals with characteristics that help them survive a change.
- Species facing a **rapid change**: natural selection takes many generations, so there may not be time for the population to change.
- Species with **small populations**, or that live in only one place such as a single island.

How to answer each type of question

Give factors that can cause extinction

1 to 3 marks

Grade 4

1. Choose from: environmental change, new predators, new diseases, new competitors, catastrophic events.
2. Give clearly different factors, not two versions of the same one.

Example. Give three factors that can cause a species to become extinct. [3 marks]

Model answer. Any three: changes to the environment, e.g. climate (1); new predators (1); new diseases (1); new, more successful competitors (1); a catastrophic event such as an asteroid collision or a massive volcanic eruption (1).

Don't lose marks

- ✗ Writing 'the environment changed' without explaining how that stopped the species surviving and reproducing.
- ✗ Confusing extinct with endangered. An endangered species still has living individuals.
- ✗ Giving 'humans' as a cause without saying what humans did (e.g. brought in a new predator, destroyed a habitat).

More tips

Memory tricks

- Causes of extinction: 'Every Panda Dreads Catastrophic Competition' (Environment change, Predators, Diseases, Catastrophes, Competitors).
- 'New' is the key word: new predators, new diseases, new competitors.

Exam technique

- Use the clues in the question: examiners expect you to name the factor that is described.
- Link each factor to its effect on survival and reproduction.
- When asked for several factors, make each one clearly different.

What each grade needs

What you need to be able to do, from the first marks up to the top grade.

Grade 3

Define extinction

A species is extinct when there are no remaining individuals of that species still alive.

Grade 4

List the causes of extinction

Environmental change, new predators, new diseases, new competitors and catastrophic events.

Grade 5

Give examples of catastrophic events

Massive volcanic eruptions or collisions with asteroids.

