

Darwin Wallace Speciation

GCSE Biology · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Give three reasons why Darwin's theory was only gradually accepted. (3 marks)

Step 1 · Religion

It challenged the idea that God made all the animals and plants that live on Earth.

Step 2 · Evidence

There was not enough evidence at the time to convince many scientists.

Step 3 · Mechanism

The mechanism of inheritance and variation was not known until 50 years after the theory was published.

Answer: Religious objection; insufficient evidence; inheritance mechanism unknown

Check: Mendel's work, rediscovered around 1900, later supplied the mechanism.

2. Now try one with the steps

Describe how a new species can form by geographical isolation. (4 marks)

Step 1 · Isolation

Step 2 · Variation and different conditions

Step 3 · Natural selection

Step 4 · Speciation

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Name the book Darwin published in 1859. [1]

2. Name the scientist who independently proposed natural selection at the same time [1]

3. Which organism did Mendel use in his breeding experiments? [1]
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4. What did Mendel conclude about how characteristics are inherited? [1]
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5. Describe Lamarck's theory of evolution. [1]
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6. Explain why Mendel's work was not recognised during his lifetime. [2]
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7. Give one piece of evidence Wallace contributed to the theory of evolution. [1]
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8. Mendel recorded 5474 round and 1850 wrinkled seeds. Calculate the ratio to 1 decimal place (? : 1). [2]
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9. Explain why Lamarck's theory is not accepted today. [2]
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10. Define speciation. [1]
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11. Explain the role of isolation in speciation. [2]
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12. Explain how the discovery of genes supported Darwin's theory. [2]
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13. Darwin's book was published in 1859; DNA's structure was discovered in 1953. How many years apart? [1]
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14. Explain why Darwin and Wallace's joint presentation is an example of how science works. [2]

4. Before you hand it in

"Darwin discovered genes."

Darwin did not know how characteristics were inherited. Mendel's work, and later genetics, supplied the mechanism.

"New species form because animals choose new habitats."

Populations are separated, different alleles are selected in each, and over many generations they can no longer produce fertile offspring together.

"Lamarck and Darwin said the same thing."

Lamarck: acquired characteristics are inherited. Darwin: natural selection acts on existing inherited variation.