Selective Breeding Genetic Engineering

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

Name _____ Class _____ Date _____

1. Worked example

Describe how a farmer could breed cattle that produce more milk. (4 marks)

Step 1 · Choose parents

Select the cows with the highest milk yield, and a bull whose mother had a high yield.

Step 2 · Breed

Breed them together.

Step 3 · Select offspring

Choose the offspring with the highest milk yield and breed them together.

Step 4 · Repeat

Continue over many generations until all the offspring show the characteristic.

Answer: Choose best parents → breed → select best offspring → repeat for many generations

Check: Selective breeding takes many generations.

2. Now try one with the steps

Mean milk yield rose from 20 to 32 litres per cow per day after selective breeding. Calculate the percentage increase. (2 marks)

Step 1 · Change

Step 2 · Percentage

Answer:

3. Practice

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

1. What is selective breeding? [1]

2. Give two characteristics that plants have been selectively bred for. [2]

3. What is genetic engineering? [2]

4. Give two examples of genetically modified (GM) crops. [2]

5. Give one benefit of producing insulin using genetically engineered bacteria. [1]

6. Give one concern some people have about GM crops. [1]

7. Explain why selective breeding takes many generations. [2]

8. A wheat yield rose from 6.0 to 7.5 tonnes per hectare. Calculate the percentage increase. [2]

9. Explain one disadvantage of crops being genetically very similar. [2]

10. A breeder produces one generation every 2 years. How many generations in 30 years? [1]

11. Name the two types of vector used in genetic engineering. [2]

12. Explain why genes are transferred to plant and animal cells at an early stage of development. [2]

13. Explain the role of enzymes in genetic engineering. [2]

14. Evaluate the use of GM crops to increase food production. [4]

4. Before you hand it in

"Selective breeding changes an animal's genes directly."
Selective breeding chooses which individuals breed; genetic engineering inserts genes.

"Selective breeding is natural selection."
In selective (artificial) breeding, humans choose; in natural selection, the environment determines survival.

"Plasmids are found in human cells."
Plasmids are small rings of DNA in bacteria, used