

Cloning

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

Name _____ Class _____ Date _____

1. Worked example

Describe how tissue culture is used to clone plants. (3 marks)

Step 1 · Cells

Small groups of cells are taken from part of the parent plant.

Step 2 · Grow

They are grown on a medium containing nutrients and plant hormones, in sterile conditions.

Step 3 · Plants

They develop into new plants that are clones of the parent.

Answer: Small groups of cells → sterile nutrient medium → identical new plants

Check: Tissue culture is used to preserve rare species and in commercial nurseries.

2. Now try one with the steps

Describe embryo transplants in cattle. (3 marks)

Step 1 · Embryo

Step 2 · Split

Step 3 · Transplant

Answer:

3. Practice

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

1. What is a clone? [1]

2. Name a simple method gardeners use to clone plants. [1]

3. Give one reason tissue culture is useful. [1]

4. What was Dolly the sheep? [1]
-
-
5. In adult cell cloning, which cell provides the nucleus? [1]
-
-
6. Explain why an electric shock is used in adult cell cloning. [1]
-
-
7. Explain why the cloned lamb is genetically identical to the animal that donated the body cell, not the egg donor. [2]
-
-
8. Explain why embryo transplant clones are not identical to their parents. [2]
-
-
9. One cutting produces 6 new plants. How many plants come from 45 cuttings? [1]
-
-
10. Out of 160 cloned embryos, 12 developed into healthy animals. Calculate the success rate percentage. [2]
-
-
11. Give one benefit of adult cell cloning. [1]
-
-
12. Explain one disadvantage of growing a crop made entirely of clones. [2]
-
-
13. Explain why tissue culture must be carried out in sterile conditions. [2]
-
-

14. Evaluate the use of adult cell cloning to save an endangered species.

[4]

4. Before you hand it in

"Dolly was identical to the sheep that gave the egg."

Dolly was a clone of the sheep that donated the BODY CELL nucleus.

"Embryo transplants clone the parents."

Embryo transplants produce clones of each OTHER, not of the parents.

"Clones are always healthier."

Cloning can lead to health problems and low success rates, raising welfare concerns.