

# 6.2.5 Cloning

## AQA GCSE Biology (Higher) Question and answer notes

For more resources, visit [www.mooramo.com](http://www.mooramo.com)

### How to use these notes

These notes cover everything you need to know for this part of the specification. They have been written in question-answer format to make them easier for you to study from.

In order to study successfully, I recommend you do the following for each question and answer:

- Read it carefully and make sure you **understand** it.
- **Memorise** the answer.
- **Practice** applying your understanding to past exam questions.

A good way to memorise information is to use **retrieval practice**. This is when you practise retrieving information from your memory. You could do this by making a flashcard for each question with the question on one side and the answer on the other. Or you could use a flashcard app. Alternatively, use a sheet of paper to cover up the answer so you can only see the question. Try to answer the question and then check how you did.

You should practise retrieving each answer from your memory until you can do it perfectly. Even once you can retrieve the answer perfectly, your ability to retrieve it will probably fade as time passes without practising. Therefore you will need to keep going back to the questions that you have previously mastered and practising them again. However, each time you re-learn the answer, the memory will be stronger and will last longer than the time before.

### What are clones?

Clones are organisms that are genetically identical to each other.

### What is cloning?

Cloning is the process of creating clones.

### What are the main methods of cloning plants?

The main methods of cloning plants are:

- Taking cuttings
- Tissue culture

### **What is a cutting? How can cuttings be used to clone plants?**

A cutting is a piece of a plant that has been cut off from the main plant. The cutting can then be grown into a new plant. This is a method of cloning plants that has been used for thousands of years.

### **What is tissue culture?**

Tissue culture is the process of taking a small sample of tissue from an organism and using it to grow new organisms. Tissue culture can be used to grow many new plants from a small sample of tissue from one plant. It is an example of cloning. It can be used in agriculture and horticulture to produce many copies of a plant that has desirable characteristics.

### **What are the main methods of cloning animals?**

The main methods of cloning animals are:

- Embryo transplants
- Adult cell cloning

### **How does an embryo transplant work?**

An embryo transplant starts with a developing animal embryo that has not yet reached the stage where the cells become specialised. These unspecialised cells (stem cells) are split apart and allowed to grow into new embryos. All of these embryos are clones of the original embryo. They are transplanted into host mothers to continue developing.

### **How does adult cell cloning work?**

Adult cell cloning is used to clone an animal that has already developed into an adult. The main steps are as follows:

- A body cell is taken from the animal that is being cloned.
- An egg cell is taken from another individual of the same species. The nucleus is removed from this egg cell.
- The egg cell with no nucleus is fused with the body cell from the animal that is being cloned. This creates a cell that is genetically identical to the animal being cloned and is capable of developing into an embryo.
- An electric shock is used to stimulate the new cell to divide to form an embryo.
- Once the embryo has developed into a ball of cells, it is inserted into the womb of an adult female to continue its development. It develops into a new individual that is genetically identical to the original animal.