

Fact sheet: B1.3 Biotechnology – Genetic modification and cloning

Question	Answer
Plants are sensitive to these three conditions (3)	Light, moisture and gravity
Plant shoots grow towards this	Light
Plant shoots grow against this	The force of gravity
Plant roots grow towards this	Moisture
Plant roots grow in the direction of this	The force of gravity
Plant hormones that coordinate and control growth	Auxin
When a plant grows in response to light	Phototropism
When a plant grows in response to gravity	Gravitropism
This causes plant shoots and roots to bend towards/ away from stimuli...	An unequal distribution of hormones
Two uses for plant hormones in agriculture and horticulture (2)	<ul style="list-style-type: none"> • Weedkillers • Rooting powder for plant cuttings
A quick and cheap way to produce new plants that are genetically identical to the parent plant	Take cuttings
A modern method for cloning plants that involves taking small groups of cells from part of a plant	Tissue culture

This is formed when a fertilised egg cell divides	Embryo
Two modern animal cloning techniques are... (2)	<ul style="list-style-type: none"> • Embryo transplants • Adult cell cloning
Type of animal cloning that involves discarding the nucleus from an egg cell	Adult cell cloning
Type of animal cloning that involves splitting apart cells from a developing animal embryo before they become specialised	Embryo transplants
Type of animal cloning that involves inserting an adult cell nucleus into an empty egg cell	Adult cell cloning
Type of animal cloning that involves using an electric shock to cause the egg cell to start to divide	Adult cell cloning
Type of animal cloning that produces clones of an adult	Adult cell cloning
Type of animal cloning that can produce many clones	Embryo transplants
Type of animal cloning where the offspring produced are identical to each other but not the parents	Embryo transplants
Where embryos need to be placed in order to develop	The womb/ uterus of a host mother
Process where genes are cut out from chromosomes and transferred to the cells of other organisms	Genetic engineering

These are used to cut genes out of chromosomes	Enzymes
The purpose of inserting genes into other organisms at an early stage in their development	So that they develop with desired characteristics
Crops that have been genetically engineered	GM (genetically modified) crops
Three reasons to genetically modify plants (3)	<ul style="list-style-type: none"> • Make them resistant to insect attack • Make them resistant to herbicides • Increase yield of fruits/ vegetables/ seeds
Two reasons for concerns about GM crops (2)	<ul style="list-style-type: none"> • The effect they may have on populations of wild flowers and insects. • Uncertainty about the effect of eating GM crops on human health.