

5.4.1 [Plant hormones] Control and coordination

AQA GCSE Biology (Higher) Question and answer notes

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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.

Why do plants produce hormones?

Plants produce hormones to coordinate and control growth and responses to stimuli.

Name three plant hormones.

Auxin, gibberellins and ethene are three plant hormones.

What is phototropism?

Phototropism is when a plant changes its direction of growth in response to the direction of light.

What kind of phototropism do plant shoots show?

Plant shoots grow towards light. This is called positive phototropism.

What kind of phototropism do plant roots show?

Plant roots grow away from light. This is called negative phototropism. (Note: this only happens when roots are above ground).

What is gravitropism?

Gravitropism (also known as geotropism) is when a plant changes its direction of growth in response to the direction of the pull of gravity.

What kind of gravitropism do plant shoots show?

Plant shoots grow away from the pull of gravity (in other words, they grow upwards). This is called negative gravitropism.

What kind of gravitropism do plant roots show?

Plant roots grow towards the pull of gravity (downwards). This is called positive gravitropism.

What effect does auxin have on shoot cells?

Auxin stimulates shoot cells to elongate (grow longer).

What effect does auxin have on root cells?

Auxin inhibits elongation of root cells (in other words, it prevents root cells from growing longer).

How does auxin cause phototropism in shoots?

Auxin accumulates on the side of the shoot that is in the shade and not on the side that is in the light. The auxin stimulates the cells on the side in the shade to elongate more than the cells on the side that is in the light. Therefore, as the shoot grows, it bends towards the light.

How does auxin cause phototropism in the roots?

Auxin accumulates on the side of the root that is in the shade. This causes the cells in the shade to elongate less than the cells in the light. Therefore, as the root grows, it bends away from the light.

How does auxin cause gravitropism in shoots?

Auxin accumulates on the lower side of the shoot. This causes the cells on the lower side to elongate more than the cells on the upper side. Therefore, as the shoot grows, it bends upwards.

How does auxin cause gravitropism in roots?

Auxin accumulates on the lower side of the root. This causes the cells on the upper side to elongate more than the cells on the lower side. Therefore, as the root grows, it bends downwards.

What is the role of gibberellins in plants?

Gibberellins are important in initiating seed germination.

What are the roles of ethene in plants?

Ethene controls cell division and ripening of fruits.