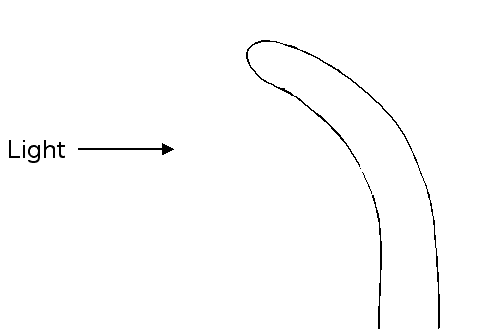
Year 11 Biology: Plant tropisms.

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Question 1. A biologist conducted an experiment on straight wheat seedlings that were exposed to light from one side. After 48 hours, the seedlings had bent as shown in the diagram below.



Give answers to the following:

1. Name the hormone that brings about this response. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)
2. Is this response an example of positive or negative phototropism? Justify your answer

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1. What part of the seedling detects this stimulus? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)
2. By the use of an arrow on the drawing above, show where auxin is produced and to where most of the auxin is transported. (1 mark)
3. What effect does auxin have on growing cells?

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Question 2. Apical dominance is a particular growth form shown by many plants

1. Describe the growth pattern of a plant that shows apical dominance. (2 marks)

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Apical dominance is believed to be caused by the production of auxin in the apical bud which is then transported to the lateral buds, blocking their growth.

1. What is another name for auxin? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)

Lateral buds and apical buds respond differently to auxin as shown in the graph below.

Lateral Buds Apical Bud

Stimulation

Inhibition

6

4

2

AUXIN CONCENTRATION (arbitrary units)

1. Indicate a concentration of auxin at which the apical bud is stimulated and the lateral buds are inhibited.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)

1. By referring to this graph and the information given, explain why the removal of the apical bud results in the lateral buds being stimulated to grow. (3 marks)

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Question 3. The brown spots on a banana produce large amounts of ethylene. Ethylene is a plant hormone.

1. What is unusual about the hormone, ethylene? (1 mark)

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1. What effect would ethylene have on other fruits, such as apples and tomatoes? (1 mark)

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Delphiniums are flowers that are grown commercially and sold to florists. They are prone to dropping their petals when they are stored with other flowers at a florist shop. This makes them worthless. However, commercial growers of Delphiniums often apply a spray containing silver thiosulphate to prevent the flowers from dropping their petals.

1. Suggest how silver thiosulphate prevents Delphiniums from dropping their petals. (2 marks)

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Question 4. A student set up the experiment using wheat seedlings and a light source as shown in the diagram below. She varied the colour of the light coming from the light source. The colours of light used were blue and green.

Wheat seedlings

Light Source[](http://www.firstlightdirect.com/images/032.jpg)

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1. In this experiment, what was the variable being investigated?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (1 mark)

1. Her results indicated that wheat seedlings display a strong phototropic response to blue light but no phototropic response to green light. In the boxes below, draw how the wheat seedlings would appear for each light source after several days. (2 marks)

Green Light [](http://www.firstlightdirect.com/images/032.jpg)

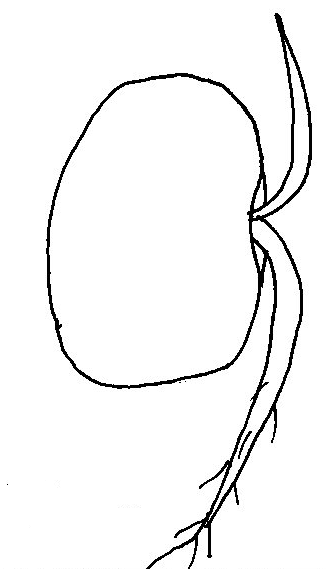
Blue Light [](http://www.firstlightdirect.com/images/032.jpg)

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c. In another experiment, a student germinated a seed and then placed the seedling in a

horizontal position in the dark. See diagram below.

Shoot Root



1. In the box below, draw how the seedling would look after a few days of growth. In your drawing, indicate where positive geotropism has occurred and where negative geotropism has occurred. (2 marks)

d. Give reasons why it is adaptive for plants to show the following responses. (4 marks)

1. Seedlings only open their leaves when they are exposed to light.

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2. The growing shoots of plants bend towards the light.

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