

# B1g: Controlling plant growth

## 1 Plant responses

John buys a plant to give to his mother as a birthday present. He puts it under his bed until her birthday.



when bought



after one week  
under the bed

a) Explain the changes that have happened to the plant.

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b) How does this type of response help the plant survive?

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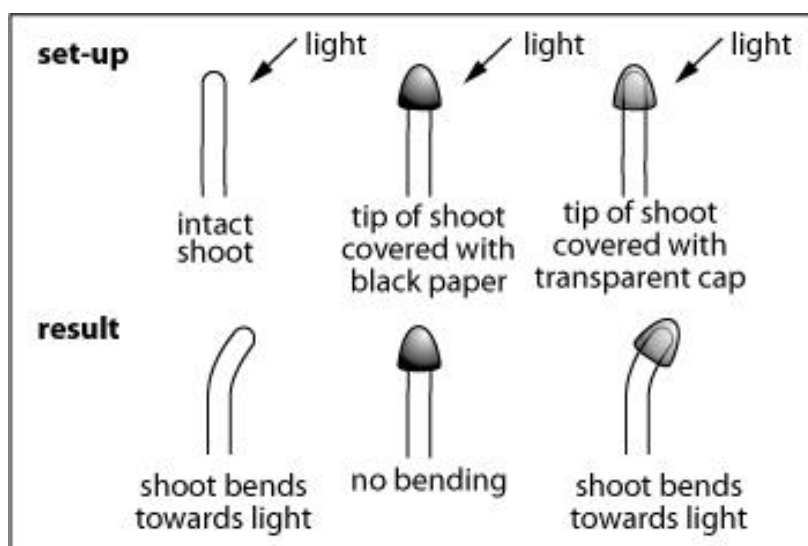
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## 2 Tropisms

a) Complete the table.

stimulus	name of response	
	in shoots	in roots
light		
gravity		positively geotropic

b) In 1880 Darwin did a set of experiments to try and work out which part of the shoot detects light.  
The diagram shows his experiment.



(i) What does Darwin's experiment show about where the light is detected?  
Explain your answer.

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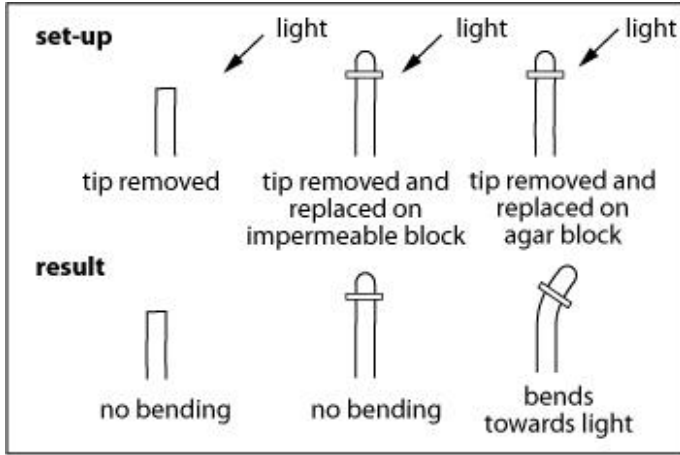
(ii) Scientists now think that a hormone must pass through the plant controlling the response to light.  
What is the name of this messenger?

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### 3 The mechanism for tropisms

Scientists carried out various experiments to try and find out how the tip of a shoot controls phototropism. Some of these are shown in the diagrams.

#### Experiment 1



a) What do the results of experiment 1 show about how the tip of a shoot controls phototropism? Explain your answer.

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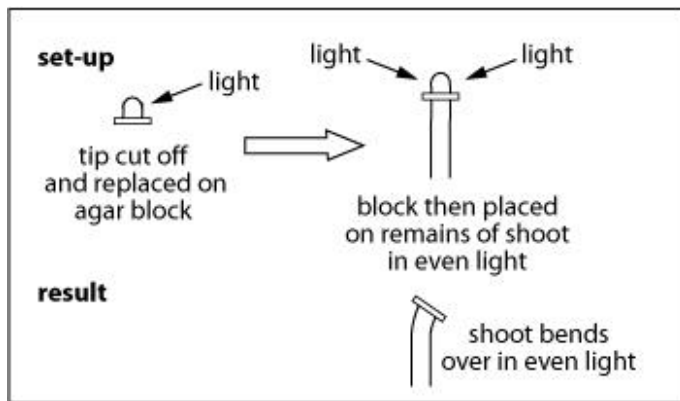


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#### Experiment 2



b) Explain the results of experiment 2.

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**Worksheet**

**Q1a** Shoot has grown and has grown sideways towards the light coming under the bed •  
**Q1b** Provides plant with more light so it can photosynthesise more and produce more food •  
• **Q2a** Shoots: positively phototropic / negatively geotropic, roots: negatively phototropic •  
**Q2bi** Light is detected by the tip of the shoot because covering this with black cover prevents the growth towards the light • **Q2bii** Auxin • **Q3a** The tip of the shoot must communicate with the rest of the shoot using a chemical that can diffuse across a permeable barrier but cannot pass across an impermeable barrier • **Q3b** The light from the side causes more auxin to be sent to the shaded side of the shoot. This collects in the agar block. It then diffuses down the shoot and causes more growth on one side in even light.