

### Types of Receptors

|                    |                                                                                   |
|--------------------|-----------------------------------------------------------------------------------|
| Photoreceptors     | Detects light, colour not important. detection of movement and shapes essential   |
| Thermoreceptors    | Infra-red detected, receptors not in eyes                                         |
| Mechanoreceptors   | Detects: touch, pressure, movement, gravity, stretch. important for co-ordination |
| Proprioceptors     | responds to tension in muscles and joints                                         |
| Chemoreceptors     | Smell (olfaction), taste(gustation)                                               |
| Auditory Receptors | Detects sound waves                                                               |
| Electrical Fields  | Fish use to detect disturbances nearby                                            |
| Magnetic Fields    | Homing in pigeons                                                                 |

### Tropism

Tropisms are a plant growth response to stimuli. This response can be positive (towards) or negative (away from).

### Types of Tropism

| Stimulus     | Root | Shoot | Advantage                                                      |
|--------------|------|-------|----------------------------------------------------------------|
| Phototropism | -    | +     | More light for shoot. Better anchorage+water+minerals for root |
| Geotropism   | +    | -     | Same as above                                                  |

### 5 Major Plant Hormones

| Name         | Stimulus                         | Produced        | Effect                                                    |
|--------------|----------------------------------|-----------------|-----------------------------------------------------------|
| Auxin        | Light in shoot, Gravity in roots | Apical Meristem | Cell elongation promoted in shoots and inhibited in roots |
| Gibberellins |                                  | Apical Meristem | Breaks dormancy, elongation of stems                      |
| Ethylene     |                                  | Senesing leaf   | Stimulates sugar production from starch                   |

### 5 Major Plant Hormones (cont)

|                     |                          |                                                                                            |
|---------------------|--------------------------|--------------------------------------------------------------------------------------------|
| Cytokinins          | Apical Meristem          | Cell division in presence of auxin.                                                        |
| Abscisic Acid (ABA) | Response to water stress | Leaves, Fruit, Stem, Root cap Controls dormancy, promotes abscission, inhibits seed growth |

### Phototropism

What causes Phototropism?

Auxin (IAA)

Where is it produced?

Apical meristem

What does it do?

Promotes cell elongation in shoot, inhibits in root

Where does it go?

Moves down plant from shoot to root

Why does it only affect one side?

Moves laterally across to the shaded side

What is the result of elongation?

Shoot grows towards light, root grows away.

What is the benefit?

More light for photosynthesis in shoots. roots grow away into soil where there is more minerals and water for photosynthesis.

### Geotropism

What is it?

Plant growth response to gravity

How is it detected?

Starch grains called Statoliths settle at bottom of root cap cells

What is the response?

Leads to redistribution of auxin at roots causing the root to grow towards gravity.

Does it affect shoots?

Yes, in the absence of light shoots exhibit negative geotropism, they grow away from gravity



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Not published yet.

Last updated 7th October, 2017.

Page 1 of 2.

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### Nastic Responses

What is it?

Movement of a plant **part** in response to stimuli

How fast does it occur?

Slow, but faster than tropisms

How responded?

Uniform response, regardless of direction of stimuli

Examples of responses

Venus flytrap responding to chemicals.



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Page 2 of 2.

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