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| [**Home**](http://docs.google.com/home.htm)  [**Abstract**](http://docs.google.com/abstract.htm)  [**Introduction**](http://docs.google.com/introduction.htm)  [**Review of Literature**](http://docs.google.com/literature_review.htm)  [**Procedure**](http://docs.google.com/procedure.htm)  [**Data**](http://docs.google.com/data.htm)  [**Conclusion**](http://docs.google.com/conclusion.htm)  [**Cross Sections**](http://docs.google.com/cross_sections.htm)  [**Journal**](http://docs.google.com/journal.htm)  [**References**](http://docs.google.com/references.htm)  [**bonus..**](http://docs.google.com/bonus.htm)**.** |  | This ground system of tissues and the support it provides the plant is essential for a plant to be able to live and function properly in the wild. Unfortunately for plants, the environment in the wild is not constant, so in order for plants to survive the various environmental stresses that nature provides such as extreme temperatures, varying degrees of light, mechanical stresses, and wind, it is essential for plants to be able to adapt to their environment. The necessity for plants to respond to environmental stimuli is much greater than that of animals because unlike animals, who have the ability to move away from environments that are potentially harmful, plants are immobile and must endure whatever stress they are faced with. Because of these limitations, plants have developed may forms of responses to environmental stimuli.  A tropism is the growth towards or away from a stimulus such as light or gravity. Phototropism, the movement towards or away from light, is an excellent example of plants adapting to their surroundings. In the late 1870s, Charles Darwin and his son Francis studied phototropism and discovered that phototropism will only occur if the tips of the shoots are exposed to light. This and other experiments lead to the discovery in 1926 by Frits Went that a hormone, which he named auxin, controlled the phototrophic response. Another form of tropism is gravitropism, the movement towards or away from the direction of the force applied by gravity. Positive gravitropism can be witnessed in the roots of plants, which grow in the direction of gravity, and negative gravitropism can be seen in the stems of plants, which grow away from the direction of gravity. Thigmotropism is yet another example of tropisms. In thigmotropism, a plant responds to touch such as when a morning glory tendril wraps itself around a stake or when ivy grows along the side of a wall. When a plant touches an object specialized cells on its epidermis signals the differentiation of cells in the tendrils. It is assumed by most botanists that thigmotropism is caused by a combination of the hormones auxin and ethylene.  Another type of environmental response that some plants exhibits is nastic movements, which differs from tropism in that the response it triggers is independent of the direction of the stimulus. When a plant responds to touch by moving either its branches or its leaves, it is called seisemonasty. A descriptive example of this phenomenon is the response of *Mimosa pudica* to touch. When this plant’s leaves are touched, its motor cells’ plasma membranes become more permeable to potassium ions, and this influx of ions into the cell causes the declination of the water potential in the intercellular space. The cell is now in a hypotonic environment, and the water inside the cell travels by osmosis into the intercellular space. This loss of water causes the cells to shrink, and consequently the plant’s leaves appear to droop. The constant cycle of night and day causes another form of nastic movement, nyctinasty, in some plants. Nyctinasty can be observed in the prayer plant, which during the daytime has its leaves spread horizontally to collect the maximum amount of sunlight and at night has its leaves folded vertically.  [previous page...](http://docs.google.com/literature_review_2.htm)  [more...](http://docs.google.com/literature_review_4.htm)  [works cited...](http://docs.google.com/works_cited.htm) |