



# Notes with Answers for Botany Module

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## Plants

Use the following chart to compare and contrast monocots and dicots.

| Structure    | Monocots                               | Dicots                                |
|--------------|--|---------------------------------------|
| Seed leaves  | <i>One</i>                             | <i>Two</i>                            |
| Floral parts | <i>Usually in 3s or multiples of 3</i> | <i>Usually in multiples of 4 or 5</i> |
| Leaves       | <i>Often parallel-veined</i>           | <i>Generally net-veined</i>           |

## Plant life cycles

Describe the following types of life cycles of plants.

Annual: *Completes its life cycle in one year.*

Biennial: *Requires all or part of two growing seasons to complete its life cycle. The first season, it produces vegetative structures and food storage organs. The following season it produces flowers, fruit, and seeds.*

Perennial: *Lives more than two years.*



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## Plant Classification

For each example, give the correct scientific name and use the correct formatting.

Species name for common garden bean.

*Phaseolus vulgaris* or *Phaseolus vulgaris*

Full scientific name for White Eastern Redbud.

*Cercis canadensis* var. *alba* or *Cercis canadensis* var. *alba*

Full scientific name for Honey Select Sweet Corn.

*Zea mays* 'Honey Select' or *Zea mays* 'Honey Select'

## Internal Plant Parts

What are meristems?

*Specialized cells that are a plant's growing points- the site of rapid, almost continuous cell division.*

What is their function? *Meristems begin growth of new cells in young seedlings, at the tips of roots and shoots, and along branches (forming buds, among other things).*

## External Plant Parts

What are the functions of roots?

*Absorb nutrients and moisture, anchor the plant in the soil, support the stem, and store food.*

What are the functions of stems?

*Support buds and leaves and serve as conduits for carrying water, minerals and food through the vascular system.*



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What is a node?

*Area on the stem where buds are located.*

Crowns, spurs, stolons, tubers, rhizomes, bulbs, and corms are all examples of what plant part?

*Specialized stems*

What is the function of leaves?

*Absorb sunlight to manufacture plant sugars through photosynthesis.*

What is the function of flowers?

*Sexual reproduction*

## Plant growth and development

What is photosynthesis?

*Plant process of creating sugars by synthesizing sunlight, carbon dioxide, and water.*

What is pollination?

*The transfer of pollen from an anther to a stigma, most often by wind or by pollinators.*

What is germination?

*Process in which a seed embryo goes from a dormant state to an active, growing state.*



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What is respiration?

*Chemical reaction with oxygen by which sugars and starches are converted into energy.*

What is evapotranspiration?

*The movement of water through a combined effect of water loss from transpiration and evaporation in the leaf.*

## Environmental factors affecting growth

How does light affect plant growth?

*There are three characteristics of light that affect plant growth: quantity, quality, and duration.*

- *Quantity: The concentration or intensity of sunlight a plant receives, the greater its capacity for producing food via photosynthesis.*
- *Quality (wavelengths): Blue light is responsible primarily for vegetative growth. Red light combined with blue light encourages flowering.*
- *Duration: The length (time) a plant is exposed to sunlight. Controls flowering in many plants. Short day plants require long periods of darkness. Long day plants require shorter periods of darkness.*



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How does temperature affect plants?

- *Influences plant processes. As temperature increases (up to a point), the processes increase.*
- *Germination: The temperature required for germination varies by species.*
- *Flowering: When combined with day length, it also affects the change from vegetative to reproductive growth.*
- *Crop quality: Low temperatures reduce energy use and increase sugar storage.*
- *Photosynthesis and respiration: If temperature is too high, respiration can increase above the rate of photosynthesis. If temperature is too low, photosynthesis is slowed, causing poor growth.*
- *Breaking dormancy: Some plants require a set amount of days at lower temperatures to break dormancy.*
- *Hardiness: A plant's ability to withstand very cold temperatures.*

How does water and humidity affect plant growth?

- *Water is the medium where biochemical reactions occur*
- *Responsible for turgor pressure*
- *Transports minerals through the plant*
- *Helps cool the plant through transpiration and respiration*