Science 2 - Chapter: Classification of Plants  
  
 ***1. Introduction to Classification of Plants***- Plants are autotrophic, eukaryotic organisms with cell walls and chlorophyll.  
- Classification helps in studying and understanding the diversity of plants by grouping them based on similarities.  
  
***2. Basis for Classification of Plants***  
Plants are classified on the following criteria:  
- Presence or absence of organs.  
- Presence or absence of conducting tissues for transporting water and food.  
- Presence or absence of seeds.  
- Whether seeds are enclosed in fruits or not.  
- Number of cotyledons (seed leaves) in seeds.  
  
***3. Major Groups of Plants***  
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| **Group** | **Characteristics** | **Examples** |
| Cryptogams\* | Do not produce seeds; reproduce by spores. | Algae, Bryophytes, Pteridophytes |
| \*\*Phanerogams\*\* | Produce seeds; these are seed-bearing plants. | Gymnosperms, Angiosperms |

**3.1 Sub-Kingdom: Cryptogams**- Plants reproduce by spores.  
- No flowers, fruits, or seeds.  
- Divisions:  
- \*\*Thallophyta\*\* - simplest plants with soft, fiber-like bodies (e.g., algae)  
- \*\*Bryophyta\*\* - called the "amphibians of plant kingdom"; need water for reproduction (e.g., moss)  
- \*\*Pteridophyta\*\* - vascular plants reproducing by spores (e.g., ferns)  
  
**3.2 Sub-Kingdom: Phanerogams**- Seed-bearing plants with flowers and fruits.  
- Divided into:  
- \*\*Gymnosperms\*\* (naked seeds; seeds not enclosed in fruit)  
- Mostly evergreen, woody plants.  
- Male and female reproductive organs on different sporophylls of the same plant.  
- Stem unbranched, leaves form crown.  
- Examples: Cycas, Pinus, Thuja.  
- \*\*Angiosperms\*\* (seeds enclosed in fruit)  
- Flowers are reproductive organs.  
- Seeds develop inside fruits.  
- Further divided into monocots and dicots based on seed leaves count.  
  
**4. Monocots vs Dicots**

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| **Feature** | **Monocots** | **Dicots** |
| Number of cotyledons | 1 | 2 |
| Root type | Fibrous root | Tap root |
| Branched | Stem branching | Usually unbranched |
| Leaf venation | Parallel venation | Reticulate venation |
| Flower parts | Usually in multiples of 3 | Usually in multiples of 4 or 5 |
| Examples | Maize, wheat, banana | Sunflower, mustard, tamarind |

**5. Additional Important Points**- Plants are autotrophic because they synthesize food through photosynthesis using chlorophyll.  
- Classification helps in understanding evolutionary relationships and adapting plants for different environments.  
- Gymnosperms do not bear fruits, whereas angiosperms bear fruits containing seeds.  
- Plants with no conducting tissues are non-vascular (algae, bryophytes), while those with conducting tissues are vascular (pteridophytes, gymnosperms, angiosperms).

**6. Quick Review - Key Definitions.**

- \*\*Spore:\*\* A reproductive unit in cryptogams for asexual reproduction.  
- \*\*Zygote:\*\* Formed during sexual reproduction in plants.  
- \*\*Cryptogams:\*\* Plants without flowers, fruits, and seeds.  
- \*\*Phanerogams:\*\* Plants with flowers, fruits, and seeds.