

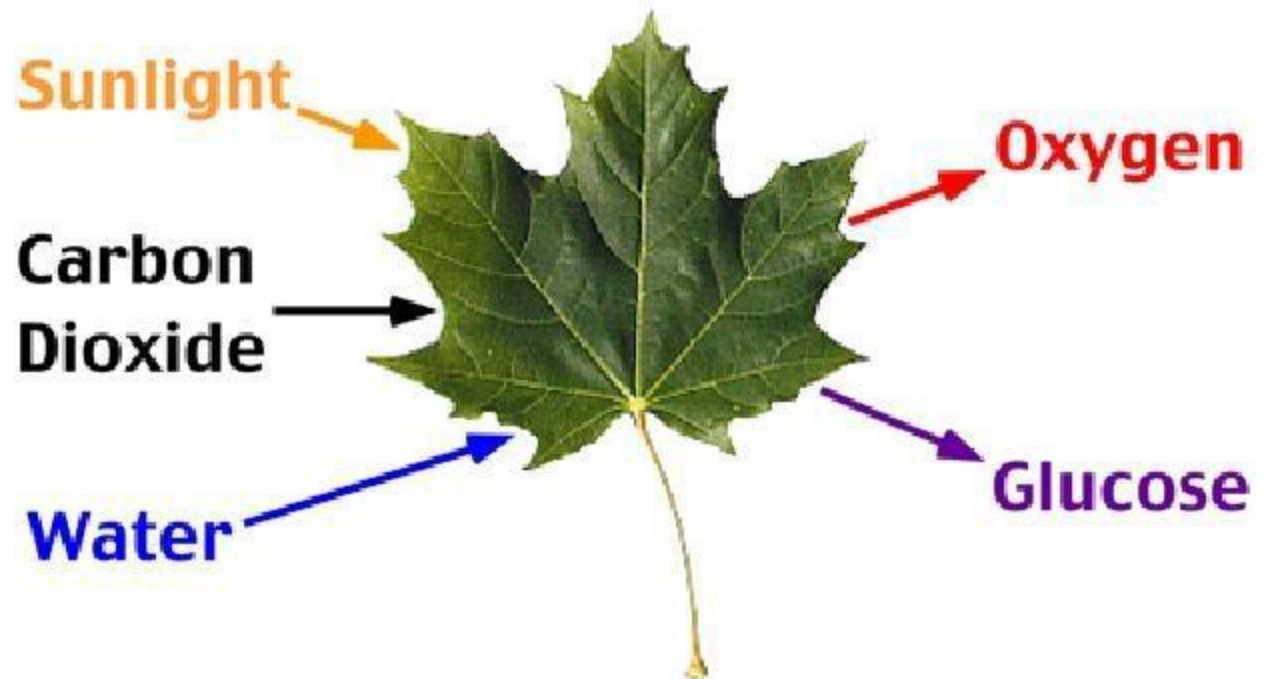
Plant Growth & Adaptations



Plant Nourishment

Photosynthesis Requirements

- Water
- Carbon dioxide
- Sunlight



Plant Nourishment

Macronutrients

- **Nitrogen**
 - Overall growth & chlorophyll structure.
- **Phosphorous**
 - Root & flower growth.
- **Potassium**
 - Root preservation; disease prevention; quality of fruit.
- **Calcium**
 - Cell wall; overall strength of plant.
- **Magnesium**
 - Chlorophyll structure.



Plant Nourishment

Micronutrients

- **Iron**
 - Chlorophyll structure.
- **Zinc**
 - Regulation of plant growth.
- **Copper**
 - Reproduction; root metabolism.



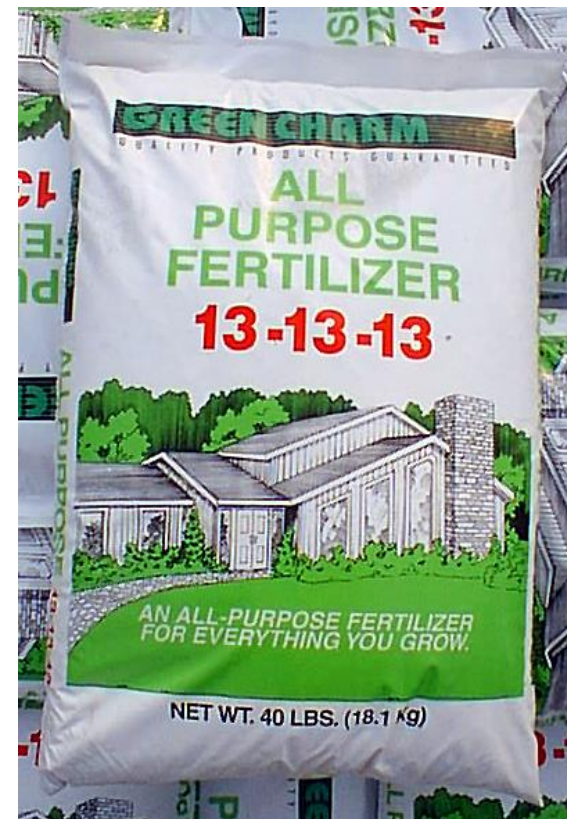
Fertilizers

Organic Fertilizers

- Sheep and cow manure.
- Mulch and compost.

Non-Organic Fertilizers

- Three numbers (e.g., 24-6-12).
 - Nitrogen-Phosphorous-Potassium



* What time of the year should “6-6-24” fertilizer be used?

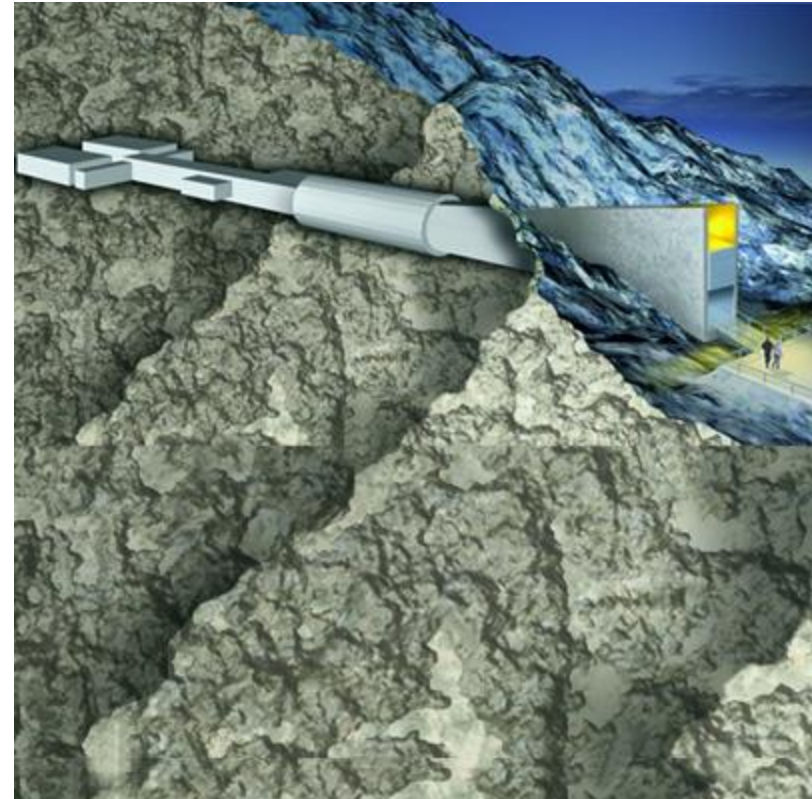
Wild Seed Speculation

- NASA sending seeds into space.
- Applications???



The Doomsday Vault

- For safekeeping of the World's vegetation.



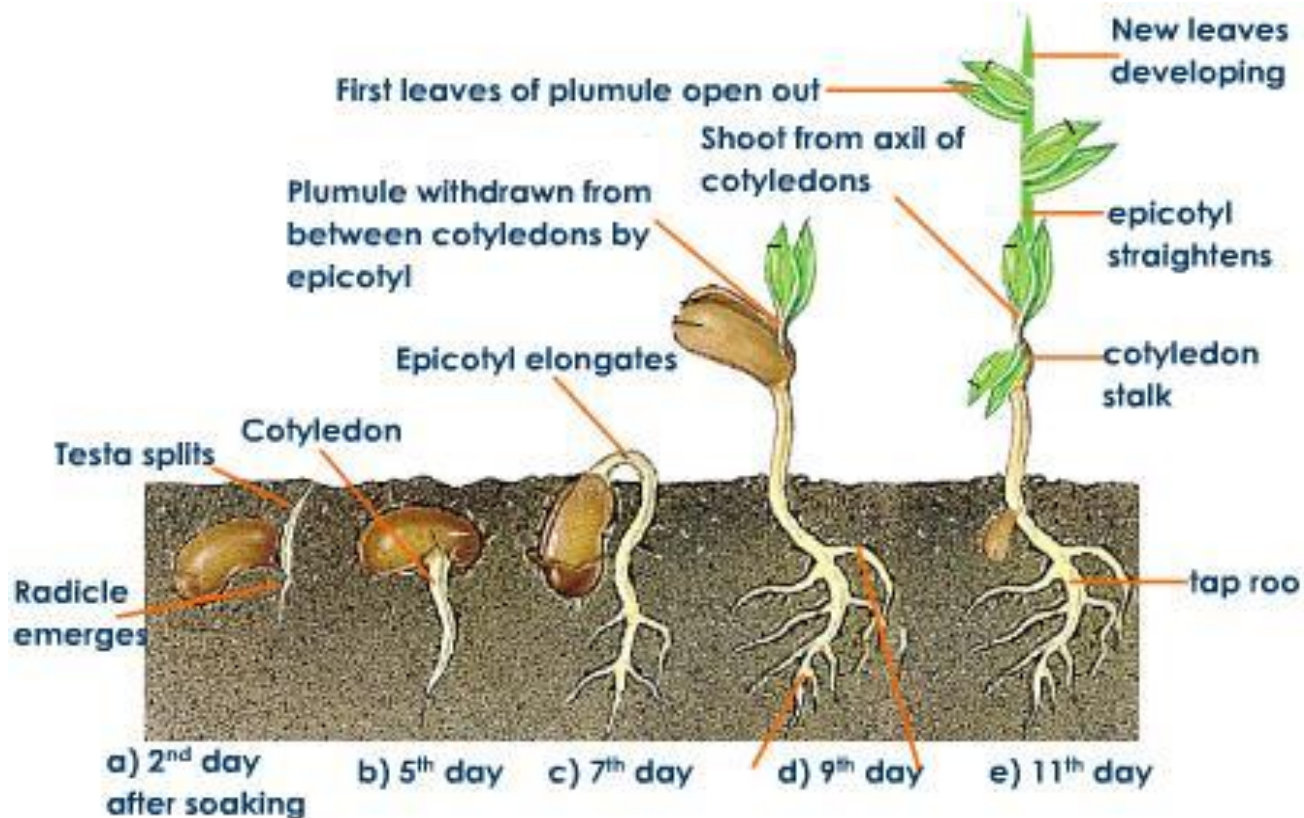
Seed Germination

When conditions are right...

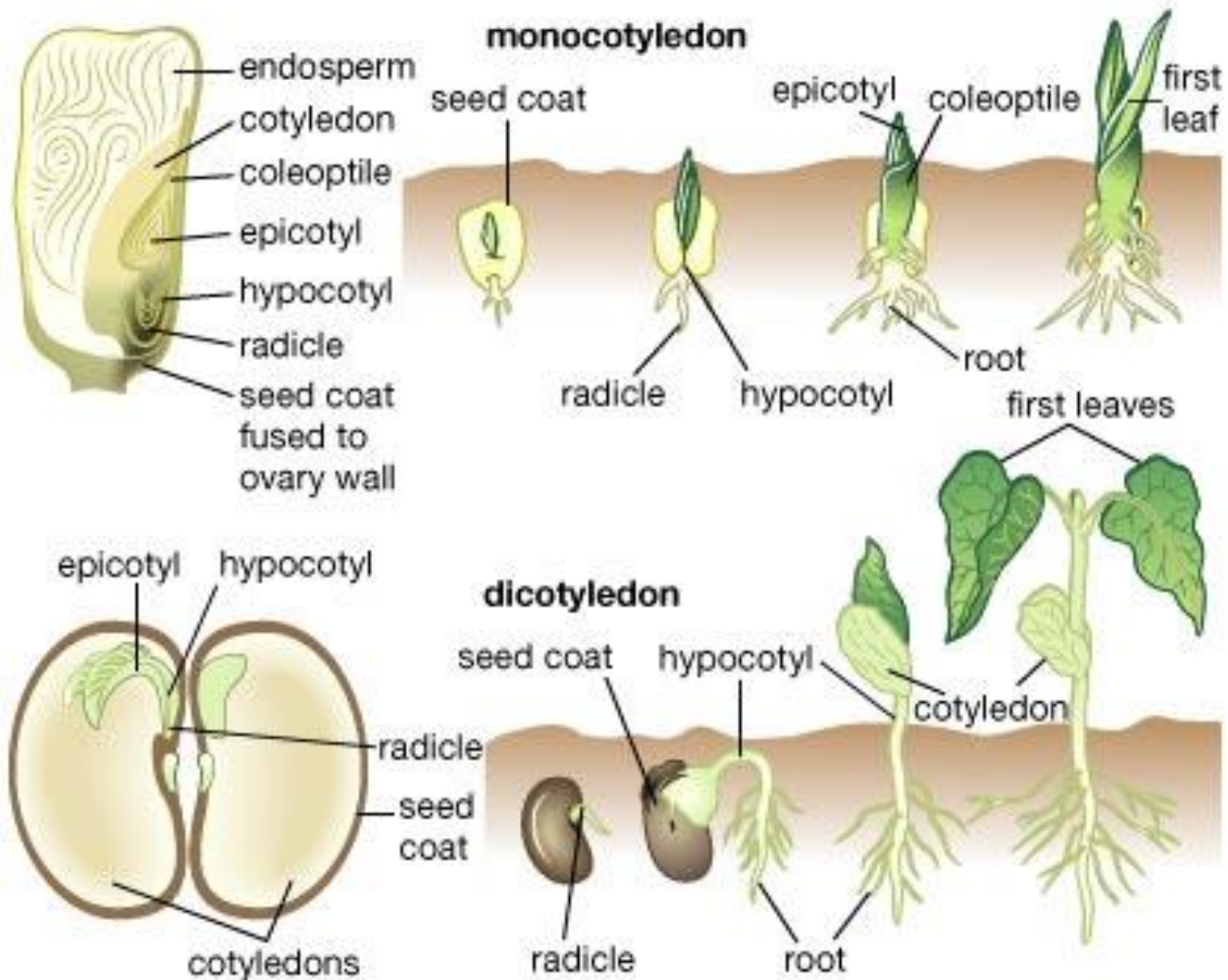
- Gibberellin released.
 - Enzymes break down starch.
 - Creates hypertonic condition → water rushes in.
 - Seed coat bursts.
 - Cellular respiration begins.

Seed Germination

- **Radicle** pushes down to form roots.
- **Hypocotyl** pushes up to form stem.
- **Epicotyl & cotyledon** grows upward to form leaves.



Seed Germination



Plant Adaptations

- Desert
- Wetlands
- Fire-prone areas
- Extreme cold
- Nutrient-poor soil
- Shade



Desert

- Modified leaves
 - Thin.
 - Thick cuticle.
- Photosynthetic stems.
- Extensive root system.
- Rapid development during rainy season.



Wetlands

- Floating leaves.
- Stomata on upper epidermis.
- Hollow stem for buoyancy and diffusion of gases.
- Floating seeds.



Fire-prone Areas

- Ashes neutralize acidic soils.
- Extreme heat opens tough seed coats.
- Few competitors.



Extreme Cold

- Longer dormant period.
- Deciduous trees lose leaves.
- Flowers act as solar collectors.
 - Concentrates solar rays on ovary...speeds up reproduction.



Nutrient-poor Soil

- Carnivorous.
 - Capture, kill and digest insects.
 - Acquire N, P and K.
 - e.g., Venus fly trap, pitcher plant.
- Parasitic.
 - Absorb water, minerals and sugars from xylem and phloem.
 - e.g., Mistletoe.



Shade

- Bloom early.
- Rapid growth.

