Sustainable Resource 11

Greenhouse lesson 6

Plants and Flowers

Botany

Botany is the study of plant life and development.

Characteristics of Plants

All plant cells have cell wall, central vacuole, chloroplasts

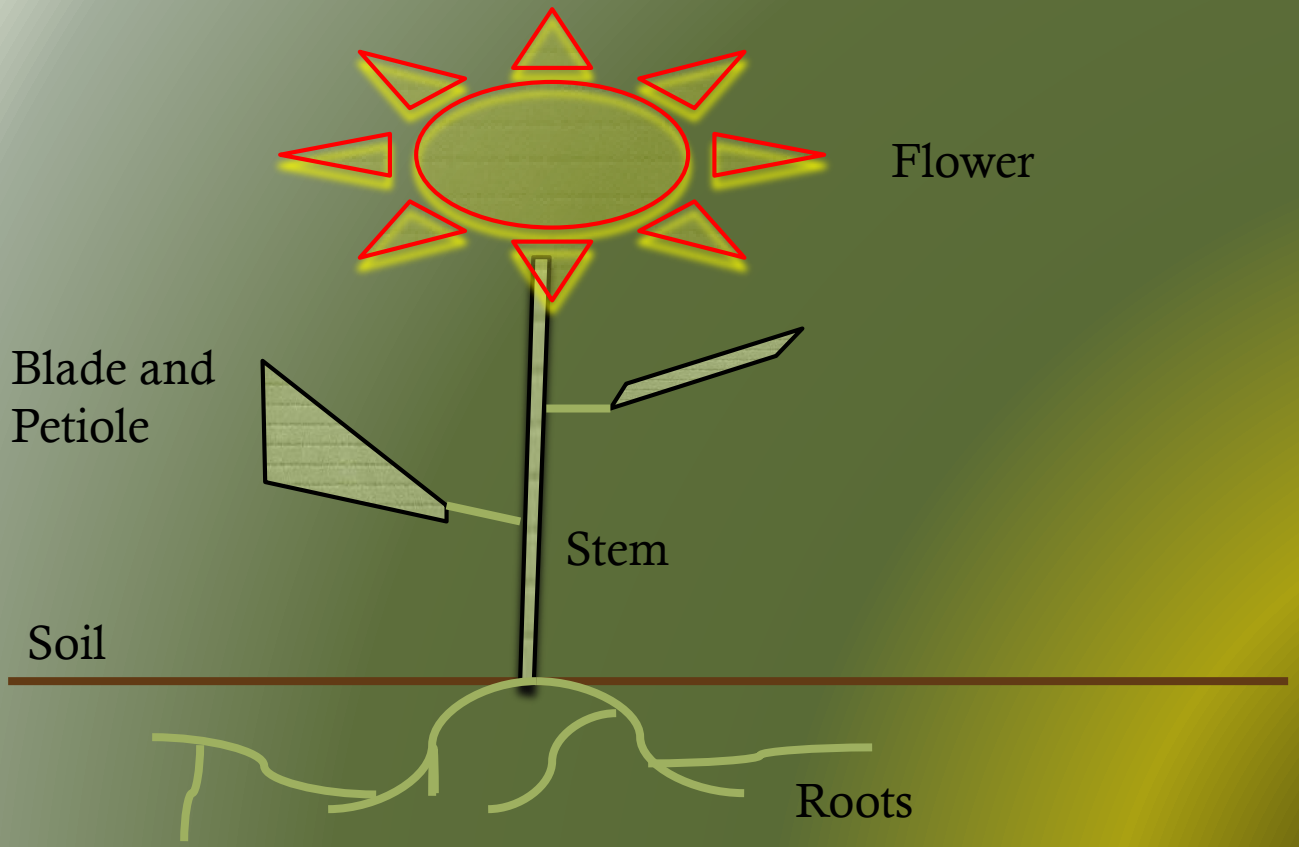
Chloroplasts:

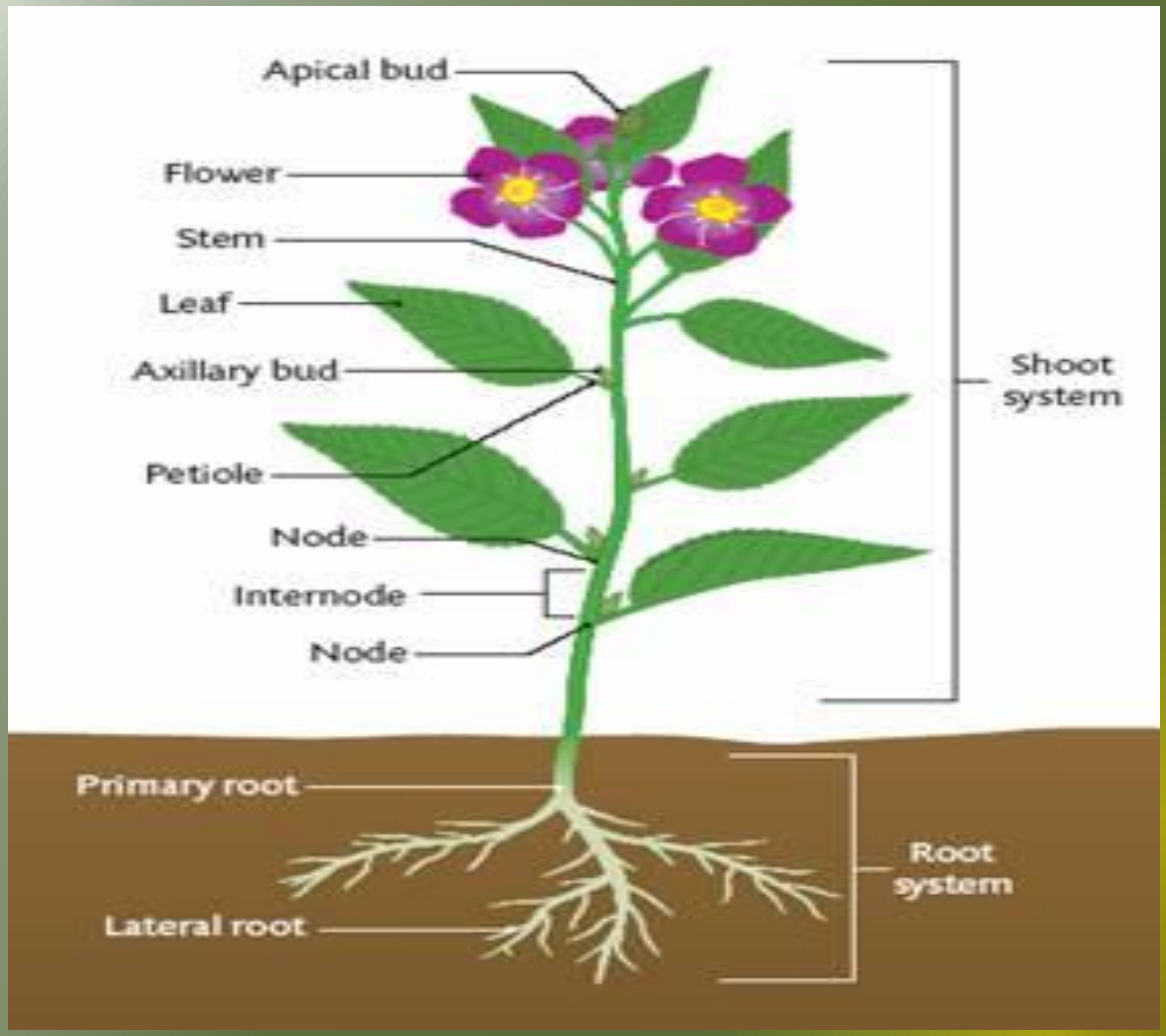
within the plants cells, take in the suns energy and CO_2, producing O_2 and sugar through a process called PHOTOSYNTHESIS.

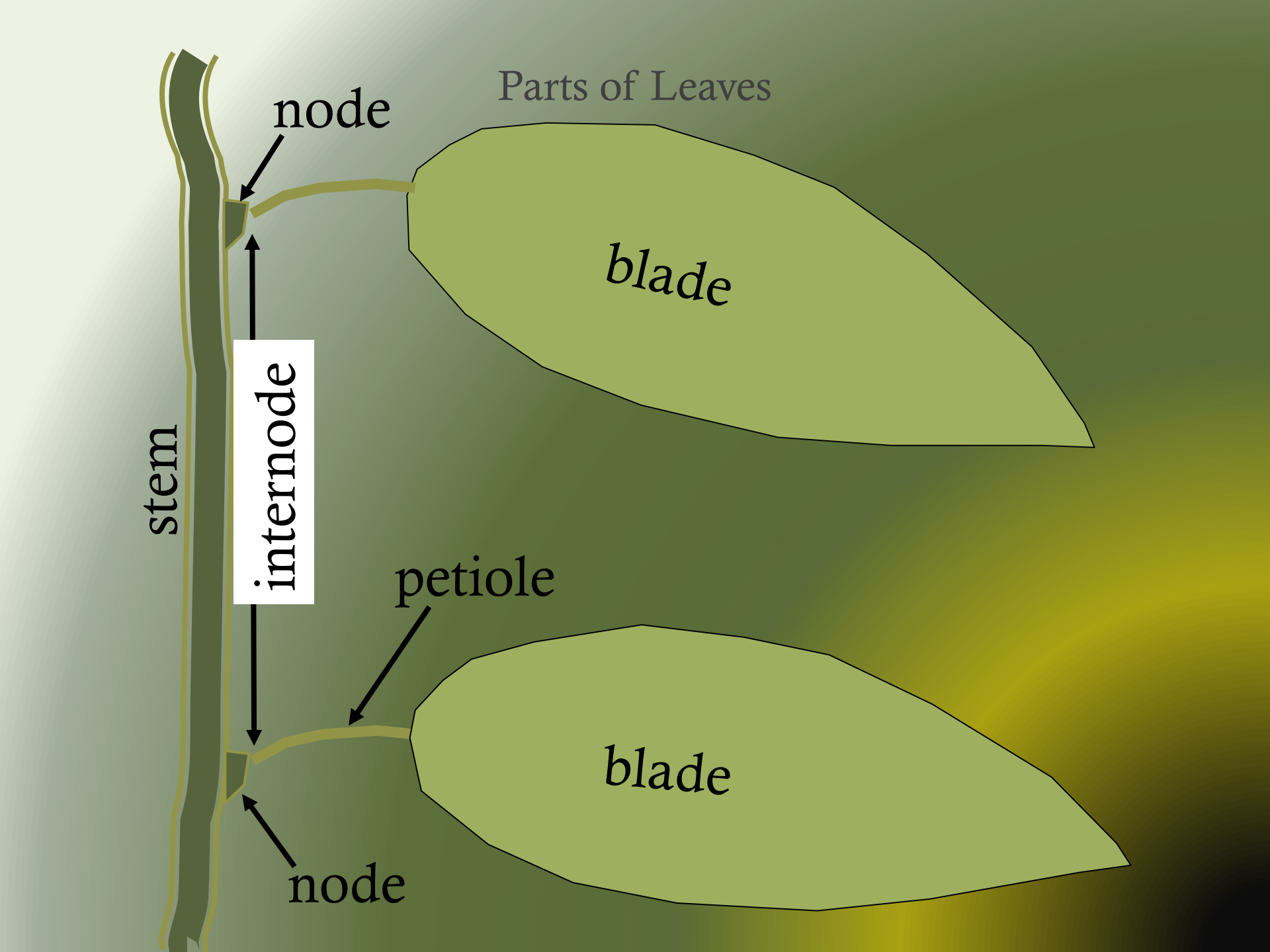
$$6CO_2 + 6H_2O \text{ (+ light energy)} \longrightarrow C_6H_{12}O_6 + 6O_2$$

Atmosphere **Glucose**

Lets Draw a plant and label its parts




Apical bud
Flower
Stem
Leaf
Axillary bud
Petiole
Node
Internode
Node
Shoot system
Primary root
Lateral root
Root system


Parts of Leaves
node
blade
stem
internode
petiole
blade
node

Structure and Function of a Plant

Leaves:

Where **photosynthesis** occurs. Recall that the structure inside the cell responsible for photosynthesis is the CHLOROPLAST.

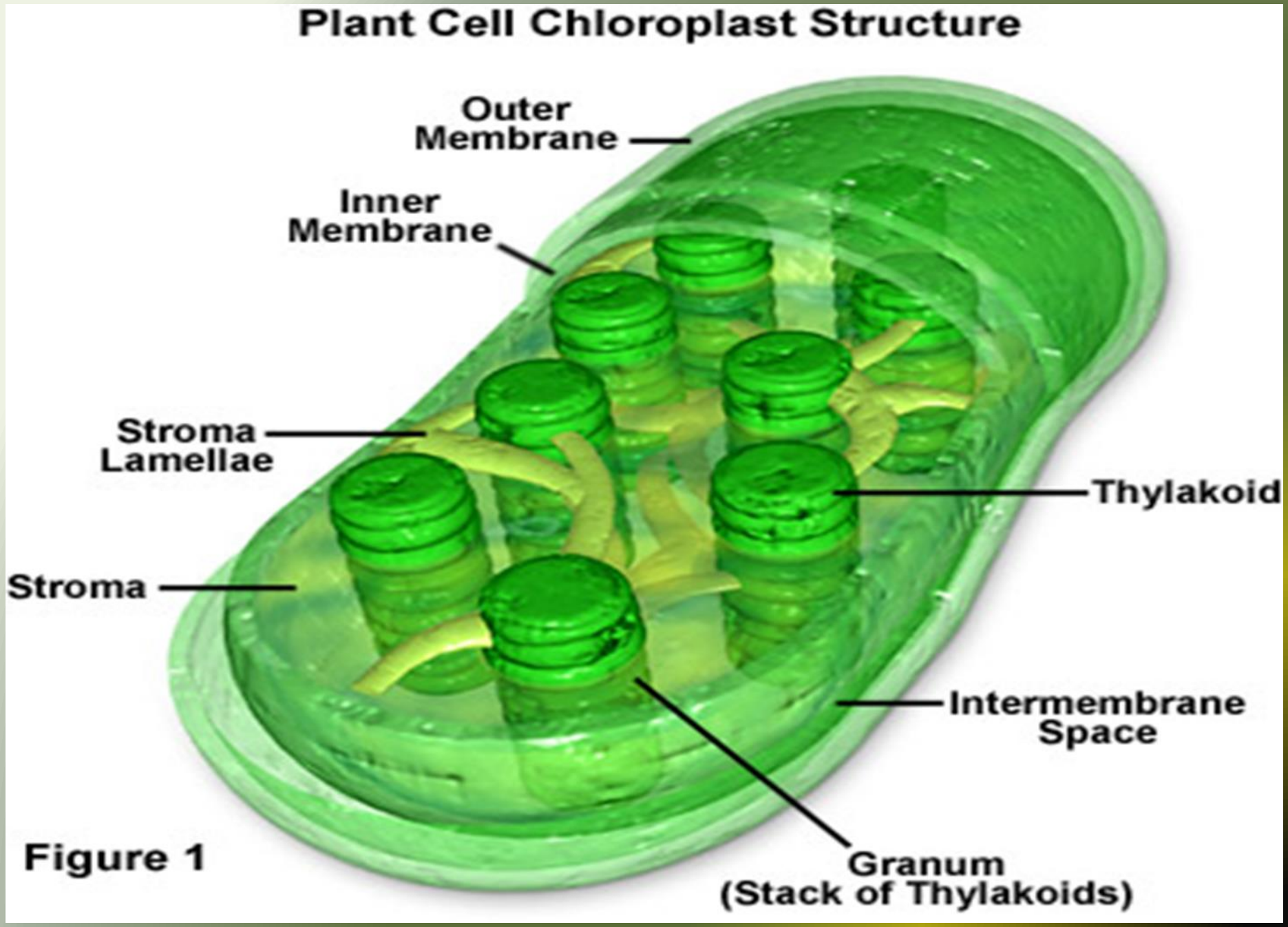
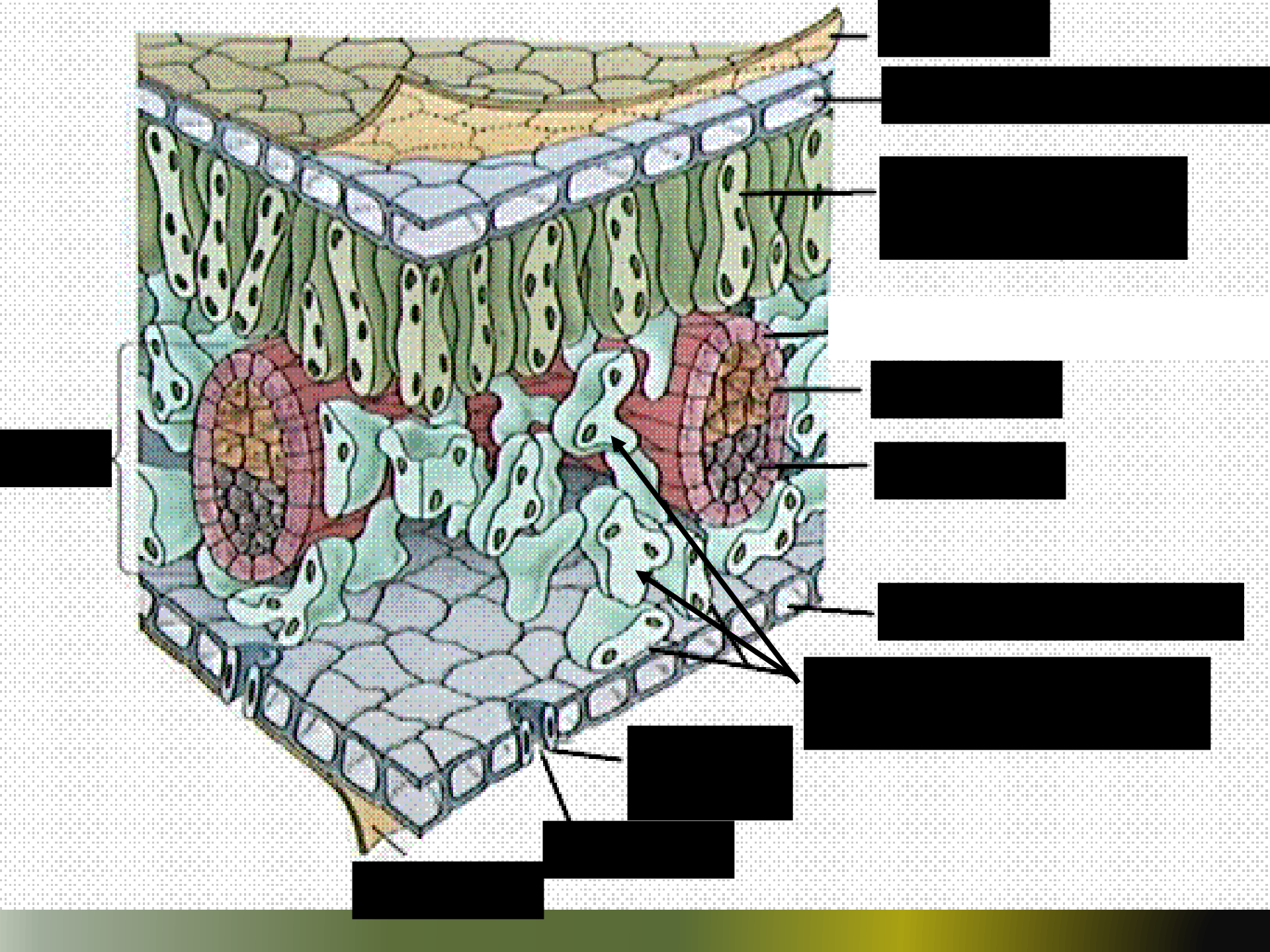

Plant Cell Chloroplast Structure
Outer Membrane
Inner Membrane
Stroma Lamellae
Thylakoid
Stroma
Intermembrane Space
Granum (Stack of Thylakoids)

Figure 1



Parts of the Leaf

Cuticle (waxy layer): keeps water in so leaf doesn't dry out.

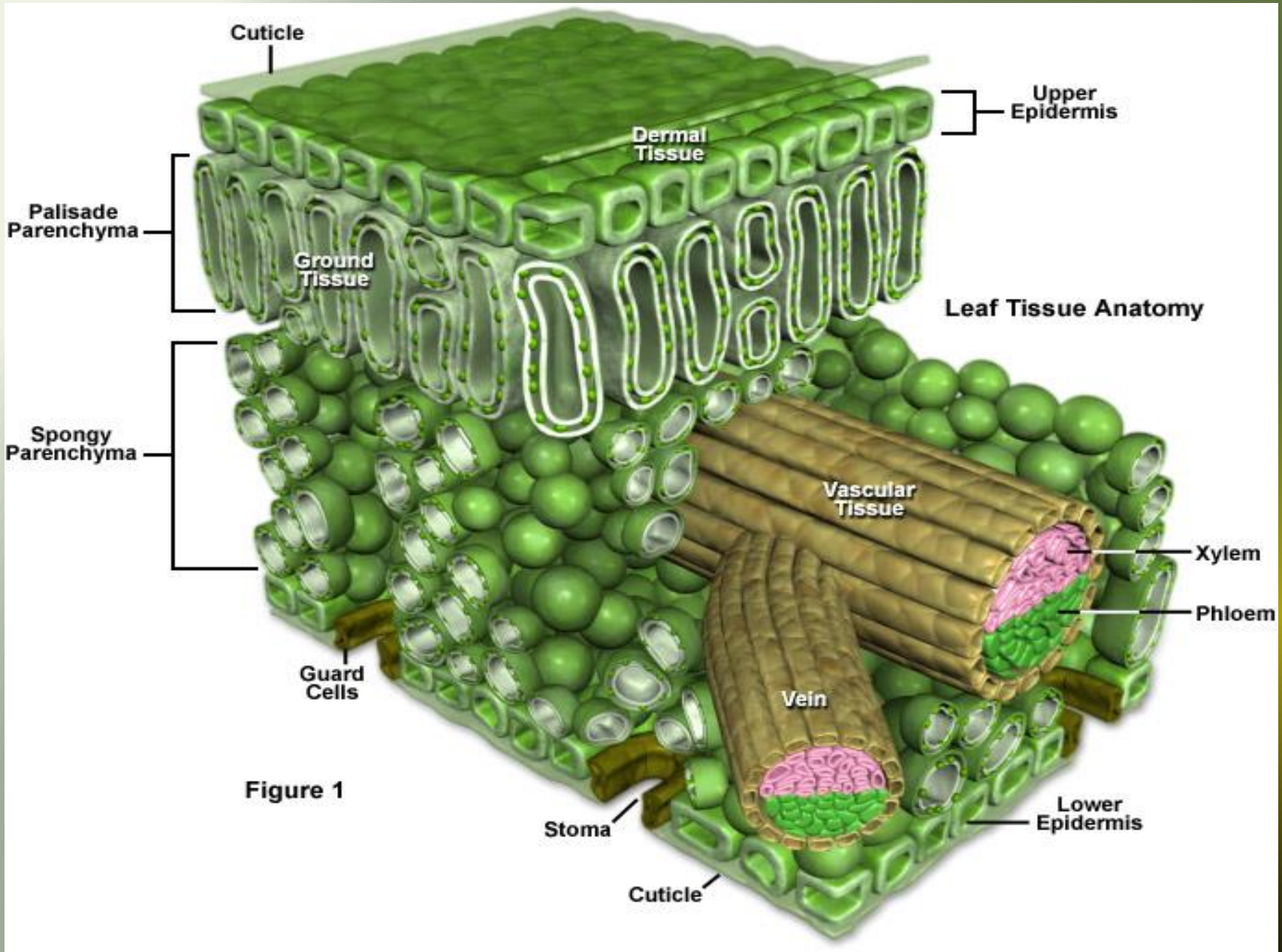
Epidermis: protection and strength

Guard cells = Stomata: air exchange and control of water loss ("doors" that open when there is lots of water, close when not).

Palisade Layer: contains chloroplasts to do

Spongy Layer: also contains Chloroplasts for photosynthesis

Loose packing of mesophyll (middle) cells facilitates gas exchange


Cuticle
Upper Epidermis
Dermal Tissue
Palisade Parenchyma
Ground Tissue
Leaf Tissue Anatomy
Spongy Parenchyma
Vascular Tissue
Xylem
Phloem
Guard Cells
Vein
Figure 1
Lower Epidermis
Stoma
Cuticle

Stems:

1. support leaves
2. movement of materials within Vascular tissues
3. gas exchange and some photosynthesis (green/herbaceous stems)

Vascular tissues

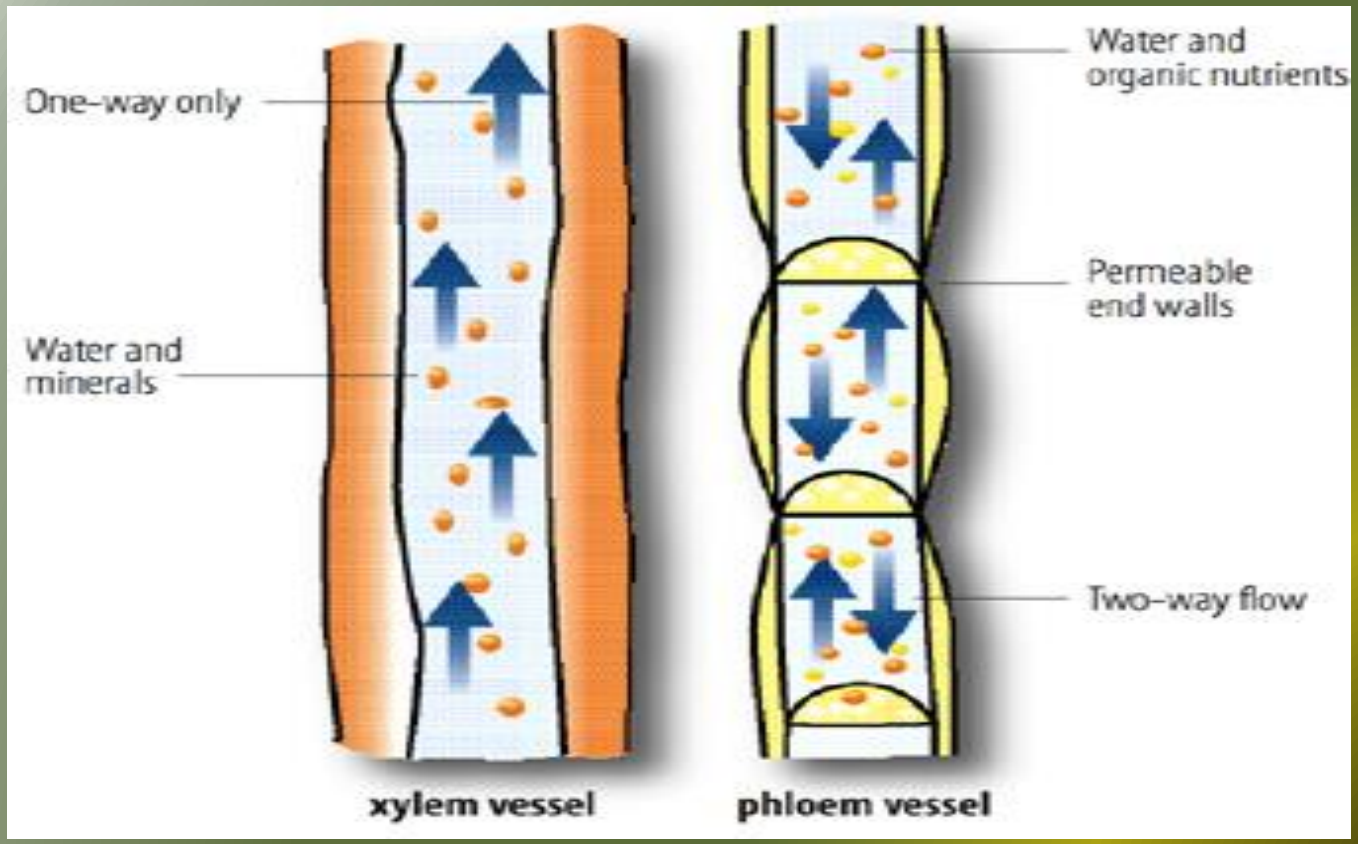
Leaves, flowers, stems and roots are all interconnected with a phloem-xylem network.

Xylem: mainly water and nutrients from roots.

- **"Xy" to the sky**

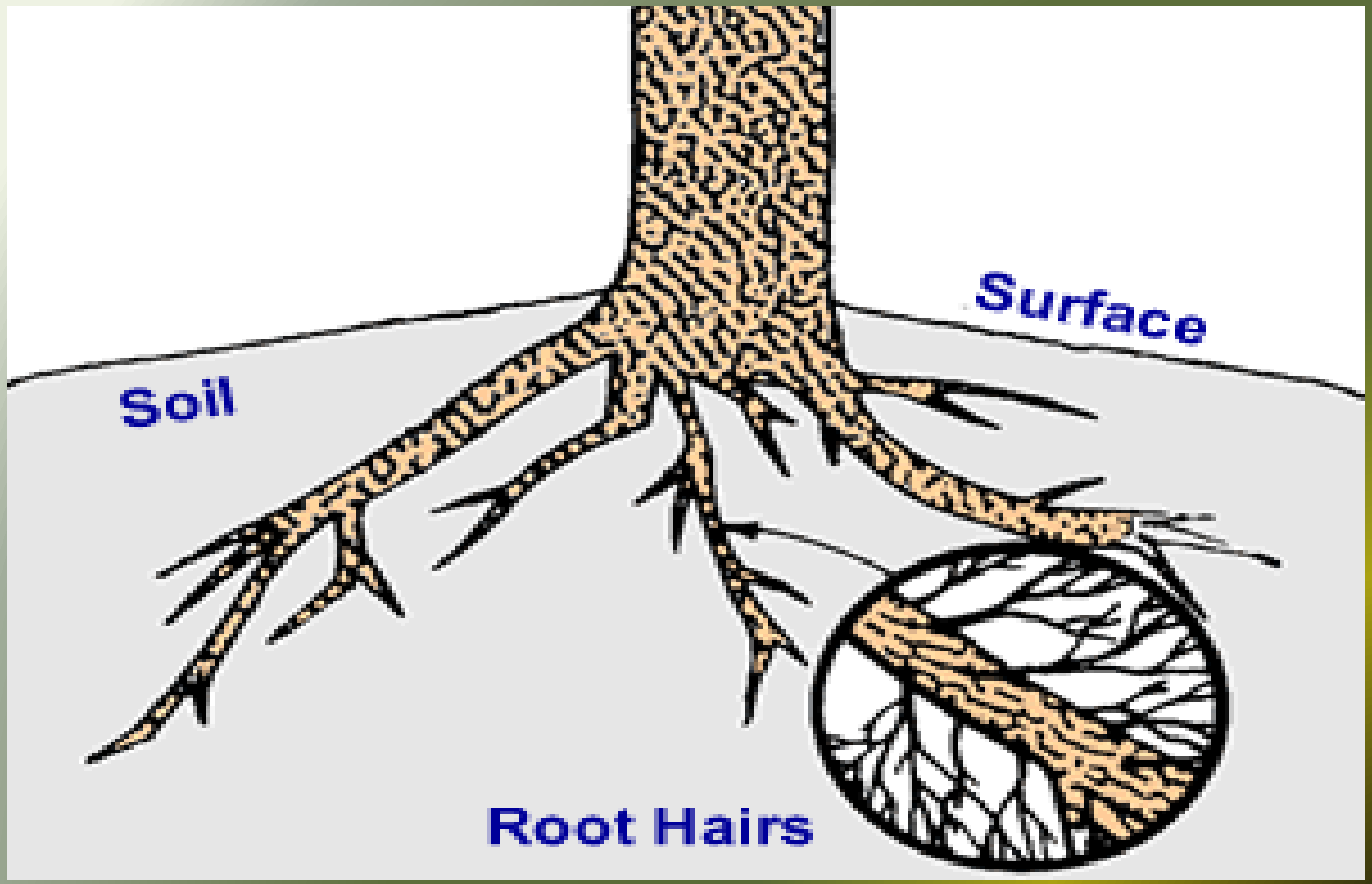
Phloem: mainly sugar and water from leaves

Vascular Tissues



ROOTS

1. Support the plant and anchor it in the soil
2. Uptake of nutrients and water
3. Storage of food


Surface
Soil
Root Hairs

Flowers

Flowering plants are classified as Angiosperms.

The Flower is the part of plant which is specialized for sexual reproduction.

Flowers:

The biological function of a flower is to mediate the union of male sperm with female ovum in order to produce seeds.

The process begins with pollination, and is followed by fertilization, leading to the formation and dispersal of the seeds.

Flowers

Pollination: The sperm (pollen) from the stamen lands on the stigma.

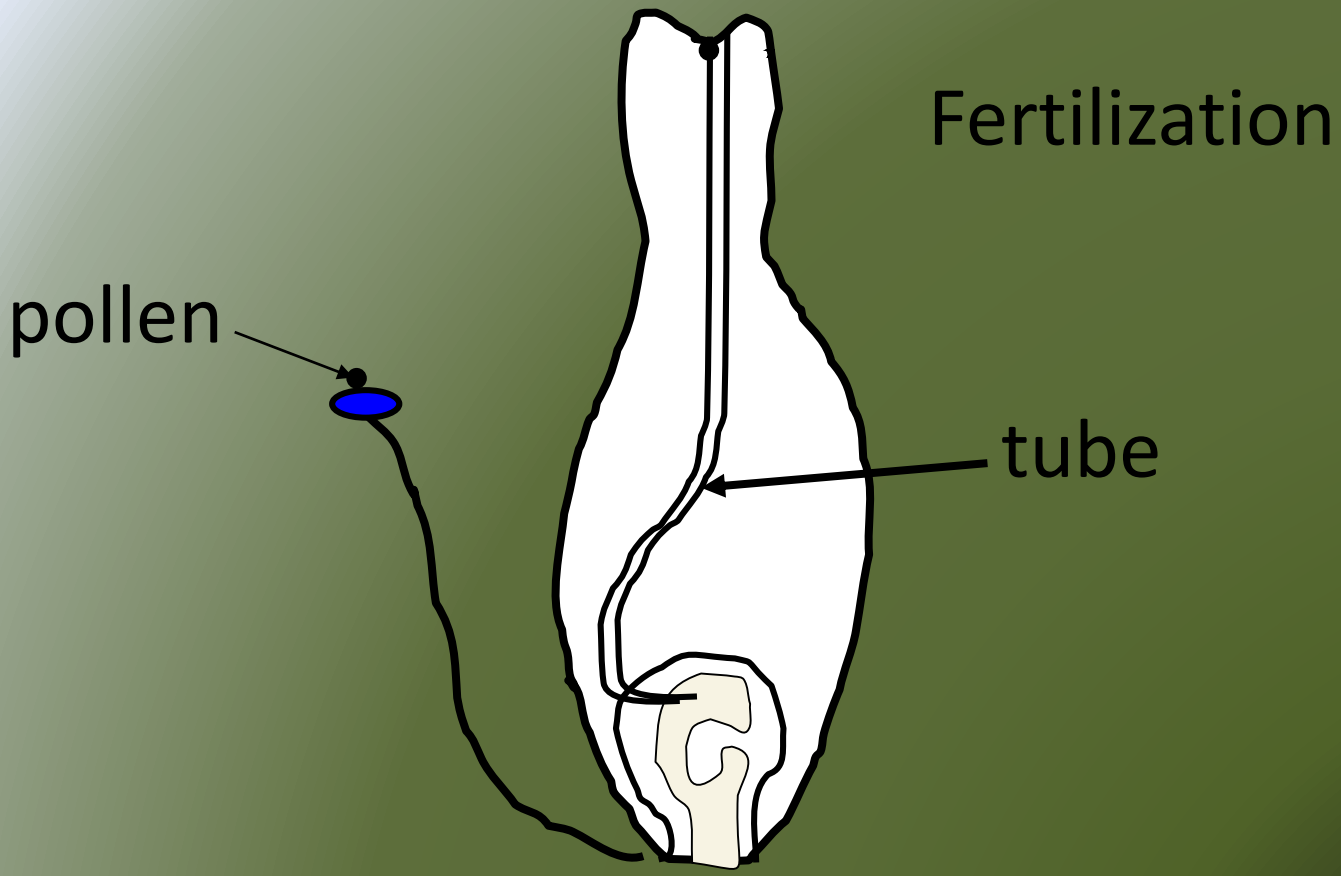
Fertilization: The sperm enters the ovum and makes a zygote.

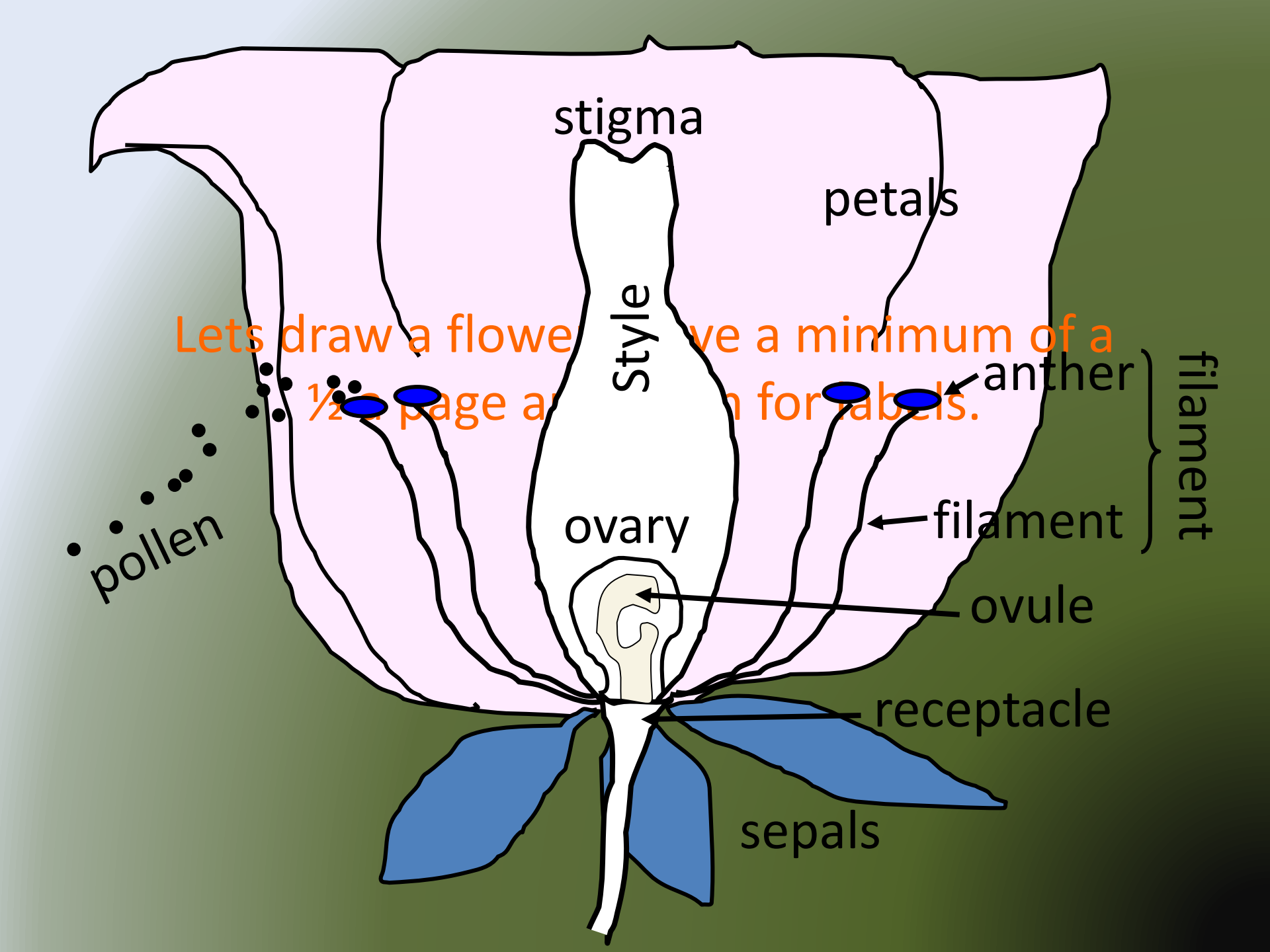
Double Fertilization:

a. one sperm fertilizes the egg (which becomes the embryo part of the seed)

another sperm fertilizes the nucleus (which become the endosperm = food supply of the seed)

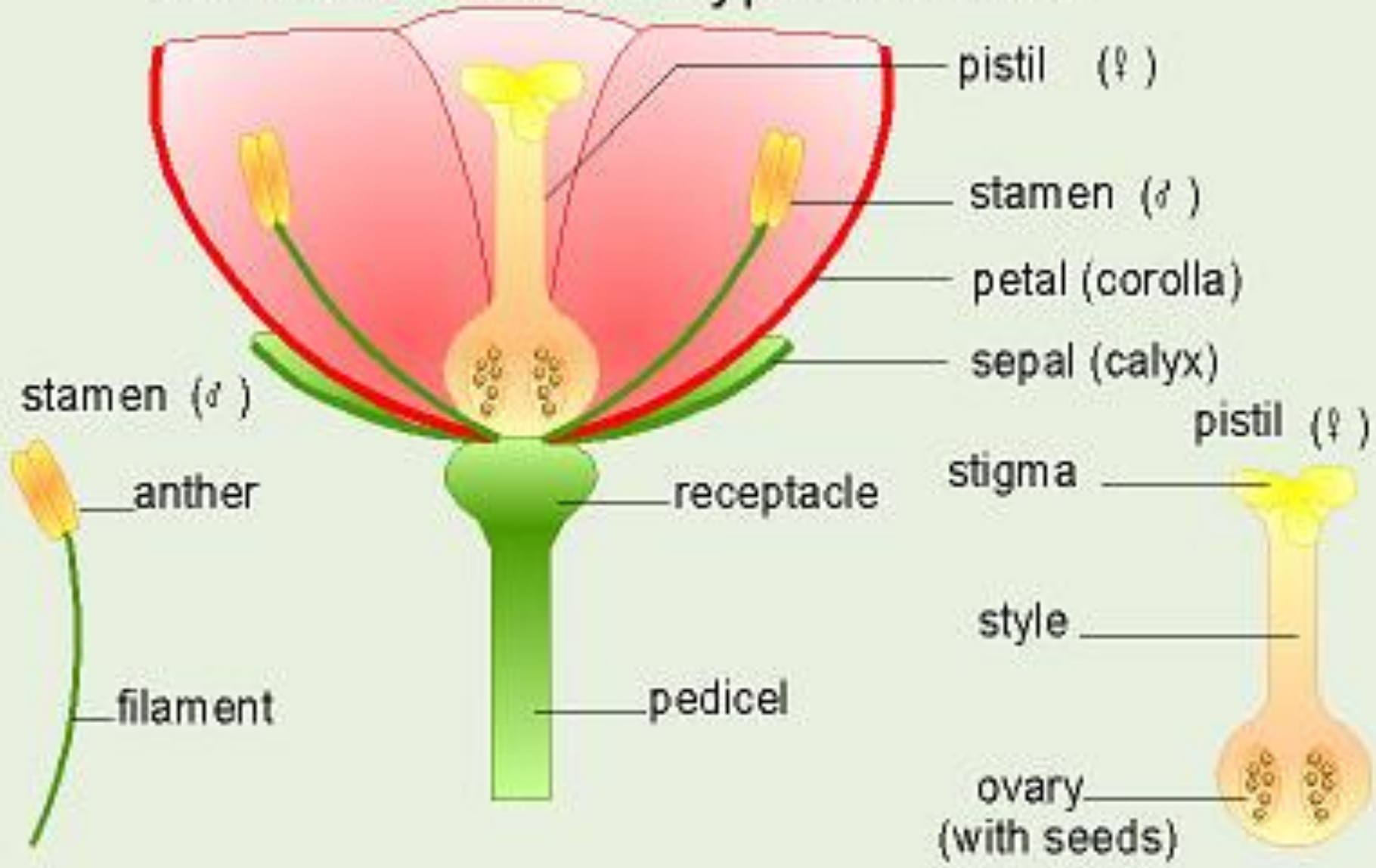
Pollination




stigma
petals
Style
Lets draw a flowe ve a minimum of a
½ page a n for labels.
anther
filament
filament
pollen
ovary
ovule
receptacle
sepals

ANGIOSPERM FLOWERS

Cross Section of Typical Flower



Functions of:

- Sepal: to protect petals
- Petal: to attract animals (i.e. insects) for pollination
- StaMEN : male part of flower that produces sperm (pollen).

  = anther + filament
- Carpel : female part of flower containing egg and where fertilization occurs.

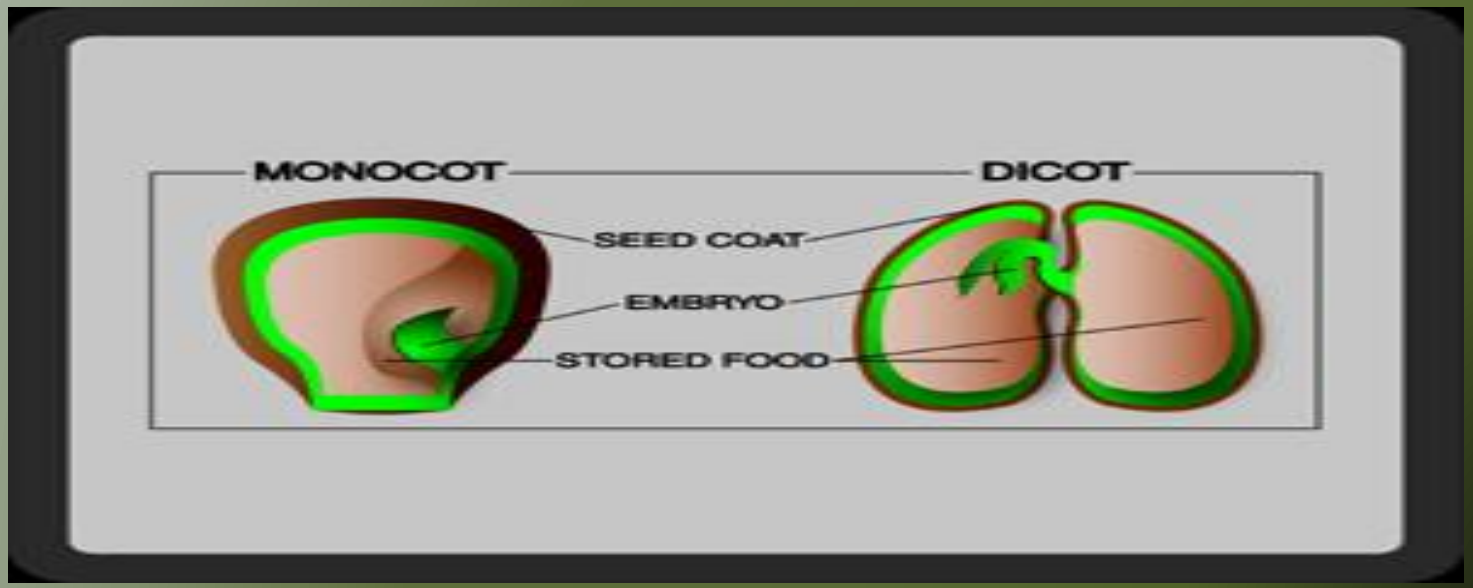
  = style + stigma + ovary + ovule

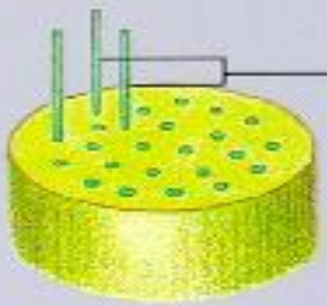
Pistil = one or more carpels

"Pistil Packin' Mama"

Monocot vs. Dicot

Flowering plants are either monocot or dicot depending on if they have 1 or 2 cotyledons (embryonic first leaf).



MONOCOTS	DICOTS
 one cotyledon	 two cotyledons
 floral parts in threes	 floral parts in fours or fives
 parallel leaf veins	 netlike leaf veins
 pollen grain has one pore or furrow	 pollen grain has three pores or furrows
 vascular bundles throughout stem's ground tissue	 stem's vascular bundles arranged in a ring

Assignment Spring:
A Plant and its Food /34

- Draw a picture of a Flower. Must be done neatly. /10
- Label all of the parts. State the structure and the function for: roots, stem, petiole, blade, node, internode, and flower. /14
- Identify where the nutrients are working in the plant and what they are used for. Include: N, P, K, Ca, Fe /10