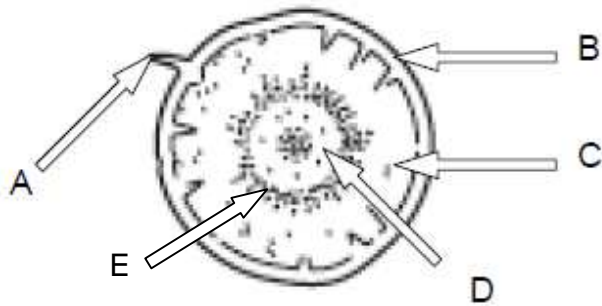


STUDY GUIDE FOR PLANT TEST

PLANT STRUCTURE AND FUNCTION

1.
 - a. *Autotrophs; make their own food using photosynthesis*
 - i. *Chloroplasts containing chlorophyll*
 - b. *Plants are stationary; they don't move from place to place*
 - c. *All cells contain rigid cell wall made of cellulose*
 - d. *Are many celled*
 - i. *Groups of specialized cells form tissues*
 - ii. *Tissues are organized into organs*
2.
 - a. *Both have complex organized cells – eukaryotic*
 - b. *Both perform photosynthesis in a similar way*
 - c. *Both cell walls are made up of similar substances*
 - d. *Both store food in the form of starches*
3. Definitions:
 - Non-vascular plant – *lack: transportation structures, true roots, stems, or leaves*
 - Fibrous roots – *branch out in many directions (Monocot – wheat, barley, beans, etc.)*
 - Herbaceous stems – *soft green flexible stems (grasses, beans, corn, most wild flowers)*
(phloem and xylem arranged in bundles)
 - Broad leaf – *have a flattened blade (grasses, maple tree, dandelions, etc.)*
 - Root – *plant organ that anchors the plant, takes in water and nutrients from the soil, and stores food*
 - Stem – *plant organ that transports water, minerals, and food between the roots and leaves of the plant, also provides support and structure.*
 - Leaf – *plant organ that produces food for the plant*
 - Root hairs – *increases the surface area of the root system*
 - Cortex – *food storage tissue*
 - Xylem – *transports water and minerals from roots to the stem and leaves*
 -
 - Cambium – *growth tissue of the plant*
 1. *produces new xylem and phloem*
 2. *new xylem layer called the ring*
 - Bark – *tough, protective covering of woody stems*
 - Annual ring – *represents growth of a tree / new xylem layer*
 -
 - Guard cell – *two cells together make up the opening of the stomata, controlling the movement of gases*
 - Cuticle – *waxy covering that helps retain moisture*
 - Stomata – *opening in the lower epidermis that control the flow of gases (CO₂ in and O₂ and H₂O vapor out)*

Root diagram

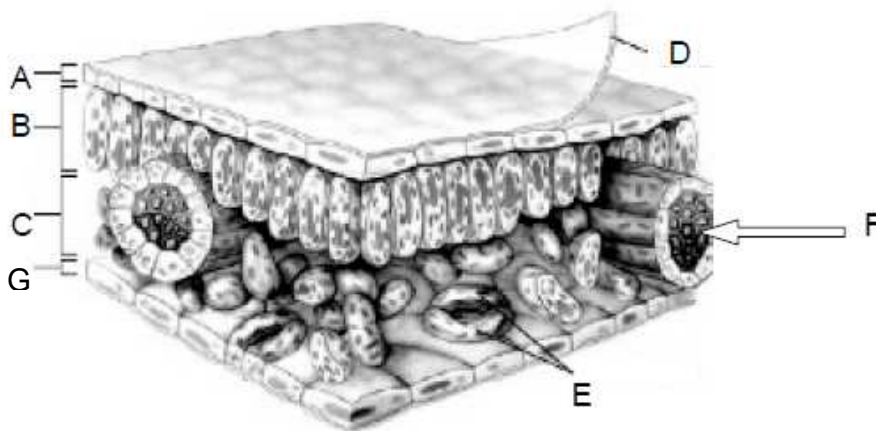


- A. Root hairs
- B. epidermis
- C. Cortex
- D. Xylem
- E. Phloem

Stem cross section diagram

Not on the test!

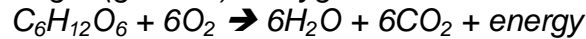
Leaf cross section diagram



- A. Upper epidermis
- B. Palisade layer
- C. Spongy layer
- D. Cuticle
- E. Guard cells
- F. Vein
- G. Lower epidermis

Aerobic Respiration

Sugar (glucose) + oxygen → water + carbon dioxide + energy



Photosynthesis

water + carbon dioxide (in the presence of sunlight and chlorophyll) → Sugar (glucose) + oxygen



Gymnosperms

Evolutionary importance:

Produced seeds using cones (no flowers)

Gymnosperm adaptations:

- 1. Needle like leaves – very thick cuticle to prevent freezing and drying out, shape reduces surface area to conserve water*
- 2. Evergreen – they make food all year*
- 3. Large taproots – collect water deep underground*

Life cycle of a conifer diagram

A. Not on the test!

FLOWERING PLANTS

Angiosperms:

Evolutionary importance:

- 1. Vascular plants in which the seed is enclosed in a fruit*
- 2. First to produce seeds using a flower*
- 3. Most common form of plant life on earth today*
- 4. Didn't exist 120 million years ago*
- 5. Form the basis of the diet of most animals*

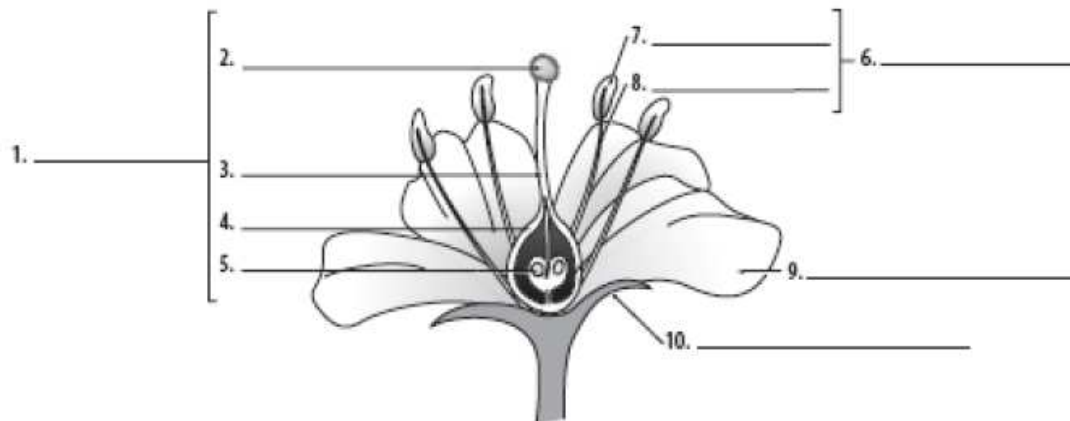
Adaptations of angiosperms

- 1. Flowers seeds and fruits; reproduce in a variety of conditions*
- 2. Vascular tissue is very specialized (strengthens stems; speeds transport of food and water)*
- 3. Shed their leaves in dry periods to conserve water*
- 4. Some produce protective chemicals (Poinsettia, poison oak, poison oak)*

Sepal – usually green, leaf-like structure that protect the flower when it is a bud

Anther – the part of the stamen that produces pollen

Flower reproductive organ diagram:



1. Pistil
2. Stigma
3. Style
4. Ovary
5. Ovule
6. Stamen
7. Anther
8. Filament
9. Petal
10. Sepal

Cross-pollination – transfer of pollen from one plant to another

Flower characteristics that attract animals to plants

Flower color, odor, size and shape

Steps to flower fertilization: (ultimately when the sperm unites with the egg)

- a. Pollen grain attaches to the stigma and forms a pollen tube
- b. Sperm travels down the pollen tube to the ovule
- c. Sperm fertilizes the egg and the zygote forms

Changes in a flower after fertilization

- a. Zygote grows into an embryo
- b. Ovule develops into a seed
- c. Ovary becomes a fruit

Cotyledon: stored food for an embryo in a seed



How can seeds be dispersed?

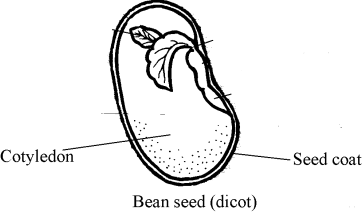
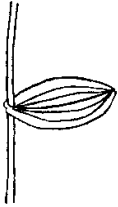
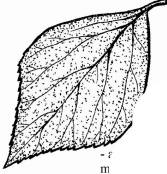
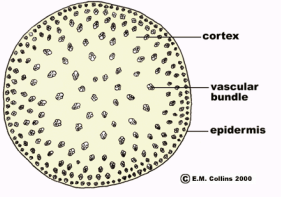
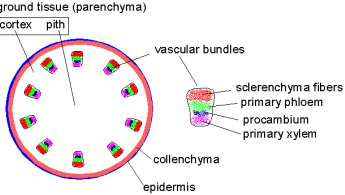
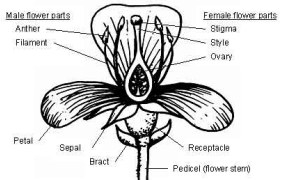
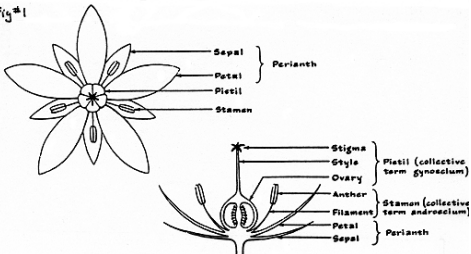
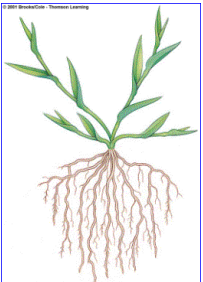
Wind, water, animals, gravity, self bursting

What is the function of the seed coat?

Protects the seed from extreme hot, cold, and lack of water.

Perennial: angiosperm that goes through a growth cycle every year, and grows back every year for many years

Recognize the difference between monocots and dicots:

Plant Parts	Monocots	Dicots
Seeds	1 Cotyledon	2 Cotyledons  <p>Cotyledon Seed coat</p> <p>Bean seed (dicot)</p>
Leaves	Parallel veins on leaf 	Branched veins on leaf 
Stems	Vascular bundles scattered (mostly herbaceous)  <p>cortex vascular bundle epidermis</p> <p>© E.M. Collins 2000</p>	Herbaceous dicot stem (c.s.)  <p>ground tissue (parenchyma) cortex pith vascular bundles sclerenchyma fibers primary phloem procambium primary xylem collenchyma epidermis</p> <p>Vascular bundles arranged in rings (mostly woody)</p>
Flowers	Parts and Petals arranged in multiples of 3  <p>Male flower parts: Anther, Filament Female flower parts: Stigma, Style, Ovary Petal, Sepal, Bract, Pedicel (flower stem), Receptacle</p>	Parts and Petals arranged in multiples of 4 or 5  <p>Fig #1 Sepal, Petal, Pistil, Stamen Stigma, Style, Ovary, Anther, Filament, Petal, Sepal Pistil (collective term gynoecium) Stamen (collective term androecium) Perianth</p>
Roots	Fibrous 	Taproot 