

BOTANY STUDY GUIDE

What Is a Plant? (Topic includes characteristics of plants and plant cells, classification of plants, origin and evolution of plants, and adaptations to land)

VOCABULARY: (not limited to the words listed below)

chlorophyll	carotenoid	vascular plant	nonvascular plant
angiosperm	gymnosperm	monocot	dicot
chloroplast	photosynthesis	producers	cuticle
cellulose	central vacuole		

CONCEPTS: (not limited to the concepts listed below)

1. Evolution of plants: development from earlier plant type(s), water to land adaptations, relative ages of seed plant development
2. Identify characteristics of plants and plant cells that differentiate them from other types of organisms.
3. Describe adaptations and advantages to life on land
4. Recognize the four main groups of plants and describe the characteristics of each one

Seedless Plants (Topic includes types of nonvascular and vascular plants in this category, importance of seedless plants)

VOCABULARY: (not limited to the words listed below)

rhizoid	pioneer species	spore	stalk
rhizome	frond	moss	hornwort
liverwort	fern	horsetail	

CONCEPTS: (not limited to the concepts listed below)

5. Be able to state examples of plant(s) in these categories:
 - a. Seedless nonvascular
 - b. Seedless vascular
6. Pioneer species: plants in this category, interaction with the environment
7. Uses of seedless plants
8. Be able to compare / contrast plant structures in the following categories:
 - a. Stem versus stalk
 - b. Seed versus spore
 - c. Root versus rhizoid

Seed Plants (Topic includes characteristics of seed plants, classification of seed plants, uses of seed plants)

VOCABULARY: (not limited to the words listed below)

pollen
cycad
dicot

cotyledon
gnetophyte

conifer
resin

ginkgo
monocot

CONCEPTS: (not limited to the concepts listed below)

9. Be able to state examples of plant(s) in these categories:
 - c. Gymnosperm
 - d. Angiosperm
10. Uses of plants in seed categories
11. List the main characteristics of seed plants
12. Be able to compare plants and plant structures in the following categories:
 - a. Monocot versus dicot
 - b. Seedless versus seed plants
 - c. Gymnosperm versus angiosperm

Structures of Seed Plants (Topic includes roots, stems, leaves, and vascular tissue)

xylem
root cap
herbaceous stem
stoma

phloem
taproot
woody stem
guard cells

epidermis
fibrous root
palisade layer
stomata

root hairs
buttress root
spongy layer

CONCEPTS: (not limited to the concepts listed below)

13. Be able to identify the names and functions of layers of the root.
14. Function and structure of leaves and features of leaf layers
15. Function of roots, stems, and vascular system
16. Diagram patterns of stomata opening and closing, focusing on the passage of gases in and out of the stoma
17. Link the leaf layers to their relationship with photosynthesis

Photosynthesis and Aerobic Cellular Respiration (Topic includes photosynthesis and respiration)

VOCABULARY: (not limited to the words listed below)

stoma
starch
light-independent reaction

grana
transpiration

stroma
light-dependent reaction
respiration

glucose
mitochondria

CONCEPTS: (not limited to the concepts listed below)

18. **Know this completely in GREAT detail!!!**
 - a. Photosynthesis versus respiration
 - b. Formulas

- c. Importance of each reaction to life
 - d. Function (which stores energy and which releases energy)
 - e. Forms of energy involved in each reaction
 - f. The organelle associated with each reaction
 - g. Light dependent versus light independent reaction (the chemistry of each)
 - h. Location of light dependent and light independent reactions
 - i. Steps in respiration and where each takes place
19. Diagram chloroplast structure and function

Plant Responses to the Environment (Topic includes plant tropisms and hormones)

tropism
ethylene
cytokinins

gravitropism
hormone
abscisic acid

phototropism
auxin

stimulus
gibberellins

CONCEPTS: (not limited to the concepts listed below)

- 20. Recognize the relationship of hormone to tropism
- 21. Identify 3 main plant tropisms to the stimulus
- 22. List the effect of specific hormones on a plant's growth

PLANTS: "LAB PRACTICAL" **(component of the exam)**

Given a diagram, sketch or photograph, be able to

- 1. Root:
 - a. Identify the type of root system
 - b. Name the layer
 - c. Identify the function of that layer
- 2. Angiosperm versus gymnosperm
 - a. Identify characteristics of each type of plant
- 3. Monocot versus dicot
 - a. Identify the type of plant
- 4. Leaf
 - a. Identify the layer
 - b. Describe the type of cell / composition of the layer
 - c. Describe the job done by that layer
 - d. Recognize the relationship of that layer to photosynthesis
 - e. Recognize patterns of the stomata versus what is happening within the leaf
 - f. Identify the structure of the mitochondria versus chloroplast
 - g. Recognize where the light dependent and light independent reactions occur