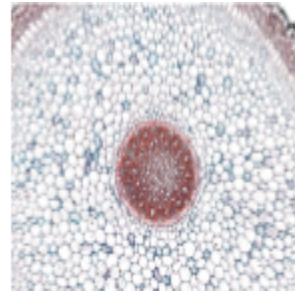
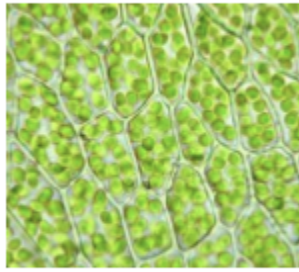
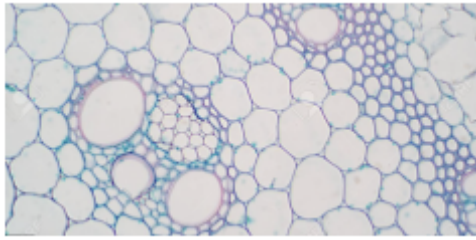




## Botany Test

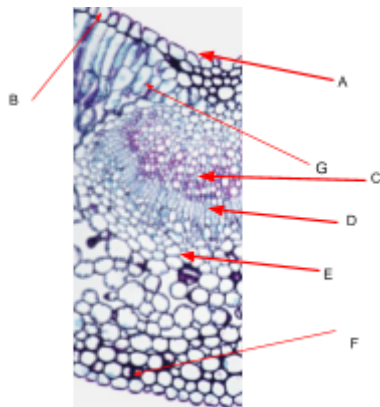
## Structure and anatomy of Plants

Identify the following cells



--	--	--

1. Label the following cell



A.	B.	C.	D.	E.	F.	G.
----	----	----	----	----	----	----

2. What is the importance of the function of stomates? On which part of the leaf are stomata mainly found (top or bottom), and what is the significance of having more stomata on that specific side.

--

3. When looking at a holly plant, you quickly take notice of the waxy texture lining the leaves. What is the importance of this texture? What is this secretion called?

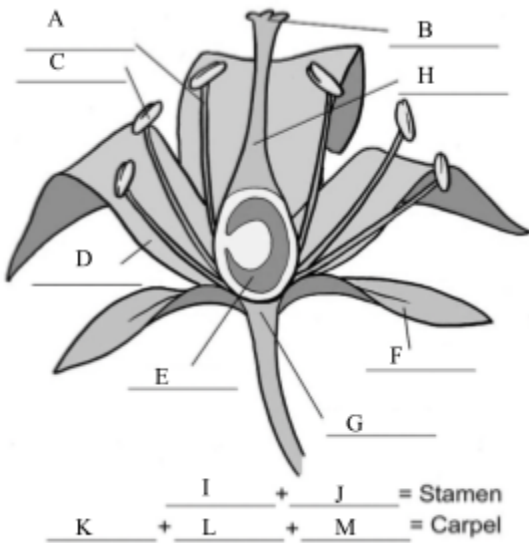
--

4. How does the structure and positioning of the spongy attribute contribute to the efficiency of photosynthesis?

--

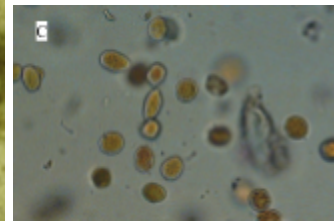
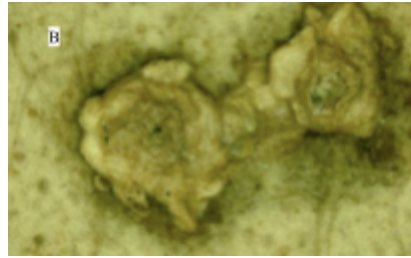
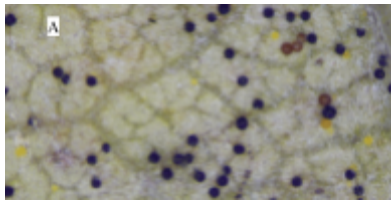
5. Why is it important that the light reactions occur before the calvin cycle?

6. Label the flower



A	B	C	D	E	F	G	H	I	J	K	L	M
---	---	---	---	---	---	---	---	---	---	---	---	---

7. What is the difference between basifixed, subasifixed, and diversified attachment? What are the pros and cons of each attachment?
  8. Pollen grains contains two types of cells. \_\_\_\_\_ cells are produced before pollen leaves the anther. \_\_\_\_\_ cells are produced after pistil pollination.
  9. There are two categories of fruits: Aggregate fruits and Multiple fruits How are multiple fruits formed? What is an example of a multiple fruit?
  10. Plants with both reproductive organs are called \_\_\_\_\_ and have \_\_\_\_\_ flowers where as plants with only male or female parts are called \_\_\_\_\_ and have \_\_\_\_\_ flowers.
  11. How does the plant cycle demonstrate an alternation of generations? Which stages do they typically alternate between? Why is this alternation so important for plant genetic diversity?
  12. Microspore mother cells go through \_\_\_\_\_
    - a. Meiosis
    - b. Mitosis
    - c. Birth
    - d. Pollination
  13. Haploid microspores go through
    - a. Meiosis
    - b. Mitosis
    - c. Birth
    - d. Pollination
  14. What are the six basic parts of a plant?
  15. Describe the difference between taproot systems and fibrous root systems (Talk about how the environment they thrive in could have an impact on their overall structure).
- Identify the following diseases



16. Identify Disease A
17. How is disease A typically spread (identify the vector if there is one)? Which climate does it thrive best in?
18. Name four plants Disease A affects.
19. How can you genetically modify a plant to develop genetic resistance against Disease A?
20. Identify Disease B
21. How is disease B typically spread (identify the vector if there is one)? Which climate does it thrive best in?
22. How would you typically identify Disease B with a microscope?
23. Where does Disease B typically affect? How is it entered inside the plant?
24. Identify Disease C
25. Which plants does Disease C typically affect?
26. Which genes in plants are resistant to Disease C?

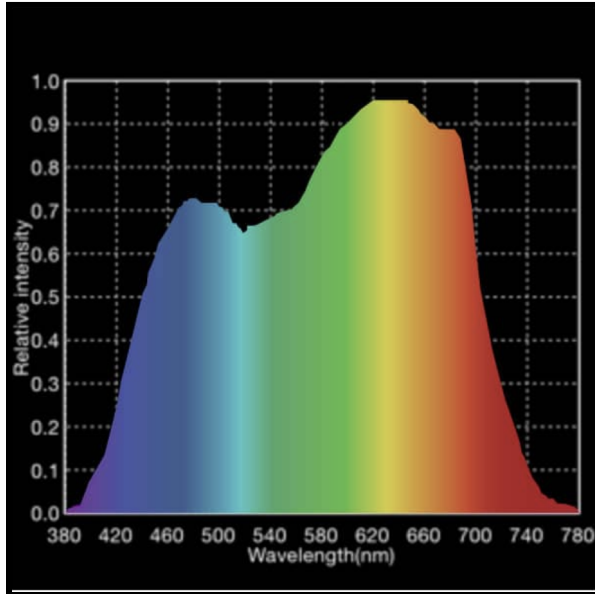


27. Identify the issue with plant A, what is it caused by?
28. How would you treat plant A?
29. Identify the issue with plant B, what is it caused by?
30. How would you treat plant B?
31. Cells that carry water are \_\_\_\_ cells. Cells that carry food are \_\_\_\_ - cells.
32. Why is it beneficial for plants with flowers to have soft and bendable bodies?
33. What is the function of alkaloids in nectar (discuss how its chemical structure helps perform this function).
34. Why is it important that the secondary cell walls of heart wood are composed of cellulose and lignin (think structure, function).
35. Which fruits are formed from the aril?
  - a. Mangosteen
  - b. Pineapple

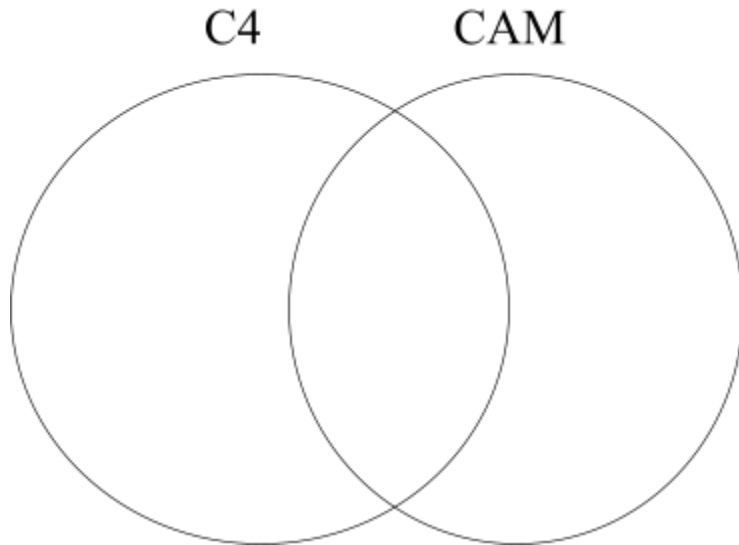
- c. Apple
- d. Strawberry
- e. Plums

#### Photosynthesis

This graph is used for the next two questions.



36. What does the graph say about photosynthesis?
37. How does this graph explain the size and growth of red, blue, or purple colored plants?
38. In photosynthesis, energy is transformed from \_\_\_\_\_ into \_\_\_\_\_ energy. The energy absorbed \_\_\_\_\_ electrons of \_\_\_\_\_ and the energy is stored in the \_\_\_\_\_ of sugar.
39. How is photosynthesis a series of redox reactions? Explain one specific example of a redox reaction that occurs.
40. Why can't the calvin cycle occur during the night?
41. Venn Diagram
  - a. Sugar cane
  - b. Succulents
  - c. 4 carbon product
  - d. Pepco isn't inhibited by oxygen
  - e. Bundle sheath is required to release CO<sub>2</sub>
  - f. Stomates remain open at night
  - g. CO<sub>2</sub> binds to an organic acid that helps store CO<sub>2</sub>
  - h. Dry climates



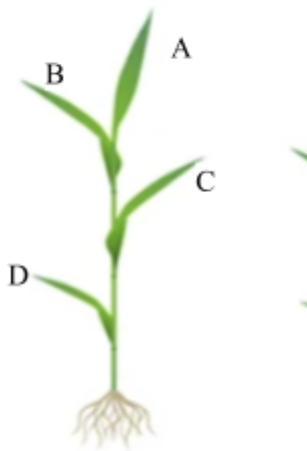
42. JC currently has a succulent that is starting to etiolate. What color light spectrum would he use so that his succulent maintains its stout size.
43. What color light activates phytochrome? Why?
44. Chlorophyll B has a methyl group which makes it more polar than chlorophyll a
45. Chlorophyll A absorbs energy from green wavelengths
46. When there is less light, chlorophyll B will be produced more than chlorophyll a. Why do you think that is the case?
47. Does photosynthesis represent a positive or negative feedback loop? Explain which process demonstrates the positive and/or negative feedback loop. (One paragraph)

#### Plant Diversity:

48. List and describe two arguments for and two against genetically modified crops? (Describe the scientific, ethical, economic, and political issues) (One paragraph)
49. What is the value, to a species, of having genetic diversity? Next, list and describe three potential consequences of biodiversity loss for society. (One paragraph)

#### Plant Growth

50. Explain what a prescribed burn is in a forestry context. Provide an example of how they can be beneficial for sustainable forestry management. Give an example of how fire can be an important natural component of a forest ecosystem. (One paragraph)
51. Where is the youngest leaf in the following wheat plant?



52. What type of growth does each plant demonstrate?



--	--	--	--

53. What are some factors that could affect PGR levels?

54. State whether the following features are monocot or dicot

- One cotyledon vein
- Number of petals are divisible by four
- Stems are formed into a ring
- Angiosperms
- Roots are fibrous
- Veins are parallel

55. Why is it important that we understand the root systems of monocot and dicot plants when it comes to fertilizers?

56. Why are the stomata only on the bottom of leaves in dicot plants?

57. State whether the following features are embryophyte or cryptograms

- Moss
- Algae
- Spores
- Sporophyte are found inside gametophytes

- e. Thallophytes
- 58. How can growth rings differ depending on the environment's seasons?
- 59. Why might the cell walls of wood be composed of more cellulose than leaves?
- 60. How do you calculate the specific gravity of wood?
- 61. What happens to density as wood shrinks?
- 62. Conifers are typically
  - a. Softwood
  - b. Hardwood
  - c. Engineered wood
- 63. Balsa is a
  - a. Softwood
  - b. Hardwood
  - c. Engineered wood
- 64. \_\_\_\_\_ and \_\_\_\_\_ strength are dependent on the sound wood.
- 65. How does the cell structure of the phloem allow it to transport sugars?
- 66. Why does the evaporation of water help the xylem pull water from the roots?
- 67. What are the three goals of plant taxonomy?
- 68. Which part of the dandelion is edible?
  - a. Leaves
  - b. Flower
  - c. Stems
  - d. Roots
  - e. All of the above

#### Genetics

- 69. Define diploid, hexaploid, and tetraploid. Provide a plant for each of the examples
- 70. Chloroplasts contain DNA
  - a. True
  - b. False
- 71. Describe heteroduplexity and how it can be useful when identifying plants with resistance?
- 72. Who is considered the first person to study plant genetics?
- 73. Why do you think one of the most common plants used in plant genetic research is grass?
- 74. Why do you think people say "if you research wheat genetics, you have mastered how to perform any plant genetic research?"

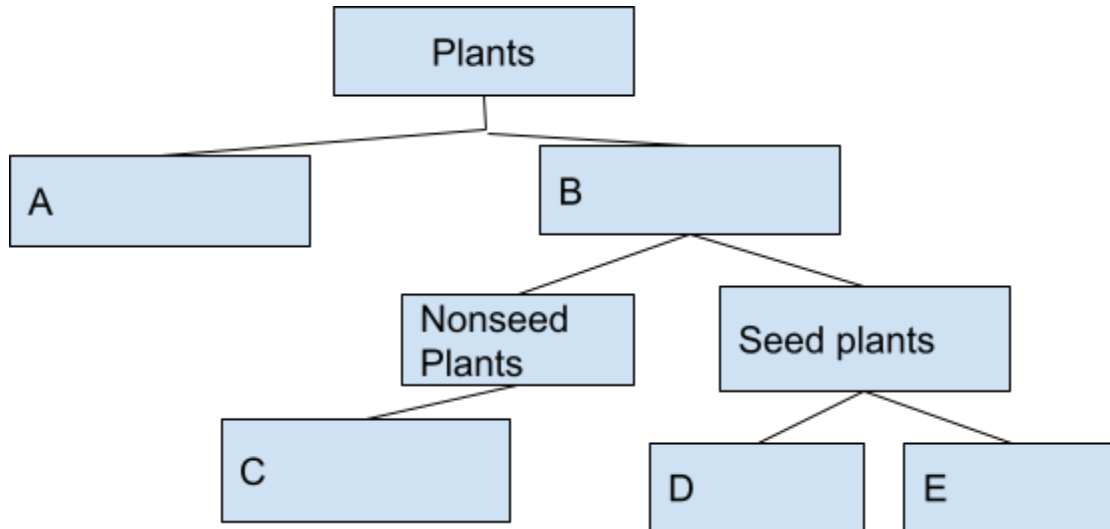
#### Fruits Fruits Fruits

- 75. What are the three anatomical categories for fruit? What defining characteristics of each category makes it different from the others?
- 76. Why might fruits have evolved to be more fleshy fruits than dry?
- 77. What is the importance of having a dead pericarp for dry fruits?
- 78. Describe two methods of fungi reproduction.
- 79. What is the first method of sexual reproduction among fungi?
  - a. Homothalism
  - b. Spores
  - c. Anastomosis
  - d. Clamp connection



## Plant evolution

80. Name three ways plants have evolved to prevent water loss.
81. During which period in the paleozoic era did the first vascular plants appear?
82. During which period in the paleozoic era did plants develop stomatas?



83.

## Propagation

How would you propagate the following plants?

84. Succulent
85. Lettuce
86. Aloe
87. potato
88. lavender
89. String of pearls
90. Tomato

## Farming

91. What was the Green Revolution, and what impact did it have on developing countries?  
Discuss two subsequent impacts of the Green Revolution on the environment.
92. Identify and discuss three practices used by farmers to protect their soils.
93. Describe how the dust bowl was a perfect example of why environment is crucial for understanding where to farm crops.

## Carbon and Nitrogen cycle

94. How do bacteria perform denitrification?
95. Describe the mutualistic relationship between plant roots and soil criteria.
96. What role do plants play in the carbon cycle?

## Principles of hydroculture and hydroponics

97. What makes peat moss the perfect supplement for growing plants without soil?
98. What are the positives and negatives of hydroculture?
99. Transitioning from typical soils to supplements such as peat moss can cause a lot of stress on plants. What are some signs of stress? How can you avoid stressing out the plant?
100. What does LECA stand for? What are the benefits of using LECA as compared to soil?

## Medicinal plants:

101. JC recently got a terrible sunburn in the outer banks. He uses aloe vera in hopes it will cure his sunburn. Why is this thought process incorrect? What does aloe vera really do for sunburns?
102. JC has been having terrible tooth pain from eating too many candy canes. What plant oil should he use to soothe his teeth? What properties of this plant allow it to soothe toothache?
103. In ancient Chinese medicine, ginseng was a popular plant used to cure many diseases. What are some diseases people may use ginseng for?
104. What are phytoestrogens? What type of disorders do they cure? Why is this so?