

10B Plant Systems Guided Practice

Reproduction

Station 1

1. Observe Plant A. Locate the following parts of the flower: stamen, stigma, style, ovary.

2. Draw and label the parts of a flower (listed above) in the box to the right.

3. Plant A is what type of plant?

Angiosperm

4. Does Plant A have seeds or vascular tissue?

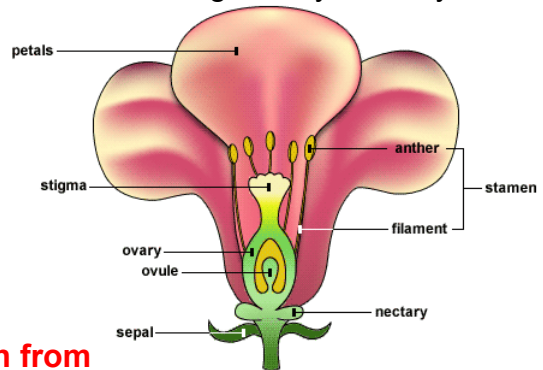
has seeds & vascular tissue

5. Describe how Plant A reproduces. **Pollination. Pollen from the stamen sticks to the stigma, travels down the style, and enters the ovary**

6. Where is pollen found on the flower? **On the anther on the stamen**

7. Pollen grains are the male sex cells of the flower. Eggs are the female sex cells. When the pollen is brought to the female part of the flower it is called pollination. Why do you think that the pistil is sticky at the top? **So the pollen sticks & isn't brushed off or blown away**

8. The male sex cells in the pollen are called sperm. When the sperm and eggs combine, sexual reproduction occurs and the egg is fertilized. The fertilized egg becomes a seed. Where would you predict you would find seeds in a fertilized flower? **fruit**



Station 2

9. Observe Plant B. What type of plant is Plant B? **fern -Sporophyte**

10. Does Plant B have seeds or vascular tissue? **Vascular tissue but no seeds**

11. How do these types of plants reproduce? **By producing haploid spores, which when released germinate to become gametophytes.**

12. Observe Plant C. What type of plant is Plant C? **moss—Bryophyte**

13. Does Plant C have seeds or vascular tissue? **neither**

14. How do these types of plants reproduce? **Asexual reproduction occurs when a sporophyte releases spores, and sexual reproduction happens when gametes fuse and form a zygote.**

15. Observe Plant D. What type of plant is Plant D? **pine cone—Gymnosperm**

16. Does Plant D have seeds or vascular tissue? **both**

17. How do these types of plants reproduce? **They do not have flowers, they have male & female cones. The male cones produce pollen that lands on the female cone. The pollen (sperm) and egg cell join together in an ovule in the female cone. The ovule then forms a naked seed.**

Transportation

Station 3

18. Observe the stem on the slide through the microscope. Find the xylem. What is the function of xylem? **Xylem transports water and minerals from the root up to other parts of the plant**
19. Find the phloem. What is the function of phloem? **Phloem transports sugars down from the leaves to other parts of the plant**
20. Observe the carnation in the cylinder. The carnation has white petals. Note the color of the water and any spots or discoloration you see on the white petals. Why has this discoloration (spots on the white petals) occurred? Be specific in your answer using vocabulary. **The water and purple food coloring traveled up from the stem through the xylem to the petals. This is why the petals had purple coloring on them.**

Photosynthesis

Station 4

21. Obtain a prepared slide. Observe the stomata in the microscope. Note the differences between the top of the leaf and the bottom of the leaf.

a. On which side do you see more open stomata?

The bottom of the leaf had more stomata

22. What is the main function of stomata?

To allow O₂ out & allow H₂O & CO₂ in

23. What is the main function of guard cells?

To open & close the stomata

24. Draw and label stomata and guard cells in the box to the right.

25. What does a larger number of leaf stomata indicate about the growing climate of that plant?

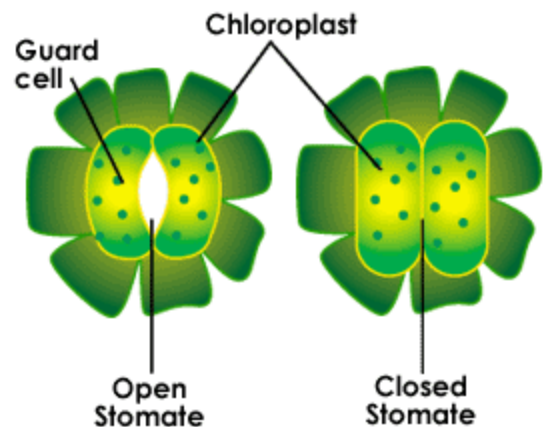
The climate is wet or humid like a rain forest.

26. Would plants in a dry, desert climate have more or less stomata than your sample. Why?

Plants in a dry desert climate would have less stomata than the sample under the microscope. Less stomata are found in plants living in dryer climates to prevent water loss.

27. At what time of day would stomata be closed and why? **Photosynthesis occurs during the day time because sunlight is needed in the Light Dependent Reaction. Stomata would be closed during the night to prevent water loss.**

28. What two gases move in and out of the leaf stomata? **CO₂ (carbon dioxide) & O₂ (oxygen)**



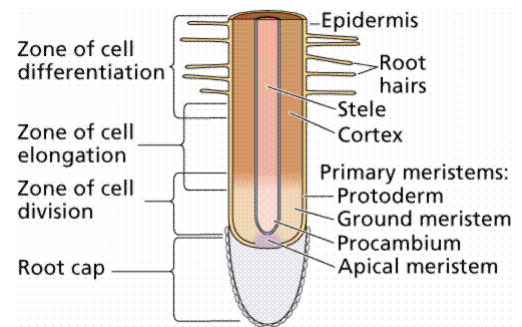
Station 5

29. Observe Plant Group A & Plant Group B. Which plant group would be suited to a dry climate? Explain. **Plant Group A is made of cactus and yucca. The leaves are thin and narrow to decrease surface area for a smaller number of stomata to reduce water loss.**
30. Which plant would be suited to a wet climate? Explain. **Plant Group B has broad, dark leaves. These big leaves provide more surface area and a higher number of stomata. Water loss is not a concern in a normally wet climate.**
31. What other adaptation(s) do you observe on Plant Group A? **numerous shallow roots & leaves are needles to prevent predators from eating them. Cactus also store water in their stems.**
32. What other adaptation(s) do you observe on Plant Group B? **the top of the leaves are dark in color. while the bottom of the leaves are light in color. The dark color mimics the dark forest floor and the light color mimics the light while looking up in a rainforest.**
33. Describe the cuticle of a plant. **Waxy outer covering of a leaf**
34. Which Plant group has a thicker cuticle. Why? **Plant Group A—to prevent water loss**

Absorption & Storage

Station 6

35. Observe the slide of the onion root tip in the microscope. Locate the following parts: root hairs, apical meristem, & root cap. Draw and label what you observe in the microscope in the box to the right.



36. What is the function of root hairs?
To increase surface area for absorption of water & nutrients
37. What is the function of the apical meristem?
It is the site of cellular growth (mitosis) in the root
38. What is the function of the root cap?
The root cap protects the apical meristem

Extension

Station 7 (2 people to a computer)

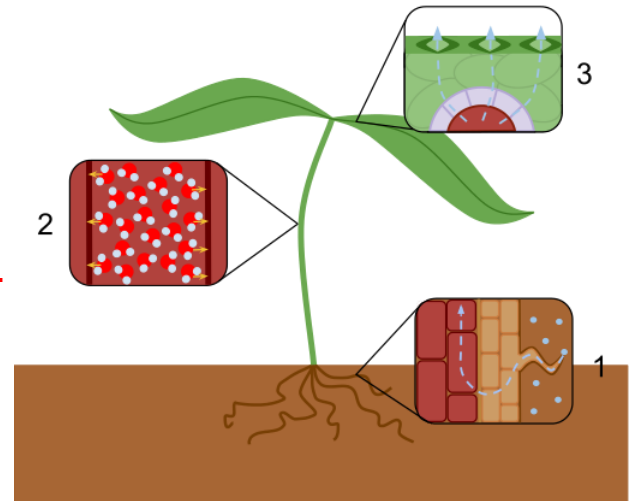
39. What are some ways that pollen can get to the pistil besides self-pollination? **Bees & humming-birds**
40. Using the computer, define transpiration. **H₂O loss through the stomata in leaves**

41. Using terms stomata, xylem, and transpiration, explain how water is absorbed and forced upwards from the roots in a tree 100 feet.

1-Water is passively transported into the roots and then into the xylem.

2-The forces of cohesion and adhesion cause the water molecules to form a column in the xylem.

3- Water moves from the xylem into the mesophyll cells, evaporates from their surfaces and leaves the plant by diffusion through the stomata.



42. Villi are tiny fingerlike structures in the small intestine that absorb nutrients. What structures on the plant are analogous to villi in the small intestine and why? **Root hairs are analogous to villi. Both increase surface area to absorb nutrients**

Responses

Station 8

Match the green labeled types of response with the pictures of examples given.

Write the definition of each response and draw an example.





43. Thigmotropism—**plants respond to touch.**

Ex: tendrils wrapped around a fence

44. Phototropism— **plants respond to light**

ex: a plant stem bends and grows towards the sunlight in a window

45. Gravitropism (aka Geotropism)- **roots grow with gravity & and stems grow against gravity**

Tropisms			
Tropisms occur when plants respond to external stimuli. Tropisms are movements caused by a change in a plant's growth pattern. Tropisms can be negative or positive. If the plant moves toward the stimulus, the tropism is defined as positive. If the plant moves away from the stimulus, the tropism is considered negative.			
Geotropism Gravity causes a response in a plant's growth.  <p>In the above image, what part of the plant exhibits positive tropism, and which part (s) of the plant exhibits negative tropism?</p>	Hydrotropism The way a plant grows or bends in response to water.  <p>Why would it be important for some parts of a plant to be pulled toward water?</p>	Thigmotropism Plants bend or grow because of touch. An example would be when vines wrap around an arbor frame.  <p>What are some other ways a plant can be "touched"?</p>	Phototropism The way a plant grows or bends in response to light.  <p>Why do you think sunflowers were given their name?</p>

Photosynthesis vs Cellular Respiration

Station 9 Venn Diagram

Place the correct characteristic in either Photosynthesis, Both, or Cellular Respiration.

46. In what organelle does photosynthesis take place? **chloroplast**

47. In what organelle does cellular respiration take place? **mitochondria**

48. Plant cells contain which of the above mentioned organelles? **Both mitochondria & chloroplast**

49. Animal cells contain which of the above mentioned organelles? **Mitochondria**

Station 10 Cellular Processes Equations

Observe the diagram on the sheet. Then place the molecules for both photosynthesis and cellular respiration equations in their correct box.

50. Write the chemical equation for photosynthesis. **$\text{CO}_2 + \text{H}_2\text{O} + \text{E (sunlight)} \rightarrow \text{O}_2 + \text{C}_6\text{H}_{12}\text{O}_6$**

51. Write the chemical equation for cellular respiration. **$\text{O}_2 + \text{C}_6\text{H}_{12}\text{O}_6 \rightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{E (ATP)}$**