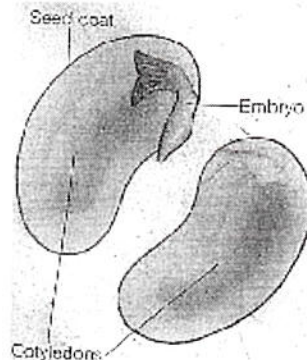


Ch 22-23 Review – Seed Plants Answers

1. What are the three main organs that allow plants to survive on dry land? **Roots, stems and leaves**
2. What are the functions of roots?
 - **Absorb water and dissolved nutrients from moist soil**
 - **Anchor plants**
3. How do roots work? **They grow and branch penetrating the soil between particles**
4. What do stems do? **Hold leaves up to sun**
5. What do leaves do? **Capture sunlight , photosynthesis**
6. How do leaves prevent water loss?
 - **Cuticle-waxy coating on surface**
 - **Stomata-controllable openings**
7. What are the two types of vascular tissue? **Xylem , phloem** What does each type do?
 - **Xylem Carry water and nutrients from roots to stems and leaves**
Structure
Dead when mature
Only move upwards
 - **Phloem Carries products of photosynthesis to other parts of plant**
Alive when mature
Move up and down
8. What generation is the most obvious part of the plant? **sporophyte**
9. What are the two types of reproductive structures in seed plants? **Flowers and cones**
10. What is pollination? **The carrying of pollen to the female gametophyte**
11. How does pollen get to the female gametophyte? **Wind, insects, birds, small animals , bats**
12. What is a seed? **Structure that protects the zygotes of seed plants that are in embryo form**
13. What are the parts of a seed?
 - **Embryo,-small plant –growing zygote**
 - **Seed coat-prevents drying out**
 - **Cotyledon- first leaf or leaves of the embryo**

Label diagram



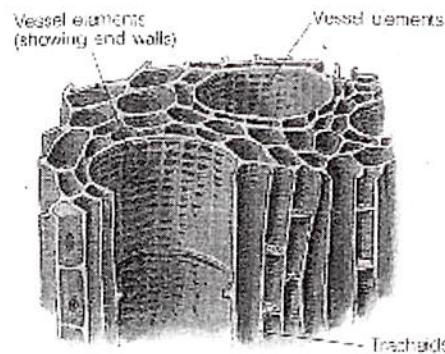
14. What are the advantages of a seed? **Can remain dormant for weeks to years, can withstand extremes of temperature of moisture, supplies embryo with food to grow**
15. What were the first seed-bearing plants? **Seed ferns**
16. How are they different from ferns? **Reproduce with seeds not spores**
17. What are the three classes of Gymnosperms? **Cycadae, ginkgoae, coniferae**
18. What specialized structure is found in gymnosperms used for reproduction? **scales gathered into cones**
19. What does the word gymnosperm mean? **Naked seed**
20. Describe cycads and where do they grow today? **Palm-like tree, only 9 genera, found in tropical and sub-tropical places**
21. What species of Ginkgo still lives and where? **Ginkgo biloba , china** Describe its fruit. **Large, wrinkled orange cherry**
22. What is the most common type of gymnosperm? **Conifer**
23. How big and old can a conifer grow? **100 meters tall, 4000 years old**
24. What leaf structure is distinctive of a conifer? **needles**
25. How do conifers reproduce? **Male pollen cones make large quantities of pollen grains Female cones produce ovule on scales of cone that are fertilized by the pollen**
26. What distinctive structure do angiosperm have for reproduction? **flowers**
27. What are the two subclasses of angiosperm and what are the difference in structure that the names are based on? **Monocot- one cotyledon (embryo leaf), dicot-two cotyledon**
28. What are the differences between the two sub-classes

	Monocot	Dicot
Leaves	Veins in leaves of most monocots are parallel to each other	Veins in leaves forma a branching network
Flower	Flower parts are in threes or multiples of three	Flower parts are in fours or fives or multiples of fours or fives
Vascular bundles in stem	Vascular bundles are scattered in a cross section of the stem	Vascular bundles are arranged in a ring in a cross section of the stem
Vascular bundles in a root	Bundles of xylem and phloem alternate with one another in a circle	A single mass of xylem forms an "x" in the centre of the root; phloem bundles are located between the arms of the "x"
Stem thickness	Stems of most monocots do not grow thicker from year to year	Stems grow thicker from year to year

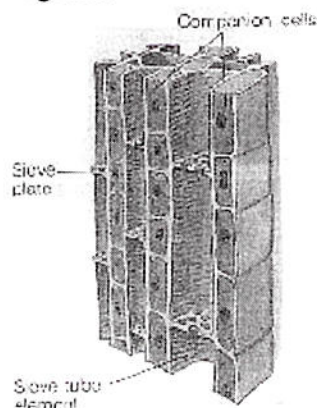
29. What type of plant tissue can undergo mitosis in a plant? **Meristematic tissue**
30. Where are these tissues found and for what purpose? **Apical (tip) at root tip and stem tip- growth and cork cambium and vascular cambium allow roots and stems to branch and grow thicker**
31. What are the functions of the different types of epidermal tissues? **Stem and leaf epidermis prevents water loss, root help in absorption of water**

32. Describe and give the function of parenchyma cells. **Thin walled cell, circular, large central vacuole with thin layer of cytoplasm** Functions: if chlorophyll-containing, photosynthesis; if not, storage of products of photosynthesis
33. Describe and give the function of sclerenchyma cells. **Tough thick-walled, star or triangular shaped; strengthen or support plant tissues**
34. Describe and give the function of different types of xylem cells.
- **Tracheids - long, narrow with pierced ends to allow water to move from one to next, dead and empty when mature**
 - **Vessel element- wider than tracheids, ends disappear when mature, dead and empty when mature**

35. Label the xylem diagram.

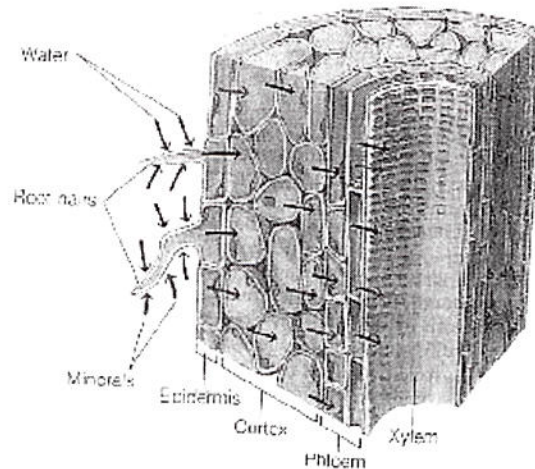


36. Describe and give the function of different types of phloem cells.
- **Sieve tube elements-end to end, end have piercings, most of cytoplasm gone when mature**
 - **Companion cells- control activity of sieve tube elements**
37. Label the phloem diagram.

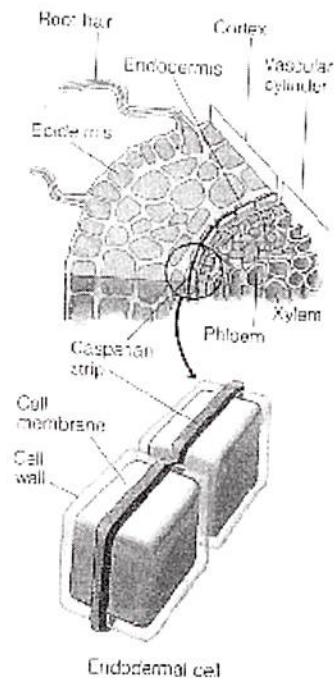


38. Describe the two patterns of root growth.
- **Taproot- primary root grows longer and thicker, secondary roots stay small**
 - **Fibrous root- secondary roots grow, all roots the same size**
39. What are the three tissues in a mature root and give their functions.
- **Epidermis – thin layer that takes in water and nutrients**
 - **Cortex- transports water and nutrients inward through root, stores sugar and starch**
 - **Vascular cylinder- contains xylem and phloem**

40. What is the function of root hairs? **Penetrate the spaces between soil particles**
41. How do roots absorb water and nutrients from the soil? **Root hairs absorb dissolved nutrients through active transport (uses energy) water is absorbed by osmosis, works because nutrients set up gradient so water can move in**
42. Label the diagram of a root hair.

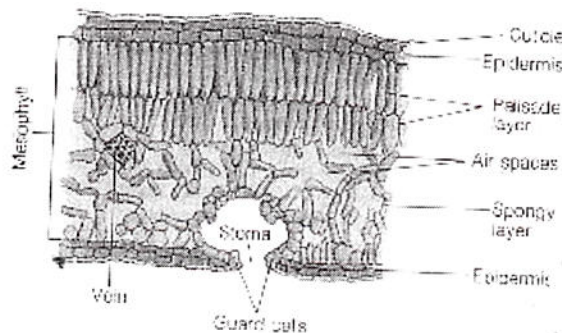


43. Label the diagram of a root.



44. How is water loss prevented from a root? **The Casparian strip are not permeable to water so water that is transported through the cells to the vascular cylinder can not leak back to outside and causes root pressure**
45. How is water moved into stems of short plants? **Root pressure causes water to go up stem. Water that has been actively transported into cylinder can only go upwards. Tall plants need additional help**
46. How are vascular tissues arranged in monocot and dicot stems?
- **Monocot- Vascular bundles are scattered in a cross section of the stem**
 - **Dicot - Vascular bundles are arranged in a ring in a cross section of the stem**
47. What is the function of parenchyma in stems? **storage**

48. How do you tell the age of a tree? **Count the number of rings** Why does it work? **A new layer of xylem is laid down each year, can tell how many years and how good the growing conditions were.**
49. Where are the different vascular tissues found in bark? **cork cambium and cork**
50. What does the cork cambium do? **Produces new cork tissue which forms the bark, a tissue filled with fats, oils or waxes and makes the outer layer waterproof**
51. What happens if the cork cambium is damaged? **The new phloem will not get made, food will not get to roots and they will starve killing the tree.**
52. What happens during dormancy? **Grow slows or stops, during winter or extended dry periods**
53. Describe the different types of modified stem used for dormancy.
- **Rhizomes- tick fleshy stems that grow along or under the surface**
 - **Tubers- underground stem thickened with stored food**
 - **Bulbs- stored food with leaves wrapped around them underground**
 - **Corms-similar to bulbs but thinner leaves**
54. What is the function of leaves? **Collect sunlight and do photosynthesis**
55. Label the cross-section of a leaf.



56. What is the function of the epidermis **control water loss**
57. How do leaves control the movement of air and water loss? **Use stoma to allow air in and let water out**
58. Describe how the stomata are formed and controlled. **The stomata (the opening) have guard cells on either side of the hole. If there is lots of water the cells swell, opening the hole; if lacking water they become limp and shut the hole.**
59. How are the vascular tissues arranged in monocot and dicot leaves?
- **Monocot- Veins in leaves of most monocots are parallel to each other**
 - **Dicot- Veins in leaves form a branching network**
60. Describe the mesophyll layers of the leaf and describe their function.
- **Palisade layer- tall columnar, tightly packed, contain chloroplast, do photosynthesis**
 - **Spongy Mesophyll- arranged with air spaces between cells, contains chloroplasts, does photosynthesis, allows air flow between cells so that CO₂ can reach the cells for photosynthesis to occur.**