

28.

Feature	Fungi	Mosses	Ferns	Gymnosperms	Angiosperms
phloem			√	√	√
frond			√		
tracheophyte			√	√	√
xylem			√	√	√
meiosis	√	√	√	√	√
flowers					√
bryophyte		√			
archegonium		√	√		
gills	√				
seeds				√	√
rhizoids	√	√			
hyphae	√				
gemmae		√			
protonema		√			
spermatophyte				√	√
spores	√	√	√		
rhizome			√		
fruit					√

30. (a) The dots are called sori.
 (b) The components of each dot are called sporangia.
 (c) The first cells within this structure are called spore mother cells.
 (d) Meiosis occurs within these cells.
 (e) The products of this process are called spores.
 (f) When these products land in a suitable location germination will occur.
31. (a) The two plants shown are a moss and a fern. The fern can be identified by its leafy green frond. The moss can be identified as a low-growing, tightly knit clump of green.
 (b) A lichen is also present.
 (c) The three different kinds of lichen are crustose, foliose, and fruticose. Crustose appears as a flat, crusty matlike structure on rocks or tree bark. Foliose has leaflike lobes that spread outwards, giving the lichen a paperlike appearance. Fruticose appears as a raised structure with stalks, multiple branching threads, and may hang from trees.
 (d) The lichens probably existed on the rock longer than the other organisms.
 (e) Lichens which die and decay provide nutrients for other plants.
32. Two plants called mosses that actually belong to other plant groups are club moss and Iceland moss. Club moss is actually a tracheophyte; these plants have vascular tissue. Iceland moss is a greyish-brown lichen. Both plants were likely named mosses because of their appearance resembles that of true mosses.
33. Rosy periwinkle (*Catharanthus roseus*) is a source of the chemicals vinblastine and vincristine, used in the treatment of Hodgkin's disease and childhood leukemia. The effects of vincristine were discovered when scientists were testing the chemical for use as a treatment for diabetes. The chemical vincristine stops cell division by

interfering with the cell's ability to synthesize nucleic acids. The rosy periwinkle is native to Madagascar.

34. One possible explanation for the increase in the earth's oxygen levels could be the proliferation of plant life. Plants produce oxygen as a byproduct of photosynthesis, thus an increase in the number of plants on Earth would increase oxygen levels.

Chapter 11

Invertebrates

Reflect on Your Learning (page 406)

1. None of the animals have feathers or fur coverings. Many have round sections—some are radially symmetrical. None have vertebrae.
2. Other animals that are invertebrates include worms, insects, and shellfish.
3. (a) Yes, vertebrates show bilateral symmetry.
(b) Bilateral symmetry allows for specialized body sections, such as a head (with a brain), abdomen, and limbs.

Try this Activity (page 407)

The spider, flatworm, millipede and octopus exhibit bilateral symmetry. The sand dollar and sea anemone exhibit radial-symmetry.

11.1 Practice (pages 411-412)

1. Animals are multicellular and eukaryotic. Their cells do not have cell walls, and they cannot produce their own food. Animals must obtain food from other organisms.
2. Complex animals contain an ectoderm (outer layer of cells forming skin and nervous system), mesoderm (middle layer forming internal organs) and an endoderm (inner layer forming the lining of the gut).
3. The coelom is a fluid filled space inside the body, between the body wall and the gut. A peritoneum lines this inner surface and holds the internal organs in place. This development has allowed animals to become larger. Larger animals and their larger organs require more space, and need to move around to enable expansion and contraction.
4. Humans are bilaterally symmetrical. The left and right sides of the human body are mirror images of each other.
5. Bilateral symmetry allows an animal to have a front end (with a brain to interpret what's coming up), facilitating forward locomotion.
6. Sponges and hydra are sessile. Jellyfish, worms, insects and vertebrates are all motile.
7. An organism would only be able to respond to its environment after it had entered it. Catching food or escaping danger would be very difficult.

11.2 Practice (pages 415-416)

1. Scientists classified sponges as plants by default. They did not appear to have any of the characteristics of animals, therefore, they must be plants.
2. The two body forms of cnidaria are polyp and medusa.
3. The tentacles of a sea anemone pull inward when touched. This draws food in closer. The tentacles are covered in nematocysts. These nematocysts have coiled, hollow, threadlike tubes which shoot out and sting prey, helping to trap them.
4. Hydra reproduce asexually by budding little hydra off its body wall, or by regenerating a whole body if a piece is broken off.