

# Exercises

## Prokaryotes Exercises

1. What do we call cells without nuclei?
2. How many cells are bacteria made of?
3. What is the difference between spirilla, bacilli, and cocci bacteria?
4. How is a bacterium's cell wall like your skin?
5. How does penicillin work?
6. What do ribosomes do?
7. Where is DNA usually found in prokaryotes?
8. How do autotrophs get the energy they need to survive?
9. What is a chemotroph?
10. How do bacteria that are chemotrophs help other organisms?
11. How are mutualistic and parasitic bacteria similar? How are they different?
12. What process do bacteria use to reproduce?
13. How do decomposer bacteria help other organisms?
14. Name three foods made using bacteria.
15. What are three ways to reduce the risk of food poisoning from bacteria?
16. Name three ways archaea are similar to bacteria.

17. How is the cells wall of archaea different than the cell walls of bacteria?
18. How do most archaea get energy?
19. What is one way archaea help other organisms?
20. Why is budding considered asexual reproduction?
21. What are some places thermophiles live?
22. Why did scientists think for many years that nothing could live in the Dead Sea?
23. How do some methanogens help cows?
24. Why would a scientist studying global warming be interested in swamps where methanogens are found?
25. Name two "non-extreme" places where archaea are found.

# Exercises

## Protists & Fungi Exercises

1. Name two ways plants are different from fungi.
2. What is the purpose of the cell wall in fungi?
3. What are two reasons fungi are hard to see?
4. How are hyphae related to mycelia?
5. How is parasitism different from mutualism?
6. What would be a benefit of getting food through mutualism instead of parasitism?
7. How do some fungi help ants?
8. How do fungi eat nematodes?
9. Why is spore production asexual reproduction?
10. What makes haploid and diploid cells different?
11. How would the soil be different if there were no fungi?
12. What are two ways humans use fungi?
13. Why are protists sometimes thought of as a "junk-drawer" kingdom?
14. What is one thing true of all protists?
15. What are the three major groups of protists?
16. How are protozoa classified?
17. How does an amoeba move?
18. In what way is a plant-like protist similar to a plant?
19. How do most fungus-like protists reproduce?
20. What are three ways people use protists?

# Exercises

## Plants Exercises

1. Why is kelp not a plant?
2. What is produced in photosynthesis?
3. How does the cuticle help plants? How does it hurt it?
4. Why are stomata necessary?
5. What is the different between xylem and phloem?
6. What does it mean if a seed is dormant?
7. Why can't nonvascular plants grow tall?
8. What group of plants do ferns belong to?
9. What does it mean if a seed is "naked?"
10. What structure do all angiosperms have?
11. What are the two generations all plants have?
12. What is one asexual way some nonvascular plants reproduce?
13. Why do seedless plants need to reproduce near water?
14. Which generation is most important in vascular seedless plants?
15. Why do plants want to spread their seeds as far as possible?
16. How does having fruit help plants?
17. Why do plants want insects to visit their flowers?
18. Why do insects want to visit plants?
19. What types of things cause the release of hormones in plants?

20. Name three things hormones control in plants.

# Answers to Exercises

## Answers to Prokaryotes Exercises

1. What do we call cells without nuclei? **prokaryotes**
2. How many cells are bacteria made of? **1**
3. What is the difference between spirilla, bacilli, and cocci bacteria? **They each have a different shape**
4. How is a bacterium's cell wall like your skin? **They both provide protection from outside objects**
5. How does penicillin work? **It destroys the proteins that make bacteria's cell walls**
6. What do ribosomes do? **Make proteins**
7. Where is DNA usually found in prokaryotes? **Either in the nucleoid region or in plasmids**
8. How do autotrophs get the energy they need to survive? **They convert the sun's energy into energy they can use**
9. What is a chemotroph? **An organism that gets energy by breaking down chemical compounds**
10. How do bacteria that are chemotrophs help other organisms? **Some of the elements broken down, including nitrogen, are needed for other organisms to survive**
11. How are mutualistic and parasitic bacteria similar? How are they different? **Both mutualistic and parasitic bacteria live in other organisms, but the mutualistic bacterium is helpful while the parasitic bacterium is harmful**
12. What process do bacteria use to reproduce? **Binary fission**

13. How do decomposer bacteria help other organisms? **They remove dead material from soil**
14. Name three foods made using bacteria. **Yogurt, cheese, sauerkraut**
15. What are three ways to reduce the risk of food poisoning from bacteria? **Wash your hands, clean down cooking surfaces, fully cook meat and eggs**
16. Name three ways archaea are similar to bacteria. **They are microscopic single-celled prokaryotes**
17. How is the cells wall of archaea different than the cell walls of bacteria? **They are made of a different protein**
18. How do most archaea get energy? **From breaking down chemicals (they are chemotrophs)**
19. What is one way archaea help other organisms? **They provide chemicals needed for life and help in digestion**
20. Why is budding considered asexual reproduction? **It involves only a single parent**
21. What are some places thermophiles live? **Geysers, hot springs, near volcanoes**
22. Why did scientists think for many years that nothing could live in the Dead Sea? **They thought it was too salty**
23. How do some methanogens help cows? **They live in their gut and break down cellulose, which is found in the plants the cows eat**
24. Why would a scientist studying global warming be interested in swamps where methanogens are found? **Methanogens produce methane, which is a greenhouse gas and causes global warming**
25. Name two "non-extreme" places where archaea are found. **In the ocean amongst plankton and in soil**

# Answers to Exercises

## Answers to Protists and Fungi Exercises

1. Name two ways plants are different from fungi. **fungi are heterotrophs and have a cell wall made of chitin**
2. What is the purpose of the cell wall in fungi? **to protect the cell**
3. What are two reasons fungi are hard to see? **many are microscopic and those that are not live in hard to find places**
4. How are hyphae related to mycelia? **mycelia are bunched up hyphae**
5. How is parasitism different from mutualism? **in parasitism, one organism benefits while the other is harmed, but in mutualism, both organism benefits**
6. What would be a benefit of getting food through mutualism instead of parasitism? **if the parasite kills the host, the parasite will have to find a new host or it will die too, but if both organisms benefit, they can stay together**
7. How do some fungi help ants? **by helping them digest cellulose**
8. How do fungi eat nematodes? **they wrap their mycelia around them and inject toxins**
9. Why is spore production asexual reproduction? **it requires only one parent**
10. What makes haploid and diploid cells different? **haploid cells have half the organisms genetic material while diploid cells have all of it**
11. How would the soil be different if there were no fungi? **dead material would pile up and the soil would be less able to grow new organisms**
12. What are two ways humans use fungi? **to eat and to create antibiotics**
13. Why are protists sometimes thought of as a "junk-drawer" kingdom? **they don't fit well into any kingdom**



14. What is one thing true of all protists? **they are all eukaryotes**
15. What are the three major groups of protists? **animal-like, plant-like, and fungus-like**
16. How are protozoa classified? **by the way they move**
17. How does an amoeba move? **it puts out an extension called a false foot, or pseudopoda, which pulls the rest of the protist along**
18. In what way is a plant-like protist similar to a plant? **they both are autotrophs that undergo photosynthesis**
19. How do most fungus-like protists reproduce? **spore production**
20. What are three ways people use protists? **in industry, in medical research, and in waste treatment facilities**

# Answers to Exercises

## Answers to Plants Exercises

1. Why is kelp not a plant? **it does not have specialized cells**
2. What is produced in photosynthesis? **energy for the plant to use and oxygen**
3. How does the cuticle help plants? How does it hurt it? **it keeps water in, but can prevent gas flow in photosynthesis**
4. Why are stomata necessary? **to allow gas exchange during photosynthesis**
5. What is the different between xylem and phloem? **xylem carries water and minerals; phloem carries sugars**
6. What does it mean if a seed is dormant? **the plant is not growing out of it yet**
7. Why can't nonvascular plants grow tall? **they have no tissue to bring up water**
8. What group of plants do ferns belong to? **vascular seedless plants**
9. What does it mean if a seed is "naked?" **it has no fruit around it**
10. What structure do all angiosperms have? **flowers**
11. What are the two generations all plants have? **gametophyte and sporophyte**
12. What is one asexual way some nonvascular plants reproduce? **fragmentation**
13. Why do seedless plants need to reproduce near water? **the sperm must be able to swim to the egg**
14. Which generation is most important in vascular seedless plants? **sporophyte**

15. Why do plants want to spread their seeds as far as possible? **to increase changes of survival and reduce risk of competition amongst the offspring**
16. How does having fruit help plants? **animals eating fruit help spread seeds**
17. Why do plants want insects to visit their flowers? **to spread pollen**
18. Why do insects want to visit plants? **to get nectar**
19. What types of things cause the release of hormones in plants? **changes in temperature, a fruit being ripe, or a flower that has fully bloomed**
20. Name three things hormones control in plants. **answers include make leaves fall, ripen fruit, make plants grow tall, promote cell division, slow aging, open the stomata**