*Biology for a Changing World 2e,* Chapter 18 Test Bank

1. Which condition(s) is/are likely to be found in a habitat near or in the hydrothermal vents of Lost City?

1. extreme heat
2. extreme pressure
3. basic ph
4. anaerobic
5. All of the above.

Answer: E

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts: hydrothermal sea vents

2. The vent fluids of the chimneys of Lost City range from

1. 0 to 4.
2. 4 to 8.
3. 7 to 9.
4. 9 to 11.
5. 11 to 14.

Answer: D

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts:hydrothermal sea vents

3. The habitats surrounding a deep-sea hydrothermal vent support differing microbial communities because of variations in

1. temperature.
2. pH.
3. hydrogen concentration.
4. methane concentration.
5. All of the above.

Answer: E

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts:hydrothermal sea vents

4. Most of the organisms found at Lost City are

1. 1-cm-long animals.
2. fish.
3. eukaryotes.
4. prokaryotes.
5. archaea.

Answer: D

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts:hydrothermal sea vents

5. The chimneys of Lost City are composed of

1. hydrocarbons.
2. carbonate.
3. iron.
4. iron and sulphur.
5. lava.

Answer: B

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts:life in and around hydrothermal sea vents

6. Lost City is located

1. at a depth of 2,600 feet.
2. on the mid-Atlantic ridge.
3. 2,300 miles east of Florida.
4. on top of a submerged mountain.
5. All of the above.

Answer: E

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts:life in and around hydrothermal sea vents

7. Which organism would most likely NOT be found at or near a deep-sea hydrothermal vent?

1. methanogen
2. methane-metabolizing archaea
3. aerobic bacteria
4. anaerobic bacteria
5. All of the above.

Answer: C

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts:life in and around hydrothermal sea vents

8. The hydrothermal vents of Lost City are unique because

1. they have the highest temperature ever found.
2. they have a different chemistry and inhabitants.
3. they are the deepest found.
4. they have the most acidic environment.
5. they are the most remote.

Answer: B

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts: life in and around hydrothermal sea vents

9. Some microbes found at Lost City

1. use hydrogen as an energy source.
2. use methane as a carbon source.
3. are anaerobic.
4. are heterotrophic.
5. All of the above.

Answer: E

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts:life in and around hydrothermal sea vents

10. Where would a scientist most likely find an archaean when sampling carbonate hydrothermal vents?

1. at the outside base of a chimney
2. mid-way up the outside of a chimney
3. at the outside top of a chimney
4. inside the chimney beside the warm vent flow
5. inside the chimney far away from the warm vent flow

Answer: D

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Use It

Difficulty: Easy

Important Words/Concepts:hydrothermal sea vents and methanogen

11. Which of the following best explains why the rock chimneys of the Lost City host such a variety of unique microbial communities?

1. The height of the chimneys creates a gradient of temperatures (hottest at the top and coolest at the bottom) along the chimney; these, in turn, become separate environments and host different communities.
2. The height of the chimneys creates a gradient of pH (most acidic at the top and most basic at the bottom) along the chimney; these, in turn, become separate environments and host different communities.
3. Although temperatures, pH, and other factors are the same all over each chimney, the chimneys are so big that different communities can occupy different sections of the chimney.
4. The Lost City comprises a huge number of rock chimneys, each of which has its own unique environment; this means that each chimney hosts its own unique microbial community.
5. None of the above.

Answer: A

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Use It

Difficulty: Medium

Important Words/Concepts: life in and around hydrothermal sea vents

12. All of the following are true of hydrothermal vents, EXCEPT

* 1. they form when rocks from Earth’s crust meet seawater.
  2. the gas and fluids that seep out of the vents can be very acidic or very basic.
  3. the temperatures never get higher than 60°C.
  4. many microbial species can inhabit hydrothermal vents.
  5. scientists are interested in organisms that live on hydrothermal vents because these organisms might give clues about how life first evolved.

Answer: C

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts:hydrothermal vent

13. Why are scientists so interested in studying the microbes that inhabit microbial vents?

*Answer:* Scientists are interested in studying the microbes that inhabit microbial vents because the environment around these vents is similar to the conditions under which the first life forms are believed to have evolved. Thus, these microbes may give clues to the origin of life itself.

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts: evolution, hydrothermal vent

14. How are samples collected from Lost City?

1. by an underwater coring apparatus
2. by using a deep-sea drilling machine
3. by using remotely controlled machines
4. by using high-pressurized scuba gear
5. by snorkeling graduate students

Answer: C

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts:sampling microbes from a deep-water environment

15. Why would a researcher be slow, careful, and meticulous while vacuuming a specific part of a deep-sea chimney?

1. to avoid cross contamination of biological species
2. to avoid breaking the chimney
3. to document a specific environmental habitat
4. because it is done remotely and requires skill
5. All of the above.

Answer: E

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts: sampling microbes from a deep-water environment

16. Why would a researcher process microbes collected from a deep-sea chimney in an anaerobic bag?

1. to avoid cross contamination of biological species
2. to keep aerobes separate from anaerobes
3. to prevent oxygen from harming the microbes and to control the environment
4. to document a specific environment
5. to culture aerobes

Answer: C

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts**:** sampling microbes from a deep-water environment

17. At which temperature would you incubate microbes collected at Lost City?

1. 100°C, boiling point
2. 2°C, seawater temperature
3. 37°C, body temperature
4. would vary, depending on collection point
5. 150 to 170°C, vent-fluid temperature

Answer: D

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Use It

Difficulty: Easy

Important Words/Concepts: sampling microbes from a deep-water environment

18. Lost City microbial samples must be processed in an anaerobic glove bag because

1. they are potentially harmful, and the anaerobic glove bag keeps scientists from being exposed to them.
2. the glove bag keeps samples of individual species from contaminating one another, which would make the microbes impossible to culture.
3. the anaerobic glove bag maintains a sterile environment that prevents any harmful microbes from growing.
4. the microbes are anaerobic and might be damaged if exposed to oxygen; the anaerobic glove bag eliminates oxygen.
5. All of the above.

Answer: D

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Use It

Difficulty: Medium

Important Words/Concepts:sampling microbes from a deep-water environment

19. Why do scientists who collect microbes from hydrothermal vents have to be so careful when handling those microbes on the surface? Specifically, what about the surface is so dangerous for the microbes?

*Answer:* Microbes from hydrothermal vents are poisoned by oxygen; thus, special care needs to be taken to ensure they are not exposed to the surface atmosphere.

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts: hydrothermal vent

20. Which of the following does NOT refer to a prokaryotic organism?

1. smaller than a eukaryotic organism
2. does not have a nucleus
3. has one chromosome
4. reproduces by binary fission
5. has organelles

Answer: E

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts:prokaryote, eukaryote, archaea, and bacteria

21. Which is NOT true of prokaryotes?

1. They are found on you.
2. They are found in you.
3. They are the first colonizers of Earth.
4. They are exclusive to land.
5. They can inhabit extreme environments.

Answer: D

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts:prokaryote, eukaryote, archaea, and bacteria

22. A prokaryote has all of the following structures, EXCEPT

1. a cell wall.
2. ribosomes.
3. mitochondria.
4. DNA.
5. cytoplasm.

Answer: C

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: prokaryote, eukaryote, archaea, and bacteria

23. Which statement about prokaryotes is FALSE?

1. Prokaryotes are diverse.
2. All prokaryotes are bacteria**.**
3. Prokaryotes are usually single celled.
4. Prokaryotes are found in two domains.
5. Prokaryotes cannot be seen by the naked eye.

Answer: B

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: prokaryote, eukaryote, archaea, and bacteria

24. Which of the following correctly compares and contrasts prokaryotic and eukaryotic cells?

1. Prokaryotic and eukaryotic cells are roughly the same size and shape. Prokaryotic cells lack organelles and have a single, circular DNA molecule not contained in a nucleus.
2. Prokaryotic cells are about the size of an individual mitochondrion. Prokaryotic cells have ribosomes and circular DNA not contained in a nucleus, and they lack the internal structure of eukaryotes.
3. Prokaryotic and eukaryotic cells are roughly the same size and shape, and both are typically found in multicellular organisms. Both have DNA and ribosomes.
4. Prokaryotic cells are about the size of a eukaryotic mitochondrion. Because of their small size, their internal structures—ribosomes, nuclei, mitochondria, etc.—are much smaller than those found in eukaryotic cells.
5. Prokaryotic and eukaryotic cells are roughly the same size and shape. Prokaryotes lack internal organelles, ribosomes, and DNA.

Answer: B

DQ: What are the prokaryotic domains of life?

Type: Use It

Difficulty: Medium

Important Words/Concepts: eukaryote, prokaryote

25. All of the following are true of prokaryotes, EXCEPT

1. they are unicellular.
2. they have no membrane-bound organelles.
3. their DNA floats freely in the cytoplasm.
4. they are microscopic.
5. they are less numerous than eukaryotes.

Answer: E

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: eukaryote, prokaryote

26. All of the following are TRUE of eukaryotes, EXCEPT

* 1. they are larger than prokaryotic cells.
  2. they are the types of cells found in humans.
  3. they have membrane-bound organelles.
  4. their DNA is found in the cytoplasm.
  5. they cannot live in as many habitats as prokaryotic cells.

Answer: D

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts:eukaryote, prokaryote

27. Fill in the following table to contrast prokaryotes and eukaryotes.

|  |  |  |
| --- | --- | --- |
|  | Prokaryotes | Eukaryotes |
| Number of cells (single/multi/either) |  |  |
| Membrane-bound organelles (yes/no) |  |  |
| DNA in nucleus (yes/no) |  |  |
| Size (small/large) |  |  |
| Abundance on earth (higher/lower) |  |  |

*Answer:*

|  |  |  |
| --- | --- | --- |
|  | Prokaryotes | Eukaryotes |
| Number of cells (single/multi/either) | single | either |
| Membrane-bound organelles (yes/no) | no | yes |
| DNA in nucleus (yes/no) | no | yes |
| Size (small/large) | small | large |
| Abundance on earth (higher/lower) | higher | lower |

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts:eukaryote, prokaryote

28. List at least three important differences between prokaryotic and eukaryotic cells.

*Answer:*

**Prokaryotic cells** **Eukaryotic cells**

small large

single-celled single- or multi-celled

no membrane-bound organelles membrane-bound organelles

DNA in cytoplasm DNA in nucleus

circular DNA DNA in thread-like chromosomes

more abundant than eukaryotes less abundant than prokaryotes

live in more environments than eukaryotes live in fewer environments

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Hard

Important Words/Concepts: eukaryote, prokaryote

29. Although prokaryotes survive in many different environments, \_\_\_\_\_\_ have been called “extremophiles” and have their own domain.

1. archaea
2. cyanobacteria
3. protists
4. facultative anaerobes
5. amoebas

Answer: A

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts:the diversity and abundance of prokaryotes

30. Which statement is NOT true of archaea?

1. They are prokaryotes.
2. They are the first colonizers of earth.
3. They are more closely related to eukaryotes than bacteria.
4. They do not have a nucleus.
5. They are not all extremophiles.

Answer: B

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts: the diversity and abundance of prokaryotes

31. Which prokaryotes inhabit our intestines?

1. aerobic bacteria
2. halophiles
3. photosynthetic bacteria
4. anaerobic bacteria
5. thermophiles

Answer: D

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts:the diversity and abundance of prokaryotes

32. Which prokaryotes would one expect to be found in the chimney-vent fluids of Lost City?

1. *E. coil*
2. methanogens
3. photosynthetic bacteria
4. aerobes
5. halophiles

Answer: B

DQ: What are the prokaryotic domains of life?

Type: Use It

Difficulty: Easy

Important Words/Concepts: the diversity and abundance of prokaryotes

33. Which prokaryotes would one expect to be found in a salt mine?

1. *E. coil*
2. methanogens
3. halophiles
4. photosynthetic bacteria
5. aerobes

Answer: C

DQ: What are the prokaryotic domains of life?

Type: Use It

Difficulty: Easy

Important Words/Concepts:the diversity and abundance of prokaryotes

34 How did the scientists ultimately identify the different species of prokaryotes they found at Lost City?

1. growth in lab cultures
2. comparison of DNA sequences
3. comparison of growth habitats
4. comparison of ph of the environment
5. All of the above.

Answer: B

DQ: What are the prokaryotic domains of life?

Type: Use It

Difficulty: Medium

Important Words/Concepts:the diversity and abundance of prokaryotes

35. Hiking in the Himalayas, you have discovered a new high-elevation valley surrounded by towering mountain peaks. You obviously expect to find prokaryotes in the hospitable environments, such as meadows and streams. Where else would you expect to find them?

1. living in glacial ice on the mountainsides
2. inside the intestines of the mammals that live in the valley
3. deep underground in mountain caves
4. in salt-evaporation ponds
5. All of the above.

Answer: E

DQ: What are the prokaryotic domains of life?

Type: Use It

Difficulty: Medium

Important Words/Concepts: the diversity and abundance of prokaryotes

36. Prokaryotes can be found in which of the following environments?

1. glaciers
2. salt lakes
3. intestines
4. miles underground
5. All the above.

Answer: E

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Easy

Important Words/Concepts:prokaryote

37. Prokaryotes live in extreme environments, where eukaryotes cannot live. List at least three such environments where you would expect to find prokaryotic cells, but likely not eukaryotic cells.

*Answer:*

glaciers

salt lakes

intestines

miles underground

DQ: What are the prokaryotic domains of life?

Type: Know It

Difficulty: Hard

Important Words/Concepts: eukaryote, prokaryote

38. Why do you think there are more species of prokaryotes than eukaryotes?

*Answer:* There are more species of prokaryotes than eukaryotes in part because prokaryotes have been present on Earth for two billion years longer than eukaryotes, thus have had more time to adapt to a variety of habitats.

DQ: What are the prokaryotic domains of life?

Type: Use It

Difficulty: Hard

Important Words/Concepts: eukaryote, prokaryote

39. Which two domains contain prokaryotic organisms?

1. Archaea and Eukarya
2. Monera and Eukarya
3. Bacteria and Archaea
4. Archaea and Monera.
5. Bacteria and Monera

Answer: C

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:the three domains

40. Humans are most genetically similar to which of the following prokaryotes:

1. spirochetes
2. gram-positive bacteria
3. cyanobacteria
4. methanogens
5. gram-negative bacteria

Answer: D

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:the three domains

41. This structure differs in its composition in Archaea and Bacteria.

1. cytoplasm
2. cell wall
3. nucleus
4. golgi
5. nucleic acid

Answer: B

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts: the three domains

42. Which of the following methods is the most reliable way to identify a new species of prokaryote?

* 1. differences in membrane structure and composition
  2. differences in cell surface proteins and carbohydrates
  3. differences in DNA sequences
  4. differences in ribosomal RNA
  5. differences in proteins

Answer: C

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:prokaryote

43. Based on their DNA, place the following species on the evolutionary tree according to their relatedness to their common ancestor. Differences from the common ancestor are underlined.

Common ancestor: ATCGCTATCGA

Species A: ATGGCTTTCGA

Species B: ATGGCTTTCAA

Species C: ATGGCTATCGA

Common Ancestor

Common Ancestor

C

A

B

*Answer:*

DQ: What are the features of Bacteria and Archaea?

Type: Use It

Difficulty: Easy

Important Words/Concepts: evolution

44. The term “extremophiles” refers to

* 1. members of domain Bacteria
  2. members of domain Archaea
  3. members of domain Eukarya
  4. members of both domains Bacteria and Archaea
  5. members of both domains Archaea and Eukarya

Answer: B

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Archaea, extremophile, prokaryote

45. Which of the following statements about the three domains of life is TRUE?

* 1. Archaea is most closely related to Bacteria.
  2. Archaea is most closely related to Eukarya.
  3. Bacteria is most closely related to Eukarya.
  4. Bacteria and Archaea are equally related to the Eukarya.
  5. Bacteria and Archaea have no evolutionary relationship to Eukarya.

Answer: B

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:Archaea, bacteria, Eukarya

46. If you explore the life inside a hydrothermal vent, you will most likely find a \_\_\_\_\_\_\_\_ cell, which is a member of domain \_\_\_\_\_\_\_\_.

* 1. eukaryotic; Bacteria
  2. eukaryotic; Archaea
  3. prokaryotic; Bacteria
  4. prokaryotic; Archaea
  5. prokaryotic; Eukarya

Answer: D

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:Archaea, extremophile, prokaryote

47. Prokaryotic cells are found in which of the following domains?

* 1. Bacteria
  2. Archaea
  3. Eukarya
  4. Bacteria and Archaea
  5. Bacteria and Eukarya

Answer: D

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Archaea, Bacteria, Eukarya, prokaryote

48. The term “halophile” means “salt-loving” and describes organisms that live in extremely salty environments. Knowing this, you would expect a halophile to be a member of domain

* 1. Bacteria.
  2. Archaea.
  3. Eukarya.
  4. Bacteria or Eukarya equally.
  5. Archaea or Eukarya equally.

Answer: B

DQ: What are the features of Bacteria and Archaea?

Type: Use It

Difficulty: Easy

Important Words/Concepts:Archaea, Bacteria, Eukarya, prokaryote

49. You cut yourself and the cut becomes infected. The cause of this infection is most likely a \_\_\_\_\_\_\_\_ cell, which is a member of domain \_\_\_\_\_\_\_\_.

* 1. eukaryotic; Bacteria
  2. eukaryotic; Archaea
  3. prokaryotic; Bacteria
  4. prokaryotic; Archaea
  5. prokaryotic; Eukarya

Answer: C

DQ: What are the features of Bacteria and Archaea?

Type: Use It

Difficulty: Easy

Important Words/Concepts: Bacteria, prokaryote

50. Malaria is a mosquito-borne disease that can be deadly when transmitted to humans. Malaria is caused by a parasite. Knowing this, you expect the parasite to be a member of domain

* 1. Bacteria.
  2. Archaea.
  3. Eukarya.
  4. Bacteria or Archaea equally.
  5. Archaea or Eukarya equally.

Answer: C

DQ: What are the features of bacteria and Archaea?

Type: Use It

Difficulty: Easy

Important Words/Concepts:Archaea, Bacteria, Eukarya

51. Which prokaryotes were the first to oxygenate our planet?

1. cyanobacteria
2. aerobic bacteria
3. archaeans
4. halophiles
5. thermophiles

Answer: A

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:bacterial diversity

52. Which term does NOT apply to bacteria?

1. anaerobic
2. aerobic
3. autotrophic
4. heterotrophic
5. None of the above.

Answer: E

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts: bacterial diversity

53. Write T for true and F for false after the following statements.

1. All bacteria are pathogenic.
2. All bacteria are useful.
3. Certain bacteria can be used as bioremediators.
4. Certain bacteria are used in biotechnology to make drugs.
5. Some bacteria are photosynthetic.
6. There are no bacterial symbionts.

Answer:

1. All bacteria are pathogenic. (F)
2. All bacteria are useful. (F)
3. Certain bacteria can be used as bioremediators. (T)
4. Certain bacteria are used in biotechnology to make drugs. (T)
5. Some bacteria are photosynthetic. (T)
6. There are no bacterial symbionts. (F)

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:bacterial diversity

54. Which is an adaptation for the survival of *Helicobacter pylori* in the intestinal gut?

1. cilium
2. capsule
3. flagellum
4. pili
5. ribosomes

Answer: C

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Hard

Important Words/Concepts:bacterial diversity and adaptations

55. Which is an adaptation for the survival of *Streptococcus mutans*, which causes plaque build up on teeth?

1. cilium
2. flagellum
3. pili
4. capsule
5. ribosomes

Answer: D

DQ: What are the features of bacteria and Archaea?

Type: Know It

Difficulty: Hard

Important Words/Concepts: bacterial diversity and adaptations

56. Which of the following statements correctly pairs specific bacteria or groups of bacteria with their adaptations to specific habitats or lifestyles?

1. Symbiotic bacteria use their flagella to adhere to cells and tissues in intestinal tracts.
2. Photosynthetic bacteria use fermentation; we take advantage of this process to produce yogurt.
3. Some harmful bacteria use pili and capsules to adhere to surfaces in host organisms.
4. Pathogenic bacteria use flagella for fermentation and photosynthesis.
5. Fermenting bacteria are important symbiotes, using pili and capsules to adhere to surfaces in their host organisms.

Answer: C

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Medium

Important Words/Concepts: bacterial diversity and adaptations

57. Bacteria that eat other bacteria are called \_\_\_\_\_\_\_\_, while photosynthetic bacteria are called \_\_\_\_\_\_\_\_.

1. autotrophs; heterotrophs
2. autotrophs; nitrogen fixers
3. autotrophs; phototrophs
4. heterotrophs; autotrophs
5. heterotrophs; phototrophs

Answer: D

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:autotroph, bacteria, heterotroph

58. List one way in which cyanobacteria facilitated the evolution of life on Earth and one way in which they have continued to be extremely important to life on Earth.

*Answer:*

Cyanobacteria were the first photosynthetic organisms and were responsible for putting a great deal of oxygen into the air.

Cyanobacteria fix nitrogen from the air and convert it into a form that plants can use.

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Hard

Important Words/Concepts:autotroph, bacteria, cyanobacteria

59. Define nitrogen fixation, what types of organisms are responsible for fixing nitrogen, and explain the importance of nitrogen fixation to life on Earth.

*Answer:* Nitrogen fixation is the process of converting atmospheric nitrogen into a form of nitrogen that plants can use. The process is carried out by cyanobacteria and is extremely important for plant growth. Plant growth is important not only because plants provide additional oxygen in the atmosphere, but also because they provide food for many other life forms.

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Hard

Important Words/Concepts: autotroph, bacteria, cyanobacteria

60. Explain the role of heterotrophic bacteria in recycling nutrients.

*Answer:* Heterotrophic bacteria consume living or dead organisms. Without heterotrophic bacteria, carbon and other nutrients would remain in dead organisms and never be available to other organisms to use. Depleting the availability of these nutrients would limit the abundance of life on Earth.

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Hard

Important Words/Concepts:bacteria, heterotroph

61. Bacteria living in the digestive tract of termites digest the cellulose of plant-cell walls, enabling the termite to feed on wood. The bacteria rely on the termite for food, and without these bacteria, the termites would starve. This relationship is an example of

* 1. symbiosis.
  2. biosis.
  3. parasitism.
  4. anabolism.
  5. fraternization.

Answer: A

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts: bacteria, symbiosis

62. What is the advantage of keeping food refrigerated? Please be very specific.

*Answer:*Keeping food refrigerated slows the growth of bacteria that may release toxins into the food and cause food poisoning.

DQ: What are the features of Bacteria and Archaea?

Type: Use It

Difficulty: Easy

Important Words/Concepts: bacteria

63. Long structures that help bacteria move are called \_\_\_\_\_\_\_\_, while shorter, hair-like structures that enable bacteria to stick to a surface are called \_\_\_\_\_\_\_\_.

* 1. pili; flagella
  2. vibrissae; flagella
  3. vibrissae; pili
  4. flagella; vibrissae
  5. flagella; pili

Answer: E

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts: bacteria

64. Which does NOT describe members of the domain Archaea?

1. They are genetically close to eukaryotes.
2. Some live in extreme environments.
3. They are prokaryotes.
4. They do not have a nucleus.
5. Their cell walls made of peptidoglycan.

Answer: E

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts: archaeal diversity and habitats

65. Archaeans have been found

1. in acidic environments.
2. in alkaline environments.
3. in hot environments.
4. in cold environments.
5. All of the above.

Answer: E

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts: archaeal diversity and habitats

66. Which member of the domain Archaea would likely be found in the Dead Sea or the Great Salt Lake of Utah?

1. *Halobacterium*
2. *Pyrodicticum*
3. *Thermoproteus*
4. *Methanosarcinia*
5. *Sulpholobus*

Answer: A

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Hard

Important Words/Concepts: archaeal diversity and habitats

67. Which member of the domain Archaea would likely be found in hot springs of volcanic origin?

1. *Halobacterium*
2. *Sulpholobus*
3. *Pyrodicticum*
4. *Thermoproteus*
5. *Methanosarcinia*

Answer: B

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Hard

Important Words/Concepts: archaeal diversity and habitats

68. Which member of the domain Archaea would likely be found in the digestive system of cows?

1. *Halobacterium*
2. *Sulpholobus*
3. *Methanobrevibacter*
4. *Pyrodicticum*
5. *Thermoproteus*

Answer: C

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Hard

Important Words/Concepts: archaeal diversity and habitats

69. At least some Archaeans are called “extremophiles” because

1. as a group, they are extremely diverse.
2. as a group, they occupy an extremely large number of environments.
3. where they occur, they occur in extremely large numbers.
4. they can live in environments where abiotic conditions are extreme--extremely hot, extremely salty, extremely toxic, for example.
5. All of the above.

Answer: D

DQ: What are the features of Bacteria and Archaea?

Type: Use It

Difficulty: Medium

Important Words/Concepts: archaeal diversity and habitats

70. Which of the following statements about the domain Archaea is TRUE?

1. Their genetic material is RNA.
2. Their genetic material is housed in a nucleus.
3. Many archaea can survive in the absence of oxygen.
4. They have cell walls made of peptidoglycan.
5. They are only found in extreme environments.

Answer: C

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Hard

Important Words/Concepts:Archaea, extremophile

71. Prokaryotic organisms that produce methane as a waste product are most likely to be members of domain \_\_\_\_\_\_\_\_\_\_.

* 1. Bacteria
  2. Archaea
  3. Eukarya
  4. Bacteria or Archaea equally
  5. Archaea or Eukarya equally

Answer: B

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts: Archaea, extremophile

72. A scientist who wants to understand what the earliest forms of life might have been like would most likely want to study members of domain

* 1. Bacteria.
  2. Archaea.
  3. Eukarya.
  4. Bacteria or Eukarya equally.
  5. Archaea or Eukarya equally.

Answer:B

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:Archaea, extremophile

73. One of the most ancient forms of metabolism on Earth is \_\_\_\_\_\_\_\_\_.

* 1. glucogenesis
  2. lipogenesis
  3. oxygenesis
  4. methanogenesis
  5. carbonogenesis

Answer: D

DQ: What are the features of Bacteria and Archaea?

Type: Know It

Difficulty: Easy

Important Words/Concepts:Archaea, extremophile

74. The research from Lost City and its inhabitants has scientists thinking about

1. the evolution of life at deep-sea underwater hydrothermal vents.
2. Earth’s primordial past environment.
3. life without oxygen.
4. a possibility of life in outer space.
5. All of the above.

Answer: E

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Easy

Important Words/Concepts:serpentinization

75. All life as we know it requires carbon and energy. Which of the following BEST describes how organisms in the Lost City can acquire these (understanding that not all species will use all sources)?

1. Lost City organisms acquire carbon from methane and energy from hydrogen gas.
2. Lost City organisms acquire carbon from methane and carbon dioxide; they acquire energy from hydrogen gas.
3. Lost City organisms acquire carbon from methane and energy from both hydrogen gas and methane.
4. Lost City organisms acquire carbon from both methane and carbon dioxide; they acquire energy from both hydrogen gas and methane.
5. Lost City organisms acquire carbon from hydrogen gas, methane, and carbon dioxide; they use the same materials as energy sources.

Answer: D

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Use It

Difficulty: Medium

Important Words/Concepts:serpentinization

76. Describe the environment of early Earth at the time when the first life forms arose.

*Answer:* At the time when life first arose, Earth was mostly warm ocean, and the atmosphere contained methane and only a small amount of oxygen. Furthermore, rocks from the mantle were closer to the surface of the planet than they are today, which could have made hydrothermal vents even more common.

DQ:What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts:Archaea, extremophile

77. Why are scientists who are interested in extraterrestrial life also interested in Lost City?

*Answer:* Scientists who are interested in extraterrestrial life are also interested in Lost City because Lost City mimics the conditions under which the first life forms evolved on Earth. The same geologic processes that provide organic compounds and energy sources to organisms in Lost City are the same processes that are believed to be occurring under the surface of the planet Mars. Thus, understanding microorganisms living in Lost City may help scientists find and understand life on other planets.

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts: Archaea, extremophile

78. What have scientists learned about the origins of life on Earth by studying Lost City?

* 1. Life requires sunlight.
  2. Life does not require organic compounds.
  3. You don’t need life to make organic compounds.
  4. Life on Earth could have begun in a cold environment.
  5. Life on Earth began with organisms that required oxygen.

Answer: C

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts: Archaea, extremophile

79. The primary energy source used by archaea living in hydrothermal vents is

* 1. inorganic carbon.
  2. nitrogen gas.
  3. oxygen gas.
  4. methane gas.
  5. hydrogen gas.

Answer: E

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts:Archaea, extremophile

80. Describe the process of serpentinization.

*Answer:* Serpentinization occurs when certain rocks from Earth’s mantle come into contact with seawater. This reaction generates heat and releases hydrogen gas. The hydrogen gas then reacts with carbon from rocks or seawater to produce hydrocarbons such as methane and other simple organic molecules.

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important Words/Concepts:Archaea, extremophile, serpentinization

81. Serpentinization describes

1. chemical reactions between lava under pressure and seawater.
2. chemical reactions between lava and seawater.
3. chemical reactions between lava and mantle rocks.
4. chemical reactions between seawater and mantle rocks.
5. chemical reactions between superheated water and seawater.

Answer: D

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important words/concepts: serpentinization

82. The serpentinization reaction produces

1. heat, oxygen, carbon dioxide, acidic vent fluid, and methane.
2. heat, hydrogen, acidic vent fluid, and methane.
3. carbon dioxide, heat, and acidic vent fluid.
4. carbon dioxide, heat, and alkaline vent fluid.
5. heat, hydrogen, alkaline vent fluid, and methane.

Answer: E

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important words/concepts: serpentinization

83. Lost City demonstrates

1. biotic methanogenesis.
2. abiotic methanogenesis from carbon in mantle rock.
3. a niche to support life in an anaerobic environment.
4. the production of organic materials in the absence of biotic factors.
5. All of the above.

Answer: E

DQ: What are the challenges faced by organisms living at Lost City, and how do they face them?

Type: Know It

Difficulty: Hard

Important words/concepts:serpentinization