

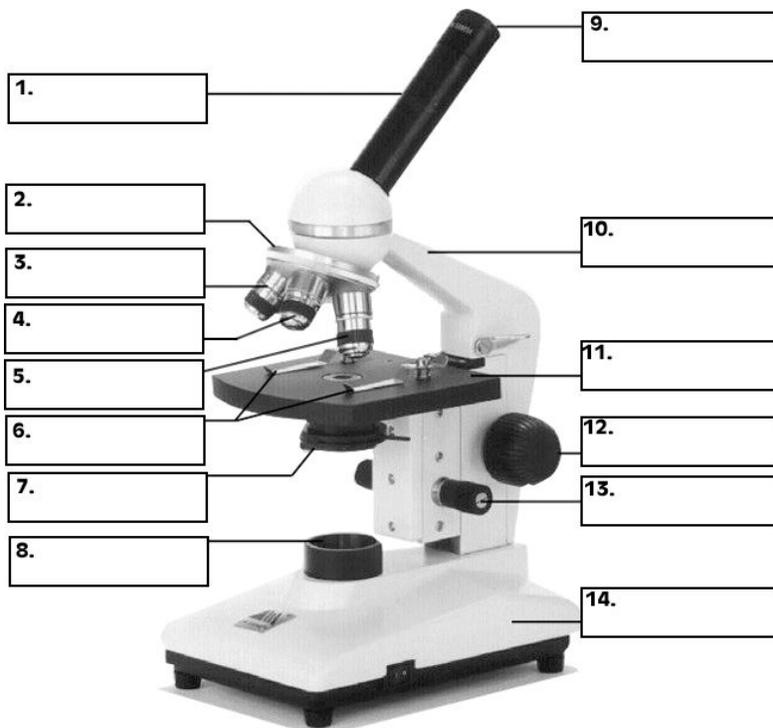
Name:

Date:

You may not return to previous stations. However, you can move to another station early if you want to do so. I won't judge you for your grammar/writing on free responses, just show you know the answer.

Station 1: Microscopes (10 min)

Label the parts of the microscope below (1 pt each):

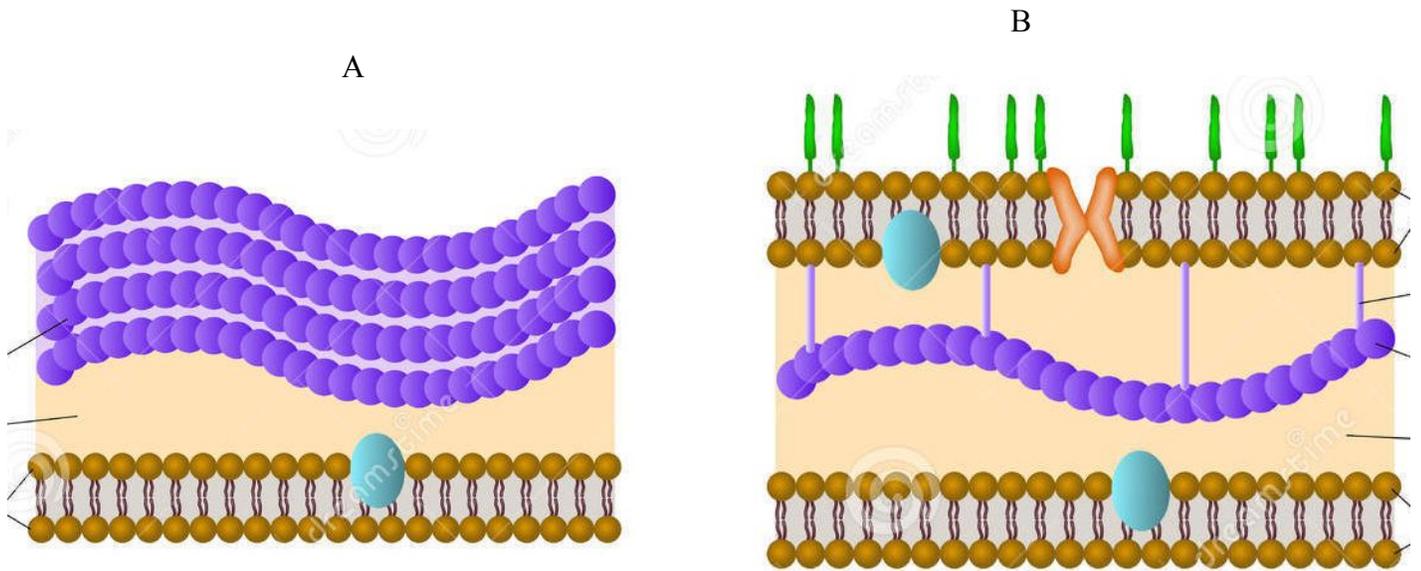


15. What is a transmission electron microscope? When would you use it? (1 pt)

16. What is a scanning electron microscope? When would you use it? (1 pt)

17. What is a confocal laser scanning microscope? When would you use it? (1 pt)

Station 2: Bacteria (10 min)



Above are photos of two different bacterial cell walls, from cells A and B.

18. Which of the above cells is gram positive? (1 pt)
19. Which of the above cells is gram negative? (1 pt)
20. What is the name of the the compound that makes up the green things on the surface of cell B that look like pine trees? (1 pt)
21. What is the compound that makes up the polymer that looks like a purple snake (1 pt)?
22. What type of stain is used to make certain bacteria appear dark purple in a gram stain? (1 pt)
23. What type of stain is used to make certain bacteria appear red or pink in a gram stain? (1 pt)
24. What is the name of the structure that looks like a red X? (1 pt)
25. Are gram positive or gram negative bacteria more likely to form spores? (1 pt)
26. Those things that look like pine trees are pretty dangerous. Are they endotoxins or exotoxins? (1 pt)

Station 3: Viruses (10 min)

27 - 33: List the 7 baltimore classifications of viruses. (7 pts)

34. What was the first virus identified? (1 pt)

35. What do you call a virus that infects a bacterium? (1 pt)

36. What type of viral life cycle causes the host cell to rupture? (1 pt)

37. What type of viral life cycle involved the integration of the viral DNA into the host genome?
(1 pt)

38. What would you call a viral genome integrated into a circular bacterial DNA chromosome?
(1 pt)

Station 4: Other weird microbes (5 min)

39. What are hyphae? (1 pt)

40. Do fungi prefer an acidic or basic environment? (1 pt)

41. What is unique about the nuclei of ciliates like paramecia? What do we call them? (3 pts)

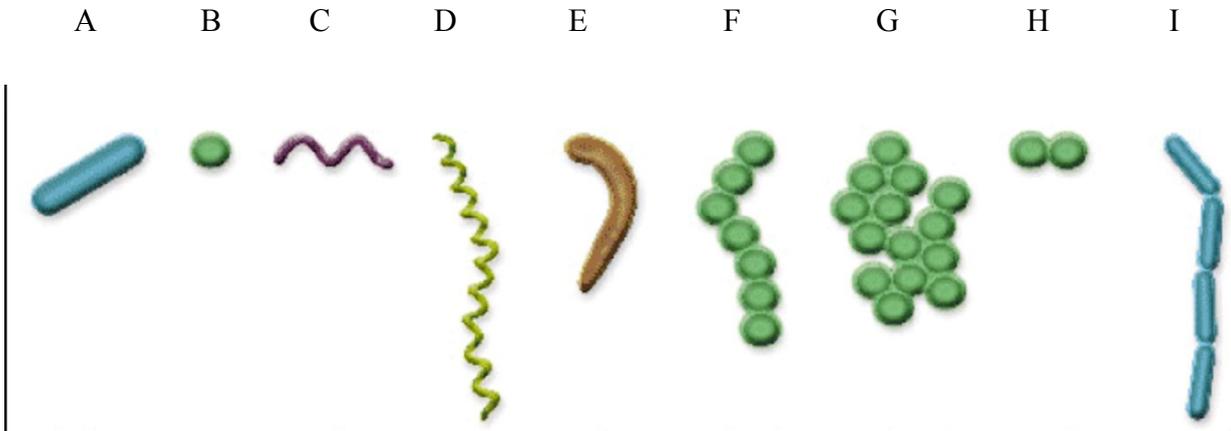
42. Which of the following has an oral groove? (1 pt)

- a. E. coli
- b. Paramecium
- c. Amoeba
- d. Slime mold

43. What is a prion? (1 pt)

45. What type of structure do amoeba use to move? (1 pt)

Station 5: Bacteria types (10 min)



Match the above bacteria shapes with their names (1 pt each)

46. Vibrio 47. Staphylococcus 48. Diplococcus 49. Bacillus 50. Spirilli

51. Spirochete 52. Coccus 53. Streptococcus 54. Streptobacillus

55. Which of the above shapes is cholera? What symptoms does it cause? (2 pts)

56. Which of the above shapes is anthrax? What symptoms does it cause? (2 pts)

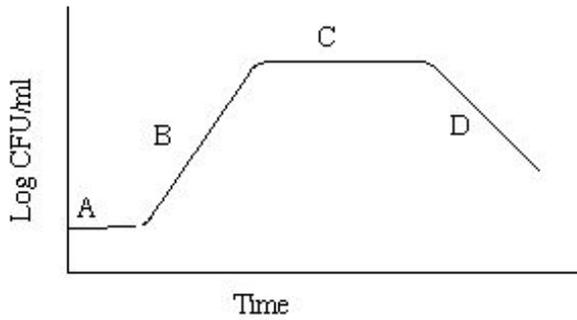
57. Which of the above shapes is strep throat? What symptoms does it cause? (2 pts)

58. Name a bacteria that forms spores. (1 pt)

Station 6: Microbiology foundations (10 min)

58. Label the growth stages in the graph below. (4 pts)

- a.
- b.
- c.
- d.



Match the following diseases with their type of microbe. (1 pt each)

59. MRSA

61. Potato blight

62. Kuru

63. Yellow fever

64. Giardiasis

65. Tetanus

66. Syphilis

67. Ringworm

68. Fatal familial insomnia

69. Mononucleosis

70. Pertussis

a. virus b. bacteria c. prion d. fungus e. other

Station 7: Cell Bio (5 min)

71. (1 pt) In the lac operon, Allolactose acts as a(n):
- corepressor
 - operator
 - inducer
 - activator
72. (1 pt) Which of the following is not found in plants or animals?
- Centriole
 - Contractile vacuole
 - Centrosome
 - Peroxisome
73. (1 pt) Which structure allows bacteria to exchange genetic information?
- Fimbriae
 - Capsule
 - Pili
 - Ribosome
74. (1 pt) Which of the following organelles is inherited maternally?
- Lysosome
 - Vacuole
 - Mitochondrion
 - Nucleus
75. (1 pt) Fermentation:
- creates ATP by adding a phosphate to ADP
 - regenerates NAD⁺ from NADH
 - creates ethanol for DNA synthesis
 - helps science olympiad students win
76. (1 pt) Which of the following is **not** a difference between Eukaryotes and Prokaryotes?
- Prokaryote flagella rotate while Eukaryote flagella undulate
 - Prokaryotes cannot perform photosynthesis
 - Histones are not found in Prokaryote DNA
 - Prokaryotes have no telomeres

Station 8: Microbes can be good (5 min)

77. Why do we add yeast when making bread? What compound does it make? (2 pts)
78. What product do bacteria in yogurt produce through fermentation? (1 pt)
79. Why are probiotics good? (2 pts)
80. Which of the following is **not** a beneficial role microbes can perform? (1 pt)
- a. Oil spill remediation
 - b. Nitrogen fixation
 - c. Water and waste treatment
 - d. Red tides increase oxygen in the ocean