Read the passage below to answer the following questions about the scientific method.

Julie grew up in Michigan and when she turned 18 decided to spend one year in Alaska. While in Alaska she noticed that plants seemed to grow much faster in Alaska than in Michigan during the summer$_{(1)}$. She wondered if the increased plant growth could be due to the longer periods of light due to the increase in day length in the far north during the summer months$_{(2)}$. When she got back to Michigan she decided to set up a quick test to see if this could be the case. She took six corn seedlings of the same height and put three in a room with the light on 20 hours a day, the same as the amount of light in Alaska during the summer, and three more in a room with the light on 17 hours, the same as the amount of light in Michigan during the summer, and she kept all other variables the same$_{(3)}$. She measured the height of all the plants daily and at the end of two months she found that the ones in the light 20 hours a day grew 2 inches taller than the ones in the light 17 hours a day$_{(4)}$. Looking at the differences in growth she noted that the plants in the room with the longer light period grew more than the plants in the room with the shorter light period$_{(5)}$.

32. Which sentence contains the hypothesis?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

33. Which sentence contains the conclusion?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

34. Which sentence contains the observation?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

35. Which sentence contains the results?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

36. Which sentence contains the experiment?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

Read the passage below to answer the following questions about the scientific method.

During the 1920s in England, it was noticed that there were dramatic changes in wing coloration (light color to dark color) for several types of moths, the most notable of which was the peppered moth$_{(1)}$. Henry Kettlewell wondered if it could be due to an adaptation of the moth's camouflage, since the trees the moths lived on were being affected by the coal smoke released from the factories nearby and becoming dark in color$_{(2)}$. Kettlewell released marked moths, both dark- and light-winged, in a polluted forest and an unpolluted forest and then recaptured the surviving moths$_{(3)}$. He found that 13% light-winged moths and 27.5% dark-winged moths originally released were still alive in the polluted woods, and 12.5% light-winged moths and 7% dark-winged moths originally released were still alive in the unpolluted forest$_{(4)}$. Kettlewell's data suggests that the dark-winged moths were better able to survive in the polluted forest than the unpolluted forest$_{(5)}$.

37. Which statement includes the hypothesis?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

38. Which statement includes the observation?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

39. Which statement includes the results?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

40. Which statement includes the experiment?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

41. Which statement includes the conclusion?
- **a.** 1
- **b.** 2
- **c.** 3
- **d.** 4
- **e.** 5

42. Why did Kettlewell test the polluted and unpolluted forest and not just the polluted one?
- **a.** To show that there was a difference in the survival rates of the moths between the polluted and the unpolluted forest.
- **b.** To show that there was no difference in the survival rates of the moths between the polluted and the unpolluted forest.
- **c.** He had extra time on his hands.
- **d.** There were not enough moths in the polluted forest for an accurate test.
- **e.** There were too many birds eating moths in the polluted forest.

43. To test a hypothesis a single factor or _____ is changed.

44. A section of the experiment in which no variable is changed is called the _____.

45. The process by which scientific evidence is gathered is known as the _____.

46. Groups of cells that perform a similar function are called _____.

47. A collection of organisms of the same species constitutes a(n) _____.

ANIMATIONS

To access an animation, visit www.mybiology.com. Choose the Web site selected by your instructor, navigate to this chapter, and select the appropriate animation.

Web Animations

Experimental Design This activity will introduce you to the scientific method, which is at the center of all scientific studies. This activity first explores the basic steps of the scientific method and defines their meaning. The subsequent portion of the activity chronicles how scientists may use the scientific method to prove their own hypotheses.

What Is Life? This activity explores both the characteristics that define life and the scientific method. You will play the part of the scientist provided with material that may contain living organisms . . . or not. It is up to you to decide. Given the recent controversy surrounding possible life on Mars, this is potentially a real-life problem.

ANSWER KEY

1. b
2. a
3. b
4. c
5. d
6. d
7. d
8. e
9. c
10. c
11. a
12. b
13. a
14. e
15. b
16. c
17. a
18. b
19. b
20. d
21. b
22. d
23. d
24. b
25. a
26. d
27. b
28. c
29. d
30. b
31. d
32. b
33. e
34. a
35. d
36. c
37. b
38. a
39. d
40. c
41. e
42. a
43. variable
44. control
45. scientific method
46. tissue
47. population
48. cells, tissue, organ
49. scientific theory
50. stimuli
51. gene
52. evolution