

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Reading Guide: Chapter 1.1, The Science of Biology 🐢🌴

([OpenStax Biology 2E](#))

1. What is the definition of biology? \_\_\_\_\_
2. What is the definition of science? \_\_\_\_\_
3. A suggested explanation for an event is called a(n): \_\_\_\_\_
4. A tested and confirmed explanation for observed phenomena is called a(n): \_\_\_\_\_
5. Science can be defined as fields of study that attempt to \_\_\_\_\_ the nature of the \_\_\_\_\_.
6. Fields of science related to the physical world are called \_\_\_\_\_ sciences.
7. What subjects would be part of this type of science? \_\_\_\_\_

### **Scientific Reasoning**

8. \_\_\_\_\_ reasoning uses related observations to arrive at a general conclusion.
9. How are brain studies an example of inductive reasoning?  
\_\_\_\_\_
10. Deductive reasoning is used in \_\_\_\_\_ - based science.
11. Deductive reasoning uses a \_\_\_\_\_ to forecast specific results.
12. What is the goal of descriptive science? \_\_\_\_\_
13. How was velcro invented? \_\_\_\_\_

### **The Scientific Method**

14. What scientist first documented the scientific method? \_\_\_\_\_
15. The process starts with an \_\_\_\_\_ which leads to a \_\_\_\_\_
16. What is the typical format of a prediction? \_\_\_\_\_
17. A valid hypothesis must be testable and also be \_\_\_\_\_.
18. What distinguishes sciences from non-sciences? \_\_\_\_\_
19. Any part of the experiment that can vary or change is called the \_\_\_\_\_
20. What is the control group? \_\_\_\_\_
21. Rejecting one hypothesis means that the other hypothesis is accepted. True / False

22. Deduction proceeds from the \_\_\_\_\_ to the \_\_\_\_\_
23. What type of reasoning has occurred when scientists reach a general conclusion from a number of specific observations? \_\_\_\_\_
24. [Figure 1.6](#) The scientific method is used to solve an everyday problem. Match the scientific method steps (numbered items) with the process of solving the everyday problem (lettered items). Based on the results of the experiment, is the hypothesis correct? If it is incorrect, propose some alternative hypotheses.
- |                   |  |
|-------------------|--|
| _____ observation | a) there is something wrong with the electrical outlet   |
| _____ question    | b) if something is wrong with the outlet, the coffeemaker also won't work when plugged into it |
| _____ hypothesis  | c) my toaster does not toast my bread  |
| _____ prediction  | d) I plug my coffeemaker into the outlet   |
| _____ experiment  | e) My coffeemaker works  |
| _____ result      | f) Why doesn't the toaster work?   |

25. [Figure 1.7](#) Decide if each of the following is an example of inductive (I) or deductive reasoning (D)

\_\_\_\_\_ All flying birds and insects have wings. Birds and insects flap their wings as they move through the air. Therefore, wings enable flight.

\_\_\_\_\_ Insects generally survive mild winters better than harsh ones. Therefore, insect pests will become more problematic if global temperatures increase.

\_\_\_\_\_ Chromosomes, the carriers of DNA, separate into daughter cells during cell division. Therefore, each daughter cell will have the same chromosome set as the mother cell.

\_\_\_\_\_ Animals as diverse as humans, insects, and wolves all exhibit social behavior. Therefore, social behavior must have an evolutionary advantage.

### **Two Types of Science: Basic Science and Applied Science**

26. What is the goal of "basic science?" \_\_\_\_\_
27. What is the goal of "applied science?" \_\_\_\_\_
28. What is the Human Genome Project? \_\_\_\_\_
29. What is serendipity? \_\_\_\_\_
30. Where do scientists publish their works? \_\_\_\_\_
31. A summary at the beginning of the scientific paper is called the \_\_\_\_\_
32. What other sections are included in a scientific paper (IMRaD)? \_\_\_\_\_
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