|  |  |  |  |
| --- | --- | --- | --- |
| CHAPTER 1  **Exploring Life** | |  | |
|  | | | |
|  |  | | |
|  | **Chapter Objectives** | | |
|  |  | | |
|  | **Exploring Life on its Many Levels** | | |
| 1. | Briefly describe the unifying themes that characterize the biological sciences. |  |  |
| 2. | Diagram the hierarchy of structural levels in biological organization. |  |  |
| 3. | Explain how the properties of life emerge from complex organization. |  |  |
| 4. | Describe the two major dynamic processes of any ecosystem. |  |  |
| 5. | Distinguish between prokaryotic and eukaryotic cells. |  |  |
| 6. | Describe the basic structure and function of DNA. |  |  |
| 7. | Describe the dilemma of reductionism. |  |  |
| 8. | Discuss the goals and activities of systems biology. List the three research developments that have advanced systems biology. |  |  |
| 9. | Explain the importance of regulatory mechanisms in living things. Distinguish between positive and negative feedback. |  |  |
|  |  | | |
|  | **Evolution, Unity, and Diversity** | | |
| 10. | Distinguish among the three domains of life. List and distinguish among the three kingdoms of multicellular, eukaryotic life. |  |  |
| 11. | Explain the phrase: “life’s dual nature of unity and diversity”. |  |  |
| 12. | Describe the observations and inferences that led Charles Darwin to his theory of evolution by natural selection. |  |  |
| 13. | Explain why diagrams of evolutionary relationships have a treelike form. |  |  |
|  |  | | |
|  | **The Process of Science** | | |
| 14. | Distinguish between discovery science and hypothesis-based science. Explain why both types of exploration contribute to our understanding of nature. |  |  |
| 15. | Distinguish between quantitative and qualitative data. |  |  |
| 16. | Distinguish between inductive and deductive reasoning. |  |  |
| 17. | Explain why hypotheses must be testable and falsifiable but are not provable. |  |  |
| 18. | Describe what is meant by a controlled experiment. |  |  |
| 19. | Distinguish between the everyday meaning of the term ‘theory’ and its meaning to scientists. |  |  |
| 20. | Explain how science is influenced by social and cultural factors. |  |  |
| 21. | Distinguish between science and technology. Explain how science and technology are interdependent. |  |  |