

Guided Reading Questions

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Chapter 1

Introduction: The Scientific Study of Life

- (essay) What is the scientific name for a leopard? What other organisms are classified in the genus *Panthera*? What characteristics do these organisms share? What adaptations do leopards have that allow them to survive? What is biology? What is the focus of this chapter?
- (1.1) Define biosphere, ecosystem, community, population, organism, organ system, organ, tissue, cell, organelle, molecule, and atom. Order these levels of organization from smallest to largest. Define emergent property.
- (1.2) Define producers and consumers. How do producers and consumers interact? What is the role of the decomposers? How does energy flow differ from nutrient flow?
- (1.3) What is the lowest level of organization that can perform all activities required for life? Explain the correlation of structure and function? Define systems and systems properties. What are the two types of cell? Compare and contrast these two types of cell.
- (1.4) What molecule carries the genetic information of all cells? Define gene. How does DNA account for the diversity of life forms? What are seven properties common to all living things?
- (1.5) How many species have been identified and how many are believed to exist? What was the highest level of classification of living organisms until this decade? What is now considered the highest level of classification? How many domains are there? What are the two domains of prokaryotes? What is the third domain? How do prokaryotes and eukaryotes differ from each other? Why are protists no longer considered a kingdom? Aside from the protists, what are the three other kingdoms in the domain Eukarya? How do the tree, sloth and bacteria in fig 1.5B interact with each other?
- (1.6) Define theory. What are the two main points of Darwin's theory of evolution? What two observations and inferences led Darwin to his theory. Explain what is happening in fig. 1.6B. How does natural selection explain the disappearance of the lighter-colored beetles in the figure? According to Darwin, how do new species evolve?
- (1.7) What is science and what are the two main approaches? What is the scope of scientific inquiry? What is discovery science and why is it also called descriptive science? What is the data of discovery science? Define inductive reasoning. What is hypothesis-based science, a.k.a. the scientific method? Define hypothesis and deduction. What is the benefit of a good hypothesis? How does a theory differ from a hypothesis?
- (1.8) What are the steps of the scientific method? What does it mean that a hypothesis is testable and falsifiable? What is an alternative hypothesis? Can a hypothesis be proven? What is mimicry? What is a controlled experiment and what does it compare? Why is the control group important?
- (1.9) What is technology? Contrast the goals of science and technology.
- (1.10) How can differences in DNA be utilized by science and technology? What is the role of the environment in evolution?