

## Chapter 1, Major Themes of Anatomy and Physiology

### “Apply What You Know” Answers

- p. 3—Aristotle’s concept was that a great variety of complex entities in nature are made from various rearrangements of a smaller variety of simple components, like a vast body of literature composed with a limited alphabet. This holds true for the human body, a very complex entity that is composed of a limited variety of cells and molecules.
- p. 7—It would be impossible to falsify the idea that gods or invisible demons cause epilepsy, because gods could just as well conceal their involvement from human detection, and invisible demons would be undetectable. Thus, such explanations of epilepsy would be unscientific. The theory that it is caused by abnormal neurological activity is falsifiable, however, because one can record brain waves during a seizure and see whether there is any abnormal activity associated with the seizure.
- p. 9—The cell theory was arrived at by the inductive method, because it is a generalization drawn from observations of a vast array of organisms, all of which exhibit cellular structure. The cell theory was not arrived at by the experimental testing of hypotheses.
- p. 13—Situs inversus could affect emergency diagnosis (for example, the location of pain from appendicitis) or surgical treatment, so it is advantageous for an emergency medical team to know of this condition before they begin treatment. (It also affects the electrocardiogram, although students would not have a basis for knowing this at this point in their study.)
- p. 21—Sullivan meant that a building should be constructed around the uses to which the occupants will put it, so that it can efficiently serve those purposes. Human anatomy evolves in a way to maximize the efficiency of physiological function. This chapter gives the example of the length of the nephron loop not being the same in all mammals, but being correlated with the animal’s habitat and need for water conservation. Of course, both evolution and embryonic development are imperfect, so we have instances in which human form does not correlate well with function, such as vestigial organs (the auricularis muscles cited in this chapter) and dextrocardia.