Structure and Function in Living Systems

5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function. As a basis for understanding this concept:
   a. Students know plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems, and the whole organism.
   b. Students know organ systems function because of the contributions of individual organs, tissues, and cells. The failure of any part can affect the entire system.
   c. Students know how bones and muscles work together to provide a structural framework for movement.
   d. Students know how the reproductive organs of the human female and male generate eggs and sperm and how sexual activity may lead to fertilization and pregnancy.
   e. Students know the function of the umbilicus and placenta during pregnancy.
   f. Students know the structures and processes by which flowering plants generate pollen, ovules, seeds, and fruit.
   g. Students know how to relate the structures of the eye and ear to their functions.

Physical Principles in Living Systems (Physical Sciences)

6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:
   a. Students know visible light is a small band within a very broad electromagnetic spectrum.
   b. Students know that for an object to be seen, light emitted by or scattered from it must be detected by the eye.
   c. Students know light travels in straight lines if the medium it travels through does not change.
   d. Students know how simple lenses are used in a magnifying glass, the eye, a camera, a telescope, and a microscope.
   e. Students know that white light is a mixture of many wavelengths (colors) and that retinal cells react differently to different wavelengths.
   f. Students know light can be reflected, refracted, transmitted, and absorbed by matter.
   g. Students know the angle of reflection of a light beam is equal to the angle of incidence.
   h. Students know how to compare joints in the body (wrist, shoulder, thigh) with structures used in machines and simple devices (hinge, ball-and-socket, and sliding joints).
   i. Students know how levers confer mechanical advantage and how the application of this principle applies to the musculoskeletal system.
   j. Students know that contractions of the heart generate blood pressure and that heart valves prevent backflow of blood in the circulatory system.

SUHSD Focus standards are printed in boldfaced type.
Investigation and Experimentation

7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.

b. Use a variety of print and electronic resources (including the World Wide Web) to collect information and evidence as part of a research project.

c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.

d. Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).

e. Communicate the steps and results from an investigation in written reports and oral presentations.