California Science Standards

The most important standards for ALL of our students.

Grade 7

Focus on Life Science

Cell Biology

1. All living organisms are composed of cells, from just one to many trillions, whose details usually are visible only through a microscope. As a basis for understanding this concept:

c. Students know the nucleus is the repository for genetic information in plant and animal cells.

d. Students know that mitochondria liberate energy for the work that cells do and that chloroplasts capture sunlight energy for photosynthesis.

e. Students know cells divide to increase their numbers through a process of mitosis, which results in two daughter cells with identical sets of chromosomes.

Genetics

2. A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences. As a basis for understanding this concept:

a. Students know the differences between the life cycles and reproduction methods of sexual and asexual organisms.

b. Students know sexual reproduction produces offspring that inherit half their genes from each parent.

c. Students know an inherited trait can be determined by one or more genes.

d. Students know plant and animal cells contain many thousands of different genes and typically have two copies of every gene. The two copies (or alleles) of the gene may or may not be identical, and one may be dominant in determining the phenotype while the other is recessive.

e. Students know DNA (deoxyribonucleic acid) is the genetic material of living organisms and is located in the chromosomes of each cell.

Evolution

3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations. As a basis for understanding this concept:

a. Students know both genetic variation and environmental factors are causes of evolution and diversity of organisms.

b. Students know the reasoning used by Charles Darwin in reaching his conclusion that natural selection is the mechanism of evolution.

c. Students know how independent lines of evidence from geology, fossils, and comparative anatomy provide the bases for the theory of evolution.

Earth and Life History (Earth Sciences)

4. Evidence from rocks allows us to understand the evolution of life on Earth. As a basis for understanding this concept:

e. Students know fossils provide evidence of how life and environmental conditions have changed.

g. Students know how to explain significant developments and extinctions of plant and animal life on the geologic time scale.

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.

c. Students know how bones and muscles work together to provide a structural framework for movement.

f. Students know the structures and processes by which flowering plants generate pollen, ovules, seeds, and fruit.

Physical Principles in Living Systems (Physical Sciences)

6. Physical principles underlie biological structures and functions. As a basis for understanding this concept:

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.

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).

j. Students know that contractions of the heart generate blood pressure and that heart valves prevent backflow of blood in the circulatory system.