IB 133
Life Science Standards for California Public Schools (1998 – present)

**Kindergarten**

Different types of plants and animals inhabit the earth. As a basis for understanding this concept:

a. *Students know* how to observe and describe similarities and differences in the appearance and behavior of plants and animals (i.e., similarities and differences among people as well as differences in the appearance and function of body organs).

b. *Students know* how to identify major structures of common plants and animals (i.e., head, arm, leg, internal organs).

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. Observe common objects by using the five senses.

b. Describe the relative position of objects by using one reference (e.g., above or below).

c. Compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).

d. Communicate observations orally and through drawings.

IB 133
Life Science Standards for California Public Schools (1998 – present)

**First grade**

Plants and animals meet their needs in different ways (structure-function relationships). As a basis for understanding this concept:

a. *Students know* different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places (i.e., the structure of organs aids in their functions).

b. *Students know* both plants and animals need water, food, and light.

c. *Students know* animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.

d. *Students know* how to infer what animals eat from the shapes of their teeth (e.g., sharp teeth: eats meat; flat teeth: eats plants).

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. Draw pictures that portray some features of the thing being described.

b. Record observations and data with pictures, numbers, or written statements.

c. Describe the relative position of objects by using two references (e.g., above and next to, below and left of).

d. Make new observations when discrepancies exist between two descriptions of the same object or phenomenon.

IB 133
Life Science Standards for California Public Schools (1998 – present)

**Second grade**

Plants and animals have predictable life cycles. As a basis for understanding this concept:

a. *Students know* that organisms reproduce offspring of their own kind and that the offspring resemble their parents and one another.

b. *Students know* the sequential stages of life cycles are different for different animals, such as butterflies, frogs, and mice.

c. *Students know* many characteristics of an organism are inherited from the parents. Some characteristics are caused or influenced by the environment.

d. *Students know* there is variation among individuals of one kind within a population (i.e., not everyone's organ systems are exactly identical).

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. Make predictions based on observed patterns and not random guessing.

b. Measure length, weight, temperature, and liquid volume with appropriate tools and express those measurements in standard metric system units.

c. Compare and sort common objects according to two or more physical attributes (e.g., color, shape, texture, size, weight).

d. Write or draw descriptions of a sequence of steps, events, and observations.

e. Construct bar graphs to record data, using appropriately labeled axes.

f. Use magnifiers or microscopes to observe and draw descriptions of small objects or small features of objects.

g. Follow oral instructions for a scientific investigation.

IB 133
Life Science Standards for California Public Schools (1998 – present)

**Third grade**

Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:

a. *Students know* plants and animals have structures that serve different functions in growth, survival, and reproduction.

b. *Students know* living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.

c. *Students know* when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.

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. Repeat observations to improve accuracy and know that the results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated, methods being used, or uncertainty in the observation.

b. Differentiate evidence from opinion and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed.

c. Use numerical data in describing and comparing objects, events, and measurements.

d. Predict the outcome of a simple investigation and compare the result with the prediction.

e. Collect data in an investigation and analyze those data to develop a logical conclusion.

IB 133
Life Science Standards for California Public Schools (1998 – present)

**Fourth grade**

All organisms need energy and matter to live and grow. As a basis for understanding this concept:

a. *Students know* plants are the primary source of matter and energy entering most food chains.

b. *Students know* producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.

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. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.

b. Measure and estimate the weight, length, or volume of objects.

c. Formulate and justify predictions based on cause-and-effect relationships.

d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.

IB 133
Life Science Standards for California Public Schools (1998 – present)

**Fifth grade**

Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials. As a basis for understanding this concept:

a. *Students know* many multicellular organisms have specialized structures to support the transport of materials.

b. *Students know* how blood circulates through the heart chambers, lungs, and body and how carbon dioxide ($CO_2$) and oxygen ($O_2$) are exchanged in the lungs and tissues.

c. *Students know* the sequential steps of digestion and the roles of teeth and the mouth, esophagus, stomach, small intestine, large intestine, and colon in the function of the digestive system.

d. *Students know* the role of the kidney in removing cellular waste from blood and converting it into urine, which is stored in the bladder.

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. Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.

b. Develop a testable question.

c. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.

d. Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.

e. Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.

f. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.

IB 133
Life Science Standards for California Public Schools (1998 – present)

**Seventh grade**

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* how to relate the structures of the eye and ear to their functions.

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 Internet) 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., cell structure).