

7th Grade: Science: Focus on Life Science

Student Name:

General Standard	Standard Notation	Standard Description	August 2010	September 2010	October 2010	November 2010	December 2010	January 2011	February 2011	March 2011	April 2011	May 2011
1.0 CELL BIOLOGY: All living organisms are composed of cells, from just one to many trillions, whose details usually are visible only through a microscope	7.1.a	Cells function similarly in all living organisms.										
	7.1.b	The characteristics that distinguish plant cells from animal cells, including chloroplasts and cell walls.										
	7.1.c	The nucleus is the repository for genetic information in plant and animal cells.										
	7.1.d	Mitochondria liberate energy for the work that cells do and that chloroplasts capture sunlight energy for photosynthesis.										
	7.1.e	Cells divide to increase their numbers through a process of mitosis, which results in two daughter cells with identical sets of chromosomes										
	7.1.f	As multicellular organisms develop, their cells differentiate.										
2.0 GENETICS: A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences	7.2.a	The differences between the life cycles and reproduction methods of sexual and asexual organisms										
	7.2.b	Sexual reproduction produces offspring that inherit half their genes from each parent										
	7.2.c	An inherited trait can be determined by one or more genes.										
	7.2.d	Plant & animal cells contain many 1,000s of different genes & typically have 2 copies of every gene. The two copies (or alleles) of the gene may or may not be identical, & one may be dominant in determining the phenotype while the other is recessive.										
	7.2.e	DNA (deoxyribonucleic acid) is the genetic material of living organisms and is located in the chromosomes of each cell.										
3.0 EVOLUTION: Biological evolution accounts for the diversity of species developed through gradual processes over many generations	7.3.a	Both genetic variation & envir. factors are causes of evolution & diversity of organisms										
	7.3.b	The reasoning used by Charles Darwin in reaching his conclusion that natural selection is the mechanism of evolution.										
	7.3.c	How independent lines of evidence from geology, fossils, and comparative anatomy provide the bases for the theory of evolution.										
	7.3.d	Construct a simple branching diagram to classify living groups of organisms by shared derived characteristics and how to expand the diagram to include fossil organisms										
	7.3.e	Extinction of a species occurs when the environment changes and that the adaptive characteristics of a species are insufficient for its survival.										
4.0 EARTH AND LIFE HISTORY: Evidence from rocks allows us to understand the evolution of life on Earth	7.4.a	Earth processes today are similar to those that occurred in the past and slow geologic processes have large cumulative effects over long periods of time.										
	7.4.b	The history of life on Earth has been disrupted by major catastrophic events, such as major volcanic eruptions or the impacts of asteroids.										
	7.4.c	The rock cycle includes the formation of new sediment and rocks and that rocks are often found in layers, with the oldest generally on the bottom.										
	7.4.d	Evidence from geologic layers and radioactive dating indicates Earth is approximately 4.6 billion years old & that life on this planet has existed for more than 3 billion years.										
	7.4.e	Fossils provide evidence of how life and environmental conditions have changed.										
	7.4.f	Movements of Earth's cont. & oceanic plates through time, w/ associated changes in climate & geog. connections have affected the past & present distrib. of organisms.										

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	7.4.g	Explain significant developments and extinctions of plant and animal life on the geologic time scale.										
5.0 STRUCTURE AND FUNCTION IN LIVING SYSTEMS: The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function	7.5.a	Plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems, and the whole organism.										
	7.5.b	Organ systems function because of the contributions of individual organs, tissues, and cells. The failure of any part can affect the entire system.										
	7.5.c	Bones and muscles work together to provide a structural framework for movement										
	7.5.d	The reproductive organs of the human female and male generate eggs and sperm and how sexual activity may lead to fertilization and pregnancy.										
	7.5.e	The function of the umbilicus and placenta during pregnancy.										
	7.5.f	Structures & processes by which flowering plants generate pollen, ovules, seeds, & fruit										
	7.5.g	Relate the structures of the eye and ear to their functions.										
6.0 PHYSICAL PRINCIPLES IN LIVING SYSTEMS (Physical Science): Physical principles underlie biological structures and functions.	7.6.a	Visible light is a small band within a very broad electromagnetic spectrum.										
	7.6.b	For an object to be seen, light emitted by or scattered from it must be detected by the eye.										
	7.6.c	Light travels in straight lines if the medium it travels through does not change.										
	7.6.d	Simple lenses are used in a magnifying glass, the eye, a camera, a telescope, and a microscope.										
	7.6.e	White light is a mixture of many wavelengths (colors) and that retinal cells react differently to different wavelengths.										
	7.6.f	Light can be reflected, refracted, transmitted, and absorbed by matter.										
	7.6.g	The angle of reflection of a light beam is equal to the angle of incidence.										
	7.6.h	Compare joints in the body (wrist, shoulder, thigh) with structures used in machines and simple devices (hinge, ball-and-socket, and sliding joints).										
	7.6.i	Levers confer mechanical advantage and how the application of this principle applies to the musculoskeletal system.										
	7.6.j	Contractions of the heart generate blood pressure and that heart valves prevent backflow of blood in the circulatory system.										
7.0 INVESTIGATION AND EXPERIMENTATION: 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.	7.7.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										
	7.7.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.										
	7.7.c	Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.										
	7.7.d	Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).										
	7.7.e	Communicate the steps and results from an investigation in written reports and oral presentations.										