Tennessee Science

Seventh Grade

Matter and Its Interactions 7.PS1	1 **Evaluate and communicate information that all substances in the universe are made of many different types of atoms that combine in various ways.** 7.PS1.1
	2 **Collect and analyze data about the physical properties of the components of a mixture to use as evidence that the identities of the components change during a chemical reaction.** 7.PS1.2
	3 **Develop a model to explain how changes to a system can be explained by changes in temperature and/or pressure and the effect of those changes on particle motion and/or spatial arrangement.** 7.PS1.3
	4 **Use computational thinking to demonstrate that all atoms in the reactants are present in the products of a chemical reaction supporting the Law of Conservation of Mass.** 7.PS1.4
Energy 7.PS3	1 **Plan and carry out an investigation to demonstrate that the interaction between substances can cause chemical reactions that release or store energy.** 7.PS3.1
	2 **Develop a model to explain how food is utilized through chemical reactions to form new molecules that support growth, resulting in the release of energy as matter moves through an organism.** 7.PS3.2
From Molecules to Organisms: Structures and Processes 7.LS1	1 **Develop models that identify and explain the structure and function of major cell organelles and structures (i.e., vacuoles, chloroplasts, lysosomes, mitochondria, cell membrane, cell wall, nucleus, cytoplasm) as they contribute to the life activities within a system.** 7.LS1.1
	2 **Obtain information about the cellular structures of unicellular and multicellular organisms across kingdoms and domains in order to compare how these structures support the functions (i.e., obtain food, water, waste disposal, and the environment in which they live) of the organism.** 7.LS1.2
	3 **Develop and use a hierarchical model of a multicellular organism to explain that the body of humans and other animals is a system of multiple interacting subsystems specialized for particular body functions [e.g., digestion, respiration, excretion, circulation, sensation (nervous and integumentary), locomotion (musculoskeletal), reproduction, and immunity].** 7.LS1.3

	4 **Analyze data to determine the effect of genetic factors (e.g., specific breeds of organisms and their typical sizes) and environmental factors (e.g., food and space availability) that influence the growth of plants and animals.** 7.LS1.4
	5 **Obtain and communicate information to provide evidence that illustrates the causal relationships between information received by sensory receptors and behavior, both immediate and over longer time scales.** 7.LS1.5
	6 **Develop and use a model (e.g., Punnett squares, diagrams, and simulations) as evidence to demonstrate why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.** 7.LS1.6
	7 **Develop a model using evidence that explains the process of photosynthesis, cellular respiration, and anaerobic respiration in the cycling of matter and flow of energy into and out of organisms.** 7.LS1.7
Ecosystems: Interactions, Energy, and Dynamics 7.LS2	1 **Develop a model to depict the cycling of matter, including carbon and oxygen, and the flow of energy among biotic and abiotic parts of an ecosystem.** 7.LS2.1
Heredity: Inheritance and Variation of Traits 7.LS3	1 **Evaluate and communicate information that chromosomes contain many distinct genes which code for the production of proteins, impacting the traits of an individual.** 7.LS3.1
	2 **Construct an explanation to describe how the impact of changes to genes (i.e., mutations) located on chromosomes may result in harmful, beneficial, or neutral effects to the structure and function of the organism.** 7.LS3.2
	3 **Predict the probability of individual dominant and recessive alleles to be transmitted from each parent to offspring during sexual reproduction and represent the phenotypic and genotypic patterns using ratios.** 7.LS3.3
Engineering Design 7.ETS1	1 **Examine a problem from the medical field (e.g., prosthetic limbs, organ transplants) and design a solution taking into consideration the criteria, constraints, and relevant scientific principles of the problem that may limit possible solutions.** 7.ETS1.1