Florida Science Benchmarks: Grade 912 Body of Knowledge: LIFE SCIENCE		**DFI Fieldtrip Series**			**Digital Frog**	**Science Matrix: Cell**
Benchmark code:	The student is expected to:	Wetlands	Rainforest	Desert		
Standard 14: Organization & Development of Living Organisms						
SC.912.L.14.2	Relate structure to function for the components of plant and animal cells. Explain the role of cell membranes as a highly selective barrier (passive and active transport).					Cell Structures screens; Cell Membrane
SC.912.L.14.3	Compare and contrast the general structures of plant and animal cells. Compare and contrast the general structures of prokaryotic and eukaryotic cells.					Comparing Cell Types screens
SC.912.L.14.7	Relate the structure of each of the major plant organs and tissues to physiological processes.		Botany screens			
SC.912.L.14.9	Relate the major structure of fungi to their functions.		Plants: Fungi			
SC.912.L.14.10	Discuss the relationship between the evolution of land plants and their anatomy.		Refer to Plants section			
SC.912.L.14.11	Classify and state the defining characteristics of epithelial tissue, connective tissue, muscle tissue, and nervous tissue.				Anatomy: Musculoskeletal System	
SC.912.L.14.12	Describe the anatomy and histology of bone tissue.				Musculoskeletal: Bones	
SC.912.L.14.13	Distinguish between bones of the axial skeleton and the appendicular skeleton.				Musculoskeletal: Appendicular Skeleton & Vertebral Column	
SC.912.L.14.14	Identify the major bones of the axial and appendicular skeleton.				Appendicular Skeleton & Vertebral Column	
SC.912.L.14.16	Describe the anatomy and histology, including ultrastructure, of muscle tissue.				Muscle System screens	
SC.912.L.14.17	List the steps involved in the sliding filament of muscle contraction.				Muscle System screens	
SC.912.L.14.18	Describe signal transmission across a myoneural junction.				Muscle System screens	
SC.912.L.14.19	Explain the physiology of skeletal muscle.				Skeletal Muscle	
SC.912.L.14.20	Identify the major muscles of the human on a model or diagram.				Muscle System: Human Comparisons	
SC.912.L.14.21	Describe the anatomy, histology, and physiology of the central and peripheral nervous systems and name the major divisions of the				Nervous System: Central	

	nervous system.				& Peripheral screens	
SC.912.L.14.22	Describe the physiology of nerve conduction, including the generator potential, action potential, and the synapse.				Neurons screens	
SC.912.L.14.23	Identify the parts of a reflex arc.				Neurons screens	
SC.912.L.14.24	Identify the general parts of a synapse and describe the physiology of signal transmission across a synapse.				Synapse screen	
SC.912.L.14.25	Identify the major parts of a cross section through the spinal cord.				Spinal Cord	
SC.912.L.14.26	Identify the major parts of the brain on diagrams or models.				Brain	
SC.912.L.14.27	Identify the functions of the major parts of the brain, including the meninges, medulla, pons, midbrain, hypothalamus, thalamus, cerebellum and cerebrum.				Brain: Human comparisons	
SC.912.L.14.28	Identify the major functions of the spinal cord.				Spinal Cord	
C.912.L.14.29	Define the terms endocrine and exocrine.				Endocrine System screens	
SC.912.L.14.30	Compare endocrine and neural controls of physiology.				Endocrine & Nervous System screens	
SC.912.L.14.31	Describe the physiology of hormones including the different types and the mechanisms of their action.				Hormones	
SC.912.L.14.32	Describe the anatomy and physiology of the endocrine system.				Endocrine System	
SC.912.L.14.33	Describe the basic anatomy and physiology of the reproductive system.				Reproductive System	
SC.912.L.14.34	Describe the composition and physiology of blood, including that of the plasma and the formed elements.				Refer to Circulatory System: Blood	
SC.912.L.14.36	Describe the factors affecting blood flow through the cardiovascular system.				Path & Action of Blood	
SC.912.L.14.40	Describe the histology of the major arteries and veins of systemic, pulmonary, hepatic portal, and coronary circulation.				Circulatory System screens	
SC.912.L.14.42	Describe the anatomy and the physiology of the lymph system.				Lymphatic System	
SC.912.L.14.43	Describe the histology of the respiratory system.				Respiratory System screens	
SC.912.L.14.44	Describe the physiology of the respiratory system including the mechanisms of ventilation, gas exchange, gas transport and the mechanisms that control the rate of ventilation.				Respiratory System screens	
SC.912.L.14.45	Describe the histology of the alimentary canal and its associated accessory organs.				Digestive System	
SC.912.L.14.46	Describe the physiology of the digestive system, including mechanical digestion, chemical digestion, absorption and the neural and hormonal mechanisms of control.				Digestive System screens	
SC.912.L.14.47	Describe the physiology of urine formation by the kidney.				Excretory System: Kidney	
SC.912.L.14.48	Describe the anatomy, histology, and physiology of the ureters, the urinary bladder and the urethra.				Refer to Urogenital System	

SC.912.L.14.49	Identify the major functions associated with the sympathetic and parasympathetic nervous systems.				Nervous System	
SC.912.L.14.50	Describe the structure of vertebrate sensory organs. Relate structure to function in vertebrate sensory systems.				Sensory Organs screens	
SC.912.L.14.51	Describe the function of the vertebrate integumentary system.				Immune System: Skin; Sensory Organs: Skin	
SC.912.L.14.52	Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics.				Immune System screens	
SC.912.L.14.53	Discuss basic classification and characteristics of plants. Identify bryophytes, pteridophytes, gymnosperms, and angiosperms.		Plant section			
Standard 15: Diversity and Evolution of Living Organisms						
SC.912.L.15.3	Describe how biological diversity is increased by the origin of new species and how it is decreased by the natural process of extinction.		Biodiversity screens			
SC.912.L.15.4	Describe how and why organisms are hierarchically classified and based on evolutionary relationships.	Refer to Organism screens	Refer to Organism screens	Refer to Organism screens		
SC.912.L.15.9	Explain the role of reproductive isolation in the process of speciation.		Biodiversity screens			
SC.912.L.15.13	Describe the conditions required for natural selection, including: overproduction of offspring, inherited variation, and the struggle to survive, which result in differential reproductive success.		Biodiversity			
Standard 16: Heredity & Reproduction						
SC.912.L.16.14	Describe the cell cycle, including the process of mitosis. Explain the role of mitosis in the formation of new cells and its importance in maintaining chromosome number during asexual reproduction.		Cellular Division			
SC.912.L.16.15	Compare and contrast binary fission and mitotic cell division.		Refer to Cellular Division			
SC.912.L.16.17	Compare and contrast mitosis and meiosis and relate to the processes of sexual and asexual reproduction and their consequences for genetic variation.		Cellular Division: Mitosis & Meiosis			
Standard 17: Interdependence						
SC.912.L.17.4	Describe changes in ecosystems resulting from seasonal variations, climate change and succession.	Wetlands Mechanisms screens & Study: Bog Formation	Mechanisms (Seasonality, Succession) and Climate	Mechanisms screens		
SC.912.L.17.6	Compare and contrast the relationships among organisms, including predation, parasitism, competition, commensalism, and mutualism.	Refer to Food Web section	Dependency Web screens & Animal Study	Refer to Animal Adaptations & Organism screens		
SC.912.L.17.7	Characterize the biotic and abiotic components that define freshwater systems, marine systems and terrestrial systems.	Refer to entire CD Refer to entire CD	Refer to entire CD	Refer to entire CD		

SC.912.L.17.8	Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.	Endangered Wetlands section	Endangered section	Human Impact section		
SC.912.L.17.9	Use a food web to identify and distinguish producers, consumers, and decomposers. Explain the pathway of energy transfer through trophic levels and the reduction of available energy at successive trophic levels.	Food Web section	Refer to Web Game	Refer to Build-a-Desert		
SC.912.L.17.10	Diagram and explain the biogeochemical cycles of an ecosystem, including water, carbon, and nitrogen cycle.	Nutrient Cycle screens	Water Cycle, refer to Soils & Decomposition & Productivity	Refer to Climatic Influences screens		
SC.912.L.17.11	Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.	Refer to Endangered Wetlands section	Human Impact exercise	Impact on the Desert; Human Impact screens		
SC.912.L.17.12	Discuss the political, social, and environmental consequences of sustainable use of land.	Refer to Endangered Wetlands section	Human Impact exercise	Impact on the Desert; Human Impact screens		
SC.912.L.17.16	Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.	Refer to Endangered Wetlands section	Human Impact exercise	Impact on the Desert; Human Impact screens		
SC.912.L.17.18	Describe how human population size and resource use relate to environmental quality.	Refer to Endangered Wetlands section	Refer to Human Impact exercise	Impact on the Desert; Human Impact screens		
SC.912.L.17.19	Describe how different natural resources are produced and how their rates of use and renewal limit availability.		Human Impact exercise	Impact on the Desert		
SC.912.L.17.20	Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.	Refer to Endangered Wetlands section	Human Impact exercise	Impact on the Desert; Human Impact screens		
Standard 18: Matter and Energy Transformations						
SC.912.L.18.7	Identify the reactants, products, and basic functions of photosynthesis.	Photosynthesis				
SC.912.L.18.8	Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration.	Photosynthesis screens			Refer to Respiration screens	
SC.912.L.18.9	Explain the interrelated nature of photosynthesis and cellular respiration.	Refer to Photosynthesis			Refer to Respiration screens	

Florida Science Benchmarks: Grade 912 Body of Knowledge: EARTH AND SPACE SCIENCE		**DFI Fieldtrip Series**			**Digital Frog**	**Science Matrix: Cell**
Benchmark code	The student is expected to:	Wetlands	Rainforest	Desert		
Standard 6: Earth Structures						
SC.912.E.6.2	Connect surface features to surface processes that are responsible for their formation.	Bog Formation	Mechanisms section	Landscape Formation screens		
SC.912.E.6.6	Analyze past, present, and potential future consequences to the environment resulting from various energy production technologies.		Refer to Human Impact	Refer to Impact on the Desert		
Standard 7: Earth Systems and Patterns						
SC.912.E.7.1	Analyze the movement of matter and energy through the different biogeochemical cycles, including water and carbon.	Nutrient Cycles, Food Webs	Water Cycle, refer to Web Game & Mechanisms	Refer to Mechanisms		
SC.912.E.7.4	Summarize the conditions that contribute to the climate of a geographic area, including the relationships to lakes and oceans.		Climate	Climatic Influences screens		