Course: 6th Grade **Course Code: 2002040** **Quarter: 4**

RESOURCES **COMMON CORE** **SCIENCE CENTER** **SYLLABUS**

Topic of Study: Cell Structure, Function and History ***(Fusion Units #6-#8)***

Bodies of Knowledge:

Big Ideas: 1: The Practice of Science; **2:** Characteristics of Scientific Knowledge **3:** The Role of Theories, Laws, Hypotheses, and Models, **14:** Organization and Development of Living Things

Essential Questions: What are living things made of? **(6-1)** What are the building blocks of organisms? **(6-2)** What are the different parts that made up a cell? **(6-3)** How are living things organized? **(6-4)** How do organisms maintain homeostasis? **(6-5)** What are the functions of the body systems, and how they work together? **(7-1)** How do your skeletal, muscular, circulatory, respiratory, digestive, excretory, nervous, and endocrine systems work? **(7-2/5)**How does your body's defense system work? **(8-1)**What causes disease? **(8-2)**

Vocabulary: cell, cytoplasm prokaryote, organism, organelle, eukaryote, cell membrane, nucleus, atom, molecule, lipid, protein, carbohydrate, nucleic acid, phospholipid, cytoskeleton, mitochondrion, ribosome, endoplasmic reticulum, Golgi complex, cell wall, vacuole, chloroplast, lysosome, organism, organ system, tissue, structure, organ, function, homeostasis, diffusion, active transport, photosynthesis, osmosis, endocytosis, cellular respiration, passive transport, exocytosis, mitosis, homeostasis, skeletal system, ligament, joint, muscular system, tendon, cardiovascular system, blood, lymph, lymphatic system, lymph node, artery, capillary, vein, pharynx, respiratory system, larynx, trachea, bronchi, alveoli, digestive system, enzyme, esophagus, stomach, small intestine, pancreas, liver, large intestine, excretory system, urine, kidney, nephron

Common Inquiry Labs:

- **SC.6.L.14.2**-How Do Tools That Magnify Help Us Study Cells: Lab Manuel p.327 **(6-1)**
- **SC. 6.L.14.1**-Properties of Lipids: Lab Manuel p.331 **(6-2)**
- **SC.6.L.14.5**-Comparing Cells: Lab Manuel p.339 **(6-3)**
- **SC.6.L.14.1**-Observing Plant Organs: Lab Manuel p.355 **(6-4)**
- **SC.6.L.14.5**-How Does Skin Provide Protection?: Lab Manuel p.407 **(7-1)**
- **SC.6.L.14.5**-Form and Motion: Lab Manuel p.417 **(7-2)**
- **SC.6.L.14.5**-Build a Model Lung: Lab Manuel p.421 **(7-3)**
- **SC.6.L.14.5**-Mechanical Digestion: Lab Manuel p.435 **(7-4)**

	Technology Links:	
Lab Assistance:	**Science Links:**	**Science Fair Assistance:**
Scientific Methods Skills	*Vocabulary Strategies*	*Math in Science*
Writing in the Sciences	*Graphic Organizers and Reading Strategies*	*Planning for Science Fair and Competitions*
Cooperative Learning Activities	*Fold Notes*	
	Rubrics and Integrated Assessments	*Lessons for Substitutes*
	Test Taking Strategies	

Teacher's Links to Online Guides:

Above Level On Level Below Level

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NGSSS	Outline of Content	Objective
SC.6.L.14.2 Investigate and explain the components of the scientific theory of cells (cell theory): all organisms are composed of cells (single-celled or multi-cellular), all cells come from pre-existing cells, and cells are the basic unit of life. **Cognitive Complexity: Moderate (6-1)**	**Unit 6 Lesson 1 (L14.2)** **The Cell** 1. The basic unit of life. 2. Cell size. **The Cell Theory** 1. The development of the cell theory. **Two Types of Cells** 1. Common cell structures 2. Prokaryotes 3. Eukaryotes	• Describe how all living things are made of cells. • Infer how cells are constantly being replaced or dying. • Explain the difference between prokaryotic and eukaryotic cells. • Cite evidence from the contributions of scientists (Hooke, Schleiden, and Schwann) who were involved with the development of the cell theory.
SC.6.L.14.1 Describe and identify patterns in the hierarchical organization of organisms from atoms to molecules and cells to tissues to organs to organ systems to organisms. **Cognitive Complexity: Low (6-2,4)**	**Unit 6 Lesson 2 (L.14.1)** **Atoms and Molecules** 1. Atoms 2. Molecules and compounds **Molecules for Life Processes** 1. Four major classes of molecules. 2. Phospholipids 3. Water	• Describe the different levels of organization in living things.
SC.6.L.14.4 Compare and contrast the structure and function of major organelles of plant and animal cells, including cell wall, cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria, and vacuoles. **Cognitive Complexity: Moderate (6-3)**	**Unit 6 Lesson 3 (L.14.4)** **Eukaryotic Cells** 1. Cell membrane 2. Cytoskeleton 3. Nucleus **Parts of Eukaryotic Cells** **Plant and Animal Cells** 1. Plant cells 2. Animal cells	• Compare and contrast the basic structures of plant and animal cells. • Compare and contrast the function of plant and cell organelles. • Compare and contrast single-celled and multi-cellular organisms.
SC.6.L.14.1 Describe and identify patterns in the hierarchical organization of organisms from atoms to molecules and cells to tissues to organs to organ systems to organisms. **Cognitive Complexity: Low (6-2,4)**	**Unit 6 Lesson 4 (L.14.1)** **Cells to Organisms** 1. Cell specialization 2. Tissues 3. Organs, and organ systems **Cellular Structure and Function** 1. Diversity of living things.	• Describe the different levels of organization in living things.
SC.6.L.14.3 Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing. **Cognitive Complexity: Moderate (6-5)**	**Unit 6 Lesson 5 (L.14.3)** **Homeostasis in Cells** 1. Homeostasis in cells 2. Photosynthesis 3. Cellular respiration 4. The cell cycle 5. Active and passive transport	• Describe how the cells function to maintain homeostasis.

	Homeostasis in Organisms 1. Responding to change 1. groups.	
SC.6.L.15. 1 Analyze and describe how and why organisms are classified according to shared characteristics with emphasis on the Linnaean system combined with the concept of Domains. **Cognitive Complexity: High (6-6)**	**Unit 6 Lesson 6 (L.15.1)** **Classification** 1. Each organism has two names **Domains & Kingdoms** 1. All organisms fall into one of three domains 2. There are eight levels for classifying organisms **Branching diagrams and dichotomous keys** 1. Organisms are organized into groups	• Explain how scientists classify organisms using a graphic organizer. • Describe the importance of classification using a graphic organizer. • Explain why classification schemes changed as greater numbers of different organisms became known. • Describe the major characteristics of the kingdoms using a graphic organizer. • Summarize why scientists organize living things into groups from Domains to species (e.g., convenience, identification, ability to produce fertile offspring) using a graphic organizer. • Utilize a dichotomous key to identify unknown organisms during an inquiry activity.
SC.6.L.14.5 Identify and investigate the general functions of the major systems of the human body (digestive, respiratory, circulatory, reproductive, excretory, immune, nervous, and musculoskeletal) and describe ways these systems interact with each other to maintain homeostasis. **Cognitive Complexity: High (7-1,2,3,4,5,6)**	**Unit 7 Lesson 1 (L.14.5)** **Functions of Human Body Systems** 1. What body systems do **Interactions of Body Systems** 1. Different tissue types 2. Shared organs **Maintaining Homeostasis** 1. Homeostasis keeps the body in Balance **Unit 7 Lesson 2 (L.14.5)** **Skeletal System and Bones** 1. The skeletal system supports and protects the body. **Muscular System and Movement** 1. The muscles of the muscular system allow movement. **Injury, Disease, and Exercise** 1. Muscles and bones can be harmed by injury or disease. **Unit 7 Lesson 3 (L.14.5)** **The Lymphatic System** 1. The lymphatic system returns fluid to blood that helps the	• Identify the functions of the various systems by analyzing a video or images. • Investigate the function of the organs associated with different body systems. • Summarize the sequence of activities involving major body systems that take place to complete a task (i.e., bend leg at knee or bend arm at elbow). (• Explain how systems interact with each other to maintain homeostasis.

	body fight disease. **The Cardiovascular System** 1. The cardiovascular system transports blood in the body. **The Respiratory System** 1. The respiratory system transports gases in the body. **Unit 7 Lesson 4 (L.14.5) (HE.6.C.1.8)** **Function of the Digestive System** 1. State the function of the digestive system 2. Distinguish between mechanical and chemical digestion **Parts of the Digestive System** 1. Describe the role of each organ 2. Trace the path of digestion 3. Explain how the digestive system interacts **Parts and Functions of the Excretory System** 1. Functions of excretory and urinary systems 2. Describe the role of each organ 3. Trace the path of waste through the urinary system **Unit 7 Lesson 5 (L.14.5)** **Function and Parts of the Nervous System** 1. Central and peripheral nervous system 2. The brain 3. Neurons **The Senses** **Function and Parts of the Endocrine System** 1. Feedback mechanisms 2. Disorders of the endocrine and nervous systems **Unit 7 Lesson 6 (L.14.5)** **Male Reproductive System** 1. The male reproductive system makes and delivers sperm **Female Reproductive System** 1. The female reproductive system makes hormones and eggs and protects and nourishes a developing embryo. 2. Egg production and protection **Human Growth and Development** 1. Stages of pregnancy 2. Birth 3. Infancy and childhood	

	4. Adolescence and adulthood **STIs** **Unit 8, Lesson 1 (L.14.5)** **Human Body Defense System** 1. Define pathogen 2. Compare external and internal defenses 3. Identify macrophages, T cells, and B cells as white blood cells. **Immunity** 1. Explain how the body builds immunity **Immune System Disorders**	• Recognize that bacteria and viruses can infect the human body through many different modes of transmission including airborne, blood borne, body fluids, etc. during an inquiry activity. • Explain why viruses depend on living things.
SC.6.L.14.6 Compare and contrast types of infectious agents that may infect the human body, including viruses, bacteria, fungi, and parasites. **Cognitive Complexity: Moderate (8-2)**	**Unit 8 Lesson 2 (L.14.6)** **Disease Overview** 1. Noninfectious disease 2. Infectious disease **Causes of Infectious Disease** 1. Bacteria, viruses, fungi, parasites **Infectious Disease Transmission** **Reducing and Treating Infectious Disease** 1. Reducing infectious disease 2. Most diseases can be treated	• Identify various infectious agents and how they affect the human body systems. • Compare and contrast the structures of bacteria and viruses and the ways they affect different organisms. • List the many ways a person may become infected with disease. • Identify ways to prevent infection from bacteria and viruses including universal precautions. • Research and describe examples of pathogens that affect human on a regular basis. • Investigate the different variables that increase the chance of disease transmission. • Recognize the need to assume responsibility for personal health care. (IV)
HE.6.C.1.3 Identify environmental factors that affect personal health. **HE.6.C.1.8** Explain how body systems are impacted by hereditary factors and infectious agents.		