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| |  | | --- | | https://peer.tamu.edu/curriculum_modules/Water_Quality/images/teach.jpg |  |  |  | | --- | --- | | **TEKS for Middle School Science and High School Biology** | **How the TEKS are Integrated into the Lesson** | | **6.1A, 7.1A, 8.1A, B.1A** Demonstrate safe practices during laboratory and field investigations as outlined in Texas Education Agency approved safety standards | During the **Activities,** students will be required to use safe practices. | | **6.1B, 7.1B, 8.1B, B.1B** Practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials | During the **Activities,** students will practice appropriate use and conservation of resources. | | **6.2A, 7.2A, 8.2A, B.2E** Plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology | During the **Activities,** students will implement comparative and descriptive investigations. | | **6.2C, 7.2C, 8.2C, B.2F** Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers | During the **Activities,** students will collect and record data. | | **6.2E, 7.2E, 8.2E, B.2G** Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends | During the **Activities,** students will analyze data. | | **6.3A, 7.3A, 8.3A** Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student. | In the **How We Find Out** section of this unit**,**students will learn scientific explanations including the hypotheses, quoted along with examples. They will be asked to analyze and evaluate those explanations by the use of questions embedded in the unit. | | **6.3D, 7.3D, 8.3D, B.3D, B.3F** Relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content | Throughout the unit and in the **Story Time** section, the history of science and contributions of scientists as related to the content is presented. | | **6.4A,B, 7.4A,B, 8.4A,B, B.2F** The student knows how to use a variety of tools. The student will use preventative safety equipment. | Throughout the **Activities,** students will use laboratory tools and safety equipment as needed. | | **6.12 A U**nderstand that all organisms are composed of one or more cells | Throughout the lesson, cells are shown and discussed along with their structure and function. | | **7.12 B I**dentify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems | The **How We Know** and **What We Know** sections mention body systems and their function, in particular, the digestive system. | | **7.12 C R**ecognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms | The **How We Know** and **What We Know** sections describe the structure and function of the mitochondria. | | **7.12 D** Differentiate between structure and function in plant and animal cells organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole | The **How We Know** and **What We Know** sections describe the structure and function of the mitochondria. | | **7.12 E** Compare the functions of cell organelles to the functions of an organ system. | The **How We Know** and **What We Know** sections describe the mitochondria and relates its function to the functions of body systems. | | **B.9A Compare the functions of different types of biomolecules, including carbohydrates, lipids, proteins, and nucleic acids;** | This unit goes into to detail in the **What We Know** and **How We Know** sections about the process of cellular respiration, including biomolecules included in the process. | | **B.9B** Compare the reactants and products of photosynthesis and cellular respiration in terms of energy, energy conversions, and matter. | In the **How We Know** and **What We Know** sections of this lesson, cellular respiration is shown in detail. A comparison is not made to photosynthesis, but an understanding of cellular respiration is critical to the comparison required. | | **B.10C** Analyze the levels of organization in biological systems and relate the levels to each other and to the whole system. | The **How We Know** and **What We Know** sections describe and analyze the mitochondria and its function, and it relates that to the function of the body systems and the survival of the organism. |  |  |  | | --- | --- | | **Next Generation Science Standards**  **Disciplinary Core Ideas** | **How the NGSS are Integrated** **into the Lesson** | | **MS-LSI.A Structure and Function**  **MS-LS1-1** All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).  **MS-LS1-2** Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. | This unit describes the function of cellular respiration and at many points discusses the existence of cells and cell organelles.  In the **What We Know** section, the mitochondrion is defined and illustrated. Its function is described in detail. | | **HS-LS1.A:** **Structure and Function**  **HS-LS1-1** Systems of specialized cells within organisms help them perform the essential functions of life.  **HS-LS1-6** As matter and energy flow through different organizational levels of living systems, chemical elements are recombined in different ways to form different products.  **HS-LS1-7** As a result of these chemical reactions, energy is transferred from one system of interacting molecules to another. Cellular respiration is a chemical process in which the bonds of food molecules and oxygen molecules are broken and new compounds are formed that can transport energy to muscles. Cellular respiration also releases the energy needed to maintain body temperature despite ongoing energy transfer to the surrounding environment. | The **How We Know** and **What We Know** sections show types of specialized cells and discusses their role in performing the essential functions of life.  This unit in its’ entirety teaches the process of cellular respiration. It describes the process of chemical elements recombining to form new products.  The main purpose of this unit is to describe the chemical reactions of cellular respiration. | |