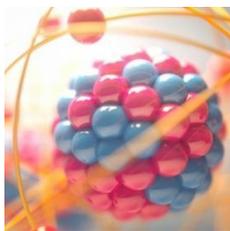


Grade 7 Model Science Units Outline

UNIT 1: Structure and Properties of Matter

Instructional Days: 20

Mosa Mack Units



Students build understandings of what occurs at the atomic and molecular scale. Students apply their understanding that pure substances have characteristic properties and are made from a single type of atom or molecule. They also provide a molecular level accounts to explain states of matter and changes between states. The crosscutting concepts of cause and effect, scale, proportion and quantity, structure and function, interdependence of science, engineering, and technology, and the influence of science, engineering and technology on society and the natural world provide a framework for understanding the disciplinary core ideas. Students demonstrate grade appropriate proficiency in developing and using models, and obtaining, evaluating, and communicating information. Students are also expected to use the scientific and engineering practices to demonstrate understanding of the core ideas.

This unit is based on MS-PS1-1, MS-PS1-2

UNIT 2: Interactions of Matter

Instructional Days: 20

Mosa Mack Units



Students provide molecular-level accounts of states of matter and changes between states, of how chemical reactions involve regrouping of atoms to form new substances, and of how atoms rearrange during chemical reactions. Students are also able to apply an understanding of optimization design and process in engineering to chemical reaction systems. The crosscutting concepts of structure and function, cause and effect, interdependence of science, engineering, and technology, and influence of science, engineering, and technology on society and on the natural world provide a framework for understanding the disciplinary core ideas. Students are expected to demonstrate grade appropriate proficiency in obtaining, evaluating, and communicating information and developing and using models. Students are also expected to use the scientific and engineering practices to demonstrate

understanding of the core ideas.

This unit is based on MS-PS1-3, MS-PS1-4

UNIT 3: Chemical Reactions

Instructional Days: 25

Mosa Mack Units



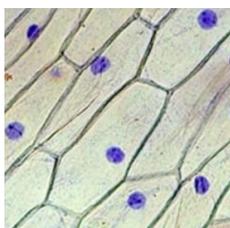
Students provide molecular-level accounts of states of matters and changes between states, of how chemical reactions involve regrouping of atoms to form new substances, and of how atoms rearrange during chemical reactions. Students also apply their understanding of optimization design and process in engineering to chemical reaction systems. The crosscutting concept of energy and matter provides a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in developing and using models, analyzing and interpreting data, designing solutions, and obtaining, evaluating, and communicating information. Students are also expected to use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

This unit is based on MS-PS1-5, MS-PS1-6, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4

UNIT 4: Structure and Function

Instructional Days: 15

Mosa Mack Units



Students demonstrate age appropriate abilities to plan and carry out investigations to develop evidence that living organisms are made of cells. Students gather information to support explanations of the relationship between structure and function in cells. They are able to communicate an understanding of cell theory and understand that all organisms are made of cells. Students understand that special structures are responsible for particular functions in organisms. They then are able to use their understanding of cell theory to develop and use physical and conceptual models of cells. The crosscutting concepts of scale, proportion, and quantity and structure and function provide a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in planning and carrying out investigations, analyzing and interpreting data, and developing and using models. Students are also

expected to use these to use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

This unit is based on MS-LS1-1, MS-LS1-2

UNIT 5: Body Systems

Instructional Days: 15

Mosa Mack Units



Interactions of Body Systems

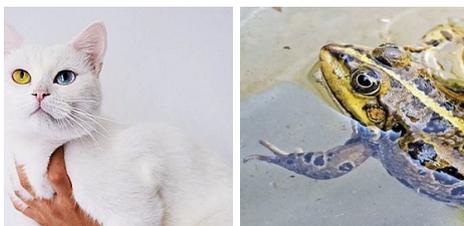
Students develop a basic understanding of the role of cells in body systems and how those systems work to support the life functions of the organism. Students will construct explanations for the interactions of systems in cells and organisms. Students understand that special structures are responsible for particular functions in organisms, and that for many organisms, the body is a system of multiple-interaction subsystems that form a hierarchy, from cells to the body. Students construct explanations for the interactions of systems in cells and organisms and for how organisms gather and use information from the environment. The crosscutting concepts of systems and system models and cause and effect provide a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in engaging in argument from evidence and obtaining, evaluating, and communicating information. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

This unit is based on MS-LS1-3, MS-LS1-8

UNIT 6: Inheritance and Variation of Traits

Instructional Days: 20

Mosa Mack Units



Mutations and Genetic Variation

Students develop and use models to describe how gene mutations and sexual reproduction contribute to genetic variation. Students understand how genetic factors determine the growth of an individual organism. They also demonstrate understanding of the genetic implications of sexual and asexual reproduction. The crosscutting concepts of cause and effect and structure and function provide a framework for understanding how gene structure determines differences in the functioning of organisms. Students are expected to demonstrate proficiency in developing and using

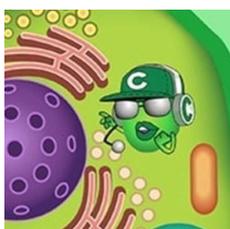
models. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

This unit is based on MS-LS3-1, MS-LS3-2

UNIT 7: Organization of Matter and Energy flow in Organisms

Instructional Days: 15

Mosa Mack Units



Students provide a mechanistic account for how cells provide a structure for the plant process of photosynthesis in the movement of matter and energy needed for the cell. Students use conceptual and physical models to explain the transfer of energy and cycling of matter as they construct explanations for the role of photosynthesis in cycling matter in ecosystems. They construct scientific explanations for the cycling of matter in organisms and the interactions of organisms to obtain matter and energy from an ecosystem to survive and grow. They understand that sustaining life requires substantial energy and matter inputs, and that the structure and functions of organisms contribute to the capture, transformation, transport, release, and elimination of matter and energy. The crosscutting concepts of matter and energy and structure and function provide a framework for understanding of the cycling of matter and energy flow into and out of organisms. Students are also expected to demonstrate proficiency in developing and using models. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

This unit is based on MS-LS1-6, MS-LS1-7

UNIT 8: Earth Systems

Instructional Days: 30

Mosa Mack Units



Students examine geoscience data in order to understand processes and events in Earth's history. Important crosscutting concepts in this unit are scale, proportion, and quantity, stability and change, and patterns in relation to the different ways geologic processes operate over geologic time. An important aspect of the history of Earth is that geologic events and conditions have affected the evolution of life, but different life forms have also played important roles in altering Earth's systems. Students

understand how Earth's geosystems operate by modeling the flow of energy and cycling of matter within and among different systems. Students investigate the controlling properties of important materials and construct explanations based on the analysis of real geoscience data. Students are expected to demonstrate proficiency in analyzing and interpreting data and constructing explanations. They are also expected to use these practices to demonstrate understanding of the core ideas.

This unit is based on MS-ESS1-4, MS-ESS2-1, MS-ESS2-2, MS-ESS2-3