Science – 6

Course #: M3602, M3607, M3608, M3609

Course Description:

Sixth grade science provides students with a coordinated science course that integrates concepts in Life, Earth, and Physical Science through the use of a storyline approach - a logical sequence of lessons that are motivated by students' questions that arise from students' interactions with phenomena. Students examine phenomena dealing with Light & Matter, Thermal Energy, Weather Climate & Water Cycling, Rock Cycling & Plate Tectonics, Natural Hazards, and Cells & Systems. Students will actively engage in scientific and engineering practices and apply crosscutting concepts to deepen their understanding of the core ideas. The learning experiences provided for students will engage them with fundamental questions about the world and in the role of scientists to investigate and find answers to those questions. Students will have ongoing opportunities to carry out scientific investigations and engineering design projects related to the disciplinary core ideas throughout the course.

Course Proficiencies:

The following is a list of skills and concepts that students will be proficient in upon successful completion of this course. These proficiencies form the basis of assessment of each student's achievement. Students will be able to:

1. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. ***(MS-PS4-2)***
2. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. ***(MS-LS1-8)***
3. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. ***(MS-PS1-4)***
4. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. ***(MS-PS3-3)***
5. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. ***(MS-PS3-4)***
6. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. ***(MS-PS3-5)***
7. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. ***(MS-ETS1-4)***
8. Develop a model to describe the cycling of water through Earth’s systems driven by energy from the sun and the force of gravity. ***(MS-ESS2-4)***
9. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. ***(MS-ESS2-5)***
10. Develop and use a model to describe how unequal heating and rotation of the Earth

cause patterns of atmospheric and oceanic circulation that determine regional climates. ***(MS-ESS2-6)***

11. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history. ***(MS-ESS1-4)***
12. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. ***(MS-ESS2-2)***
13. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. ***(MS-ESS2-3)***
14. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. ***(MS-ESS2-1)***
15. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. ***(MS-ESS3-2)***
16. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. ***(MS-ETS1-1)***
17. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. ***(MS-ETS1-2)***
18. Conduct an investigation to provide evidence that living things are made of cells, either one cell or many different numbers and types of cells. ***(MS-LS1-1)***
19. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. ***(MS-LS1-2)***
20. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. ***(MS-LS1-3)***
21. Identify questions and make predictions that can be addressed by conducting investigations. ***(Science and Engineering Practices – 1, 2)***
22. Collect and analyze data in order to evaluate the strength and weakness claims and arguments throughout the course. ***(Science and Engineering Practices – 3, 4, 6, 7)***
23. Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences. **(*Science and Engineering Practices – 7, 8)***
24. Identify laboratory equipment and demonstrate its appropriate safe use. ***(Science and Engineering Practice – 3)***
25. Use appropriate technology in construction of a simple spreadsheet, the design and production of basic multimedia projects, and in the creation of documents in word processing with advanced text formatting and graphics. ***(NJSLS – 8.1.8.A.2, 8.1.8.A.4)***
26. Select and use technology applications effectively and productively to gather, evaluate and use the information to explore a problem, develop a solution, and communicate ideas. ***(8.1.8.A.1, 8.1.8.A.2, 8.1.8.A.3, 8.1.8.A.4, 8.1.8.C.1, 8.1.8.E.1, 8.1.8.F.1)***
27. Develop an understanding of the nature and impact of technology, engineering, design, and computational thinking on the individual, global society, and the environment. ***(8.2.8.A.4, 8.2.8.A.5, 8.2.8.B.2, 8.2.8.C.8, 8.2.8.D.2, 8.2.8.D.3)***
28. Develop important attributes for career success including communication, collaboration, critical thinking, creativity, and leadership skills. ***(9.2.8.CAP.2)***

Assessment:

Evaluation of student achievement in this course will be based on the following assessment tools:

a. Tests and quizzes.
b. Laboratory performance, reports, and journals.
c. Class participation.
d. Well-developed homework.
e. Maintaining a folder/notebook.
f. Projects, including oral presentations.
g. Teacher observation.

Board Adopted Textbook:

None

Board Approved - 9/29/2021