Science Grade 5

Course #: M3502, M3509

Course Description:

The performance expectations in fifth grade help students formulate answers to questions such as: "When matter changes, does its weight change? How much water can be found in different places on Earth? Can new substances be created by combining other substances? How does matter cycle through ecosystems? Where does the energy in food come from and what is it used for? How do lengths and directions of shadows or relative lengths of day and night change from day to day, and how does the appearance of some stars change in different seasons?" Students are able to describe that matter is made of particles too small to be seen through the development of a model. Students develop an understanding of the idea that regardless of the type of change that matter undergoes, the total weight of matter is conserved. Students determine whether the mixing of two or more substances results in new substances. Through the development of a model using an example, students are able to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. They describe and graph data to provide evidence about the distribution of water on Earth. Students develop an understanding of the idea that plants get the materials they need for growth chiefly from air and water. Using models, students can describe the movement of matter among plants, animals, decomposers, and the environment and that energy in animals' food was once energy from the sun. Students are expected to develop an understanding of patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. The crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; energy and matter; and systems and systems models are called out as organizing concepts for these disciplinary core ideas. In the fifth-grade performance expectations, students are expected to demonstrate grade-appropriate proficiency in developing and using models, planning and carrying out investigations, analyzing and interpreting data, using mathematics and computational thinking, engaging in argument from evidence, and obtaining, evaluating, and communicating information; and to use these practices to demonstrate understanding of the core ideas.

Course Proficiencies:

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

1. Support an argument that the apparent brightness of the Sun and stars is due to their relative distances from Earth. ***(5-ESS1-1)***
2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. ***(5-ESS1-2)***

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3. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. ***(5-ESS2-1)***
4. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. ***(5-ESS2-2)***
5. Obtain and combine information about ways individual communities use science ideas to protect Earth's resources and environment. ***(5-ESS3-1)***
6. Develop a model to describe that matter is made of particles too small to be seen. ***(5-PS1-1)***
7. Support an argument that the gravitational force exerted by Earth on objects is directed down. ***(5-PS2-1)***
8. Develop a model to describe that matter is made of particles too small to be seen. ***(5-PS1-1)***
9. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. ***(5-PS1-2)***
10. Make observations and measurements to identify materials based on their properties. ***(5-PS1-3)***
11. Conduct an investigation to determine whether the mixing of two or more substances results in new substances. ***(5-PS1-4)***
12. Support an argument that plants get the materials they need for growth chiefly from air and water. ***(5-LS1-1)***
13. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. ***(4-LS1-2)***
14. Use a model to describe the movement of matter among plants, animals, decomposers, and the environment. ***(5-LS2-1)***
15. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the Sun. ***(5-PS3-1)***
16. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. ***(5-ESS2-1)***
17. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. ***(5-ESS3-1)***
18. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. ***(3-5-ETS1-1)***
19. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. ***(3-5-ETS1-2)***
20. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. ***(3-5-ETS1-3)***

21. 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. ***(8.1.5.A.1, 8.1.5.A.2, 8.1.5.A.3, 8.1.5.A.4, 8.1.5.E.1, 8.1.5.F.1)***
22. Develop an understanding of the nature and impact of technology, engineering, design, and computational thinking on the individual, global society, and the environment. ***(8.2.5.A.4, 8.2.5.A.5, 8.2.5.B.4, 8.2.5.C.4, 8.2.5.D.1, 8.2.5.D.7)***
23. Develop important attributes for career success including communication, collaboration, critical thinking, creativity, and leadership skills. ***(9.2.8.B.1, 9.2.8.B.3)***

Assessment:

In grade 5, student progress in science is measured through teacher observation of students as they work with science materials, work with their peers and independently, and by the questions they ask and answer. Students will also maintain a science journal to record their observations, analyze data and draw conclusions. Students' progress will also be assessed through benchmarks and/or a summative assessment at the end of each investigation.

Board Adopted Materials:

Teaching Resources and Related Student Materials:
Title: FOSS (Full Options Science System) Next Generation
Modules:

1. Earth and Sun
2. Mixtures and Solutions
3. Living Systems

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