Instructional Unit Title: Matter Responds to Energy

Science 8th Grade

The teacher may provide interactive examples of the different states of matter so that students can observe and determine how energy is involved in changing states.



The teacher may model physical and chemical change so that students can explore and explain the differences between a physical and chemical change, including evidence of each type of change (e.g., change in state lab, using substances such as cornstarch, baking soda, sugar, and baking powder to see how they react with water, vinegar and iodine to determine physical and chemical changes).



The teacher may provide opportunities to discuss and investigate the Law of Conservation of Mass so that the students can recognize that mass is conserved in chemical and physical changes of matter (e.g., close reading discussion or laboratory experiment).



The teacher may provide opportunities to investigate an object's motion so that students can explore ways to calculate speed, velocity, acceleration and momentum (e.g., Motion Lab, Calculation Practice Sheet, Inquiry Design Lab).



The teacher may provide interactive opportunities so that students can explore energy transformations so that they can begin to see how energy is conserved in all transformations (e.g., scenarios, laboratory experiments, NEED Project Science of Energy Kit).



The teacher may introduce and provide interactive examples of the different forms of energy so that students can explore, observe and generate their own thoughts and definitions of energy.



The teacher may introduce Newton's Laws of Motion through real life scenarios or case studies and provide concrete examples of each law so that students can apply these laws in unfamiliar situations.



The teacher may provide opportunities for students to explore the different types of forces so that students can identify how forces affect matter (e.g., provide demonstrations and inquiry activities to identify forces).



The teacher may provide opportunities for students to explore advantages and disadvantages of various renewable and nonrenewable resources so that students can draw conclusions and determine the best energy resources for their local area (e.g., The Great Energy Debate, Energy Enigma, Energy Resource Stations).



The teacher may facilitate the understanding of how humans impact their environment through the use of renewable and nonrenewable energy resources so that students can formulate their own opinions and conclusions in regards to environmental issues (e.g., argumentative paper, debate, Global Trading Game).



PERFORMANCE ASSESSMENT: You have been assigned to the Colorado Energy Task Force to determine which site to develop and construct a hydroelectric power plant. You must draw upon your conceptual understanding of matter and motion and how energy is used or transformed. You will create a report for your local government recommending one of the proposed sites for the development of a hydroelectric power plant. You must include evidence on energy efficiency by looking at the gravitational potential energy of both sites and how energy was transformed. The report should also include justification for your selected site based on environmental, social and economic impacts. Be sure you provide evidence supporting your selected proposed site as well as acknowledging counter claims of why it should not be the other proposed site.

This unit was authored by a team of Colorado educators. The unit is intended to support teachers, schools, and districts as they make their own local decisions around the best instructional plans and practices for all students. To see the entire instructional unit sample with possible learning experiences, resources, differentiation, and assessments visit http://www.cde.state.co.us/standardsandinstruction/instructionalunitsamples.