


Physics Curriculum Bundle # 5

Title		Suggested Dates
Work & Energy		11/16 – 12/4 (12 days)

Big Idea/Enduring Understanding	Guiding Questions
The energy of a system is changed when work is done on or by the system. Energy can take many forms but the total energy in a system is constant.	How is the energy in a system conserved?

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the district curriculum.

Knowledge & Skills with Student Expectations	Specificity & Examples	Suggested Resources (Read the note above)
<p>5 The student knows that changes occur within a physical system and recognizes that energy and momentum are conserved.</p> <p>5A Interpret evidence for the work-energy theorem.</p>	<p>Including</p> <ul style="list-style-type: none"> • Relate work to energy changes • Applying work-energy theorem in problems involving conservative and non-conservative forces. 	<p>Work-energy theorem for lifting a weight and stretching a spring. (phys_4_WorkEnergyWeightSpring)</p> <p>Work-energy theorem for cart pulled by falling weight using the change in KE. (phys_4_WorkEnergyTheorem)</p> <p>Work-energy simulation – http://www.glenbrook.k12.il.us/gbssci/phys/mmedia/energy/au.html</p>
<p>5 The student knows that changes occur within a physical system and recognizes that energy and momentum are conserved.</p> <p>5B Observe and describe examples of kinetic and potential energy and their transformations</p>	<p>Including</p> <ul style="list-style-type: none"> • Describe conversion of forms of mechanical energy in different systems Such as <ul style="list-style-type: none"> ○ Falling bodies ○ Roller coasters ○ Pendulums 	<p>Conservation of energy on inclined plane – cart rolling down track from different heights. (phys_4_ConservationEnergy)</p> <p>Conservation of energy with simple pendulum (phys_4_ConsEnergyPendulum)</p> <p>Pendulum energy conservation simulation – http://www.glenbrook.k12.il.us/gbssci/phys/mmedia/energy/pe.html</p> <p>Roller coaster energy simulation – http://www.glenbrook.k12.il.us/gbssci/phys/mmedia/energy/ce.html</p> <p>Hermann von Helmholtz’s lecture on conservation of</p>

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		energy— http://www.bartleby.com/30/125.html
<p>5 The student knows that changes occur within a physical system and recognizes that energy and momentum are conserved.</p> <p>5C Calculate the mechanical energy and momentum in a physical system.</p>	<p>Including</p> <ul style="list-style-type: none"> • Solve problems involving conservation and calculation of mechanical energy. <p>Such as</p> <ul style="list-style-type: none"> ○ Billiards ○ Cars ○ Trains 	<p>Roller coaster lab – determine how well energy is conserved for marble roller coaster. (Phys_4_rollercoasterlab)</p> <p>Mechanical energy website – http://www.glenbrook.k12.il.us/gbssci/phys/Class/energy/u511d.html</p> <p>Honda Rube Goldberg Machine Video – http://autorepair.about.com/library/multimedia/honda-ad-300k.swf</p>
<p>1 For at least 40% of instructional time, conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices.</p> <p>1B Make wise choices in the use and conservation of resources and the disposal or recycling of materials.</p>	<p>Including</p> <ul style="list-style-type: none"> • Alternative energy sources. 	<p>Suggested Equipment – marble roller coaster, pendulum, cart & ramp, force sensor, spring.</p>