

NGSS and NEED: Fourth Grade Energy

Some educators have asked for insight on how to use NEED materials exclusively to meet large portions of the Next Generation Science Standards. We have put this document together to show how you can use what we have to meet those rich, complex learning expectations. The following plan has been assembled for fourth grade – specifically, the page in NGSS entitled, “4-PS3 Energy”. The accompanying spreadsheet was developed by downloading our entire NGSS correlations spreadsheet, clicking to the fourth grade tab, and hiding the unnecessary columns from view. The columns remaining in view were those only found on that page of NGSS. For any other grade or NGSS page, you would follow the same procedure.

When we correlate our materials to any set of educational standards, we use a two-dot system. Solid dots indicate a strong correlation such that we think the listed activity or book can be used to teach that standard. Anywhere we have placed a hollow dot we are indicating that activity or curriculum guide can be used in support of other materials to meet that standard. When choosing materials from our curriculum library to teach a set of standards without incorporating any other resource, you will want to choose materials with solid dots.

As you look over the spreadsheet at the end of this document, you will notice two units in particular are most strongly correlated to the "4-PS3-Energy" page of NGSS – *EnergyWorks* and *Elementary Science of Energy*. We have developed a suggested plan that will allow you to cover most of the Science and Engineering Practices, Disciplinary Core Ideas, and Cross-Cutting Concepts used to help students be able to meet the Performance Expectations on that NGSS page. The suggested guide below assumes that you will spend 45-60 minutes every day working with fourth graders on science. If your school days are structured differently, you will have to make some adjustments.

DAY	SUGGESTED LESSON(S)	CURRICULUM GUIDE(S) NEEDED
1	Heat module – introduction and demonstration	EnergyWorks Teacher EnergyWorks Student
2	Heat module – student explorations	
3		
4		
5	Light module – introduction and demonstration	
6	Light module – student explorations	
7		
8		
9	Motion module – introduction and demonstration	
10	Motion module – student explorations	
11		
12		
13	Sound module – introduction and demonstration	
14	Sound module – student explorations	
15		
16		
17	Growth module – introduction and demonstration	
18	Growth module – set up student explorations (take data daily for 7-10 days)	
19	Science of Energy – Teacher demonstration	Elementary Science of Energy
20	Science of Energy – Station investigations	
21	Science of Energy – Presentation Planning	
22	Science of Energy – Station Rotations	
23		
24		
25	Science of Energy – Energy Flows	

Following the above plan will enable your students to establish a good understanding of the nature of energy and energy transfers.

With respect to *4-PS3-4, Apply scientific ideas to design, test, and refine a device that converts energy from one form to another*, we recommend taking your students through activities from one or more of our energy source curriculum units. For example, *Wonders of Water*, *Wonders of Wind*, and *Wonders of the Sun* are all good choices that introduce and explore the very interesting, (as far as fourth graders are concerned), topics of renewable energy. Our intermediate-level wind curriculum, *Energy from the Wind*, has a set of activities about wind turbine blades that can very easily be adapted into an engineering and design challenge. The individual books for each energy source unit can be found by navigating to <http://www.need.org/curriculum> and then choosing the topic you're interested in from the left side menu bar or icons in the center of the page.

Keep in mind that *EnergyWorks*, *Elementary Science of Energy*, and many of our energy source curriculum guides also have associated kits containing much of what is needed to conduct all of the activities. Some things, such as a lamp, an apple, water, etc. will need to be provided by you but they are all things that are very easy to obtain. You can find purchasing information for our kits at <http://shop.need.org/>.

Energy House		█	█		○		○	█	█		█			█		○	█		○		○	█	█	○	█		●		█	█	○
Energy in the Balance		█	█					█	█		█			█			█				█	█		█					█	█	
Energy Jeopardy		█	█					█	█		█			█			█				█	█		█					█	█	
Energy Math Challenge		█	█					█	█		█			█			█				█	█		█					█	█	
Energy on Stage		█	█					█	█		█			█			█				█	█		█					█	█	
Energy Rock Performances		█	█					█	█		█			█			█				█	█		█					█	█	
Energy Stories and More	Stories	█	█					█	█		█			█			█				█	█		█				█	█		
	Activities	█	█					█	█		█			█			█				█	█		█				█	█		
EnergyWorks	Heat and Energy Informational Text and Modules	█	█		●		○	█	█	●	█	○	█	●		○	█	●		○	█	█	●	█		○		█	█	●	
	Light and Energy Informational Text and Modules	█	█		●		○	█	█	●	█	○	█	●		○	█	●	●	█	█	●	█		○		█	█	●		
	Motion and Energy Informational Text and Modules	█	█	●	●		○	█	█	●	█	○	█	●	●	█	█	●		○	█	█	●	█		○		█	█	●	
	Sound and Energy Informational Text and Module	█	█		●		○	█	█	●	█	○	█	●		○	█	●		○	█	█	●	█		○		█	█	●	
	Growth and Energy Informational Text and Module	█	█		○		○	█	█	●	█	○	█	●		○	█	●	●	█	█	●	█		○		█	█	●		
	Technology and Energy Informational Text and Activities	█	█		●		○	█	█	●	█	○	█	●		○	█	●	○	█	█	●	█		○		█	█	●		
Greek Mythology and the Forms of Energy		█	█					█	█		█			█			█				█	█		█				█	█		
Hybrid Buses	Informational Text	█	█		○		○	█	█	○	█	○	█		○	█	○		○	█	█	○	█		○		█	█	○		
	Activities	█	█		○		○	█	█	○	█	○	█		●	█	●		●	█	█	●	█		○		█	█	●		
Monitoring and Mentoring	Informational Text	█	█		○		○	█	█	○	█	○	█		○	█	○		○	█	█	○	█		○		█	█	○		
	Activities	█	█		●		○	█	█	●	█	○	█		●	█	●		●	█	█	●	█		○		█	█	●		

School Survey, Energy Plan and Monitoring			•		○			•		•	○					•		•			•		○				•
	Building Buddies		•		○			•		•	○					○		○			○		○		○		○
Mystery World Tour																											
NEED Songbook																											
Saving Energy at Home and School	Informational Text		○		○			○		○	○				○		○			○		○		○			○
	Activities		•		○			•		•	○				•		•			•		•		○			•
Talking Trash																											
This Mine of Mine																											
Today in Energy																											
Transportation Fuels Rock Performances																											
U.S. Energy Geography																											
Wonders of Magnets																											
Wonders of Oil and Gas	Informational Text		○		○			○		○	○				•		•			•		•		○			•
	Activities		•		•			•		•	○				•		•			•		•		•			•
Wonders of the Sun	Informational Text		○		○			○		○	○			○		•		•		•		•		○			•
	Activities		•		•			•		•	○			•		•		•		•		•		•			•
Wonders of Water	Informational Text		○		○			○		○	○				•		•			•		•		○			•
	Activities		•		•			•		•	○			•		•		•		•		•		•			•
Wonders of Wind	Informational Text		○		○			○		○	○				•		•			•		•		○			•
	Blade Investigations		•		•			•		•	○			•		•		•		•		•		○			•
	Activities		•		•			•		•	○			•		•		•		•		•		•			•
Yesterday in Energy																											