

PROJECT OVERVIEW

Name of Project:	What Powers Your World?	Duration:			
Subject/Course: 7 th Grade Science	Teacher(s): Brandy Butcher, Reid McGuire, Jeremy Newcomb, Jon Kimball, Adam Fisher	Grade Level: 7			
Other subject areas to be included, if any:	Math, Language Arts				
Project Idea Summary of the issue, challenge, investigation, scenario, or problem:	Given a scenario where fossil fuels are no longer a viable source of energy, students will be challenged to propose and defend a plan to build a renewable energy power plant or infrastructure for the Mid-Michigan area.				
Driving Question	Considering the current energy crisis for the world, how would you replace non-renewable energy resources with renewable resources of energy for Mid-Michigan?				
Content and Skills Standards to be addressed:	<ul style="list-style-type: none"> • E.E.S.07.41/ E.E.S.07.41 Human Activities • P.PM.07.21 ATOM • P.EN.07.61 NUCLEAR REACTIONS • N.FL.07.07 SOLVING PROBLEMS INVOLVING OPERATIONS AND ITERGERS • N.FL.07.08 ADD,SUBTRACT,MULTIPLY,AND DIVIDE POSITIVE AND NEGATIVE RATIONAL NUMBERS FLUETNLY • N.FL.07.09 ESTIMATE RESULTS OF COMPUTAITIONS WITH RATIONAL NUMBERS • W.GN.07.02 WRITE A RESEARCH REPORT USING A VARIETY OF RESOURCES • R.CM.07.04 APPLY SIGNIFICANT KNOWLEDGE FROM SCIENCE AND MATHEMATICS TEXTS 				
	T+A	E		T+A	E
21st Century Skills to be explicitly <i>taught and assessed</i> (T+A) or that will be <i>encouraged</i> (E) by project work, but not taught or assessed:	Collaboration	X	X	Other:	
	Presentation	X			
	Critical Thinking:	X	X		
Presentation Audience:					
Group:	The group will produce a “Glogster,” an online communication tool, to propose and defend			Class:	X

Culminating Products and Performances		the building of a renewable energy power plant or infrastructure of their choice in the Mid-Michigan area.	School:	
			Community:	
	Individual:	Students will work in groups of three: Each student will be responsible to research and complete the framework of research notes for every available renewable energy option listed. In addition, as individuals, students will be responsible for defined roles in creating and presenting their proposal for a renewable energy power plant or infrastructure.	Experts:	
			Web:	
			Other:	

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Entry event to launch inquiry, engage students:	<p>First day of this unit, students will run class absent electricity.</p> <p>Students will review the concept of non-renewable energy and renewable energy resources. Included in this review will be a collection of all of the products in our world are produced using fossil fuels as an energy resource.</p> <p>Given the knowledge that this challenge presupposes that we will be living in a world without fossil fuels as an energy resource, students will be asked to go home and estimate the amount of power that their homes use on a daily basis.</p>
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Assessments	Formative Assessments (During Project)	Quizzes/Tests		Practice Presentations	X
		Journal/Learning Log		Notes	X
		Preliminary Plans/Outlines/Prototypes	X	Checklists	X
		Rough Drafts	X	Concept Maps	
		Online Tests/Exams		Other:	
	Summative Assessments (End of Project)	Written Product(s), with rubric: _____		Other Product(s) or Performance(s), with rubric: _____ Glogster _____ _____	X
		Oral Presentation, with rubric	X	Peer Evaluation	X

		Multiple Choice/Short Answer Test		Self-Evaluation	X
		Essay Test		Other:	
Resources Needed	On-site people, facilities:	Principal, Media Center/Computer Lab			
	Equipment:	Computers w/internet access Virtual Field Trip Equipment			
	Materials:	Lab supplies Supplemental Handouts Books: Read aloud <u>Empty</u>			
	Community resources:	MSU, FRIB			
Reflection Methods	(Individual, Group, and/or Whole Class)	Journal/Learning Log		Focus Group	
		Whole-Class Discussion	X	Fishbowl Discussion	X
		Survey	X	Other:	

PROJECT TEACHING AND LEARNING GUIDE

Project:	Course/Semester:
Knowledge and Skills Needed by Students to successfully complete culminating products and performances, and do well on summative assessments	Scaffolding / Materials / Lessons to be Provided by the project teacher, other teachers, experts, mentors, community members
Content knowledge about the atom and nuclear reactions	→ direct instruction atom...review nuclear reaction...domino lab
Content knowledge about non-renewable and renewable energy resources	→ Website resources: delicious bookmarks/ diigo posts
Content knowledge about environmental impacts of human activities	→ Website resources: You tube... “The Story of Stuff” PPT...Nuclear Accidents
How to collaborate with team members How to effectively communicate to a specific audience	→ “Clutch” “Slap the Coach” Team/group roles contract Teampedia.net
Operations with rational numbers	→ Direct instruction
Read grade level informational text with comprehension	→ Scaffold access to information with “diigo.” Self –comprehension questions with “Quiblo.”
Use a variety of information to look up info Use digital resources to collaborate w/ peers Experts and other audiences Create an original project using a variety of media to present content information to an audience	→ Computer lab/ direct instruction Exploration/ prior practice

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P R O J E C T C A L E N D A R

Project: What Powers Your World?

Start Date: Jan. 2nd , 2012

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

P R O J E C T W E E K O N E

<p>Entry Event: Teach class with no electricity</p> <p>Review Concept of energy</p> <p>KWL about energy</p> <p>Review different forms of energy</p>	<p>Ppt about everything we use that is plugged in</p> <p>Review of Renewable and nonrenewable sources of energy</p> <p>Forms of Energy Exit Slip</p>	<p>Mr. Kimball: Research Lesson</p> <ul style="list-style-type: none"> • Internet Sources • Citations • Set up Live Binders <p>Computer Lab</p>	<p>Introduce Project Part 1: Comparing different energy resources to each other</p> <p>Focus on Nuclear Energy</p> <p>Set up Live Binders</p> <p>Computer Lab</p>	<p>Continue Project Part 1: Comparing different energy resources to each other</p> <p>Complete Comparison Tab in Live Binder</p> <p>Nuclear Reactions Exit Slip</p> <p>Computer Lab</p>
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P R O J E C T W E E K T W O

<p>Continue Project Part 1: Comparing different energy resources to each other</p> <p>Complete Comparison Tab in Live Binder</p> <p>Computer Lab</p>	<p>Virtual Field Trip: Green Energy</p>	<p>Introduce Project Part 2: Choose and Design</p> <p>Mr. McGuire: Budget Vocabulary & Lesson</p> <p>Percents review</p> <p>Scientific Notation?</p> <p>Data Tables</p> <p>Online Resource for this?</p>	<p>Continue Part 2: Choose and Design</p> <p>Research options and cost</p> <p>Complete section in Live Binder for Budget & Design</p> <p>Computer Lab</p>	<p>Continue Part 2: Choose and Design</p> <p>Research options and cost</p> <p>Complete section in Live Binder for Budget & Design</p> <p>Computer Lab</p>
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P R O J E C T W E E K T H R E E

<p>Continue Part 2: Choose and Design</p> <p>Research options and cost</p> <p>Complete section in Live Binder for Budget & Design</p> <p>Computer Lab</p>	<p>Introduce Project Part 3: Create a Glog and Present Your Idea</p> <p>Set up Glog and introduce Glog features</p> <p>Go over Glog Rubric</p> <p>Work on Glog</p> <p>Computer Lab</p>	<p>Continue Project Part 3: Work on Glog</p> <p>Computer Lab</p>	<p>Continue Project Part 3: Work on Glog</p> <p>Computer Lab</p>	<p>Continue Project Part 3: Work on Glog</p> <p>Computer Lab</p>
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PROJECT WEEK FOUR

<p>Lesson on presentation skills (Kimball?)</p> <p>Practice Presentations with Partner Groups & Flip Cameras</p> <p>Feedback checklist</p>	<p>Class Presentations</p> <p>Guest Audience: Mr. Pridegon, MSU Scientist?, Mr. McGuire, Mr. Kimball</p>	<p>Class Presentations</p> <p>Guest Audience: Mr. Pridegon, MSU Scientist?, Mr. McGuire, Mr. Kimball</p>	<p>Class Presentations</p> <p>Guest Audience: Mr. Pridegon, MSU Scientist?, Mr. McGuire, Mr. Kimball</p>	
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Universal Design for Learning Identifying Barriers and Solutions

Lesson Name: What Powers Your World? Project-based Learning Unit

Method(s)	Barriers in Traditional Lesson	UDL Solution
Notetaking of class discussions and KWL charts	Students have difficulty writing notes while maintaining attention on material. Students write slowly and fall behind in material when note-taking.	<p>Class set of notes and charts of information available for students who did not complete notes in class.</p> <p>UDL is all about How about an alternative for the note-taking? Perhaps adding supplemental or alternative forms of these notes would allow certain types of learners the opportunity to catch up on the content without having to take notes. This could be videos on YouTube for viewing at home, or perhaps there could be an audio recording of your lecture?</p>
Complete Exit Slip about forms of energy at end of class	Students may have difficulty explaining ideas in writing.	<p>Students may write, draw, or orally tell their ideas.</p> <p>I really like this one. This has the UDL principles in mind, and is relevant, valid, and helpful. The only suggestion I can think of would be to add something like an option that is more electronic media related.</p>
Compare/Contrast different energy resources	Students may have difficulty identifying similarities or differences in ideas. Students may have difficulty knowing what parts of the text and lecture to focus on for comparison.	<p>- Students will use graphic organizer that will direct them on where to focus for similarities and differences.</p> <p>- Students can discuss with table partners before putting ideas into compare/contrast graphic organizer.</p> <p>This is great because it provides students with a little voice and choice. Very PBL/UDL minded.</p>
Assessment(s)		

<p>Presentation of learning to class</p>	<p>Students may be uncomfortable presenting in front of a large group. Students may not be interested enough in energy resources to study different ones.</p>	<ul style="list-style-type: none"> - Students will have choice of what energy resources they focus on. - Students will have team to share presentation responsibilities. - Students will be able to video record much of their presentation to alleviate stress of presenting. - Glogs allow for writing, images, charts, and video as a means of communicating learning. <p>I love the UDL principles you added to this one. Adding options, technology, and media are likely to help break down learning barriers.</p>
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PBL Content Knowledge Rubric

Rubric for Content Knowledge and Understanding : Glog Presentation			
Criteria	Developing <i>(does not meet performance standards)</i>	Proficient <i>(meets performance standards)</i>	Advanced <i>(exceeds performance standards)</i>
Completeness and Accuracy of Required Information <ul style="list-style-type: none"> Renewable energy resource of choice is defined Comparison of different renewable energy resources Advantages & disadvantages of each type of renewable energy resources Budget for renewable energy resource is provided 	<p>One or more of required information are omitted.</p> <p>Significant information is incorrect; key terms are used inappropriately, and/or important details are missing.</p>	<p>All required information is included.</p> <p>Most significant information is correct, although there are some minor errors or missing details.</p>	<p>All required information is included.</p> <p>All information is correct and discussed in detail.</p>
Understanding of Concepts: <ul style="list-style-type: none"> Explains the importance of finding a renewable energy resource Explains why renewable resource of choice is best for Lansing, Michigan. 	<p>Explanation is not complete, clear, accurate and/or detailed.</p>	<p>Explanation is generally complete, clear, accurate and detailed.</p>	<p>Explanation is complete, clear, accurate, and detailed.</p> <p>Explanation shows sophisticated understanding (ex. Use of analogies, examples, complex vocabulary)</p>