**Green Energy: Creating Connections with Multimedia**

<http://goo.gl/oiQvI>

**Welcome and Introductions**

* Resources from [KQED](http://www.kqed.org/education) and [QUEST](http://science.kqed.org/quest/)

**Using Multimedia in the Classroom**

* [Why Use Multimedia in Science Education](http://science.kqed.org/quest/files/downloads/2011/06/QUESTWhyMedia.pdf)
* [How to Use Media Effectively for Teaching and Learning](http://science.kqed.org/quest/files/downloads/2011/06/QUESTMediaTips.pdf)

**Using Multimedia for Real-world Connections**

* [Energy Sources](http://ca.pbslearningmedia.org/resource/kqedcl11.sci.ess.energysources/energy-sources/) video (from [Clue into Climate](http://www.kqed.org/education/educators/clue-into-climate/))
	+ [Energy Sources diagram](http://d43fweuh3sg51.cloudfront.net/media/media_files/energy_sources.pdf) - can have students graph, also research and compare use from past years’ data or other countries
	+ [Background article](http://d43fweuh3sg51.cloudfront.net/media/media_files/strand-4-background-article.pdf)
* [Airborne Wind Energy](http://science.kqed.org/quest/video/airborne-wind-energy/)
	+ How a turbine works (1:05-1:58)
	+ Viewing activity: First, discuss (or brainstorm and list) why wind as an energy source can be tricky. Then watch to 2:32 (or further along in the piece) for some answers. Have students take notes as they watch.
	+ Viewing activity: Without sound, watch 2:32-4:19 and have students write down questions as they watch. Try to figure out what the people in the video are working on and why. Then watch with sound to 6:30 for answers.
	+ Discuss the feasibility of using and airborne wind turbines as an alternate source of energy.
	+ [Lesson plan for designing a windmill on PBSLM](http://ca.pbslearningmedia.org/resource/phy03.sci.engin.systems.lp_renew/capturing-renewable-energy/)
* [What’s Next for Nuclear?](http://education.kqed.org/edspace/2012/12/11/do-now-53-cap-and-trade-for-carbon/) – focus questions (assign 1-2 to each student)
	+ What percentage of Northern CA’s electricity do Diablo Canyon Nuclear Power Plant’s reactors produce? *16% (enough to power about 2 million homes)*
	+ How long has it been since new nuclear power plants have been constructed in the U.S.? *more than 30 years*
	+ What does Ralph Cavanaugh think are better options than nuclear energy? *natural gas technologies, energy efficiency and renewable energy*
	+ Nuclear energy provides what percent of U.S. electricity? *20%*
	+ Why can’t nuclear plants be built in CA? *a moratorium from 1976, and until there is a permanent site to dispose of nuclear waste*
	+ What is the goal of all power plants, including nuclear? *to produce heat and turn water into steam to turn turbines*
	+ How much energy comes from a nuclear reaction compared to chemical reaction? *1 million times more*
	+ What are the challenges of nuclear energy? *the possibility of radioactive material being released*
	+ What have been the effects of the Chernobyl accident in 1986? *28 workers died from radiation exposure, increase risk of thyroid cancer and other diseases in children and teens, increased risk of leukemia for those that participated in cleanup*
	+ What may prevent the effects of radiation exposure? *potassium iodide*
	+ What’s different about the new reactor being worked on by a team at UC Berkeley? *water is removed as the coolant and replaced by fluoride salts, use pebbles that move instead of rods*
* [Do Now - Nuclear Energy](http://education.kqed.org/edspace/2012/10/10/do-now-43-nuclear-energy/) and [Do Now - Cap-and-Trade for Carbon](http://education.kqed.org/edspace/2012/12/11/do-now-53-cap-and-trade-for-carbon/)
	+ students use Twitter or can comment in the comment box
* [Biofuels: Beyond Ethanol](http://science.kqed.org/quest/video/biofuels-beyond-ethanol/)
	+ On a sheet of paper, create 2 columns. While watching the video (1:05 -7:00) list the pros of new biofuels in one column and the cons or challenges in the other
	+ [Educator Guide](http://science.kqed.org/quest/files/imp/202b_BiofuelsBeyondEthanol.pdf)
* [With Large Oil Reserves, California Faces Fracking Debate](http://science.kqed.org/quest/audio/with-large-oil-reserve-california-faces-fracking-debate/)
	+ Can watch this [Fracking](http://ca.pbslearningmedia.org/resource/envh10.sci.phys.energy.fracking/fracking/) video to :50 for an explanation of fracking.
	+ Students list pros/cons of fracking while watching [With Large Oil Reserves, California Faces Fracking Debate](http://science.kqed.org/quest/audio/with-large-oil-reserve-california-faces-fracking-debate/)

**The** [**QUEST Website**](http://science.kqed.org/quest/)

* [“](http://science.kqed.org/quest/education/curriculum/energy/)[E](http://www.google.com/url?q=http%3A%2F%2Fscience.kqed.org%2Fquest%2Feducation%2Fcurriculum%2Fenergy%2F&sa=D&sntz=1&usg=AFQjCNEZrSTKmNykU-ANqJKhCez9SU20Ig)[nergy](http://science.kqed.org/quest/education/curriculum/energy/)[”](http://www.google.com/url?q=http%3A%2F%2Fscience.kqed.org%2Fquest%2Feducation%2Fcurriculum%2Fenergy%2F&sa=D&sntz=1&usg=AFQjCNEZrSTKmNykU-ANqJKhCez9SU20Ig) [Science Education Collection](http://science.kqed.org/quest/education/curriculum/energy/)
* [Education worksheets](http://science.kqed.org/quest/education/curriculum/) and [media-making toolkit](http://science.kqed.org/quest/education/media-making-toolkit/)
* [Multimedia Analysis](http://science.kqed.org/quest/files/downloads/2011/06/QUESTMediaAnalysis.pdf) - especially good for controversial issues

**Coming in the Fall from KQED: e-book and iTunes U course on alternative energy**

* Will likely include career-profile videos
* New video and audio pieces, plus explainers

**More Resources**

* [**Clue into Climate - Renewable Energy**](http://www.kqed.org/education/educators/clue-into-climate/renewable-energy.jsp) (lots of GREAT media here!)
* [**Energy Resources on PBS LearningMedia**](http://ca.pbslearningmedia.org/search/?q=renewable%20energy&selected_facets=grades_exact%3A11&display=renewable%20energy)