Activities

Two tables on this page:

1. Activities that are tested by Lifelines high school teachers.
2. Activities under consideration for use in high school climate change education .

[To add activities, in edit mode, use "Insert row" in the "Table" menu]

Table 1: Lifelines Teacher-Tested Activities

Activity Name with link.	**Comments** give date, your name, description, value of resource or how you used it in a course. If it's in the Climate Literacy and Energy Awareness Network (CLEAN) collection, give that link as well.	**Reviewed in CLEAN network?** If yes, include link
Earth Exploration Toolbook	2011 Mar 8; Cris DeWolf: I have participated in these, and they are very good. This site offers a series of lessons that incorporate a variety of software tools that allow the user to work with real data. Periodic workshops, delivered remotely via telephone and website, are also offered, to train teachers in the use of the lessons. Lessons include 9 that involve climate and climate change topics. Last week I had many of my PLC members join me to do one of the workshops and are currently engaged in an ongoing discussion about the experience on our wiki.	**Yes** - Various activities
Global Systems Science (GSS) Investigations	2011 Aug 20; Alan Gould: Lots of good investigations in the GSS Climate Change book. Other books highly relevant to climate change as well.	No
GLOBE Student Climate Research Campaign	2012 May 1; Bydlowski: **http://globe.gov/scrc**	
The Nature Conservancy Climate Wizard	2011 March 27; Goodman: allows you to visualize various emissions scenarios and climate models for any country or the world. A map-based tool that allows users to access historical data and also visualize model predictions for future climate change.	No
Solar Constant Lab	2011 May 10; Gary Bent: This is a solar constant lab that enables students to measure the solar constant using simple equipment and also estimate the temperature at the surface of the sun. There are also are teacher notes on the mathematics used to get some of the equations in the lab. A prelab that can be used with the solar constant lab is the light intensity lab which is also uploaded. They are posted as **attachments on the main Resource page**.	
Wedges activity: **Climate Wedges** Princeton	2011 Mar 13; Emily Sherman: A climate mitigation/stabilization group exercise for students. I have used this in class and it is a great way to close the unit with a solutions-based approach. The carbon capture options will require some additional teacher explanations. Goodman: I also have used this resource. Nice activity, best for AP or honors (in my school, at least)	**Yes**
Alliance for Climate Education	May 2011; Fran Hess: Mission is to educate high school students on the science behind climate change and inspire them to take action to curb the causes of global warming. Goals include:	No

	- to educate high school students about climate change using free multimedia assemblies - encourage student activism through school and community projects - many suggested student activities -student and teacher resources - grant and scholarship opportunities	
Learn More About Climate	2011 July; Stephanie Chasteen: Has reviewed lesson plans specific to Colorado and the American West including "Zoo Poo," "Evidence for Climate Change," "What Makes you Hot", and "Pine Bark Beetle." THe "Evidence" lesson can be a useful template for using local or state specific data with students.	Yes - "Pine Bark Beetles" activity

Table 2: Activities Untested by Lifelines Teachers

Activity Name with link	**Comments** give date, your name, description, value of resource or how you used it in a course. If it's in the Climate Literacy and Energy Awareness Network (CLEAN) collection, give that link as well.	**Reviewed in CLEAN network?** If yes, include link
CAMEL (Climate, Adaptation, Mitigation, E-Learning)	2012 April; Gould: CAMEL is a free, comprehensive, interdisciplinary, multimedia resource for educators, providing over 200 interdisciplinary topic areas and numerous resource types to give the educator the tools they need to teach about climate change-- causes, consequences, solutions and actions.	
Climate Literacy and Energy Awareness Network (CLEAN) - http://cleanet.org/ Climate Literacy Network (CLN) - http://cleanet.org/cln/ has weekly telecons for individuals, projects, and organizations working to promote climate literacy.	2011 Feb 20; Gould: CLEAN has reviewed collection of educational resources aimed at building students' understanding of core ideas in climate and energy science. E.g. activities on sea ice... • Whither Arctic Sea Ice? from Earth Exploration Toolbook: students examine an animation that shows 30 years of satellite images to see how the extent of sea ice in the Arctic has diminished over time. • Melting Sea Ice - a mix of multimedia resources and hands-on activities to support a storyline of investigation into melting sea ice. • Graphing the Extent of Sea Ice in the Arctic and Antarctic - Students learn about sea ice extent in both polar regions (Arctic and Antarctic). • March of the Polar Bears - Students use NASA satellite data to study changes in temperature and snow-ice coverage in the South Beaufort Sea, Alaska, correlate with USGS ground tracking of polar bears, and relate this to global change, sea ice changes, and polar bear migration and survival. • Understanding Albedo - teaches students about the albedo of surfaces and how it relates to the ice-albedo feedback effect.	
Carbon Calculators	• EPA's Global Warming Wheel Card is a hand-held tool that you can use to estimate your household's emissions of carbon dioxide and learn how you can reduce them. http://www.epa.gov/climatechange/emissions/wheel_card.html • EPA: Greenhouse Gas Equivalencies Calculator - http://www.epa.gov/cleanenergy/energy-resources/calculator.html • EPA: Household Emissions Calculator - http://www.epa.gov/climatechange/emissions/ind_calculator.html • http://www.ei.lehigh.edu/learners/cc/carboncalc.html Instructional support at: http://www.ei.lehigh.edu/eli/cc/sequence/day16.html • Comparing Carbon Calculators, intended to help measure energy footprints, can produce wildly different results. Students compare different calculators to determine which ones are the most accurate, relevant, and/or transparent. • International Student Carbon Footprint Challenge (Stanford University) - http://footprint.stanford.edu/ • Squidoo—About 80 different calculators: http://www.squidoo.com/carboncalcs • WattsOn - http://www.wattzon.com/ • What's your favorite carbon calculator? (7 carbon calculators reviewed by Kristen Poppleton of the Will Steger Foundation - http://www.willstegerfoundation.org/climate-lessons-blog/item/1175-carbon-calculators-reviewed • Calculators specifically for lights: ○ EPA calculator for lights - http://www.epa.gov/climatechange/students/calc/index.html#calc-lights	No

	○ Change a light N. C. – http://www.changealightnc.org/more.html – see "CFL Savings Calculator" in the "Save Money" section ○ Light Bulb Finder App – http://appsfortheenvironment.challenge.gov/submissions/4571-light-bulb-finder	
Clean Energy Curriculum from Colorado State University (CSU)	2013 July; Gould: The scientific, mathematical, and engineering content connections related to the Clean Energy Technologies of Wind, Solar, and Fuel Cell Technologies. – http://www.engr.colostate.edu/~mdemira/curriculum.php	
Experience-based Environmental Projects	2011 Apr 9; Gould: learning through one's own lifestyle and actions.	No
"Fueling the Car of Tomorrow"	2010 Dec; Gould: hands-on activities in engineering, chemistry, and biology intended to teach high school students about the future of the automobile through the eyes of scientists and engineers. Laboratory experiments, computer simulations, and group research projects.	No
The Habitable Planet: A Systems Approach to Environmental Science	produced by the Annenberg Learner – http://www.learner.org/courses/envsci/	
Lehigh University – Environmental Literacy and Inquiry – Climate Change	2011 May; Gould: Climate Change Curriculum; here are some of the units: Weather and Climate with Google Earth (use Google Earth to explore global temperature changes). Atmospheric Gases (explore compounds and elements that make up the Earth's atmosphere). Greenhouse Effect Lab (understand the importance of greenhouse gases in our atmosphere and that excess CO2 intensifies the greenhouse effect). Paleoclimate Reconstruction Lab (students reconstruct past climates using lake varves as a proxy). Carbon Calculator Activity (students use Web-based carbon calculator to determine carbon footprint). Investigating Climate Hot Spots with Google Earth (students use Google Earth to investigate areas affected by climate change). Investigating Future Worlds with Google Earth (Part 1; students use Google Earth to explore evidence of climate change during 1980 – 2010, changes in the extent of Arctic Sea ice. Investigating Future Worlds with Google Earth (Part 2; use Google Earth version 5.2; students use Google Earth to explore the effects of a 2 meter rise in sea level on the existing landscape).	Yes – "What Does Carbon Dioxide Have to do with Global Warming Video" only
NASA Resources	• NASA Innovations in Climate Education (NICE) Resources for Teachers – https://nice.larc.nasa.gov/node/19 • http://climate.nasa.gov/ – NASA Climate Change website. ○ "Tips 'n' Tricks for Teachers: 6 ways to use NASA's Global Climate Change Website in your classroom" http://climate.nasa.gov/TipsandTricks/index.cfm ○ Climate Quizzes – What's your CQ? (Climate IQ) – http://climate.nasa.gov/quizzes/index.cfm • My NASA Data – https://mynasadata.larc.nasa.gov ○ Think GREEN – Utilizing Renewable Solar Energy – Through this lesson plan, students utilize satellite data to determine greatest renewable energy potentials in any given region. This process allows students to develop skills in graphing and reading graphs. • http://spacemath.gsfc.nasa.gov/ – SpaceMath @ NASA. Math problems, e.g. Problem 397: The Changing Pace of Global Warming in which students forecast temperature change to 2050 with linear extrapolation or quadratic extrapolation using a table of global temperature anomalies.	No
National Energy Education Development (NEED) Project	2011 Nov; Gould: Many activities on energy at a variety of grade levels. I tried the Transportation Fuels Debate activity and found it engaging.	Yes – Various activities
Teachers' Domain, Climate Literacy collection	2010 Nov; Gould: media resources (videos and Flash interactives, with background essays and teaching tips) from Wisconsin Educational Communications Board, ThinkTV Dayton, and WGBH Boston, funded as a part of a CPB STEM media initiative.	Yes – Various activites
USGS	Earth Explorer http://earthexplorer.usgs.gov/	No

USGS	• Earth Explorer **http://earthexplorer.usgs.gov/** • Global Visualization Viewer **http://glovis.usgs.gov/**	No
Windows to the Universe – Climate Activities – also... **Our Changing Planet**	2011 Apr 9; Gould: Many activities, simple and clear writeups, standards-aligned. **Example**: CO_2-How Much Do You Spew? Students analyze the energy consumption of a hypothetical household to determine the amount of carbon dioxide they are adding to the atmosphere each year. Our Changing Planet: Video clips and related classroom activities.	**Yes** – Various activities
Wisconsin Cooperative Inst for Meteorological Satellite Studies (CIMSS) Weather & Climate Applets	2011 Apr 29; Gould • CIMSS Global & Regional Climate Change Course **http://cimss.ssec.wisc.edu/climatechange/** • Global and Regional Climate Change professional development course for middle and high school science teachers from University of Wisconsin-Madison: **Lesson plans** --||-- **Resources**	Yes – "Probabilities, Uncertainties and Units Used to Quantify Climate Change" activity only