

Climate and Energy Resources for Teachers

SUCCEED Program Funders

- Center for Climate and Energy Decision Making <http://cedmcenter.org/>
 - SUCCEED Program <http://cedmcenter.org/succeed-program/>
 - Build your own power plant tool <http://cedmcenter.org/tools-for-cedm/informing-the-public-about-low-carbon-technologies/>
 - Research Tools <http://cedmcenter.org/tools-for-cedm/>
 - Additional Resources <http://cedmcenter.org/additional-resources/>
- Leonard Gelfand Center for Service Learning and Outreach - <http://www.cmu.edu/gelfand/>
 - K-12 summer schools
 - Educational Material / Curricula
 - Professional Development Programs

Carbon Footprint

- Quantifying the global and distributional aspects of American household carbon footprint | Weber & Matthews <http://www.ce.cmu.edu/~hsm/sust2008/readings/Weber-households-08.pdf>
- How big is your Ecological Footprint? | Ecological Footprint <http://myfootprint.org/>
- Carbon Emissions Calculator | Lehigh University <http://www.ei.lehigh.edu/learners/cc/carboncalc.html>
- Carbon Footprint and LCA | Empreinte Carbone Quebec http://www.empreintecarbonequebec.org/en/empreinte_carbone_acv.php
- Ecological Footprint Quiz | Center for Sustainable Economy <http://myfootprint.org/en/>
- Ecological Footprint Quiz | Earth Day Network <http://www.earthday.org/footprint-calculator>
- Kids Carbon Footprint Calculator | Cool the World <http://www.cooltheworld.com/kidscarboncalculator.php>

Climate & Severe Weather Events

- Education Resources | National Oceanic and Atmospheric Administration (NOAA) <http://www.education.noaa.gov/>
- Teacher Resources | Commonwealth Scientific and Industrial Research Organization (CSIRO) <http://www.csiro.au/Portals/Education/Teachers.aspx>
- Classroom Resources | National Science Foundation (NSF) <http://www.nsf.gov/news/classroom/>
- Students for the Environment | EPA <http://www.epa.gov/students/index.html>
- Teacher Resources | National Aeronautics and Space Administration (NASA) <http://www.nasa.gov/audience/foreducators/index.html#.UgPyvZLVBsk>



Center for Climate and Energy Decision Making



- What is Climate? | The National Center for Atmospheric Research (NCAR)
<http://eo.ucar.edu/kids/green/what1.htm>
- Fifth Assessment Report (AR5) | Intergovernmental Panel on Climate Change (IPCC)
<http://www.ipcc.ch/>
- Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation || Intergovernmental Panel on Climate Change (IPCC)
http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#SREX
- National Climate Assessment | US Global Change Research Program
<http://www.globalchange.gov/what-we-do/assessment>
- NatCatService | Munich Reinsurance <http://www.munichre.com/en/reinsurance/business/non-life/georisks/natcatservice/default.aspx>
- Climate Change 101 | The Center for Climate and Energy Solutions (C2ES)
<http://www.c2es.org/docUploads/climate101-overview.pdf>

Energy

- Reports on Special Issues | International Risk Governance Council (IRGC)
<http://www.irgc.org/publications/reports-on-special-issues/>
- Power Your City | CityVille http://cityville.wikia.com/wiki/Power_Your_City
- Power Plants in the US | Energy Information Administration (EIA) <http://www.eia.gov/state/>
- Energy Kids | Energy Information Administration (EIA) <http://www.eia.gov/kids/>
- Educational Activities Section Outreach Committee | Institute of Electrical and Electronics Engineers (IEEE)
http://www.ieee.org/education_careers/education/eab/section_outreach_committee.html
- Batteries | Department of Energy (DOE) <http://energy.gov/articles/building-better-battery-vehicles-and-grid>
- Batteries: Electricity through chemical reactions | UC Davis.
http://chemwiki.ucdavis.edu/Analytical_Chemistry/Electrochemistry/Voltaic_Cells/Batteries:_Electricity_through_chemical_reactions
- Electric Power | Georgia State University <http://hyperphysics.phy-astr.gsu.edu/hbase/electric/elepow.html>
- Electrified Vehicles | Carnegie Mellon University http://www.cmu.edu/cit/veg/electrified_vehicles/index.html
- How do batteries work? | Northwestern University
<http://www.qrg.northwestern.edu/projects/vss/docs/power/2-how-do-batteries-work.html>
- Ask An Engineer – How does a battery work? | Massachusetts Institute of Technology
<http://engineering.mit.edu/live/news/2037-how-does-a-battery-work>
- Energy Storage – Batteries | National Renewable Energy Laboratory (NREL)
<http://www.nrel.gov/vehiclesandfuels/energystorage/batteries.html>
- Vehicle Technologies Office | Department of Energy
http://www1.eere.energy.gov/vehiclesandfuels/technologies/energy_storage/



- Home Energy Audits: Making Homes More Energy Efficient and Comfortable | Department of Energy (DOE). <http://energy.gov/articles/home-energy-audits-making-homes-more-energy-efficient-and-comfortable>
- Physics 101 – what is the difference between power and energy? | Solar Choice <http://www.solarchoice.net.au/blog/power-and-energy/>
- Base concepts of methane and other hydrocarbons | Youtube <http://www.youtube.com/watch?v=UY8DAIHkkw8>
- How natural gas is extracted from shale | Youtube http://www.youtube.com/watch?v=WF3_gFTCN7A
- Marcellus Shale Gas Play, Appalachian Basin | US Energy Information Administration (EIA) http://www.eia.gov/oil_gas/rpd/shaleusa5.pdf
- Natural Gas | US Environmental Protection Agency (EPA) <http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html>
- Review of Emerging Resources: US Shale Gas and Shale Oil Plays | US Energy Information Administration (EIA) <http://www.eia.gov/analysis/studies/usshalegas/>
- Study of Hydraulic Fracturing and Its Potential Impact on Drinking Water Resources | US Environmental Protection Agency <http://www2.epa.gov/hfstudy>
- Office of Nuclear Energy | Department of Energy (DOE) <http://energy.gov/ne/office-nuclear-energy>
- How Does Nuclear Energy Work? | Emirates Nuclear Energy Corporation (ENEC) <http://www.enec.gov.ae/learn-about-nuclear-energy/how-does-nuclear-energy-work/>
- Open Educational Resources | Organisation for Economic Co-operation and Development <http://www.oecd.org/edu/cei/38654317.pdf>
- Teachers' Lesson Plans | United States Nuclear Regulatory Commission (NRC) <http://www.nrc.gov/reading-rm/basic-ref/teachers.html>
- How much electricity does an American home use? | U.S. Energy Information Administration <http://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3>
- How Do Wind Turbines Work? | Department of Energy: Energy Efficiency and Renewable Energy (DOE EERE) https://www1.eere.energy.gov/wind/wind_how.html
- Ocean Wave Energy | Bureau of Ocean Energy Management <http://www.boem.gov/Renewable-Energy-Program/Renewable-Energy-Guide/Ocean-Wave-Energy.aspx>
- Managing Variable Energy Resources to Increase | Carnegie Mellon University <http://www.cmu.edu/energy/public-policy/renewable-energy-guide.pdf>
- Hydroelectricity | US Environmental Protection Agency <http://www.epa.gov/cleanenergy/energy-and-you/affect/hydro.html>
- Renewable Energy | Environmental Protection Agency <http://www.epa.gov/statelocalclimate/state/topics/renewable.html>
- About Solar Energy | Mass.Gov Energy and Environmental Affairs <http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/solar/about-solar-energy.html>
- References for Kids | National Resources Defense Council (NRDC) <http://www.nrdc.org/reference/kids.asp>
- Practitioner Resources | National Resources Defense Council (NRDC) <http://www.nrdc.org.uk/content.asp?CategoryID=502>



- Learning - Biomass Energy | National Renewable Energy Laboratory (NREL)
http://www.nrel.gov/learning/re_biomass.html
- Learning – Geothermal Energy | National Renewable Energy Laboratory (NREL)
http://www.nrel.gov/learning/re_geothermal.html
- Renewable Energy Activities - Choices for Tomorrow | National Renewable Energy Laboratory (NREL) <http://www.nrel.gov/docs/gen/fy01/30927.pdf>
- Confronting Climate Change | Union of Concerned Scientists
http://www.ucsusa.org/assets/documents/global_warming/UCS_gulf_curriculum.pdf
- How Do Wind Turbines Work? | Department of Energy: Energy Efficiency and Renewable Energy (DOE EERE) https://www1.eere.energy.gov/wind/wind_how.html

Life Cycle Analysis

- Life Cycle Assessment (LCA) | US Environmental Protection Agency
<http://www.epa.gov/nrmrl/std/lca/lca.html>
- Life Cycle Assessment Harmonization | National Renewable Energy Laboratory.
http://www.nrel.gov/analysis/sustain_lcah.html
- MSU Life Cycle Analysis Powerpoint | Susan Selke
<http://www.ftc.gov/bcp/workshops/packaging/presentations/selke.pdf>
- The Life Cycle of a CD or DVD | US Environmental Protection Agency.
<http://www.epa.gov/osw/education/pdfs/finalposter.pdf>
- Life Cycle Assessment | Quantis: Sustainability Counts http://www.quantis-intl.com/life_cycle_assessment.php
- Life Cycle Analysis of Cotton | Cotton Natural. <http://cottontoday.cottoninc.com/sustainability-about/LCI-LCA-Cotton-Fiber-Fabric/>
- The Benefits of Life Cycle Analysis | Elisabeth Comere
<http://www.environmentalleader.com/2012/03/21/the-benefits-of-life-cycle-analysis/>
- Life Cycle of a Jean | Levi Strauss. <http://www.levistrauss.com/sustainability/product/life-cycle-jean>
- How a toaster works | Youtube http://www.youtube.com/watch?v=WYcw_DcZsak
- How a hair dryer is made | Youtube <http://www.youtube.com/watch?v=LeRa7WfMETU>
- How a remote control is made | Youtube <http://www.youtube.com/watch?v=cSaGifj9sF0>
- How a book is made | Youtube <http://www.youtube.com/watch?v=mfcEFEaxaLs>
- How a kindle is made | Youtube http://www.youtube.com/storyofstuffproject#p/u/3/sW_7i6T_H78

Blogs, Opinion Pieces, Less Reputable Stuff That May Still Be Useful

- 101 Top Web Resources on Climate Change | Environmental Science Degree
<http://www.environmentalsciencedegree.com/climate-change/>
- 101 Terrific Sites on Renewable Energy | Environmental Science Degree
<http://www.environmentalsciencedegree.com/terrific-renewable-energy/>



Center for Climate and Energy Decision Making



- News and Analysis on Energy Policy, Renewables, Innovation, & Climate Change | The Energy Collective <http://theenergycollective.com/>

Select Workshops / Summer Programs for Students

- @ Carnegie Mellon University
 - SUCCEED <http://cedmcenter.org/succeed-program/>
 - Leonard Gelfand Center for Service Learning and Outreach <http://www.cmu.edu/gelfand/k12-students-parents/programs.html>
 - ACE Mentor Program - <http://acementor.org/>
 - SEE – <http://www.ices.cmu.edu/see/>
 - C-Mites - <http://www.cmu.edu/cmities/>
 - Creative Technology Nights for Girls <http://women.cs.cmu.edu/technights/>
 - PROGRESS <http://www.heinz.cmu.edu/PROGRESS/>
 - Robotics Academy <http://www.education.rec.ri.cmu.edu/>
 - Summer Academy for Mathematics and Science (SAMS) <http://www.cmu.edu/enrollment/summerprogramsfordiversity/sams.html>
 - Andrew's Leap <http://www.cs.cmu.edu/~leap/>
 - Green Design Apprenticeship <http://www.ce.cmu.edu/GreenDesign/education/primary-public.html>
- @ Carlow University
 - ECO (Environmental Career Opportunities) Camp <http://www.carlow.edu/administration/community/women/eco/index.html>
 - Summer Science Nation <http://www.carlow.edu/administration/community/women/ssn/index.html>
 - Prepare to Care <http://www.carlow.edu/administration/community/women/p2c/index.html>
- @ Carnegie Science Center
 - All Programs <http://www.carnegiesciencecenter.org/programs/>
 - Girls, Math & Science Partnership.
 - Brain Cake: <http://www.braincake.org/default.aspx>
 - Tour Your Future <http://www.braincake.org/touryourfuture/>
 - Carnegie Science Awards <http://www.carnegiesciencecenter.org/default.aspx?pageId=363>
- @ Magee-Womens Research Institute
 - Summer Internship Program for High School Students <http://mwrif.org/29/high-school-interns>
 - Girls Adventures in Mathematics, Engineering, and Science <http://engineering.illinois.edu/wie/games/>
- @ Robert Morris University
 - STEM Outreach <http://www.rmu.edu/web/cms/academics/sems/outreach/Pages/default.aspx>
- @ University of Pittsburgh
 - Pitt Science Outreach <http://www.pittscienceoutreach.com/>
 - Pitt Engineering Career Access Program (PECAP) <http://www.engineering.pitt.edu/PECAP/>
 - Pittsburgh Tissue Engineering Initiative (PTEI) <http://www.ptei.org/interior.php?pageID=48>



- Taking College Math and Science Classes
 - Carlow University <http://admissions.carlow.edu/high-school/college-hs.html>
 - Community College of Allegheny County <http://www.ccac.edu/default.aspx?id=137212>
 - La Roche College <http://www.laroche.edu/academics/scip.htm>
 - Penn State University - Greater Allegheny Campus
<http://www.ga.psu.edu/Admissions/dualenrollment.htm>
 - University of Pittsburgh - Main Campus <http://www.asundergrad.pitt.edu/audience/high-school.html>
- Choosing an Environmental Science Degree <http://www.environmentalsciencedegree.com/choosing-an-environmental-science-degree/>

