# Columbia Water & Light Educational Programs

Please note: Most programs can be customized to fit learning goals, age levels, time constraints, etc.
Contact Eric Hempel (573) 441-5513, eahempel@gocolumbiamo.com with any questions or to schedule a program.

| Title | Primary Subject | Description | Grade | Type | Duration | Hands on |
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| **Electrical Safety** | Electrical Safety | Another Pohlman masterpiece, this display shows where potential dangers in the electrical system are and how we can avoid getting hurt. | Elem and up | Activity | 30 min | y |
| **Build a transformer** | General Electricity | Why do cars use 12 volts and houses on 120 volts? This two hour program explains why electricity is transmitted the way it is using demonstrations and thermal images. Students will also build and test their own transformers. | MS and up | Activity | 2hr | y |
| **Mini Motor** | General Electricity | This demonstration and activity introduces the concepts of energy transformation and electromagnetic induction. Students will construct their very own motor using every day materials. The motors can also be spun backwards to produce a current. | MS and up | Activity | 1 hr | y |
| **Simple Circuits** | General Electricity | Using aluminum foil, batteries and holiday lights, students will explore electricity safely and learn about the concept of a circuit. | Elem and up | Activity | 45 min | y |
| **Stokes City** | General Electricity | Participants explore the electrical usage of a home by building a model home with working electric appliances. Paired with the Energy Bike, this activity connects the concepts of energy usage, generation, and efficiency. | MS and up | Activity | 3 hrs | y |
| **Bottle Battle** | General Energy | Bottle Battle is a three day program which has been used at Battle High School in the physics curriculum. The project explores heat transfer processes of conduction, convection and radiation. Students, working within a scenario of a power outage, construct insulating structures from prepared materials for water bottles. On testing day teams compete head to head and measure temperature drop over time. W&L provides thermal images for each team to identify where thermal energy loss is taking place. The winning team minimizes thermal energy loss and cost of construction. | HS | Activity | 3 days | y |
| **Mining for Chocolate** | General Energy | This activity explores the issues associated with resource extraction using chocolate chip cookies. After matching everyday objects to their raw source materials, students participate in a mining operation and then are challenged to "reclaim" the cookie. | Elem and up | Activity | 45 min | y |

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| **Energy Bike** | General Energy | The Energy Bike never ceases to draw attention to just how much it takes to light up our world. Students of all ages can experience an energy transformation, from lunch to light. | MS and up | Display | Varies | y |
| **Energy Bike, Jr.** | General Energy | A new addition, this pint sized bike demonstrates the benefit of efficiency using LED bulbs rather than incandescent. Match it up with the original Energy Bike and see the light! | Elem | Display | Varies | y |
| **Fossil Fuels** | General Energy | This activity explores tectonic plate movement and uses sand, sugar and heat as an analogy for geologic processes. | MS and up | Activity | 45 min | y |
| **Energy Houses** | General Energy | The kit comes with different precut materials students use to make houses (sheetrock, foam board insulation, foil faced foam, cardboard, plexiglass). The houses are set on bases that have circulating fans and heat sources. The kit comes with infrared thermometers to take surface readings as well as probe thermometers to measure inside air temperatures. This lesson can be done in several ways. The students can move through conduction, convection, and radiation stations in one session. Or each house is tested on different days to illustrate these concepts of thermal energy transfer. | MS and up | Activity | 2 hr-3days | y |
| **House of Pressure** | Home Performance | This 2 hour, hands-on program explains how air pressure affects home comfort levels and energy efficiency. Students will learn about air pressure, duct work, infrared cameras and will use the same tools our home performance experts use to find and measure air leaks and practice some air sealing techniques themselves. | MS and up | Activity | 1 1/2 hrs | y |
| **Columbia's Renewable Energy** | Renewable Energy | This presentation can be tailored to the age of the audience and highlights the current state of renewable energy in Columbia Water & Light's energy portfolio. This presentation pairs well with a tour of one of our local energy production facilities. Facility tour group sizes are limited. | All | Presentation | 1 hr | n |
| **Energy Choices The story of Heat** | Resource Conservation | Energy Choices is one of Water & Light's longstanding education programs created by Tim Pohlman and Jay Hasheider years ago. W&L has been presenting it to local middle schools ever since. Newly revised to include the ever popular Infrared Camera and Energy Bike, students interact with thermal energy science principles of transfer, insulation, and Infrared.<br>On day two, students do a take-home lab after practicing it in the classroom demostration and calculate the actual cost for hot water in their showers at home. | MS and up | school program | 50 min program and 50 min lab class | y |

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| **Using Water Wisely** | Resource Conservation | A brief presentation on water efficiency and conservation, this can be used in conjuction with the Water Town Activity. | Elem and up | Presentation | 30 min | n |
| **Solar Energy at Home** | Solar | Is Solar power right for your home? This presentation introduces homeowners to the factors to consider when looking at a solar energy system for their home. Can be combined with actual working solar display. | MS and up | Presentation | 1 hr | n |
| **Solar Panels** | Solar | A fully functional solar panel display can be used in conjuction with a presentation on residential solar energy systems or renewable energy sources. | MS and up | Display | Varies | y |
| **Gatorade Solar Cell** | Solar | Another energy transformations example, using copper plates, gatorade (or any electrolyte), and a light source, students will build functioning solar cells and learn to measure current! | Elem and up | Activity | 45 min | y |
| **Water Heaters** | Water Heater | How do you heat? This demostration includes gas, electric and solar water heaters. If outdoor space (and sunshine) is available, the solar model is fully functional. | Elem and up | Display/ presentation | 25 min | y |
| **Hands-on Solar Panels** | | Students explore basic concepts of electricity: voltage, series, parallel, current, etc. using individual solar panel kits. | MS and up | Activity | 1hr | y |
| **Edible Aquifers** | Water system | This demonstration uses edible treats to illustrate the components of an aquifer and how it works. | Elem and up | Activity | 30 min | y |
| **Water Town** | Water system | The master of it all, Tim Pohlman has created a functioning, small scale model of a neighborhood to illustrate water infrastructure, efficiency, and safety. | MS and up | Activity | 45 min | y |
| **Aquifer to Tap** | Water system | This presentation explains where the City of Columbia's water comes from, how it is accessed, treated and distributed. Can be arranged in conjuction with tours of the water plant. | MS and up | Presentation | 30 min | n |
| **Energy Efficiency at Home** | Home Performance | Does your house rule your life? This program provides basic information on energy and water efficiency practices to help conserve resources, save money and maintain comfort. The program can be tailored for adults, middle and high school students, renters, and home owners. In addition to giving helpful tips on how to make the most of what you have, this program will provide information on how to identify and prioritize efficiency improvements, find contractors and take advantage of the rebate program offered by Columbia Water and Light. | MS and up | Presentation | 45 min | n |

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| **Budgeting for Energy** | Home Performance | Intended to be used as a part of personal finance education for young adults, this program introduces the components of the City's utility bill. Students will also learn how to estimate the cost of energy use and how to stay comfortable affordably! | HS and up | Presentation | 45 min | y |
| **Rental Energy Efficiency** | Home Performance | This program covers much of the same information as "Energy Efficiency at Home" and includes tips on how to identify an energy efficient rental property. | Adult | Presentation | 45 min | n |
| **Home Performance with Energy Star** | Home Performance | This program provides an introduction to the concepts of energy efficiency as well as information on Columbia Water & Light's energy efficiency rebates and low interest loans. | Adult | Presentation | 45 min | n |
| **Energy efficiency programs for property owners** | Home Performance | In addition to the home performance programs above, Water & Light programs like "Tree Power" can help owners improve the value and comfort of their property. | Adult | Presentation | 45 min | n |
| **Selling Energy Efficient Homes** | Real Estate | Selling homes isn't easy, talking about energy efficiency can give you a sales edge. | Adult | Presentation | 30 min | n |