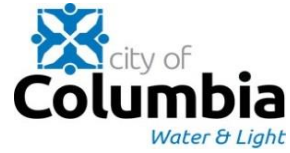


Columbia Water & Light Educational Programs

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

| Title | Primary Subject | Description | Grade | Type | Duration | Hands-On? |
|---------------------------------|---------------------|--|------------------|--------------|---------------------------|-----------|
| Danger Town | Electrical Safety | This engaging presentation and display shows where potential dangers in the electrical system are and how we can avoid getting hurt. | Elem and up | Activity | 30 min | Yes |
| Build a Transformer | General Electricity | Why do cars use 12 volts and houses use 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 | Yes |
| Mini Motor | General Electricity | This activity and presentation demonstrates how magnets, motion, coils of wire and electricity interact. Students will construct their very own motor using every day materials. | MS and up | Activity | 45 min | Yes |
| Squishy Circuits | General Electricity | An introduction to electricity and circuits, this hands on activity allows students to explore electricity safely and learn about the concept of a circuit, parallel and series wiring, and how to use a multi-meter. | 4th grade and up | Activity | 45 min | Yes |
| Stokes City | General Electricity | Students explore the electrical usage of a home by measuring the electrical usage of appliances and how it is affected by efficiency. Paired with the Energy Bike and a small solar PV array, this activity connects the concepts of energy usage, generation, and efficiency. | MS and up | Activity | 3 hrs | Yes |
| Bottle Battle | General Energy | Bottle Battle is a three-day program that 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. Water & Light 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 | Yes |
| Energy Bike: Pedal Power | 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 electricity. They also feel the benefit of efficiency, using LED bulbs rather than incandescent. | MS and up | Display | Varies | Yes |
| Energy Houses | General Energy | The kit comes with different pre-cut 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. | Elem and up | Activity | 45 min or 3 class periods | Yes |
| House of Pressure | Home Performance | This two-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 | Yes |
| 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 | Yes |



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|--|-----------------------|---|-------------|----------------|--|-----------|
| 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 | No |
| Energy Choices: The Story of Heat | Resource Conservation | Energy Choices is one of Water & Light's longstanding educational programs created by Tim Pohlman and Jay Hasheider years ago. Water & Light 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. On day two, students do a take-home lab after practicing it in the classroom demonstration and calculate the actual cost for hot water in their showers at home. | MS and up | School program | 50 min program, 50 min in-class lab, take-home lab kit | Yes |
| Using Water Wisely | Resource Conservation | A brief presentation on water efficiency and conservation, this can be used in conjunction with the Water Town Activity. | Elem and up | Presentation | 30 min | No |
| Gatorade Solar Cell | Solar | Another energy transformation 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 | Yes |
| Hands-on Solar Panels | Solar | Students explore basic concepts of electricity: voltage, series, parallel, current, etc. using individual solar panel kits. | MS and up | Activity | 1hr | Yes |
| 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 | Yes |
| 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. | Elem and up | Presentation | 45 min | No |
| 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 conjunction with tours of the water plant. | Elem and up | Presentation | 45 min | No |