How do you get middle school students to learn about the benefits of driving electric? Start a contest to see who can make the best video encouraging the use of electric vehicles. More than 40 students provided entries to demonstrate what they learned in their research and how to influence potential car drivers to drive electric.

The videos are posted on YouTube. If you would like your students to participate in the 2020 Charge Up Change! competition, contact our staff at etcmail@smud.org and we’ll provide you with information for the contest which will kick off in August.

1st place ($1,500) – Jacob Wollwerth and James Msechu – Sutter Middle School, Folsom
2nd place ($1,000) – Grace Timmons – Folsom Cordova Charter, Mather
3rd place ($800) – Garrott Roddy, Liam Tudor and Tyler Woodhill – Kit Carson, Sacramento
4th place ($500) – Poorvaja Panneerselvan – Sutter Middle School, Folsom
5th place ($200) – Kaitlyn Dias – Sacramento County Day School, Sacramento

Honorable Mentions:
Nissan of Elk Grove – Bailey Kaufman – Winston Churchill, Carmichael
California Air Resource Board – Margret Gibney – California Middle School, Sacramento
California Auto Museum – Margret Gibney – California Middle School, Sacramento
Sacramento Electric Vehicle Association – Daniel Krotine – St. John Notre Dame School, Folsom
Come experience the wonders of science by registering for a teacher workshop sponsored by SMUD.

Our workshops are open to any public or private teacher, home school teacher, student teacher or outreach educator. Register at smud.org/Education. Check with your school district to see if you are required to submit a document in order to acquire professional development credits. Free parking, classroom materials, curriculum and meals are provided. All workshops are held at SMUD 6301 S Street, Sacramento unless otherwise noted.

**Take the Bristlebot Challenge**  
(Grades 2 – 6)  
**Tuesday, March 3, 2020 | 4:30 – 7:30 p.m.**  
SMUD Customer Service Center  
6301 S Street, Sacramento

Expose young students to their first personal robot with an easy to design and build Bristlebot. Teachers will learn how to make connections with NGSS and Common Core and STEAM while having their students design and implement competition challenges using their Bristlebots. Each teacher will receive a classroom set of Bristlebot motors and instructions on how to acquire the materials for a class for under $20.

**Crazy Electric Circuits with Legos**  
(Grades 3 – 9)  
**Wednesday, March 18, 2020 | 4:30 – 7:30 p.m.**  
Folsom Community Center, 52 Natoma St., Folsom

Electric Circuits are highly recommended for fourth grade teachers preparing for Next Generation Science Standards in electricity and electromagnetism. The easy to use crafting make-and-take projects support science and language arts while introducing students to electricity and electric circuits. Davin Bowker of the San Juan Unified School District will lead educators through activities where they will learn how to build and diagram circuits along to support NGSS. Teachers will receive a classroom Crazy Circuits Maker Space set and vehicle Legos.
Exploring Watershed Science & Interrelationships with Project WET
(Grades 4 – 12)
Wednesday, April 1, 2020 | 4:30 – 7:30 p.m.
SMUD Customer Service Center
6301 S Street, Sacramento

How does one begin to manage a watershed? Join us for an evening exploring activities to engage students in the study of watersheds. Teachers will be shown techniques for delineating these features on maps, calculating the effects of changing land use patterns and understanding relationships in data used to monitor potential impacts to water quality. This interdisciplinary workshop experience will feature Project WET activities that integrate concepts and skills at the heart of Common Core and Next Generation Science Standards. Participants will receive a copy of each activity and a starter kit of materials for each activity we explore.

Exploring Water Systems, Technology and Career Opportunities with Project WET
(Grades K – 12)
Thursday, April 2, 2020 | 4:30 – 7:30 p.m.
SMUD Customer Service Center
6301 S Street, Sacramento

Looking for a future career? Join us for an evening exploring activities to engage students in the study of potential future careers in the water sector from the urban water cycle to learning basic skills to interpret streamflow relationships. We’ll also look at water use technology through time and how studying the past can inform engineering of the future. This interdisciplinary workshop experience will feature Project WET activities that integrate concepts and skills at the heart of Common Core and Next Generation Science Standards. All participants will receive a starter kit of materials and copy of each activity we explore. Participants who have attended a previous SMUD Project WET workshop this school year will also receive a copy of Project WET Guide 2.0.
I recall my first WOW moment about solar energy. I visited a building in Santa Barbara that was designed to heat and cool itself, produce electricity and heat water…primarily with sunshine! I was amazed. The sun’s heat was stored in thermal mass (bricks, concrete floors and phase change materials) during the day, this would then keep the building comfortable at night. This process is called passive solar design. Water running through rooftop collectors was heated up for use in showers and the kitchen. For electrical needs, sunlight was converted into electricity using photovoltaic modules - a truly magical invention. By using the sun’s energy efficiently, very little outside energy (grid electricity and natural gas) was needed.

Over the years I continued to discover interesting ways that solar energy was being used to heat, cool and power our lives. Solar cooking is a fascinating application, where one can build an insulated box with dark interior, a glass window, and reflectors which can achieve temperatures hot enough to boil water and cook most meals. From baking brownies in solar cookers made from pizza boxes, to hosting solar potlucks using larger solar box-type ovens, there is a wide range of possibilities for exploring building low-cost cookers, and also learning to cook various recipes using them. Recently, several middle school culinary arts classes started learning how to adapt recipes for solar ovens.

In recent times, the word “solar” has meant photovoltaics (PV) aka solar electricity. Solar applications are vast — including powering satellites and other spacecraft, homes, cars, charging stations, warning lights, fountains, communication towers, street lights and more. When our family built our house 10 years ago, we added a solar array to the rooftop, and while we are still connected to the electrical grid, the solar array has produced more solar electricity each year than we’ve consumed, making our electrical bill nearly zero dollars. This story is no longer unique as California recently celebrated the milestone of installing 1 million solar rooftops.

The beauty of using the sun’s energy to heat, cool and power our lives is that sunlight is abundant and clean. The sun shines around the world and doesn’t create pollution when we capture its rays to heat our home, or convert to electricity to power our refrigerators, lights and phones. As we learn more about the negative effects of burning fossil fuels, solar energy (and its renewable energy cousins - wind, water, geothermal) become more important.

Ancient civilizations knew to orient their homes toward the sun, to provide heat in the winter, while staying cool in the summer. They used concave shiny bronze bowls to reflect and amplify the sun’s intensity to start the family cooking fire. In later years, solar greenhouses provided produce through winter months. Today, in California, new homes are required to have a solar rooftop, and we are working toward a goal of producing 100% of our electricity from carbon-free resources, of which solar is a part. We are adopting these technologies and strategies more every day, as we work on reducing carbon emissions from fossil fuels and shaping a cleaner energy future.

In K-12 classrooms, the study of solar energy is a natural ingredient. We live on Earth, a planet where life is driven by sunshine. By exploring and increasing our understanding of how it all works, your students will be better prepared to be active participants in shaping a clean energy future.

To encourage your students to be more involved in developing that cleaner energy future and to find ways in which you can integrate solar into your classroom, consider taking one of Solar Schoolhouse’s workshops at SMUD or applying for the Rahus Institute Summer Camp stipend through your school district. For more information visit solarschoolhouse.org.
Science in the River City

Science in the River City provides standards based professional development for K-12 teachers of science with hands-on activities, lessons and strategies to use in the classroom. All work is aligned with the Next Generation Science Standards and led by Sacramento State and UC Davis faculty and Sacramento Area Science Project (SASP) teacher leaders. Visit sasp-science.org/sirc for additional information and registration. Fees apply.

February 25, 2020 or March 17, 2020
4:30 - 6:30 p.m.  - Teachers attend science workshops
6:30 - 7:15 p.m.  - Dinner, networking & information tables
7:15 - 8 p.m.  - Guest speaker

Custom workshops

If your district or educational organization would like to hold a science workshop for teachers, contact our Energy Education & Technology Center for information on how to reserve a presenter and topic. We require a minimum of 30 teachers in attendance.

Recently we offered several workshops on solar cooking and paper crafting and LEDs. For more information or a list of topics, contact Suzette.Bienvenue@smud.org.

Solar scholarships for teachers

SMUD offers teacher scholarships to attend the week-long Solar Schoolhouse Camp at the Rahus Institute during the week of July 26 – 30. Teachers will learn everything solar from geometry related to the sun and making their own solar module by hand. Curriculum, lesson plans and hands-on activities will give teachers relatable and practical programs to bring to their classrooms. This opportunity is only available to teachers or outreach educators in Sacramento County. For more information, or to apply for this scholarship, visit solarschoolhouse.org.
15th Annual Solar Car Race at Cosumnes River College

The 15th annual Solar Car Race on April 22, 2020 will highlight the most creative, innovative and fastest models that student teams from the Sacramento area designed and built themselves.

Some of the schools will have had earlier race-offs at their schools with winners moving onto Cosumnes River College (CRC) for the official race day. This race is held in conjunction with Cosumnes River College’s Earth Week festivities.

The race venue will also showcase automotive technology and display electric vehicles courtesy of the Sacramento Electric Vehicle Association. This is a great opportunity for students to sit behind the wheel of an electric vehicle.

To participate in the race, your school must be in Sacramento County and students must be in grades 9 - 12. A teacher must contact us before attending the race. SMUD will provide race car kits. The deadline to apply for the Solar Car Race is February 28, 2020. For more information on the 2020 race, getting assistance scheduling a field trip to CRC or getting registered, contact etcmail@smud.org. Learn more at smud.org/Solar-Car-Race.

Bristlebot Challenge in your classroom

If you’re looking for a way to integrate a bit of engineering and electric circuits into your classroom, check out SMUD’s mini-robotic curriculum, Bristlebots. The lesson is available for free online at smud.org/TeachingTools. The Bristlebot Challenge is a simple and quick introduction to electric circuits, engineering and design. The suggested grade level for the curriculum, teacher guide and student worksheets is 3-5 but high school teachers have successfully used this program as an intro into a robotics program.

The website includes a video from a recent teacher workshop in which participants not only designed and built Bristlebots but came up with interesting and fun challenges for the mini robots. The next professional development workshop featuring the Bristlebot Challenge will be held on March 3, from 4:30 – 7:30 p.m. at SMUD’s Customer Service Center.
Career Ambassador Program

SMUD Career Ambassadors help students explore electric utility careers and learn about jobs at SMUD. Career ambassadors participate in a wide range of workforce related events hosted by local schools and colleges. They work with teachers to deliver age-appropriate materials at career events. These events include career fairs, career exploration events, mock interviews, resume reviews, competition judging and student mentoring. Ambassadors can showcase the Human Power Generator which demonstrates the different amounts of energy needed to power LED and incandescent light bulbs.

To have a SMUD Career Ambassador attend your career related event, contact EducationOutreach@smud.org.

May 1-2, 2020

2020 California Solar Regatta

Join us for the 9th Annual California Solar Regatta at the lake at Rancho Seco Recreational Area in Herald, CA. This is a great field trip destination to learn about solar energy while observing other students competing in a design/build completion. Twenty-two high school teams will compete with 230-watt solar modules on Friday, May 1 and 14 colleges will compete on Saturday, May 2.

The California Solar Regatta is a hands-on event where students learn about renewable energy using solar as the learning vehicle. This is a creative, engineering and design competition where students can retrofit an existing craft or build a boat by hand.

The solar boats will be judged for speed, distance, maneuverability and more. This event is sponsored and run by SMUD’s Energy Education & Technology Center. Read the Solar Regatta manual at smud.org/Solar-Regatta for details.
Electricity Fair

More than 1,000 visitors came to celebrate everything electric at the Historic Folsom Powerhouse at the 2019 Electricity Fair held on September 14. California State Parks staff and docents gave tours of the powerhouse, museum and grounds. Visitors learned the historical significance of this first location for long-distance transmission of power, which stretched 22 miles from Folsom to Sacramento in 1895. This transmission of electricity was a catalyst in developing the economy and future of Sacramento. Volunteers from Louis Pasteur Middle School and Casa Roble High School shared engaging hands-on activities at learning science stations. Children made pinwheels to learn about wind power and solar powered spin art as they learned about solar energy.

Families learned more about electric vehicles courtesy of volunteer members from the Sacramento Electric Vehicle Association (SacEV). This was a popular spot for visitors to ask questions and get a real-world view of EV ownership.

The Electricity Fair is a magnet for students in 4th and 5th grades who are learning about energy and California history. Many of the science activities available at the Museum help students learn about electricity and California history.

Save the date for the next Electricity Fair on September 12, 2020. For more information on how to integrate this family event into your classroom’s science program, contact Suzette.Bienvenue@smud.org.

GETA students visit the historic Folsom Powerhouse

Seventy students from Laguna Creek High School’s Green Energy and Technology Academy visited the historic Folsom Powerhouse for a day of learning about energy technology, old and new. California State Park docents gave tours of the powerhouse technology which was cutting edge back in 1895. SMUD’s Energy Education & Technology staff assisted with a solar tower challenge and had the students make LED name tags. It was also a beautiful day to visit Lake Natoma and view the Native American grinding rocks.
Expanding Your Horizons

The Expanding Your Horizons Network was started in the 1970s by a group of women scientists and educators in the San Francisco Bay Area. These women were concerned about low female participation in math classes.

This network developed conferences in which middle school girls could participate in hands-on activities in math, science and engineering. The primary workshops were led by women currently working in STEM careers. The girls had fun working in real world topic workshops while they also learned about STEM careers while interacting with role models.

The Expanding Your Horizons Network—which is now world-wide—is a volunteer community for STEM professionals, educators, parents, community leaders and government representatives. Financial support comes from corporate donations, foundations and grants.

Sacramento State holds the annual Expanding Your Horizons workshops every fall. SMUD sponsored a career information booth as well as a hands-on activity workshop where girls got their own solar power exploration kit and attended the Girl Power=Solar Power workshop.

Learn to use LED lights to encourage art and literacy

David Cole, from NEXMAP, taught a variety of teacher workshops relating LED lights to art and literacy. NEXMAP works with teachers to boost their confidence with using the intersection of literacy, technology, crafts and open data. The hands-on activities allow learners to explore LED circuit crafting as a scaffolding which leads to language arts, geography and social studies often using open sourced data which can also connect the learner to their community.

Focusing on leadership development and the use of public data as part of an emerging civic infrastructure, the workshops Hack Your Notebook and Project Planning and Human Centered Design use paper and simple electronics as a learning platform for school projects that focus on engineering, storytelling, computer coding and data literacy.

If you are interested in learning how to use these projects in your classroom contact David Cole at NEXMAP, david.cv2@gmail.com or stay tuned to enroll in the Fall 2020 workshops at SMUD.
AmeriCorps partners with SMUD

AmeriCorps is a network of national service programs, made up of three primary programs that each take a different approach to improving lives and fostering civic engagement. Members commit their time to address critical community needs like increasing academic achievement, mentoring youth and fighting poverty. One of AmeriCorps’s programs is City Year which involves a 10-month commitment to work in a high poverty area and school district to aid teachers or after-school programs in helping students achieve a higher quality educational experience.

SMUD helped over 60 AmeriCorps new volunteers learn about electric circuits and paper crafting. They, in turn, are teaching their teachers and students how electricity and circuits intersect with art and language arts.

Free online tools

Let’s power student learning

Take advantage of free lesson plans, teacher guides, student worksheets and videos available on-line at smud.org/Education. Topics include energy auditing in your home and classroom, BristleBots, electronic greeting cards and exploring wind energy.

Check out our latest engaging, hands-on STEM lessons at smud.org/TeachingTools.
Applications for SMUD’s paid high school internship program coming soon

SMUD offers a 6-week paid internship to current high school juniors and seniors in the following school districts:

- Sacramento Unified School District
- Sacramento County Office of Education (court and community schools)
- Center Joint Unified School District
- San Juan Unified
- Galt Joint Union School District

Students can check out smud.org/StudentJobs under the High School Student Jobs section for the application link in early April 2020.

College Scholarships up to $5,000!

Applications will be accepted Feb. 24 - April 17, 2020.

At SMUD, we recognize the value of education and the impact it can have on our families and our community. We’re proud to offer Powering Futures, a special annual college scholarship program awarding up to $60,000 to students.

- As many as 21 students may receive up to $5,000 each in scholarships.
- Applicants must be enrolled or planning to enroll as a full-time undergraduate student at an accredited 2 or 4 year college/university in the U.S. in the fall of 2020.
- Applicants must be a SMUD customer living in SMUD’s service area or have a SMUD customer as a legal guardian.
- Awards will be based on merit and financial need.
- A preference will be given to students with a major relevant to SMUD.
- Some scholarships will include a paid internship.

Learn more at smud.org/Scholarships.