



21st CCLC NASA Projects



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NASA and 21st Century Community Learning Centers (21st CCLC): Fact Sheet

Since 2013, the U.S. Department of Education's (ED's) 21st Century Community Learning Centers program has collaborated with NASA to bring exciting science, technology, engineering and math (STEM) learning opportunities to student participants. Through this nationwide partnership, student teams at 148 sites across the U.S. will interact directly with NASA scientists and engineers to tackle real-world engineering design challenges and learn about scientific investigation processes linked to environmental monitoring and earth science.

The 21st Century Community Learning Centers Program

The 21st CCLC program provides funding for community learning centers around the country that connect young students with academic enrichment opportunities during non-school hours, particularly students who attend high-poverty and low-performing schools. The 21st CCLCs help students meet state and local standards in core academic subjects, such as reading and math, and offer enrichment activities designed to complement and reinforce the regular academic programs.

The 21st CCLC program was created under the 1994 reauthorization of the Elementary and Secondary Education Act as part of a national strategy to increase the impact of federal investments targeted at underserved student populations.

Why Out-of-School STEM Experiences Are Important

Evidence indicates out-of-school time can provide a critical pathway to encourage student interest in STEM learning and can be particularly effective in engaging students who might not otherwise have the opportunity to participate in STEM activities. STEM skill acquisition is important for several reasons, including:

- STEM is vitally important to our economic future. Data reveals that STEM jobs are projected to increase over time and the demand for occupations that require expert thinking and complex communication is higher than that for manual and routine jobs. A survey of educators, parents and students found near consensus that problem solving and critical thinking are essential skills for students to learn.
- A 2011 report from the US Department of Commerce found that over the previous 10 years, growth in STEM jobs was three times greater than that of non-STEM jobs, and STEM jobs are expected to continue to grow at a faster rate than other jobs in the coming decade.
- A 2014 report from the Brookings Institution showed that the number of US companies reporting difficulty in filling positions because of a lack of skills grew from 14% in 2010 to 40% in 2013.
- There is a large interest and achievement gap among some groups in STEM, and African Americans, Hispanics, Native Americans, and women are seriously underrepresented in many STEM fields. This limits their participation in many

well-paid, high-growth professions and deprives the nation of the full benefit of their talents and perspectives.

- It is important to note that the problem is not just a lack of *proficiency* among American students; there is also a lack of *interest* in STEM fields among many students. Recent evidence suggests that many of the most proficient students, including minority students and women, have been gravitating away from science and engineering toward other professions.
- Disparities in access to high quality STEM programs aren't limited to the school day – significant disparities also persist during out-of-school time. Typically, by sixth grade, students from middle or upper class households will have experienced over 6,000 more hours of enrichment programs (including, but not exclusively involving STEM) than their less financially fortunate peers. This lack of access amplifies the challenges experienced during the school day.
- The 21st CCLC program, serving more than 1.5 million students in all 50 states, provides an unparalleled avenue for reaching students in high-need schools, who often have little or no opportunity to engage with STEM content and experiences or with STEM professionals. Participation in this program is free, giving students access to new experiences and opportunities to apply knowledge and practice in these disciplines.

Hands On with NASA

The collaboration with NASA provides students a way to learn about the Earth and the environment through making first-hand scientific observations as well as an opportunity to tackle real-world challenges currently being addressed by NASA scientists and engineers.

- In 2016, the program will reach up to 148 sites across 15 states.
- Throughout the program, both 21st CCLC staff and students interact directly with NASA scientists and engineers, learning firsthand about engineering design and the scientific method.
- Program options include the Engineering Design Challenge (EDC) and Global Observation to Benefit the Environment (GLOBE) Investigation:
 - The EDC program provides students with the opportunity to work on engineering design problems that are based on real mission data and experiences encountered by NASA scientists and engineers and highlight NASA's unique mission of space exploration. In 2016, four challenge options will be offered students:
 - **Parachuting onto Mars.** Students develop a drag device to slow the descent of a spacecraft or probe, while protecting its cargo for a successful landing.
 - **Why Pressure Suits?** Students design a pressure suit or spacesuit that will protect a high-altitude pilot or astronaut from the low-pressure, near-vacuum environment that is experienced in space.
 - **Packing Up for the Moon.** Students design a plant growth chamber that could be used by astronauts to grow vegetables on the moon.



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- **Designing a Crew Exploration Vehicle.** Students design and construct a Crew Exploration Vehicle that can carry two toy astronauts as passengers in space travel.
- GLOBE is an international science and education program that has been underway since 1995 that teaches students how to become “citizen scientists”—members of the general public who help conduct environmental observations that are of use to the scientific community—as they contribute to our understanding of the Earth’s systems and the global environment. In this year’s program, which focuses on investigating clouds and energy, students will collect and analyze measurements of clouds, air temperature and surface temperature to determine how clouds impact Earth’s energy systems, connect with scientists to discuss their investigations and produce short videos explaining their hypotheses and supporting data for NASA’s review.

State and Local Impact

There are 15 - 21st CCLC sites in Montana offering NASA STEM programs in 2016, serving students across the state. ACES has 8 students enrolled working in 2 groups.

Resources for Teachers

STEM activity examples are available through the 21st CCLC’s Y4Y online community (<https://y4y.ed.gov/stemchallenge>), which provides free, research-based content to more than 165,000 21st CCLC practitioners in over 10,000 program sites across the nation. Please note that scientist and engineer connections and associated support are only available to participating programs. For more information on the 21st CCLC program and the interagency collaboration visit: <http://www2.ed.gov/programs/21stcclc/index.html>.