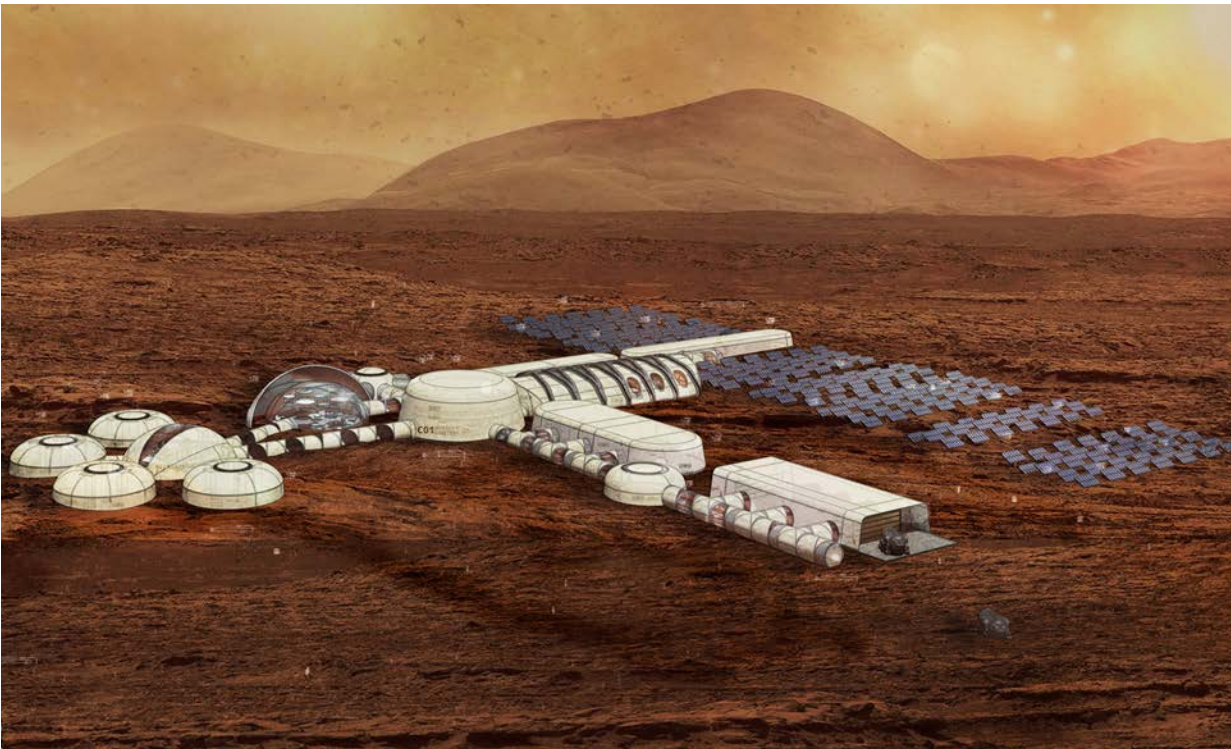




Science, Technology, Engineering and Mathematics (STEM) Education Program



Advancing STEM to Support Facility Design, Construction, Operations and Maintenance

On earth and in space, buildings and their related infrastructure must operate in an environment with constrained resources (both financial and physical). Recognizing these common issues, the National Institute of Building Sciences, the Total Learning Research Institute (TLRI) and the National Aeronautics and Space Administration (NASA) look to engage and inspire K-12 students in Science, Technology, Engineering and Mathematics (STEM) activities related to the building sciences. The Institute leads development of a joint Institute/TLRI/NASA program to create and inspire interest in careers within the built environment and leverage STEM K-12 challenge curriculum and utilize educational resources developed by NASA along with technical assistance from the Human Exploration and Operations Mission Directorate, the Chief Technologist, the Science Mission Directorate and others.

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Like many government agencies, NASA's facilities are in need of increased maintenance, major renovation, or total replacement. At the same time, increased concern for energy conservation and other aspects of a healthy, sustainable environment are driving the adoption of many new technologies. In order to provide and operate facilities which meet the projected requirements for government and private sector facilities, it is essential that a workforce trained in the design, construction, operation and maintenance of the rapidly changing materials, methods and standards of sustainable facilities be available.

The Institute and other participating organizations are working to:

- Create the "Mars City Facility Ops Challenge" using TLRI's existing Mars City initiative. Mars City serves as a virtual environment for inquiry and learning opportunities around STEM disciplines. The Facility Ops Challenge has students serve as facility managers responsible for maintaining the base while learning about building systems and the importance of teamwork. It will foster multidisciplinary facilities teams focused on indoor environment needs.
- Develop specific resource pages within the Whole Building Design Guide (www.wbdg.org) for use by students in pursuit of STEM related activities including Mars City and other building and space related programs;
- Engage representatives from across the building and infrastructure industry to revise existing STEM curricula and materials and develop new curricula and materials that recognize the role of sciences and technologies important to the building industry (e.g., controls, etc.); and
- Promote career opportunities. As part of the STEM Program, the Institute has developed the Building Sciences Career Center. The Center contains resources on a variety of building science disciplines, including interviews with current practitioners and links to relevant industry programs. Visit the Center at www.wbdg.org/BuildingSciencesCareerCenter.

Improving the STEM literacy of students and the general public—particularly in the areas of building sciences, engineering, human physiology, and auto-

mation—will provide benefits for the building industry as a whole (including building owners and operators like NASA).

In support of this initiative, the Institute seeks the following assistance from representatives of the building community:

- Architects, engineers and facility managers to work with experts in space environments to develop operations and maintenance procedures for the Mars City Challenge and serve as Mars City facilitators in their community.
- Sponsors provide technical and financial resources.
- Building community representatives to work with curriculum specialists to develop new resources and enhance existing resources (including the Whole Building Design Guide) incorporating building science and STEM education elements.

Participating Organizations

The **National Institute of Building Sciences**, authorized by Congress in 1974, is a nonprofit, nongovernmental organization that brings together representatives of government, the professions, industry, labor and consumer interests to identify and resolve building process and facility performance problems. The Institute serves as an authoritative source of advice for both the private and public sectors with respect to the use of building science and technology. For more information, visit www.nibs.org.

The **Total Learning Research Institute** is a 501(c)(3) non-profit educational and scientific organization dedicated to solving the problem of American and world illiteracy and competitiveness through systemic educational reform and the intelligent application of learning technology. For more information, visit www.tlri.org.

The **National Aeronautics and Space Administration** is a United States government agency responsible for science and technology related to air and space. The Space Age started in 1957 with the launch of the Soviet satellite Sputnik. NASA was created in 1958. The agency was created to oversee U.S. space exploration and aeronautics research. For more information, visit www.nasa.gov. ■



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