ON THE MOON

NASA AND DESIGN SQUAD TEAM UP TO INSPIRE A NEW GENERATION OF ENGINEERS

in collaboration with the
National Aeronautics and Space Administration

ENGINEERING CHALLENGES FOR SCHOOL AND AFTERSCHOOL PROGRAMS
GRADES 3–12
Dear Educators,

In 2004, President Bush announced a new vision for the United States’ space program. Today, that vision is becoming reality. The men and women of NASA are working on the next generation of spacecraft that will return Americans to the moon by 2020. A new generation of students across the country and around the world will be inspired by what President Kennedy called the “greatest adventure on which humankind has ever embarked.”

As NASA prepares for the future of exploration, we recognize that the young people of today are the engineers, scientists, and astronauts of tomorrow. Creativity, curiosity, and analytical thinking are the trusted tools of NASA’s engineering arsenal, and we continually direct our educational efforts to create experiences that allow young people to develop these skills as they investigate and solve challenging problems.

NASA is proud to partner with Design Squad®, PBS’s reality competition series focused on the fun and excitement of engineering. Central to this partnership is our belief that science, technology, engineering, and mathematics education will play a vital role in solving the problems of the 21st century. On the Moon is part of our long, proud tradition of showcasing how engineering fuels space exploration. By structuring the activities around real-world engineering applications, it is our hope that you will find the On the Moon activities to be effective, innovative ways to engage your students in the engineering design process, encourage their interest in space exploration, and inspire them to pursue a career in engineering.

NASA supports people like you who play a key role in preparing the minds that will strengthen the Nation’s future. Use this guide to bring the possibilities of engineering to life for young people and to inspire them to solve challenging problems. Engage their creativity, foster their curiosity, and teach them to autograph their work with excellence.

Sincerely,

Joyce Winterton
Assistant Administrator for Education
On the Moon was produced by the WGBH Educational Outreach department, in collaboration with NASA.

**Credits**

**Director, Educational Outreach**
Julie Benyo

**Associate Director, Educational Outreach**
Thea Sahr

**Educational Content Manager**
Sonja Latimore

**Editorial Project Director**
Chris Randall

**Associate Editor**
Joan Pedersen

**Outreach Coordinator**
Natalie Hebshie

**Outreach Assistant**
Margot Sigur

**Writer**
Jeff Lockwood

**Evaluator**
Christine Andrews Paulsen, Ph.D.
American Institutes for Research

**Advisors**
Jenny Atkinson, M.Ed.
Executive Director, Charlestown Club, Boys & Girls Club of Boston

Brian Day
Education and Public Outreach Lead
Lunar Crater Observation and Sensing Satellite
NASA Ames Research Center

Michelle Hailey
Manager, THE ARTS
Girl Scouts of the USA

Jerry G. Hartman
Education Lead—Exploration Systems Mission Directorate
NASA Headquarters

Al Krause
Education Specialist—WILL Technology, Inc.
Academic Affairs Office
NASA Marshall Space Flight Center

Hollington Lee
Curriculum consultant

Rick McMaster, Ph.D., P.E.
Executive Project Manager, IBM Chair, Central Texas Discover Engineering

Dawn Mercer
Education Specialist—WILL Technology, Inc.
NASA Marshall Space Flight Center

Brian Mitchell
Education and Public Outreach Program Manager
Lunar Precursor Robotic Program
NASA Marshall Space Flight Center

Danielle Moran
Communications Strategist
Lunar Precursor Robotic Program
NASA Marshall Space Flight Center

Kate L. Pickle
STEM Program Manager
Girl Scouts of the USA

Stephanie Stockman
Education and Public Outreach Lead
Lunar Reconnaissance Orbiter
NASA Goddard Space Flight Center

**Senior Designer**
Peter Lyons

**Designers**
Greta Merrick
Jonathan Rissmeyer

**Illustrator**
Hannah Bonner

**Senior Executive Producer**
Kate Taylor

**Series Executive Producer**
Marisa Wolsky

**Series Content Director**
Dr. David Wallace
Associate Professor of Mechanical Engineering
Massachusetts Institute of Technology

**Field Test Sites**
Donna Falk
Manalapan-Englishtown Middle School
Manalapan, NJ

Matthew Loughran
Watertown Middle School
Watertown, MA

Von Mom, and
Michelle Hatem Meehan
Lowell Boys and Girls Club
Lowell, MA

Front cover photos: Anthony Tieuli, Lauren Feinberg, NASA.