

**just for fun**



This activity is part of Challenger Center's Vista Station™ Program. For more information on how to purchase Vista Station™ to use in your classroom, visit [www.challenger.org/store](http://www.challenger.org/store).

Another Series of Challenger Learning EdVentures™ from



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## overview



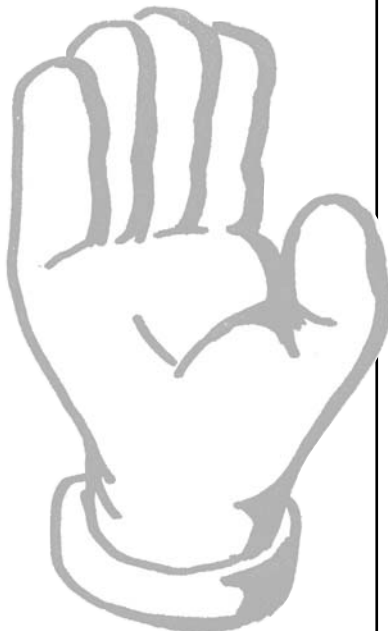
IT IS NOT BY CHANCE OR FOR LOOKS THAT THE OUTER LAYER OF A SPACE SUIT IS CONSTRUCTED OF A DURABLE WHITE FABRIC. ENVIRONMENTS IN OUTER SPACE FLUCTUATE FROM SHADE TO FULL SUNLIGHT. IN FULL SUN, THE TEMPERATURE WILL RISE TO 120 DEGREES C AND IN SHADE DROP TO MINUS 100 DEGREES C. SUCH EXTREMES ARE CONSTANTLY BEING ENCOUNTERED BY ASTRONAUTS OUT ON EXTRAVEHICULAR ACTIVITIES. THE SIDE OF THE SPACE SUIT FACING THE SUN COOKS WHILE THE SIDE IN SHADE FREEZES. WHITE FABRIC ON THE OUTSIDE OF THE SUIT IS USED BECAUSE IT ABSORBS LESS HEAT THAN DOES DARK FABRIC.

THIS ACTIVITY ALLOWS STUDENTS TO EXPERIENCE THE RELATIVE EFFECTS OF LIGHT VERSUS DARK SURFACES ON HEAT ABSORPTION AND RADIATION.

## materials

- *HEAVY DUTY ALUMINUM FOIL*
- *WHITE PAINT*
- *BLACK PAINT*
- *GLUE*
- *MEDIUM PAINT BRUSH*
- *THERMOMETERS (OPTIONAL)*
- *ICE CUBES (OPTIONAL)*

## procedures



1. FORM A PIECE OF ALUMINUM FOIL TO FIT THE HAND.
2. PAINT ONE SIDE OF THE MITT WITH WHITE PAINT AND THE OTHER WITH BLACK PAINT. ADD A COUPLE DROPS OF GLUE TO THE PAINT TO MAKE IT ADHERE BETTER TO THE FOIL.
3. HOLD THE WHITE SIDE, PALM FACING THE SUN FOR APPROXIMATELY FIVE MINUTES. DESCRIBE THE TEMPERATURE.
4. CHANGE HANDS AND HOLD THE BLACK SIDE, PALM FACING THE SUN FOR APPROXIMATELY FIVE MINUTES. DESCRIBE THE TEMPERATURE. WHAT MAKES THE DIFFERENCE?
5. OPTIONAL: THERMOMETERS CAN BE PLACED INSIDE THE GLOVE TO RECORD AND OBSERVE THE DIFFERENCES IN THE HEAT ABSORPTION.
6. OPTIONAL: ICE CUBES CAN BE PLACED ON THE WHITE SIDE OF ONE MITT AND THE DARK SIDE OF ANOTHER MITT TO COMPARE HOW FAST THE ICE CUBES MELT.

# Challenger Center Programs



The internationally acclaimed **Challenger Learning Center** Network currently consists of state-of-the-art, innovative educational simulators located at 49 sites across 29 states, Canada, and the United Kingdom. Staffed by master teachers, the core of each Center is a two-room simulator consisting of a space station, complete with communications, medical, life, and computer science equipment, and a mission control room patterned after NASA's Johnson Space Center. See [www.challenger.org](http://www.challenger.org) for information.

A joint initiative of Challenger Center for Space Science Education, the Smithsonian Institution, and NASA, *Voyage — A Journey through our Solar System* is a space science exhibition project that includes permanent placement of a scale model solar system on the National Mall in Washington, DC, and at locations all over the world. See [www.voyageonline.org](http://www.voyageonline.org) for information.



**Space Day**<sup>SM</sup> launches new *Design Challenges* created by Challenger Center each school year. The inquiry-based challenges are designed to inspire students in grades 4-8 to create innovative solutions that could aid future exploration of our solar system. See [www.spaceday.org](http://www.spaceday.org) for information.

Challenger Center's *Journey through the Universe* program provides under-served communities with diverse national resources, including K-12 curriculum materials, teacher workshops, classroom visits by scientists from all over the country, and Family Science Nights. See [www.challenger.org/journey](http://www.challenger.org/journey) for information.



The **MESSENGER** spacecraft (MErcury Surface, Space ENvironment, GEOchemistry and Ranging) is to be launched in 2004 and go into Mercurian orbit in 2009. Challenger Center is one of the partner organizations charged with MESSENGER education and public outreach activities. See [www.messenger.jhuapl.edu](http://www.messenger.jhuapl.edu) for information.

Through the Challenger Center **Speakers Bureau, Voyages Across the Universe**, staff members speak to student audiences of 30-1,000, conduct workshops for 100-300 educators, give keynote and featured presentations at conferences, as well as conduct Family Science Nights at the National Air and Space Museum, and other facilities across the nation, for audiences of 300-1,000 parents, students, and teachers. See [www.challenger.org/speakers](http://www.challenger.org/speakers) for information.

For information about other Challenger Center programs, or to purchase our classroom resources, visit [www.challenger.org/store](http://www.challenger.org/store).