

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.

Another Series of Challenger Learning EdVentures™ from



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overview



THE SPACE SHUTTLE WAS DESIGNED TO CARRY PAYLOADS TO AND FROM SPACE AND TO BE REUSABLE. IT IS LAUNCHED LIKE A ROCKET AND GLIDES IN AND LANDS ON A RUNWAY LIKE AN AIRPLANE. IT IS THE SIZE OF A DC-9 AIRPLANE AND HAS PARTS JUST LIKE AN AIRPLANE. THE ORBITER USES ELEVATORS, AILERONS, AND A RUDDER TO HELP STEER IT ON LANDINGS. TO HELP IT LAUNCH INTO SPACE, THERE ARE TWO SOLID ROCKET BOOSTERS THAT HELP LIFT IT THROUGH EARTH'S THICKEST PART OF THE ATMOSPHERE. THE ORBITER HAS THREE MAIN ENGINES THAT GIVE IT THRUST FROM LIFTOFF TO ORBIT. THE ENGINES GET THEIR FUEL FROM THE EXTERNAL TANK, THE ORANGE CYLINDER UNDERNEATH THE ORBITER. IN THIS ACTIVITY, STUDENTS MAKE A SIMPLE MODEL OF A "SHUTTLE CRUISER" THAT CAN TRAVEL BETWEEN SPACE STATIONS. STUDENTS CAN COPY THE PRESENT DAY SPACE SHUTTLE OR MODIFY THE DESIGN TO SHOW A SHUTTLE THAT TRAVELS TO AND FROM OTHER SPACE STATIONS.

materials

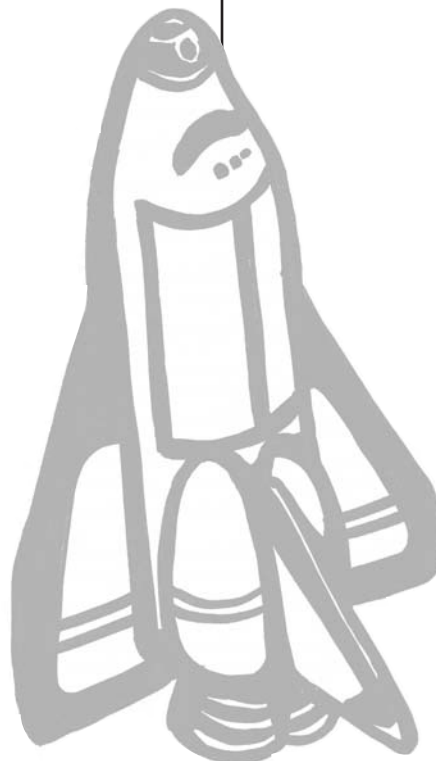
- *CARDBOARD*
- *CONSTRUCTION PAPER*
- *TOILET PAPER TUBE*
- *STRAWS*
- *GLUE*
- *SCISSORS*
- *TAPE*
- *PAINTS AND PAINTBRUSHES*
- *SMALL SHARP KNIFE*

procedures

1. WRAP THE TOILET PAPER TUBE WITH WHITE CONSTRUCTION PAPER AND GLUE IN PLACE.
2. CUT A STRAW IN HALF AND SET ASIDE. CUT TWO STRAWS THE LENGTH OF THE TOILET PAPER TUBE. SET ASIDE.
3. PLACE THE WRAPPED TOILET PAPER TUBE ON A PIECE OF CARDBOARD TO DRAW THE WINGS. CUT OUT THE WINGS.

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4. CUT THE TAIL OUT OF CARDBOARD.
5. SLIT THE TOILET PAPER TUBE THE LENGTH OF THE TAIL USING A SHARP KNIFE (TEACHER WILL NEED TO DO THIS). SLIP THE TAIL INTO THE CUT AND TAPE ON THE INSIDE.
6. CUT THE NOSE CONE FROM CONSTRUCTION PAPER. BE SURE TO FIT IT PROPERLY AND GLUE IT INTO PLACE. USE THE PAINTBRUSH TO APPLY GLUE AROUND THE EDGE OF THE TUBE AND THE CONE. STUDENTS MAY HAVE A DIFFICULT TIME WITH THIS STEP. MONITOR THEM CLOSELY AND ALLOW THOSE STUDENTS THAT MASTERED THE TECHNIQUE TO HELP OTHERS. LET A LITTLE TIME PASS TO ALLOW THE GLUE TO SET BEFORE GOING ONTO THE NEXT STEP.
7. GLUE THE TWO SMALL STRAWS ON THE WING ON EACH SIDE OF THE TUBE.
8. GLUE THE ENTIRE STRUCTURE ON TOP OF THE TWO LARGER STRAWS.
9. PAINT AND ADD DETAILS.



Challenger Center Programs



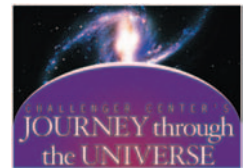
The internationally acclaimed **Challenger Learning Center** Network currently consists of state-of-the-art, innovative educational simulators located at 49 sites across 29 states, Canada, and the United Kingdom. Staffed by master teachers, the core of each Center is a two-room simulator consisting of 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 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 for information.



Space DaySM 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 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 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 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 for information.

For information about other Challenger Center programs, or to purchase our classroom resources, visit www.challenger.org/store.