

NASA Space Science Days in El Paso – 2010
MISSION PATCH COMPETITION

“Exploring Our Solar System -- Understanding the Surfaces of Planets and Other Solar System Bodies by Understanding Earth’s Surface Processes”

For this year’s event, we’d like for each school to submit 2 projects which relate to our theme. The project will be a Mission Patch which is described in better detail below. Schools must decide which 2 projects will be submitted. Students can only be on 1 team. In addition, we’d like a detailed description of the project and a list of questions from students related to this year’s theme attached to build interest from students.

Project: Student in a group of 4 to 6 members must design a Mission Flight Patch. See the information below on how NASA designs their own patches.

Theme:

The project must represent our theme - “Exploring Our Solar System -- Understanding the Surfaces of Planets and Other Solar System Bodies by Understanding Earth’s Surface Processes”

Media:

Pencil, ink, acrylic, oil, marker, crayon or pastel (No computer generated projects).

Format:

Projects must be on a 20” X 30” Foamboard or Foam Core Board of any color. (No glass or heavy objects, please).

Each project must have the following on the BACK of your board.

1. Full Name of Students
2. Full Name of School District & School
3. Grade Level

Each project must have the following on the Front of your board

4. TOP CENTER PORTION OF THE BOARD – THE PATCH.
5. LOWER LEFT-HAND CORNER - A TYPED DETAILED DESCRIPTION OF THE PATCH.
6. LOWER RIGHT-HAND CORNER - Questions Asked by Students related to the theme

Awards:

Awards will be given to each team member in the following categories (1st, 2nd and 3rd place for THREE 5th grade teams and THREE 8th grade teams). These items will be handed to students after the lunch session. Please come by our display room before you leave our campus so you can pick up your project and possible awards. Thank You!

Disclaimer: The University of Texas at El Paso, El Paso Community College, other supporting organizations, event staff and volunteers cannot be held responsible for lost, stolen or damaged entries or for any work remaining after the event on April 24, 2010. For additional information, please contact Javier Garcia at javier.garcia1@utb.edu or call UT Brownsville at 956 882-5058

Mission Patch Design Activity

Suggested Grade Level: 3–9

Background Information:

A space mission requires hundreds (sometimes thousands) of people working together in a variety of jobs. Construction workers, truck drivers, spacecraft designers, engineers, planetary geologists, chemists, physicists, and astronauts may all work together to create a successful mission. One of the things that holds this group together is a well-defined understanding of their mission goals and objectives and pride in their achievement. The mission patch is the graphic representation of their common goal. Each mission patch is unique and is frequently designed by the people involved in the mission to represent the important aspects of the mission

Activity – Discussion for students by teachers

- Study a range of mission patches and discuss the different designs and the use of symbols. For more information about NASA mission patches, log on to www.hq.nasa.gov/office/pao/History/mission_patches.html or have students access this site prior to the activity.
 - Discuss the types of activities that may be undertaken in a mission
 - Divide students into groups or work individually
 - If working in groups, allocate students different nationalities or roles (it has often been commented that the hardest part of any mission is getting a crew of astronauts to agree on a mission patch)
 - Ask students to design a mission patch on the **20" X 30" Foamboard or Foam Core Board of any color** (patches can be of any shape). Also, a detailed description of the patch and questions students have related to our theme must be included in the project. The project will be placed on an easel at the event's display room to be judged.
 - Remind students that patches are stitched and that intricate detail cannot be shown.
 - Have each group present their mission patch to the class, describing the symbols chosen and the reasons for each choice.
 - Collect all the mission patch designs from your school and decide on 2 projects to submit for the event.
 - In order to design the patch, the teams will use the Mission Patch Checklist to select a mission type, destination, mission goal(s), science objective(s), and mission name.

Introduction for Students

Hundreds, sometimes thousands, of people work on a NASA space mission. Every one of those people proudly wears the mission patch on T-shirts, hats, jackets, flight suits, or spacesuits (depending on their mission-related job). Have you noticed that the shuttle astronauts all wear a special mission patch in addition to their NASA patches? Have you seen photographs of the Apollo astronauts wearing their distinctive patches? Each space mission, whether it is a human mission or a robotic planetary mission, has its own special mission patch. Who designs these mission patches? Usually, it is the people involved in the mission. The patch is designed to represent the mission. If you had the opportunity to work on a NASA mission, what type of mission would you want to experience? What type of patch would you design?

Procedure

1. Each student team may be assigned a mission type or choose one based on the Mission Patch Checklist (last page of this document).
2. Teams will design their patch after choosing their mission type, mission goal, science objectives, and mission name. Use the sample patches included in this activity or have your students research patches that were designed and used in previous human and robotic missions.
3. Each team should sketch/color their patch. The patch design can be drawn, colored, or painted, but it could also be done in another medium such as paper collage, mosaic or clay.
4. The completed mission patches can be displayed in the classroom. Each team should choose a spokesperson to present their patch to the rest of the class and give their reasons for the design of the patch.
5. FOLLOW the instructions on Page 1 of this document.

Process/Closure

Discuss the decisions that each team made about mission type, goals, names, and patch design, including the compromises necessary to come up with a single design. Each person, and each job type, involved in a mission has their own interest in the mission, but they must learn to work together as a team to achieve their goal or the mission will not be successful. Real missions can take up to 10 years of planning and implementation before the mission reaches its destination; therefore, all of the mission team members must agree to the essential decisions early in the planning stages.

Extension/Enrichment

Ask students to research the actual design of real NASA mission patches. Limit the activity to patches for Mars missions. Have the students research patches for all previous NASA Mars missions and then design new patches for future rover, sample-return, and human missions to Mars.

Use the techniques described in this activity to produce a class patch, based on school or grade level features, goals, and objectives, that will become the insignia for the entire class.

This activity can be presented separately but can also be linked with one or more of the following activities: *Flyby, Orbiter, or Lander?*, *Your Own Mission to Mars* and/ or *Select a Landing Site on Mars* in order to present an entire thematic unit on mission planning and implementation.

Credits: Portions of this activity was created by Jayne Aubele, New Mexico Museum of Natural History & Science. Modifications were completed by Javier Garcia, STEMS Program director at The University of Texas at Brownsville and Texas Southmost College (UTB/TSC) for the purpose of NASA Space Science Day at El Paso April 24, 2010.

Team Name _____ Date _____

Mission Patch Design Checklist

Mission Type (choose one)

- Flyby
- Orbiter
- Lander
- Rover
- Probe (atmospheric or surface)
- Sample return
- Human mission

Destination (choose one)

- Mars
- Phobos
- Moon
- Other _____

Mission Goals (choose two)

- Scientific discovery
- Reconnaissance of planet
- Collecting a sample
- Setting up a habitat

for a human colony

- Other _____

Design of Patch Includes:

(choose as many as needed)

- Spacecraft
- Destination
- Science objective
- Names of astronauts
- Other _____

Mission Name _____

Scientific Objectives (choose three)

- Geology of surface
- Chemistry and mineralogy
- of rocks and soil
- Composition of atmosphere
- Composition of ice
- Search for present water
- Search for past water
- Search for life
- Search for fossils
- Find resources that can be used

by humans

- Other _____

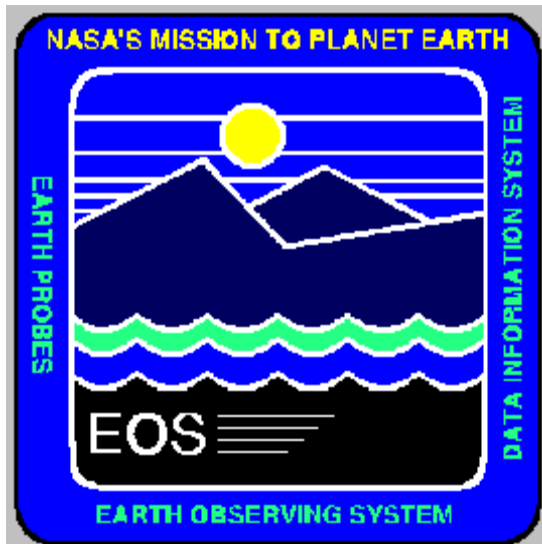
Shape of Patch (choose one)

- Round
- Oval
- Square
- Rectangle
- Triangle (point up or point down)
- Hexagonal
- Octagonal
- Other _____

Mission Patch Examples

Mission: Apollo 8

First human mission to the moon, shown by the design of the patch. The orbit was in the shape of a picture “figure eight.” Names of astronauts are included.



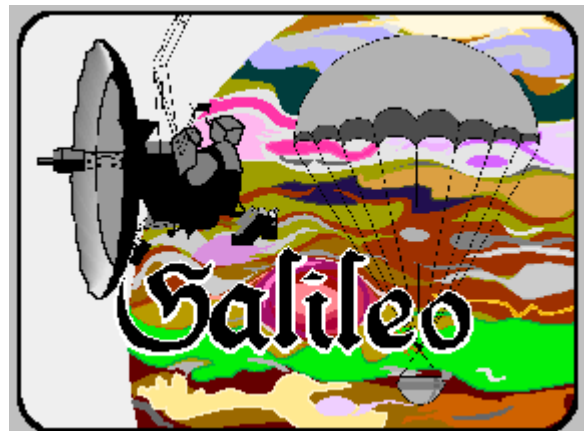
Mission: Earth Observing System (EOS) Satellite

This was an orbiting spacecraft designed to observe Earth's atmosphere, surface, geology, and oceans. Mission goals and Earth features to be observed are on the patch.

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Mission: Galileo Mission to Jupiter

This mission included an orbiter spacecraft and an atmospheric probe, both of which are shown on the patch.





Mission: Space Shuttle Mission STS-30
 This shuttle also launched the Magellan
 Spacecraft that went into polar orbit
 around Venus. The trajectory of Magellan
 from Earth to Venus is shown as well as the
 original Magellan's ship. Names of
 astronauts are included.

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Making Tracks on Mars

Exhibit Logo

New Mexico Museum of Natural History & Science
 and LodeStar Astronomy Center

This patch incorporates the replica rover on display
 at

the LodeStar Astronomy Center and commemorates
 our link with this historic mission. The design in the
 center was created by Joe Aragon and the New
 Mexico

Teacher–Student MER Intern Team. It incorporates
 Acoma Pueblo design elements in order to represent
 the topics that the Mars Exploration Rover mission
 was

designed to study on Mars: atmosphere, rain (possible
 water), surface features, and possible life.



Standards

NM Science Content Standards: Strand III, Science and Society

NM Arts Content Standards 2, 4, and 5

NM Career Readiness Standard 5

National Science Education Standards: Standard G, History and Nature of Science.

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