

# Design Your Mission Patch

Suggested Grade Level: 3–9

## Summary

- Students will work in teams to design a space mission patch.
- 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.

## 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

## 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.

## Suggested Materials

- Mission Patch Checklist accompanying this activity
- Color or black and white copies of a variety of mission patches (included)
- White drawing paper
- Pens, crayons, or markers

## Preparation

Print and photocopy the Mission Patch Checklist and Mission Patch Examples for each team of students.

For more information about NASA mission patches, log on to [http://www.hq.nasa.gov/office/pao/History/mission\\_patches.html](http://www.hq.nasa.gov/office/pao/History/mission_patches.html) or have students access this site prior to the activity.

## 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 may choose one based on the Mission Patch Checklist.
2. After choosing their mission type, mission goal, science objectives, and mission name, teams will design their patch. 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.

## 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

This activity was created by Jayne Aubele, New Mexico Museum of Natural History & Science.



The rock outcrop named Sunset Ridge seen from Spirit on Sol 519

Team Name \_\_\_\_\_

Date \_\_\_\_\_

## Design Your Mission Patch

### Mission Patch 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 \_\_\_\_\_

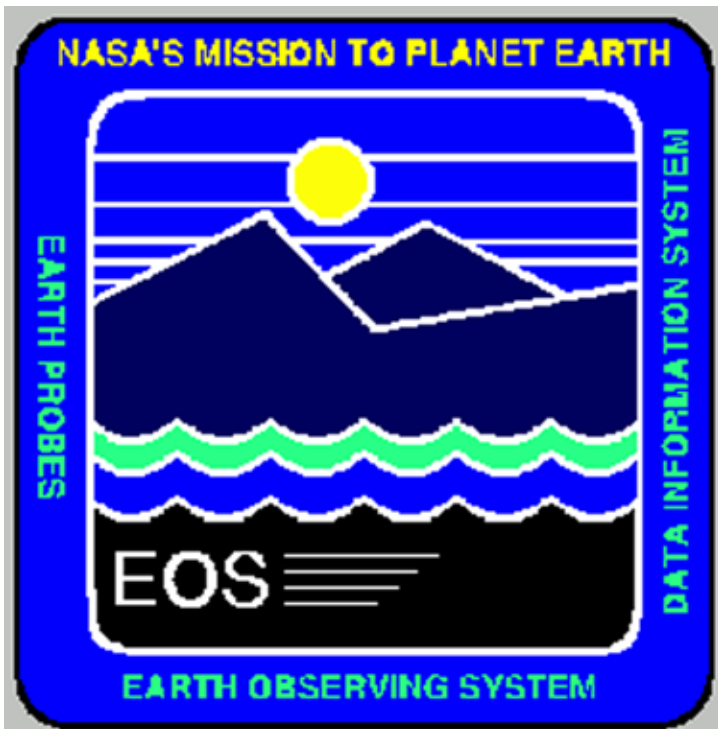
#### Shape of Patch (choose one)

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

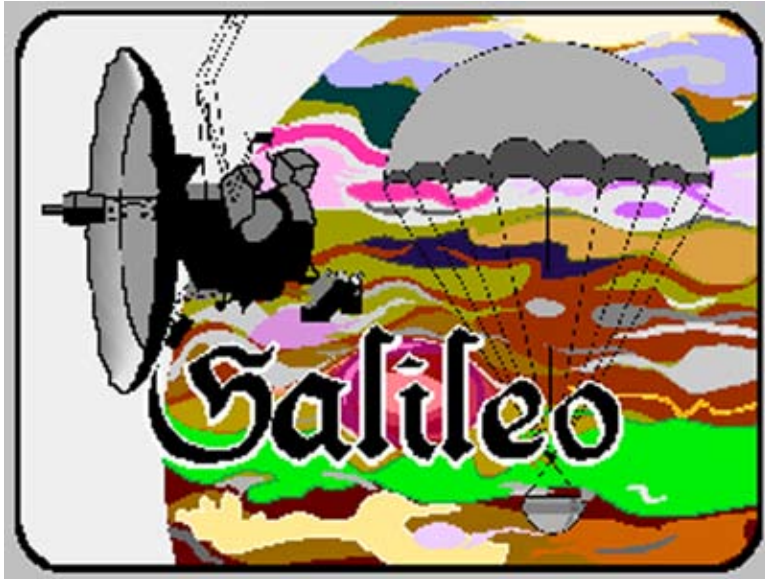
## Mission Patch Examples



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.



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.





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.