

JUNIOR MISSION TEACHER PACKET HMNS



HMNS Expedition Center Program

This packet is pre-visit material for a **Junior Expedition Center Mission** at the **Houston Museum of Natural Science**.

Junior Missions are designed for students in K through 4th grades.

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TO TEACHERS



Dear Teachers,

Thank you for planning a field trip to the Expedition Learning Center (EC) at the Houston Museum of Natural Science. The Expedition Center Program is the most innovative and engaging way for students to experience STEM objectives, and HMNS has 25 years of experience doing so. This packet will help you prepare for a field trip that your students will not soon forget. Our web site will also give you more information and help preparing your students. Go to www.hmns.org/Expedition.

Please use the enclosed material to help prepare your students for their mission. This packet is divided into three sections: “**Must Do**” contains the minimum preparation necessary, “**Recommended**” are the activities that will help teachers and students understand and increase the learning potential of the mission, and “**Fun Stuff**” are activities that can get your students more excited about the field trip. The EC uses space flight to make many fields of science exciting and open up scientific career options. As astronauts they will become electrical engineers, chemists, biologists, geologists, environmental scientists, and more. During the mission we will focus on the teamwork, communication and problem solving skills needed to successfully accomplish goals. We will not go into the concepts of each science, so this should be done in your classroom.

To help you prepare for your field trip, the Expedition Center is open for you to visit. We recommend that any teachers who have not previously brought a group to the EC come to the center and meet with a staff member. To arrange a visit to the EC, call 713-639-4727 or email expedition@hmns.org

We enjoy working with a broad range of students with different abilities. If you have students with learning or physical disabilities, or do not read or speak English, it is helpful if you let us know at the start of each mission so that we can give them the attention they need. A Junior Mission is designed for students in Kindergarten through fourth grades. Because they are still working on their reading, we require that at least one adult per two children for K and 1st graders or one adult for every 5 students in 2nd - 4th grades.

We are here to help make your field trip the best it can be. If you have any questions, call 713-639-4727 or email expedition@hmns.org

We look forward to your visit!
The Expedition Center Staff

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CONTENTS



MUST DO

Preparation that must be done before each mission.

Mission Overview

An outline of your day at the Expedition Center.

Team Descriptions

This is a list of job description and skill sets for each position. Review these with your students and choose who is best for each job. Each team has a different job using different abilities and is based on a career on Earth. There is a Job Application in the “Recommended” activity section that you can use to help decide assignments.

Team Assignments

This chart will show which teams should be used for your group size. If a student is absent on the day of your field trip, use it to shift the team assignments before your mission.

Crew Manifest

Use this to assign students to their teams. One Crew Manifest is needed for each mission. Write the names of your students and their “Team Assistant” (chaperone) in the team slots. If you have trouble decided how to assign jobs, do not hesitate to call the Expedition Center for help. Bring the Crew Manifest to the Expedition Center for you mission.

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RECOMMENDED

These activities will help your students function more efficiently and understand the mission.

Team Application

Students can apply for the team they want using the Team Application. This will also help teachers decide who to assign to what teams.

FUN STUFF

Activities that can be added to your mission.

Crew Patch

Your students can design a crew patch for your mission. Select a patch that represents your group and bring it with you to the Expedition Center. Your patch will be added to our Mission Patch Database and displayed in the Briefing Room.

Certificate

Make a copy for each student to reward them after their mission.

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MISSION OVERVIEW



When you arrive at HMNS, line your students up in front of the doors to the museum. Your lead teacher must check in at the Box Office. Your group should receive a ticket and bright green or blue ID tags for each chaperone. If your school is scheduled to arrive early in the morning a staff member from the Expedition Center will meet you at the entrance to the Museum to help you get organized. For missions during the day, your group should go to the Expedition Center (located on the lower level near the Chemistry exhibit) about 10 minutes before your mission is scheduled to start. At the beginning of the mission, make sure each student knows their team name. Also, **please tell the Expedition staff if your students are scheduled for a Giant Screen Theater or Planetarium show immediately after the mission** so that we can be sure to finish a few minutes early. It is helpful if we know of any students that have special needs that may require extra attention. The Expedition Center is completely wheelchair accessible.

Two staff members will work with your group. To start the mission, one of the staff will give a “mission briefing” in which the scenario, goals, and team responsibilities will be reviewed. Then the students will be given specific instructions on how to do their jobs. As the mission starts, the students on board their ship, the *SS Legacy*, will detach from the Earth-orbiting space station and start their flight toward Mars. Along the way, they must conduct several experiments and work to complete their mission. The role of the parents is to be “Team Assistants” to the students. Parents should only assist with reading and not actually do any of the work. One adult should be assigned to each team. Through the journey, there may be problems or emergencies that the crews will have to work through such as high radiation, explosive gases, power blackouts, air system malfunctions and more. The mission ends with the landing on Mars, and finally with a debriefing to discuss what the students learned.

You are welcome to take as many pictures as you like.

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TEAM DESCRIPTIONS

COMMUNICATIONS TEAM: As a member of the Communications Team, the students will be responsible for all verbal messages between Mission Control and the ship. These students should be responsible and cool under pressure. **Skills:** reading and oral communications, work in high stress situations, ability to prioritize.

DATA TEAM: The Data Team is responsible for all written information exchanged between Mission Control and the Flight Simulator. **Skills:** computer keyboard operation, good communication, ability to organize.

MEDICAL TEAM: As members of the Medical Team, the students will study the effects of space flight on the human body, and are responsible for the health and safety of the astronauts. **Skills:** simple math, keyboard operations, and good interpersonal skills.

NAVIGATION TEAM: The navigators will identify constellations, take measurements and make calculations to get the ship into orbit and land on Mars. **Skills:** math, geography, and an interest in astronomy.

ISOLATION TEAM: The Isolation Team will use robot arms to conduct tests on “hazardous” and radioactive material and analyze the results of the tests. **Skills:** strong hand eye coordination, patience.

PROBE TEAM: As members of the Probe Team the students are responsible for the assembly, deployment, and monitoring of a satellite. **Skills:** strong mechanical skills, analytical problem solving, deduction skills.

REMOTE TEAM: The Remote Team will operate a video program simulating jets flying on Mars. **Skills:** strong hand eye coordination, patience, observation skills.

LIFE SUPPORT TEAM: Students on the Life Support Team are responsible for the environmental conditions on the ship that are required to live. They will monitor the air filtering system, water recycling, and electricity. **Skills:** strong problem solving skills, interest in environmental and biological sciences.

BIOLOGY LAB TEAM: The biologists will evaluate living animals, analyze the growth of plants in greenhouse systems, and study crop and seed samples. **Skills:** interest in biology, observation, measurement.

GEOLOGY LAB TEAM: The Geology Team will study and compare rocks and surface features of the Earth, Moon, and Mars. **Skills:** interest in geology, observation, measurement.

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TEAM ASSIGNMENTS

Use this chart to make the best team assignments for your number of students.

NOTE: The Data Team involves typing. If you don't have any students that can type, this job can be assigned to an adult. If you have an adult on the Data Team, count the adult as a student and use the assignments that match your group size.

# of Students	Assignments to Each Team
12	1 Comm, 1 Data, 2 Nav, 2 Probe, 2 Iso, 2 LS, 2 Rem
13	1 Comm, 1 Data, 2 Nav, 1 Med, 2 Probe, 2 Iso, 2 LS, 2 Rem
14	1 Comm, 1 Data, 2 Nav, 2 Med, 2 Probe, 2 Iso, 2 LS, 2 Rem
15	1 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 2 Iso, 2 LS, 2 Rem
16	2 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 2 Iso, 2 LS, 2 Rem
17	2 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 3 Iso, 2 LS, 2 Rem
18	2 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 2 Iso, 2 LS, 2 Rem, 2 Geo
19	2 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 3 Iso, 2 LS, 2 Rem, 2 Geo
20	2 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 2 Iso, 2 LS, 2 Rem, 2 Geo, 2 Bio
21	2 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 3 Iso, 2 LS, 2 Rem, 2 Geo, 2 Bio
22	2 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 3 Iso, 2 LS, 3 Rem, 2 Geo, 2 Bio
23	2 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 3 Iso, 2 LS, 3 Rem, 3 Geo, 2 Bio
24	2 Comm, 2 Data, 2 Nav, 2 Med, 2 Probe, 3 Iso, 2 LS, 3 Rem, 3 Geo, 3 Bio

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CREW MANIFEST



Use this **Crew Manifest** for Junior Expedition Missions at the Houston Museum of Natural Science. Each student will become a crew member on one of the teams in the Expedition Center. Use the **Team Assignments** chart for the best team setup. Review the **Team Descriptions** with your students prior to filling out the **Team Application** and **Crew Manifest**.

Teams	Astronauts	Adult Assistant
Communications	_____ _____	_____
Data	_____ _____	_____
Medical	_____ _____	_____
Navigation	_____ _____	_____
Isolation	_____ _____ _____	_____
Probe	_____ _____	_____
Remote	_____ _____ _____	_____
Life Support	_____ _____	_____
Bio Lab	_____ _____	_____
Geo Lab	_____ _____	_____

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TEAM APPLICATION



By completing the Team Application, student will be introduced to and think about the different jobs that scientists and engineers do.

Procedures

1. Copy and pass out the Team Applications.
2. Make a list of available jobs on the chalkboard and discuss them using the Team Description page of this packet.
3. Students complete the applications.
4. Teacher assigns jobs for the upcoming Expedition Mission.

PERFORMANCE REVIEW

After the Mission, teachers can lead their students in a discussion of the Mission. Possible questions are:

What were your responsibilities as part of a team?

What problems did you encounter in meeting your objectives during the mission?

What might you do differently or better if you had the job to do again?

What other team interested you and why?

Are you more interested in going into science because of having a role on this mission?

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TEAM APPLICATION



Name _____
Date _____ Grade _____
School _____ Teacher _____

Career Objectives:

I am applying for a position on these teams:
Number your first, second, and third choices.

- | | | | |
|---|------------------------------------|---------------------------------------|-------------------------------------|
| <input type="checkbox"/> Communications | <input type="checkbox"/> Data | <input type="checkbox"/> Life Support | <input type="checkbox"/> Navigation |
| <input type="checkbox"/> Probe | <input type="checkbox"/> Isolation | <input type="checkbox"/> Remote | <input type="checkbox"/> Medical |
| <input type="checkbox"/> Geology | <input type="checkbox"/> Biology | | |

What qualities do you have for these positions?

What experience do you have for these positions?

References

Name _____

Name _____

This certifies that

_____ has successfully completed a

MARS' LANDING
ON BOARD THE SS LEGACY

HIMNS
Expedition Center
Program



Teacher's signature

Date

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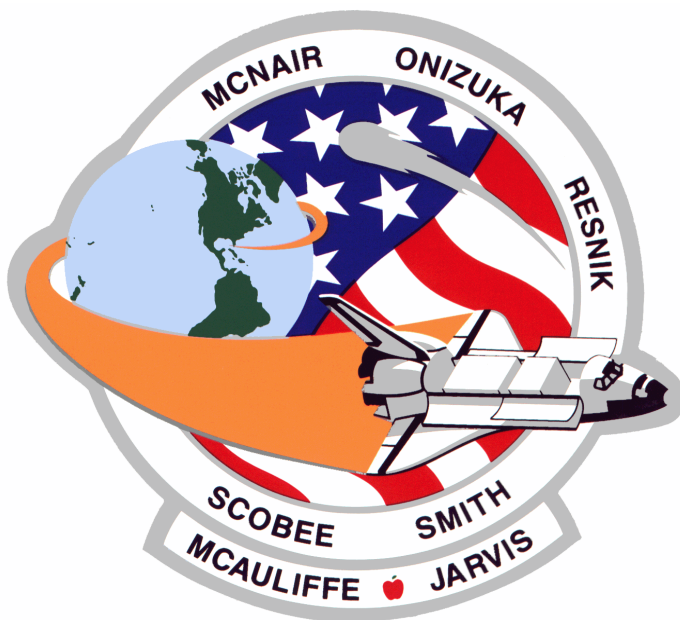


CREW PATCH

Your students can design a crew patch for their mission. Bring one patch to the Expedition Center. Your patch will be added to our digital Mission Patch Database and displayed in the Briefing Room.

Patch Specifications:

- Patch should be on 8 ½" x 11" paper.
- Design should include the name of the school and the year.
- Designs should be colorful and represent the school or the class.
- One patch per Mission. Students can design the patch together, or students can each design a patch then the group votes for one to represent them.



51-L Mission Patch

This patch symbolizes the mission to fly, to explore, to teach. The shuttle, being launched from the United States of America, encircles the planet to signify its U.S. presence in space to explore new frontiers. The shuttle in flight with open cargo doors represents the 51-L mission to launch a communications satellite to collect data from Comet Halley and to conduct scientific experiments. The apple next to the teacher's name signifies the educational mission of the crew to touch the future through the lessons taught in space. The scene is encircled by the surnames of the crew members. They were astronauts Francis R. (Dick) Scobee,

Commander; Michael J. Smith, pilot; Ron McNair, Ellison Onizuka and Judy Resnik, all mission specialists; Greg Jarvis, payload specialist; and Christa McAuliffe, teacher.