

Explore Mars

Activities Overview

Mars Imaginings: The Story

During this 45–60 minute activity, children ages 6 to 13 consider depictions of Mars from science fiction books and video clips. As a group, children discuss what they know about Mars and compare their ideas with the way Mars and imaginary Martians are presented in the science fiction works. They then use what they've learned to create their own Mars Science Fiction 'Movie Trailer' Zines.

Searching for Life

In this 45–60 minute indoor activity, children ages 8 to 13 discuss how life is defined and conduct a simple experiment, looking for signs of life in three different "soil" samples. The experiment introduces the children to the difficulty that scientists face in defining life. By observing the soil samples, the children try to determine if any contain signs of life and work to identify, refine, and create a set of characteristics that may be used to identify living versus non-living things. The activity concludes with the development of a group definition of life. This group definition will be important, and should be referred to as the children work through the subsequent module activities (if they are undertaken).

Strange New Planet

Children ages 10 to 13 work in teams to collect data and plan missions to explore unknown worlds! The facilitator creates three "planets" out of clay decorated with craft items ahead of time. In this 45-minute activity, the planets are unveiled and teams send observers armed with "viewers" (paper towel tubes) to study them. The observers first view the planets from a distance to simulate observations by ground-based telescopes, then have opportunities to study them from increasingly closer distances during flybys and orbits. The teams use their collected information to plan lander and sample return missions.

Crater Creations

In the 30-45 minute Crater Creations activity, teams of children ages 8-13, experiment to create impact craters and examine the associated features. The children observe images of Martian craters and explore how the mass, shape, velocity, and angle of impactors affects the size and shape of the crater.

Mars Match

Mars Match, a 15 minute activity for children ages 8–13, engages children in an exploration of Mars' surface features by comparing and contrasting them with surface features on Earth. The children form teams of "planetary investigators" to examine images of volcanos, channels, and craters on Earth and Mars. The teams then use what they've learned to match the appropriate Mars feature cards to their Earth counterparts. The teams conclude by considering how scientists view these features from space, and what that may mean for our search for life beyond Earth.

Carving Channels

Carving Channels is a 15 minute activity in which children ages 8 to 13 create channel features with flowing water, comparing their observations to real images of Mars and Earth taken by satellites/orbiters. Their observations of the ways in which flowing water alters the surrounding terrain are used as clues to draw conclusions about Mars' geologic past and its ability to support life, as well as how scientists view these features from space.

Live Tonight: The Planets

This activity encourages children, ages 7 and up, and their families go outside on a clear evening to view the planets and other celestial bodies for themselves. Using sky charts and other resources, and possibly in partnership with a local astronomical society or club, children and their families view Mars with binoculars and/or telescopes. Depending on what works best for your library, this outdoor night viewing can be combined with highlights of past activities from the module, having the audience undertake some of the activities, and hosting a presentation by an astrobiologist or Mars scientist. The children who have participated in the other Explore: Life on Mars? activities may serve as docents at this public, community event, sharing what they have done and learned about what life is, the requirements for life, and the possibility for life on Mars now – or in the past!

Protecting Life: The Martian Challenge

During this 60 minute activity, children ages 8 to 13, create their own 'Martian' using craft materials and UV beads. They will explore how UV radiation from the Sun can affect living things, comparing conditions on Earth and Mars, and then discussing ways that organisms may protect themselves from UV radiation. They will then take part in a Mars Creature Challenge, where they will change their creature to help it survive harsh UV conditions – like on Mars. They will then test their Mars Creatures by subjecting them to different environmental conditions to see how well they "survive" in a Martian environment. This investigation will explore shelter and protection as one of life's requirements and how Earth's atmosphere protects life from harmful UV radiation.

Mars Engineering

Children ages 8 to 13 create their own models of a Mars rover out of readily available materials and craft supplies in this 45–60 minute activity. They determine what tools would be necessary to help them better understand Mars (and something about life on Mars/its habitability). Then they work in teams of 4–6 to complete a design challenge where they incorporate these elements into their models, which must successfully complete a task. Teams may also work together to create a large-scale, lobby-sized version that may be put on display in the library to engage their community.

About the Explore! Program

Explore! Fun with Science is designed to engage youth in space and planetary science in the library and after-school informal learning environments.

Through hands-on activities, and supporting resources such as videos, recommended books and Web sites, children of all ages are immersed in the wonders of rockets, space colonies, our solar system, how our planets were shaped, staying healthy in space, and more!

How to Use Explore

Explore! was created specifically for the library setting and after-school informal educational venues:

- Hands-on activities are designed to be easy to do, use readily available materials, and require little preparation time.
- The topics are designed to be flexible and can be incorporated in any program involving children, including summer sessions, after-school programs, festivals, science days, and family events.
- Activities are one to two hours in length and children can take their creations home with them.
- *Explore!* provides opportunities for partnering libraries with volunteer groups, local businesses, community programs, and schools.

<http://www.lpi.usra.edu/education/explore/>

We recommend that you examine the *Explore!* Web site and select the topics that will interest your patrons. Try one topic at a time. Realize that each topic has background information for you, and additional resources that you can share with your patrons. Consider having some of the books and videos on display for your patrons to check out after the event. In addition to the main activities and demonstrations, there are extensions that allow younger and older children to investigate the topic.

Consider getting in touch with local planetariums, museums, scientists, and Solar System Ambassadors – ask them to join your events and share their experiences or resources with the children. And remember your *Explore!* Network – your colleagues and the Lunar and Planetary Institute *Explore!* team are always willing to share ideas!

Most Important: Have Fun!

What's Available?

On the Web you can find:

- *Explore!* activities, resources, background information for a variety of space and planetary science topics – including the *Mars: Inside and Out* module!
- *Explore!* News - Current space science information
- How to order *Explore!* videos
- The *Explore!* brochure, certificates for trainers and for children, and letterhead
- Copies of covers for *Explore!* videos (just in case you want to make copies of them!)

A Bit of History ... There will NOT be a Test ...

Libraries have long been known as inviting environments for lifelong learning. In many instances, libraries are the hub of their communities, meeting the particular needs of the public and school communities they serve. Libraries are places that all types of people use in the everyday course of their lives. They offer classes, meeting spaces, discussion groups, and programs for children and teens all year long. By their basic structure, libraries offer the perfect setting to obtain guided research by information professionals who foster continued learning in any topic.

In 1998, the Lunar and Planetary Institute (LPI), believing that libraries have the potential to play a vital role in bringing space science to everyone, developed *Explore!*, a program intended to bring space science resources into libraries. In 1999, the LPI recognized the tremendous potential for making more direct connections with children through ongoing youth programs in libraries. They began collaborating with the State Library of Louisiana to design an after-school science activity program for use in public libraries or other informal education settings, including museums and planetariums. *Fun with Science* was seen as a new and exciting way to partner public libraries, community entities, and scientists to bring space science into neighborhood libraries. The format was intended to be flexible — materials could be presented in myriad venues, short or long, including summer youth programs, family days, after-school programs, and festivals, to name just a few. The first workshop was held in 1999 in West Baton Rouge Parish. Of the twenty librarians attending, ten hosted *Explore! Fun with Science* workshops that fall, reaching approximately 300 children. By the end of the summer of 2000, *Explore!* library members numbered 253, and reached more than 9000 children through *Explore! Fun with Science* activities.

Explore! Fun with Science was originally supported through the Lunar and Planetary Institute by a grant from the NASA Office of Space Science for the Support Network of Broker/Facilitators and Forums. *Explore!* was only one component of the Lunar and Planetary Institute's Broker/Facilitator Program. A grant in 2001 from the National Science Foundation broadened the *Explore! Fun with Science* program resources and extended its reach. And generous grants from NASA are supporting development of additional modules as well as workshops across more states — and supporting the inclusion of the exciting learning environments of after-school programs. *Explore!* is in use in over 21 states with over 500 trainers in libraries and after-school programs.

Explore Partners



Explore! materials were produced by the Lunar and Planetary Institute Education and Public Outreach Team.



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