

Earth-Moon Resources

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

Resources:

Our goal is to make all of our activities and resource information freely available. Many of these are searchable at <http://www.lpi.usra.edu/education/resources/>. We have included our powerpoints from our workshops so that you may access them for yourselves, to download and share with other educators. Downloading the powerpoints will give you access to the notes for each slide—we have included comments, resources, and Web sites in the note section. The powerpoints are not intended to be used directly in K-12 classrooms. You may edit them to use as appropriate.

The powerpoints are located at:

<http://www.lpi.usra.edu/education/workshops/unknownMoon/agenda>

Activities

Moon Mineralogy Mapper Education

<http://m3.cofc.edu/educators.html>

Here you will find a variety of educational activities, including *Seeing the Moon: Using Light to Investigate the Moon Educator Activities*, which we conducted on Monday. Through the hands-on inquiry based activities, students experiment with light and color, collect and analyze authentic data from rock samples using a reflectance spectrometer, map the rock types of the Moon, and develop theories of the Moon's history.

Exploring the Moon: NASA ARES

Has many hands-on activities and background information on lunar geology and more. This site contains teacher activities appropriate to be done in the classroom for middle school and high school students.

<http://ares.jsc.nasa.gov/Education/activities/ExpMoon/ExpMoon.htm>

Explore! To the Moon and Beyond with the Lunar Reconnaissance Orbiter Mission

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

Hands-on activities, background information, suggested books and Web sites for further exploration.

Impact Cratering Lab Activity

<http://www.lpi.usra.edu/nlsi/education/hsResearch/crateringLab/>

These impact cratering exercises introduce the fundamental concepts of impact cratering and basic image processing techniques. The activities have been used extensively in undergraduate courses but are also appropriate for advanced high school students.

Lunar Resources

DPS Powerpoint: Water Found on the Moon ([PowerPoint](#), [1 page](#), [PDF](#))

The Lunar Core ([PowerPoint](#), [1 page](#), [PDF](#))

Moon Posters by LPI

http://www.lpi.usra.edu/education/moon_poster.shtml

A series of three posters explores what — and how — we know about our Moon's formation and evolution, and how its history affects lunar resources. The front of the posters provide content depth for students, while back panels provide educators with information, activities, stories about the Moon, resources, and introductions to lunar scientists.

Lunar Exhibits by the Center for Lunar Science and Exploration

<http://www.lpi.usra.edu/nlsi/education/exhibits/current/>

Designed for libraries, these banners use colorful images and text to share current lunar science and exploration stories. The displays can be borrowed by informal education organizations; complete visuals are available for download and printing.

Animations and Information at CLOE

<http://cloe.boulder.swri.edu/aboutTheMoon/>

This website, created by high school students, contains a variety of graphics and animations about the Moon.

General Lunar Websites

NASA Lunar Science Institute

<http://lunarscience.arc.nasa.gov/>

This site has information about the research being conducted by various lunar scientists, the opportunity to ask a question of lunar scientists, and more.

NASA's Science Mission Directorate

<http://science.hq.nasa.gov/missions/index.html>

Explore past, present, and future missions that are revealing new insights into Earth, our Sun, the Solar System, and the Universe

NASA's Exploration Mission Directorate

<http://www.nasa.gov/directorates/esmd/home/index.html>

The latest news on getting into space – the rockets, the modules, the missions ... and more! Lots of videos.

The Lunar Reconnaissance Orbiter Site – LRO!

<http://lunar.gsfc.nasa.gov/>

Check out the educational materials for loads of stuff about the Moon. Nice video clips. And home to the Lunar Librarian newsletter (<http://lunar.gsfc.nasa.gov/outreach.html>)

The Lunar Crater Observation and Sensing Satellite – LCROSS!

<http://lcross.arc.nasa.gov/>

Check here for design challenges, impact observing information, and other educational opportunities

Pat Rawlings Images

<http://www.patrawlings.com/default.cfm>

Great site for beautiful illustrations of space travel, lunar bases, Mars outposts, and more. You are invited to use the images copyrighted to NASA and the public.

NASA's (actually the Jet Propulsion Laboratory's) Solar System Ambassadors

<http://www2.jpl.nasa.gov/ambassador/directory.htm>

Need some expertise for your space programs? Be sure to find the Ambassador near you!

Explore Home Page

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

Links to present and past Explore Newsletters and several other Explore! modules like Health in Space, Mars, Rockets, Comets, and more (<http://www.lpi.usra.edu/education/explore/explorations.shtml>).

Inconstant Moon

<http://www.inconstantmoon.com/>

Offers pictures, calendars, and music that can be enjoyed by all ages.

Fourmilab Switzerland

<http://www.fourmilab.ch/earthview/vplanet.html>

An interactive site created by John Walker that allows you to view the Moon from Earth, our Sun and the night side.



It also gives descriptions and details of lunar formations. This site is suitable for all ages.

Lunar Map Catalog

<http://www.lpi.usra.edu/resources/mapcatalog/>

The Lunar and Planetary Institute offers a number of lunar maps and catalogs. This site is suitable for children 12 and up.

The Astronomical Society of the Pacific

<http://www.astrosociety.org/education/family/resources/moonguide.html>

Offers an extensive reference list of books, articles, and Web sites pertaining to our Moon.

The Center for Lunar Science and Exploration

<http://www.lpi.usra.edu/nlsi/index.shtml>

This NLSI team site includes background science information, images, the traveling exhibits, high school research projects, and more.

Lunar Impact Crater Geology and Structure

<http://www.lpi.usra.edu/expmoon/science/craterstructure.html>

This page at the Lunar and Planetary Institute has detailed information about the types and formation of craters on the Moon. Written for adults.

Books

The Universe at Your Fingertips: An Astronomy Activity and Resource Notebook

Andrew Fraknoi and Dennis Schatz, 1995, Astronomical Society of the Pacific, ISBN 1886733007

A section on Moon phases and eclipses is included in this comprehensive 800-page loose-leaf astronomy resource guide with ready-to-use activities for ages 6–18.

The Earth and the Moon

Linda Elkins-Tanton, Chelsea House, 2006, ISBN 0816051941

Written for young adults and adults, this book discusses Earth's size, orbit, mass, seasons and more as well as the evolution of the Moon.

The Moon and How to Observe It

Peter Grego, 2010, Springer, ISBN: 1852337486

A book for practical amateur astronomers who not only want to observe, but want to know the details of exactly what they are looking at. Includes observation guides, photos, and clear explanations of the Moon's geological evolution.

The Modern Moon: A Personal View

Charles Wood, 2003, Sky Publishing Corporation, ISBN: 0933346999

The perfect companion to lunar telescope viewing. Wood works his way across the lunar surface, identifying features of scientific importance and the people involved in unraveling their story.

The Once and Future Moon

Paul Spudis, 1998, Smithsonian Inst. Press. ISBN: 1560988479

A geologist discusses what our exploration of the Moon has taught us, and what we might do in the future to know and use the Moon better.

Types of rocks found on the Moon and Mars can be ordered for children to examine and for display. The following links are for samples from Ward's Natural Science Company, but other science supply companies also have rock samples.

Basalt http://www.wardsci.com/product.asp_Q_pn_E_IG0004711_A_Basalt



Vesicular Basalt (gas pocket "holes")

http://www.wardsci.com/product.asp_Q_pn_E_IG0004713_A_Basalt+%28Vesicular%29

Flood Basalt http://www.wardsci.com/product.asp_Q_pn_E_IG0004710_A_Basalt+%28Flood%29

Anorthosite http://www.wardsci.com/product.asp_Q_pn_E_IG0004709_A_Anorthosite
(Moon only!)

Actual Impact Breccia from Earth

http://www.wardsci.com/product.asp_Q_pn_E_IG0003107_A_Impact+Breccia

Basalt Breccia http://www.wardsci.com/product.asp_Q_pn_E_IG0004668_A_Breccia+%28Basalt%29

Volcanic Breccia http://www.wardsci.com/product.asp_Q_pn_E_IG0004671_A_Breccia+%28Volcanic%29

Lunar and Mars Soil Simulant can be ordered from <http://www.orbitec.com/store/simulant.html>