Resources for *Molten Moon*

Moon Mix! Activity

Model how an ocean of molten rock — magma — helped shape the Moon. Dense materials in the molten mixture sank, while the least dense materials floated to the top and cooled to form the light–colored areas we see on the Moon today. Additional details and options are available in Explore! Marvel Moon.

Materials

- A clear area
- An (8 oz.) empty clear plastic water bottle with the label removed
- A handful of at least 5 the following items: small aquarium gravel, buttons, dried beans, marbles, sequins, small pieces of coffee stirrers, small pieces of a dry sponge, pony beads, lego pieces, wooden beads
- A clear plastic cup filled halfway with water
- A pitcher of water
- A funnel
- Towel for cleaning up spills

Procedure

The early Moon was hot from its formation. Its rocks – at least the upper layer – were molten; they were liquid, just like the water.

1. Some materials float in water and others sink. Use the cup of water to test them, but first, make some predictions: which items will sink and which will float? Then test your predictions: add one piece of each type of item to the cup of water. Why did some items float and others sink?

   Discuss with your family or friends: Which items could represent dense minerals on the Moon? Which items could represent the materials that floated to the top of the magma ocean?

2. There were different materials inside the early Moon's outer layers, and at first, they were all mixed together. Use the items you tested to make a model of the infant Moon's super-hot rock soup: choose two types of items – one that sinks and one that floats – to add to your bottle.

   Use the funnel to fill the bottle half-full of water, then add a small handful of each to the bottle. Tighten the cap on the bottle, shake it, and watch carefully. Once everything has settled, note the order of the three different layers.

   Discuss with your family or friends: What is on the very bottom? What is in the middle? Which items floated to the top?

Some minerals -- plagioclase feldspar—solidified and floated to the top of the Moon's magma ocean. These formed into rocks called anorthosites— the first rocks to form on the Moon, 4.5 billion years ago. Scientists are still looking inside lunar rocks for pieces of infant crust to learn more about how the early Moon cooled.

Websites for Further Exploration

Infant Moon: Moon Mix!
www.lpi.usra.edu/education/explore/marvelMoon/activities/familyNight/magmaOcean/index.shtml
This webpage contains an activity for children and background information about the lunar magma ocean at the bottom for adults.

NASA's Moon Website
moon.nasa.gov
This website offers information about Earth's Moon including an interactive Moon globe, news about the Moon, lunar missions, a gallery of images, facts and figures, and other resources.

Lunar Science and Exploration Posters
www.lpi.usra.edu/education/moonPosters
This series of three posters from the LPI provides a detailed description of what past and current lunar exploration has taught us about the Moon and how to prepare for future missions to the Moon.

Lunar South Pole Atlas
www.lpi.usra.edu/lunar/lunar-south-pole-atlas
NASA has been directed to land astronauts at the lunar south pole by 2024. To assist NASA and the lunar community, the LPI has compiled an online atlas that consists of a series of maps, images, and illustrations of the south polar region.