

(Open Agriculture, 2019)

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To produce food for astronauts, different research groups are testing ways to grow food using lunar soil mixed with bacteria and fertilizers.

The shell, built from lunar soil by robots using a 3D printer, would protect astronauts from meteoroids, gamma radiation and temperature variations.



Lunar base prototype (ESA)

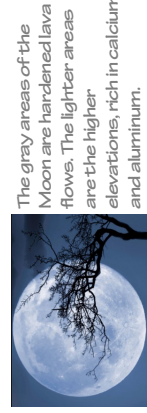
Transporting everything needed to sustain long-term missions to the Moon would be very expensive. A better approach would be to make what is needed using lunar materials.

The Moon is close to the horizon it appears orange - and even more so during lunar eclipses. This is because the dust in our atmosphere disperses the blue and green light from the Sun and only lets through the yellow, orange and red light. During eclipses, the Moon passes through the Earth's shadow. The sunlight first travels through Earth's atmosphere on its way to the Moon, and then the reflected light goes through the atmosphere a second time before finally reaching us on the Earth.

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The color of the Moon

The Moon shines because it reflects the light of the Sun. It has grey areas that are hardened lava flows. The Moon rocks brought back by the astronauts resemble lava from volcanoes. The lighter areas of the Moon are the highest in elevation; they are rich in calcium and aluminum, and reflect the most sunlight.



Credit NASA

The gray areas of the Moon are hardened lava flows. The lighter areas are the higher elevations, rich in calcium and aluminum.



Credit NASA

The dark rocks on the Moon resemble terrestrial volcanic rocks.

The dust suspended in the atmosphere disperses blue and green light and only lets through orange and red light. The Moon looks slightly orange when it is close to the horizon because the thickness of the Earth's atmosphere through which the reflected sunlight must pass is greater than when it is at a higher elevation.



Credit NASA

During lunar eclipses, the Moon takes on a dark orange color.



Credit NASA

Future stays on the Moon

There is little water on the Moon. At the bottom of craters and crevasses near the poles where no sunlight falls it is frozen. In the future, robots will be used to transport this water to greenhouses, where plants will not only provide fresh food, but also generate oxygen for breathing and fuel.

When the first astronauts went to the Moon, their space suits were covered with very fine, scratchy dust, and it was difficult to clean them. Astronauts used brushes which dispersed some of the dust, causing them respiratory and eye problems. Future explorers will carry dust vacuum cleaners for their suits.

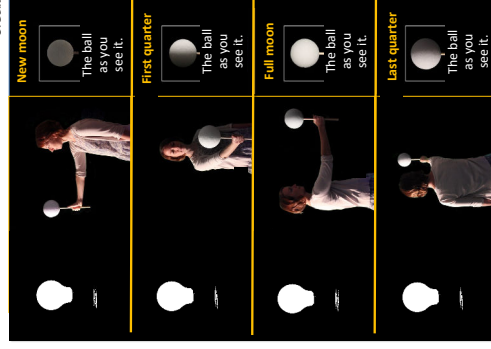
Moon dust will be used to grow crops in lunar greenhouses and to manufacture equipment with 3D printers.

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An experiment to understand the phases of the Moon

Instructions on the reverse side

credit: JPL



The Universe in my Pocket



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Credit: JIM MacLeod

Image of the Moon taken on January 21, 2019. The arrow shows the location of an impact flash caused by a meteoroid striking the surface on this date.

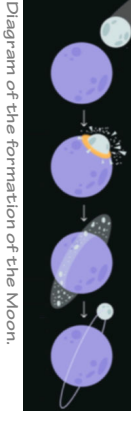


Diagram of the formation of the Moon.

Credit: Wikipedia

The Moon is thought to have formed shortly after the formation of the Earth.



Credit: SWRI

Artistic vision of Earth's formation with a newly formed planet called Theia.

