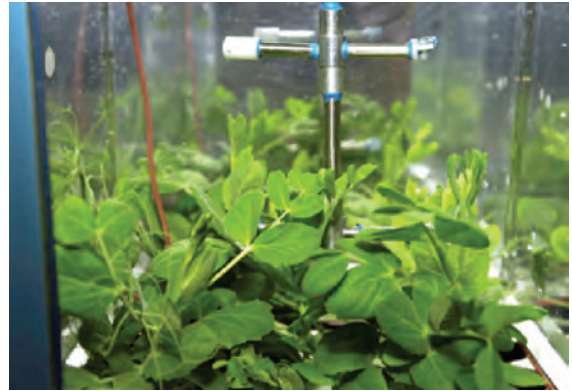


## Key Questions:

- What will people eat on the Moon?
- From where will food come?
- How will they get water?
- Where will waste from humans be contained?
- What can and cannot be recycled?



## Sustainability Overview:

Imagine for a moment that you are alone on a planet. There is no vegetation, no water, and you are getting hungry. This would be a terrible situation and one that we hope never occurs on the Moon. Therefore, consideration of food, water, sleeping, recreation, ventilation, fresh air, waste treatment, and more must be carefully researched.

## Design Challenge Factor:

As you begin making designs for your lunar colony proposal, you will need to be able to explain how the environment will be sustainable. For instance, if water is not on the Moon, will you need a facility that can treat the liquid waste to ensure that it is safe to drink? This and other similar decisions will impact the design of your colony. In addition, there are also financial considerations that need to be thought through. How will the lunar colony generate income to help validate its usage?

## Economic Development:

For long-term sustainability, a space colony should be close to self-sufficient. Onsite mining and refining of the Moon's materials could provide an advantage over deliveries from Earth—for use both on the Moon and elsewhere in the solar system—as they can be launched into space at a much lower energy cost than from Earth. It is possible that vast sums of money will be spent in interplanetary exploration in the twenty-first century, and the cost of providing goods from the Moon could be attractive.

Exporting material to Earth in trade is more problematic due to the high cost of transportation. One suggested candidate, a Helium-3 from the solar wind, which may have accumulated on the Moon's surface over billions of years, may prove to be a desirable fuel in fusion reactors, and is rare on Earth. Neither the abundance of Helium-3 on the lunar surface nor the feasibility of its use in fusion power plants has been established, however. China has made measurement of Helium-3 abundance on the lunar surface one of the goals of its exploration program.

Other economic possibilities include the tourism industry; manufacturing that requires a sterile, low-gravity environment in a vacuum, research and processing of potentially dangerous life forms or nanotechnology, and long-term storage of radioactive materials. The low gravity may find health uses such as allowing the physically challenged to continue to enjoy an active lifestyle. Large, pressurized domes, or caverns would permit human-powered flight, which may result in new sports activities. This section was excerpted from:

Wikimedia Foundation, Inc. (May, 2007). *Wikipedia: The Free Encyclopedia*. Retrieved May 10, 2007 from, <[http://en.wikipedia.org/wiki/Colonization\\_of\\_the\\_Moon - Economic\\_development](http://en.wikipedia.org/wiki/Colonization_of_the_Moon - Economic_development)>.