Day 9 - Air

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One of the most obvious challenges with supporting live beyond Earth is oxygen supply and CO2 removal. The current systems for CO2 removal and oxygen creation (particularly those which attempt to convert Martian atmospheric air into breathable air).
https://www.computerworld.com/article/2490934/emerging-technology/when-astronauts-breathe-on-mars--they-ll-thank-mit-professor.html
Current methods use robotics. MOXIE or Mars OXygen In situ resource utilization Experiment takes CO2 and electricity to produce oxygen.

Our proposed method will utilize what we do on Earth. Algae produces the majority of our oxygen. Our spirulina farms, moss for H2O reclamation and cabbage/kale farm will produce much of our Oxygen and scrub out our Carbon Dioxide.

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Activities
K-8
Creating a closed ecosystem in a bottle can be excellent practice, be sure to discuss what kind of life students would want to support on Mars. Discuss what kind of ecosystem; swam, aquatic, terrestrial etc. would best support this life. An outline for a potential ecosystem in a bottle is below.

- Cut a bottle in half and fill the bottom half with water or soil depending on your desired ecosystem.
- Add appropriate plants for your ecosystem, small aquatic plants and small terrestrial plants can be picked up from pet stores - small terrestrial plants can be grown from seed. Algae can be a fun addition to aquatic systems.
- Introduce a small organism to your environment
- Wait a few days before sealing your ecosystem.

9-12
If O_2 or CO_2 sensors are available create a closed system as above, but change conditions such as quantity or species of photosynthetic organisms. How do these changes alter available O_2 levels.

Discussion:
How does a balanced ecosystem sustain life? How can shift or disruption to a system affect living organisms? How do ecosystems recover after disruptions? What is needed to sustain aerobic life forms?