MARS GREENHOUSE

Tips for a successful Martian greenhouse

- Since your greenhouse is on the Earth, solar irradiation is quite high, therefore it is best not to expose your greenhouse to direct sunlight for more than 5 or 10 minutes per day.
- Stand or lay a small thermometer (the kind you see for attaching to coat zippers) in your ecosystem where it can be easily seen.
- Place a small piece of Litmus paper in your ecosystem so that you can monitor changes in the acid-base level of moisture within your ecosystem.
- A small amount (approximately 10-20 grams) of steel wool, washed with alcohol and rinsed with clean fresh water (to remove grease) and then mixed with the soil will not only remove excess oxygen from your greenhouse (rendering the atmosphere in the jar more Mars-like), it will also add iron oxides to the soil (making the soil more Mars-like too.)
- Plants adapt well to most light and temperature conditions (within a reasonable range), but they do not adapt well to frequent changes in their environment. Keep your Martian greenhouse in the same location, well lighted, and at a fairly constant temperature.
- Try to avoid "standing" water in your greenhouse. Before you add the carbon dioxide atmosphere check that the soil is moist, but not saturated, and that the inside bottom of the jar is just wet enough that water does not run from side to side within the jar when it is tilted.
- A few drops of liquid indoor-plant fertilizer added to the jar, according the manufacturer's directions, will help stabilize the plants in their new environment.
- If you use the vinegar and baking soda method to produce carbon dioxide you will notice that it produces a large amount of foam and mist. Be careful not to inadvertently allow any of the foam or mist to enter your greenhouse jar
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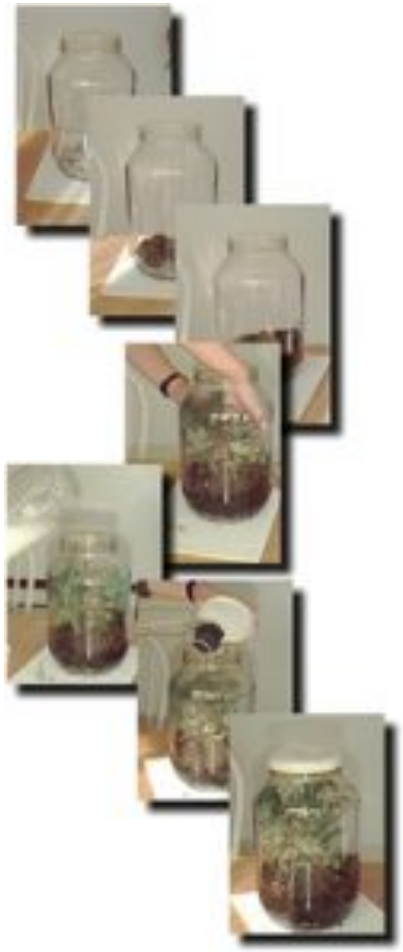

Experience has shown that in a sample of ten or twelve micro-ecosystems, some will survive only a few weeks, others will last a few months, and rarely, a few will survive more than a year. The challenge is to determine, if possible, the reasons for the failure of some and the success of others.

In a follow up to discuss:

What were some of the failure/success of the student greenhouse simulators? Talk about what students think may be an opportunity design further experiments to test their hypothesis.