ALPHA SESSION

TASK α-1: Define the broad experimental parameters *within your area of specialty.*

    1) Which variables will be important to include in our experiments?

        • Air Temperature: -87° to +20° C (or 186° to 293° K)

        • Atmospheric Pressure: 6.1 – 12.0 millibars

        • Mix of Atmospheric Gases: CO_2 (95.3%)

                                 N_2 (2.7%)

                                 Argon (1.6%)

                                 O_2 (0.13%)

                                 CO   (0.07%)

                                 H_2O (0.03%)

        • Perhaps the students will suggest other variables?

    2) For each variable, what range of values should be tested?

        • See above

    3) What are your justifications for choosing those variables and range of values?

- Temperature ranges have been measured by various Mars landers, and will demonstrate whether Cyanobacteria can survive daily freeze/thaw cycles.

- Pressures are also typical on Martian surface (higher pressures in deep craters and valleys). Important to stay above 6.1 millibars, since H2O cannot exist in liquid form   if pressure is less than 6.1 mbar.

- Gas mix is precisely what has been measured by various Mars landers

TASK α-2: For EACH variable, define at least ONE hypothesis we will need to test. If you have multiple hypotheses for each variable, all the better!

    1) Try to structure each hypothesis in such a way that it can be easily answered by a numerical measurement, or by a simple "Yes-No" or "True-False"answer.

- Example (True or False): Cyanobacteria can survive daily freeze/thaw cycles.

- Example (Numerical Measurement): At which temperature and pressure combinations can water be maintained as a liquid?

- Example (Yes or No): Changes in temperature will also cause the atmospheric pressure to change.