



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?
 - Day Length: 24.6 hours
 - Photoperiod: Variable with Martian season;
Longer days & shorter nights in Summer
 - Visible Light: 400-700 nanometers
 $\sim 490 \text{ W/m}^2$ to $\sim 720 \text{ W/m}^2$
 - UV Light: 200-400 nanometers
 $0 - 51 \text{ W/m}^2$
 - 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?
 - Day length and photoperiod are well established by planetary studies.
 - Visible & UV Light are estimated in their readings; specific values for specific locations can be estimated by various complex models (which I will have to provide).

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 cannot survive exposure to UV radiation on Mars.
 - Example (Numerical Measurement): At which visible light intensities (W/m^2) do cyanobacteria exhibit maximal growth potential?
 - Example (Yes or No): Do longer days negatively impact cyanobacterial growth due to increased daytime exposure to damaging UV radiation?