Activity 6. Designing a greenhouse for Mars

Supplying oxygen is only one of many life-support necessities for human spaceflight, but for long-term missions it is obviously the most vital. Now, you are invited to work in groups:

1. Using Internet, find out what are the conditions on Mars compared to the Earth (gravity, air pressure, consistence of atmosphere, temperature, mineral consistence of the ground, is it possible to use the existing ground for growing plants, level of radiation, length of the day and year). Record your findings to the Table 1.

2. What are the main problems caused by the specific conditions on Mars comparing to Earth scientists will encounter when planning a greenhouse for producing oxygen, food and absorbing carbon dioxide?

3. Based on the created list, propose possible solutions to the problems (record your solutions into Table 1).

4. Develop a visualised scheme of a greenhouse taking into account the considerations above. Provide your drawing with references to the conditions that are artificially created or, used as they exist on Mars.

5. Present your design to the other groups.

6. Discuss with your group members: What are the limitations of your model? What aspects of your model need further development?

Table 1.

Condition/Feature	Mars	Earth	Possible problems/affordances related to greenhouse design	Possible solution to the problem
Temperature				
Gravity				
Atmospheric pressure				
Type and level of radiation				
Consistence of atmosphere				
Consistence of ground (soil)				
Lenght of day/year				
Water				