

National Aeronautics and Space Administration



Living and Working in Space: Habitat Assessment Rubric: Life in a Sealed Container

Living and Working in Space: Habitat

Assessment Rubric Life in a Sealed Container

Guide Questions: What are the important characteristics of a successful ecosystem? What modifications are necessary for a successful ecosystem on the Moon or Mars?

Task to be assessed: Students will design an ecosystem in a sealed container and explain why it should be successful on the Moon or Mars.

Knowledge Areas

	Exemplary	Proficient	Developing	Novice
Understanding of characteristics of successful ecosystems on Earth	Ecosystem has all of the elements necessary to provide a flow of energy and recycling of materials. Each organism is able to meet its needs sustainably. Presentation clearly and accurately describes energy pyramid, food pyramid, recycling of materials, food webs, and interactions of biotic and abiotic factors in the ecosystem. Attempt is made to quantitatively determine and describe characteristics.	Organisms are chosen and abiotic factors provided so that organisms can meet requirements for life and material is recycled. Presentation describes interactions of biotic and abiotic factors. Presentation describes why organisms should survive for extended period of time.	Organisms are chosen because one organism eats another. Abiotic factors are provided based on students' experience providing care for plants and animals. Presentation describes what is in the system.	Organisms for ecosystem are chosen because the student likes or needs them. The system would require additions of materials.
Understanding of current technology	The technology chosen appropriately supplements ecosystem and is appropriate for the Moon or Mars. Presentation clearly and accurately describes the technology used and its role in supporting the ecosystem. Attempt is made to quantitatively determine and describe characteristics.	Technology appropriately supplements ecosystem and is appropriate for the Moon or Mars. Presentation describes how the technology supports the ecosystem.	Student uses technology described for the International Space Station. Presentation describes what technology is used.	Student uses technology familiar in the home or school.

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Assessment Rubric				
Life in a Sealed Container (continued)				
Knowledge Areas (continued)				
	Exemplary	Proficient	Developing	Novice
Understanding of resources and challenges on the Moon or Mars	Design includes accurate information about the resources and challenges for a successful ecosystem on the Moon or Mars. Choice of location is explained. Attempt is made to quantify resources and challenges in comparison with Earth.	Design uses local resources and technology to solve the challenges to maintaining a successful ecosystem on the Moon or Mars. Presentation describes how challenges are met.	Design focuses on some of the challenges of creating an ecosystem on the Moon or Mars. Presentation describes the challenges.	Design is based on the assumption that Mars is very similar to Earth, but hotter (or colder), and the resources will be the same. OR Design includes constant re-supply of materials.
Integration of Knowledge	Design takes into account the elements for a healthy ecosystem on Earth, current technology, and modifications necessary for the Moon or Mars. Presentation describes the inter-relatedness of all knowledge areas clearly and accurately.	Design takes into account the elements for a healthy ecosystem on Earth, current technology, and modifications necessary for the Moon or Mars.	Design takes into account more than one knowledge area, and one dominates.	Design tends to focus on one knowledge area, assuming the Moon or Mars will not be different from Earth.
Construction of Design Model	The model represents all of the elements of the design clearly and accurately. Functionally appropriate materials are chosen and used creatively. The model is attractive and informative.	The model represents all of the elements of the design. The materials are functionally appropriate and add to the understanding of the design.	The model represents the functionally critical elements of the design. Functionally appropriate materials are used.	The model focuses on the aspects that stand out or are of interest to the builder. Materials are chosen for attractiveness or availability.

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Assessment Rubric				
Life in a Sealed Container (continued)				
	Exemplary	Proficient	Developing	Novice
Effectiveness of Presentation	Presentation was clear, accurate, well organized, and interesting. Visual aids were accurate, attractive and important to the presentation. A focus of the presentation was the audience understanding the plan and the reasons to expect success at chosen location.	Student presentation organized ideas in a logical or creative way. Visual aids were used to highlight the ideas. A focus of the presentation was the audience understanding of the diet and exercise plan.	Student presentation was clear and organized. Visual aids were used.	Student presented ideas as they came to mind.