

Teaching Guide: Project Mars Ecosystem



Thank you for choosing our Project Mars Ecosystem program! During this program, students will join our team as we support NASA in determining the best Ecosystem to build on Mars to support life. Students will be working in teams to develop a proposal, to be presented to NASA, with a recommendation for the first Ecosystem to be created on Mars. They will gather evidence to support their claim after reflecting and learning about terrestrial and aquatic ecosystems on Earth. Students will be analyzing the biotic and abiotic factors of ecosystems.

Pre Activities:

- Vocabulary- Abiotic, Biotic, Carnivore, Herbivore, Omnivore, Community, Population, Organisms, Consumer, Producer, Decomposer, Predator, Prey, Food Chain, Food Web, Terrestrial Ecosystem, and Aquatic Ecosystems.
- Review ecosystems- Terrestrial and Aquatic.

Before the Program Instructions:

- Print out Project Mars Ecosystem Proposal sheets- one per student or one per pair (your choice)
- Print expert cards and cut out.

Instructions for Day of the Program:

- Arrange students in 3 groups and assign each groups an ecosystem: Grassland, Ocean, or Pond.
- Provide Project Mars Ecosystem Proposal Sheet to pairs or individual students (your choice).
- Assign expert card to a student in that ecosystem group.
- Assign forest to any student within the class.

Post Activities

- Have students present their chosen ecosystem to the class with supporting evidence.
- **Career Connection**
 - Astronaut
 - Engineer
 - Nutritionist
 - Scientist

Project Mars Ecosystems Expert Sheet

Please cut up expert passages and pass out to 4 students in the class. They will be reading the information to the class.

<p style="text-align: center;"><u>Forest Expert</u></p> <p>The temperature in a forest can be cold in the winter and hot in the summer. The rain provides the water needed for plants to grow. Forest soil is very rich because of the decomposing leaves and plant materials. Sunlight filters through from the tops of the trees down to the forest floor.</p>	<p style="text-align: center;"><u>Grassland Expert</u></p> <p>Grassland temperatures can range from very cold in winter to hot during the summer. The amount of rainfall that grasslands receive is typically less than that of a forest. The soil of grasslands are fertile and typically receive full sunlight all day.</p>
<p style="text-align: center;"><u>Ocean Expert</u></p> <p>Oceans are large bodies of salt water divided by continents. Temperatures depend on the depth of the water. Full sunlight warms the top of the ocean but does not penetrate to deeper water.</p>	<p style="text-align: center;"><u>Pond Expert</u></p> <p>Ponds are bodies of freshwater surrounded by land. The water temperature usually stays the same from top to bottom due to its shallow depth. The surface of the pond receives full sunlight unless shaded by trees.</p>



Project Mars Ecosystem Proposal

Forest	
Abiotic	Biotic
Sunlight	P-
Temp	C-
Soil	D-
Water	

Ocean	
Abiotic	Biotic
Sunlight	P-
Temp	C-
Soil	D-
Water	

Grassland	
Abiotic	Biotic
Sunlight	P-
Temp	C-
Soil	D-
Water	

Pond	
Abiotic	Biotic
Sunlight	P-
Temp	C-
Soil	D-
Water	

We Recommend

Blank space for recommendations.

Supporting Evidence

Blank space for supporting evidence.