

Astroverse

Astrobiology Research: Existence of Life on Mars

Storyboard Title, Sequence, & Description

Deltas are believed to be the best places on Mars to search for potential signs of ancient microbial life. This training scenario tests an astronaut's ability to identify such Deltas in a specific radius around their habitat, travel to these Deltas, extract rock samples, perform preliminary analysis using tools such as SHERLOC(Scanning Habitable Environments with Raman & Luminescence for Organics & Chemicals), Handheld X-ray Fluorescence Spectrometer, and Laser-Induced Breakdown Spectroscopy instrument, and effectively preserve collected rock samples for potential sample return missions.

Assets Available in this Storyboard

1. Map of terrain surrounding the habitat, with detailed information on Deltas.
2. Surface transport rover
3. SHERLOC device
4. XRF Handheld Spectrometer
5. LIBS Handheld Spectrometer
6. Mars Sample Return (MRS) canister



Actions Executable in this Storyboard

1. Identification of viable Deltas in a given radius around the astronaut's habitat from data collected by Nasa.
2. Chart and subsequently traverse the optimal path to cover all specimen locations efficiently.
3. Perform preliminary analysis using SHERLOC (Scanning Habitable Environments with Raman & Luminescence for Organics & Chemicals). Fire the laser from SHERLOC on multiple locations on the sample.
4. Use the Handheld X-ray Fluorescence Spectrometer(XRF) and Laser-Induced Breakdown Spectroscopy instrument(LIBS) on the rock sample to obtain data of the composition of rock sample.
5. Record data of findings using electronic notebooks and digital cameras. Preserve collected rock samples in Mars Sample Return (MSR) canisters for any potential sample return missions.



Frame Descriptions

- 1 This frame shows the astronaut consulting a digital map of the surrounding areas to identify potential Deltas.
- 2 It shows the astronaut using a surface transport rover to travel to the identified locations.
- 3 It shows the astronaut using a spectrometer to analyze a rock sample in order to determine its chemical composition.
- 4 It shows the astronaut recording the observations made in the previous step using electronic notebooks and digital cameras
- 5 It shows the astronaut preserving the rock sample in a Mars Sample Return canister for future sample return missions.