ROADS on Mars - Mission Development Log Rubric

All good scientists keep a portfolio, lab notebook, or other documentation of their work so that they and others can refer to it later. A team must keep one Mission Development Log (MDL) that documents the students' scientific method, engineering design process, and decisions made during mission preparation and practice. The MDL describes the decisions team members make, the analysis of results, and any modifications made throughout the process. Scientists and engineers rarely get it right the first time!

The MDL is a record of the modifications and decisions made throughout the 9 or more sections of ROADS on Mars as listed below. Teams are welcome and encouraged to document other parts of the challenge that they worked on in other sections, beyond the 9 listed sections. Suggested contents include labeled sketches, diagrams, descriptions, bulleted lists, photos, and/or other appropriate documentation. If there are several iterations of a design, a team may choose to illustrate the initial and final designs, using descriptive text to describe the middle stages.

Judges will score the overall MDL using the provided rubric. Points will also be awarded based on whether the MDL contains the 9 sections listed below. Judges will not directly score the content of each section, but they will ask questions about two of them. Teams must be prepared to discuss any section.

Judges will look for and award points for the presence of each of following sections, in no specific order:

- ☐ Social Media Plan
- ☐ Delta Dynamics[1]
- ☐ Crater Formation[2]
- ☐ Mission Patch Design
- ☐ Methane Detection
- ☐ Search for Small Invertebrates
- ☐ Rover Design & Testing[3]
- ☐ Team Attire Design
- ☐ MO1 Landing System Design
- ☐ MO2 Communications Dish Design

[1] Formerly called "Alluvial Fan Dynamics." We are logging our initial error! Thank you, NASA Scientist Jim Rice, for correctly identifying this.
[2] Crater Formation not required for Sojourner Division.
[3] Ozobots for Spirit Division, LEGO Mindstorms for Curiosity and Opportunity teams.

Mission Development Log (MDL) Rubric

	2	4	6	8
Creativity	The MDL is not creative or inventive and does not demonstrate any prior planning.	The MDL is not creative or inventive and demonstrates a limited amount of prior planning.	The MDL is somewhat creative or inventive and demonstrates planning.	The MDL is creative and inventive and demonstrates thoughtful planning.
Level of detail & description	The MDL sections have no detail and are not descriptive. Judges don't have a clear understanding of the team's decision processes.	The MDL sections have little detail and are a little descriptive. Judges have only a vague understanding of most components the team's decision processes.	The MDL sections have some detail and are somewhat descriptive. Judges have a good understanding of most components of the team's decision processes.	The MDL sections have substantial detail and are substantially descriptive. Judges have a clear understanding of the team's full mission decision processes.
Content clarity & replicability	The MDL is not clear, and others couldn't use it to replicate the team's designs.	The MDL has limited clarity, and others could use it to replicate limited parts of the team's designs.	The MDL is somewhat clear and others could use it to replicate most of the team's designs.	The MDL is very clear and others could use it to replicate the team's designs.
Clearly shows following scientific method	The MDL does not show the team's use of the scientific method.	The MDL shows a little evidence of the team's use of the scientific method.	The MDL contains good examples of the team using the scientific method.	The MDL contains excellent examples of the team using the scientific method.
Shows engineering design and testing process	The MDL does not show the team's use of the engineering design and testing process.	The MDL shows a little evidence of the team's use of the engineering design and testing process.	The MDL contains good examples of the team using the engineering design and testing process.	The MDL contains excellent examples of the team using the engineering design and testing process.
Team members' verbal presentation	The team does not appear to be knowledgeable about the contents of the MDL and is unable to satisfactorily answer the Judge's follow-up questions.	The team is slightly knowledgeable about the contents of the MDL and is somewhat able to satisfactorily answer the Judge's follow-up questions.	The team is mostly knowledgeable about the contents of the MDL and is mostly able to satisfactorily answer the Judge's follow-up questions.	The team is knowledgeable about the contents of the MDL and is able to satisfactorily answer all of the Judge's follow-up questions.