Alyssa Stewart
Summer 2022

Big Idea: To engage students in the engineering design process, encourage interest in space and the pursuit of engineering ideas.

Science Standards:

MS-ESS1-1.	Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

ELA Standards:

RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts. (MS-ETS1-1),*(MS-ETS1-2),(MS-ETS1-3)*
RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). *(MS-ETS1-3)*
RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (MS-ETS1-2),(MS-ETS1-3)
WHST.6-8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-ETS1-2)
WHST.6-8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ETS1-1)
WHST.6-8.9	Draw evidence from informational texts to support analysis, reflection, and research. *(MS-ETS1-2)*
SL.8.5	Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. *(MS-ETS1-4)*

Engineering Standards:

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

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MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

ETS1.B: Developing Possible Solutions
There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Mathematics Standards:

MP.4	Model with mathematics. *(MS-ESS1-1)*
6.RP.A.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *(MS-ESS1-1)*
7.RP.A.2	Recognize and represent proportional relationships between quantities.

Problem solving and declarative/procedural knowledge:

There is a plethora of declarative knowledge required for students to complete this project. Students will need to have cooperative learning skills as well as background knowledge. For example, students will have to assign roles within their groups without assistance from the teacher. Additionally, students will be tasked with following a design model to improve upon their project. Procedures are sequential and build upon each other. Students will need knowledge of the NASA design model so that they may make appropriate design modifications.

Objectives and ancillary concepts:
Students will need to be able to cite evidence and record their observations and track progress using their ELA background knowledge. Knowledge of the engineering design model as well as the scientific method are also necessary ancillary concepts required by this project.

Identify possible activities.
Launch It
Touchdown
Roving on the Moon
Heavy Lifting

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On Target
Feel the Heat

Select the best activity for your classroom.
Launch It