# Phase 1:Engineering Design Challenge Research and Planning

By

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**The Big Concept:** The kids will be answering the questions: What if we could no longer live on Earth?

## Learning Standards:

4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.
4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

**Declarative Knowledge needed:**The students need to know what is needed to survive on Earth. Students also need to have knowledge of Mars and its environment.

**Procedural Knowledge Needed:**They need to know about the rovers and how they travel.They also need to

have knowledge of a soft landing. Finally, they need to know how the rover is used and what powers it.

**Ancillary Concepts:** They need to understand the concept of absorbing shock and energy transfer.

**Possible Activities:** The possible activities are building a hovercraft with a CD, water bottle flip lid,and balloon. Or build a Mars Rover using and egg as the rover.

**Activity chosen for my class:**

**https://ca.pbslearningmedia.org/resource/mss13.sci.engin.design.softland/soft-landing-challenge#.WrFomm3wbIW**

I will be having the students make a Mars Rover, using an egg to represent the the rover and the balloons to model the soft landing.