"Mission to Mars"
a Grade 5 PBL

Driving Question/s: (Overarching) How can we plan a mission to Mars, and convince NASA to fund our plan?

How can we design a spacecraft capable of making the journey to Mars?

How can we design a habitat for astronauts to live on Mars?

How can we design a system to help with temperature control on Mars?

How can we design a rocket to leave Earth and land on Mars?

Content: In Mission to Mars, students plan a manned voyage to Mars with four main mission elements. Each mission element incorporates a different science idea. The culminating design problem helps students grow in their understanding of forces.

Standards: NGSS: Earth and Solar System Standards (MS-ESS1-3), Engineering and Design Standards (MS-ETS1-1, 3, 4) CCSS.ELA-LITERACY.W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. CCSS.ELA-LITERACY.SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly. CCSS.ELA-LITERACY.SL.5.3 Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence. CCSS.ELA-LITERACY.SL.5.4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. CCSS.ELA-LITERACY.SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

Major Products:

1. Students will construct a model of the solar system, determine the distance from Earth to Mars, and build solar sails, which will be used to span the distance.
2. Students will design astronaut habitats either for traveling to Mars or for life on Mars' surface.
3. Students will design a temperature control system for space suits.
4. Students will design, build and deploy a rocket capable of making the journey. Multiple trials are included.
5. Finally, at the conclusion of the 4 phases, students will sell their plans to NASA, giving oral presentations based on a persuasive letter that they craft throughout the process.

Public Presentations: Students will present their projects to a panel of "NASA" officials.