

Big Concept: Force & Motion

Standards:

- NGSS - 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.
- NGSS - 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.
- NGSS - 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.

Identify and discuss the different types of problem solving and declarative/procedure knowledge needed

- Why it's important for spacecraft to be able to land smoothly on the moon. (Possibly show a real-world example/video)
- Engineering design process
- Trial and error. Improving your design after testing.
- Identifying criteria and constraints
- Satellites and spacecraft
- Gravity, energy, motion and force
- Shock absorbers converting energy

Objectives and Ancillary Concepts/Content:

- Connect this problem to a STEM Career
- Real-world examples from either an event or object
- Build and test their prototype. Redesign for improvements
- Brainstorm different ideas
- Describe how force and gravity affecting the prototype

Best Activity: Lunar Landing (Touchdown, shock-absorbing system)