



Drexel-SDP GK-12 LESSON

- *Egg Drop – Mars Rover Challenge*
- *Engineering Module*
- Subject Area (Unit): ***Engineering***
- Concept: Packaging, Space Travel, Force and Energy
- Objectives: *Students design a method to encase an egg and protect it during a fall from a large height, relating the design to landing the mars rover from an orbiting space craft.*
- PA Academic Standards: *3.1.7ABCE, 3.2.7BCD, 3.4.7AB*
- Grade Level: **6**
- Setting/Group Size: Classroom split into smaller 3-4 person groups.
- Duration/Time Required: ***2 60 minute sessions followed by 1 30-60 minute drop period***
- Materials List: General craft material including cotton balls, cardboard, plastic containers, balloons, paper plates, plastic cups etc. Plastic eggs as a stand-in during design is helpful and of course for the final drop eggs are needed.
- Context: *This is a continuing part of the engineering module that gives students a sense of what engineers do. This lesson can also be tied to several physics and science concepts including energy absorption, elasticity and forces. It has a strong tie to understanding the mars rover and how it was protected during its land on mars. The activity lends itself to several discussions in the field of science that can be initiated by student questions and guided by the instructor*

- **Methods and Procedure:**

1. Begin with a discussion of the Mars rover, perhaps even showing pictures of what it looks like and some of the pictures it has taken. Lead the discussion to how the rover was protected during its fall to Mars.
2. Provide the students with the necessary materials and ask them to design a way to protect an egg if it were to fall from a 2 or 3 story window to the pavement. Give them a parts list and pricing and tell them what their initial budget is. They have that much money to spend on parts and have to create the best design under these financial constraints.
3. Ask each group to create an initial design on paper and remind them that the egg must be able to be removed and placed into the design and that they must stay within their budget.
4. Allow each group to construct their apparatus and move around commenting and suggesting problems or good parts of their design.
5. Have the egg drop competition, preferably in two stages dropping from an initial height and then a taller height to see which designs survive.

- *Assessment: Have each group write up a short essay on why or why not their design failed.*

- **Keywords:** Forces, Space

- **Author:** Eric Gallo