

Design Challenge: Create a Lunar Lander

Description:

Students will create a lander to safely transport astronauts, with an emphasis on designing with constraints.

Objective(s):

Students will collaborate and utilize the Engineering Design Process to complete a task.

ISTE/NGSS Standards:

4c: Students develop, test and refine prototypes as part of a cyclical design process.

5c: Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

MS-ETS-1.1: 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.

MS-ETS-1.2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Teq Lesson Plan Activity

Essential Question(s):

How do we maximize limited resources?

Materials:

- Styrofoam cups
- Ping Pong balls
- Tape
- Paper
- Straws
- EDP Graphic Organizer

<https://docs.google.com/document/d/1UYqqzT3aMgdNVb6-zog02Q4mY686WuM-2iHSEfsyLps/edit>

<https://www.youtube.com/watch?v=em3X3bSOchk>

Do Now:

What are the challenges of landing people on another object in space rather than a machine?

Lesson:

1. Class will be given the task of creating a lander that can safely land astronauts (ping pong balls) on another planet.
2. Students must create these landers with the following materials and limitations:
 - Can only use the materials provided
 - The lander should remain relatively intact once it hits the ground
 - The astronauts need to stay within the lander on impact
3. Students will utilize their EDP Graphic Organizer to plan and create their crafts. Students can test and reflect on their prototypes.
4. Students will demonstrate their crafts; teacher will drop them while standing on a chair or desk.

Teq™ Lesson Plan Activity

Closure:

Students will complete reflection section of graphic organizer.

Extension:

Class can collaborate to create ideal craft working off of various prototypes.