

### ***Problem Description***

NASA wants to discover if there is life on the moon. NASA needs to launch a rocket to reach the moon. It's key to note that the more air pressure created the more power the rocket gains for it to be launched higher. Help NASA build a rocket to find out if life exist on the moon!

### ***Teacher preparation***

- Read the activity teacher guide to be familiar with the concept of building the activity
- Build a sample of the activity
- Gather materials needed

### ***Materials needed for this activity***

- 1 Storage tote "Toolkit" (refer to appendix for detailed material list)
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### ***Constraints***

- The student is expected to finish activity within 45-50 minutes timeframe.
- Every engineering design step has a specific time limit.

### ***Learning outcomes:***

- The student must show an understanding of the problem
- The student must show an understanding of the solution and the purpose of the solution
- The student must be able to plan/design the solution
- The student must be able to implement their plan to the solution with the materials provided at hand
- The student must be able to test the solution
- The student must be able to understand why the solution does/not work
- The student must show an understanding of the engineering design process steps

### ***Introducing the activity***

- Distribute materials to the students
- Introduce activity
- Proceed to the Engineering design process steps

### ***Engineering Design process steps***

- **Step 1: Ask** ( Duration = 5 minutes )
  - What is the problem that NASA is facing? (**Learning outcome 1**)
- **Step 2: Imagine and plan** (Duration = 10 minutes)
  - Questions

- What does NASA need to be able to get to the moon? Why does NASA need a rocket to be built? **(Learning outcome 2)**
  - How can we make/build a rocket? **(Learning outcome 3)**
- Task
  - Have the students draw out their designs of the rocket on paper
- *Step 3: Create (Duration = 20 minutes )*
  - Questions
    - Using the materials provided at hand, how will you make the rocket? **(Learning outcome 4)**
  - Task
    - Show the students the possible designs diagram then let them create the rocket
- *Step 4: Test (Duration = 5 minutes )*
  - Question
    - To check if the rocket works, we should test that it will be launched at a high distance,How can we test if the rocket works? **(Learning outcome 5)**
  - Task
    - Have the students test their rocket designs by going outside to the playground. The student should launch the rocket by jumping on the \*\*\* to release the air inside. The air moves to the !! of the rocket, if the rocket launches then it is a success.
- *Step 5: Improve (Duration = 5 minutes)*
  - Debriefing through the following questions
    - For the bridges that collapsed, Why did the bridge collapse? How can we re-make the bridge to improve it? **(Learning outcome 6)**
    - What have you learned ? **(Learning outcome 7)**

### **Adjusting difficulty (Optional)**