Lunar Lander Project Guide

intel
FUTURE SKILLS

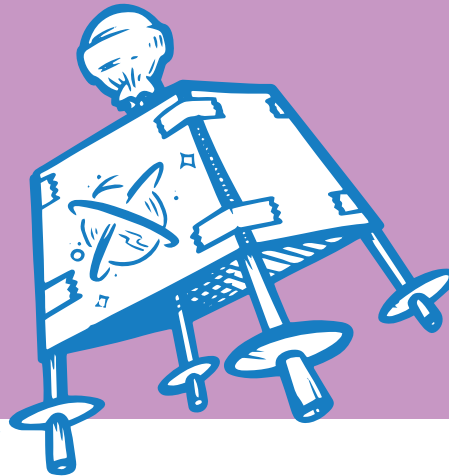**PROJECT OVERVIEW:**

Using only the materials listed, design and build a device that will keep an "astronaut" safe when dropped from various heights.

Project Intro Video:
Lunar Lander

Inspirational Video:
Lunar Lander Simulation

PROJECT CATEGORY:
Innovator

DIFFICULTY LEVEL:
Beginner

TIME RANGE:
45 - 75 minutes

ESSENTIAL SKILLS/ MINDSETS THAT YOU MAY LEARN:
Design Thinking

Iteration

Tinkering

Collaboration

Communication

Resiliency/Grit

TOOLS AND MATERIALS:
- 3 pieces of 3x5 inch paper/index cards
- 1 piece of 5x7 inch card stock (or thick paper)
- 3 rubber bands
- 8 flexible straws
- 1 mini Tootsie Pop (or small lollipop)
- 1 yard of masking tape
- 1 small paper cup (mini dixie cup)
- Scissors

AT HOME SUBSTITUTIONS:
- The list above is ideal but you may substitute any items that you do not have at home –just make sure all groups have the same materials and quantities to make it a fair challenge.

MATERIAL PURCHASE LINK:
http://tiny.cc/Intelbuylist

Project Steps
Dream it!

1 Watch the Project Intro video and then Inspire-to video to see what the original lunar landing was like.   [:07]

2 Empathize with astronauts, what type of landing do they want and how can you design a vehicle to land safely?   [:03]

Draw It!

3 Examine the materials that you have available to build your lander. [:05]

4 Sketch multiple ideas of what your landing craft could look like and label the design features. [:05]

Build It!

5 Gather your tools and materials –remember you only get the limited quantities outlined above. [:05]

6 Design and build your first lander. [:15]

7 Test (drop from above your head), troubleshoot, and iterate to make your lander better and better as you go. [:10]

Share It!

8 When you are satisfied with your design, show it off to others, or have a friendly competition for whose lander can fall the farthest and still keep the astronaut safe without popping out. [:10]

Expand it!

Now that you've completed this challenge project, you may want to try it again to see what other designs you can come up with.

- Could you make your lander float to the ground slower using some sort of parachute or fins?
- Maybe you want to upsize the challenge and see if you can land an egg in a paper craft?
- How high can you safely test your craft from?
- Keep iterating and testing and share your best build with us!

Q'S TO CONSIDER:

- Start to think like an astronaut, "what do you need vs. want?"
- What will the landing experience be like for the astronauts?
- Do astronauts want a soft or rough landing?
- How fast or slow will your craft need to land?

DASH OF DESIGN:
Iteration is one of the key components of Design Thinking. Watch our video to learn more:

RULES TO REMEMBER:

- The astronauts must be free to escape the lander (i.e. you can't tape, strap or otherwise hold them in).
- You may not modify the "astronaut" –don't cut the lollipop stick.
- Use the materials wisely as you cannot get any extra materials once you start –sorry, there's no craft stores in space.
- No eating your lollipop. The astronauts don't like that.

HELPFUL RESOURCES:

- Watch NASA Engineers solve the lunar lander challenge:
  https://www.youtube.com/watch?v=X7O-Eh8hGXk

NEED MORE HELP AND INFORMATION?
Contact us at: **intelfutureskills@intel.com**