in partnership with Royal Observatory Edinburgh

Space Landers

Engineers use shock-absorbing systems to protect spacecrafts and their contents during landing. For example, the Mars rovers used a complex set of mechanisms to land safely and absorb the shock of landing on a rough and rocky surface. Some of these mechanisms include a parachute descent to slow down how quickly the rover falls, cushioning from airbags that surround the rover during landing and suspension to stabilise the rover without it tipping over.

This activity has been adapted from Vivify STEM.

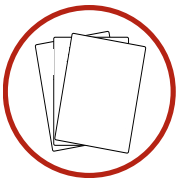
What do you need?


A Paper Cup


3 Rubber Bands


Tape


2 Marshmallows


6 Index Cards


6 Straws


Cardboard


Mini Marshmallows

TIPS

1. Having a countdown on the board was helpful for keeping the group on task and adding further excitement.

2. We used chocolate eggs which worked well (or if you're looking for a challenge, real eggs!)

What to do

1. Give each group of 2-3 a set of the materials (you can substitute craft materials with what you have available and give the groups creative freedom to pick their materials together).
2. The groups task is to design and build a shock-absorbing lander to protect two alien 'eggs' on board an alien spacecraft as they land on Earth (the marshmallows in the cup). The cup containing the two alien eggs has to stay open, covering the top is not allowed!
3. Encourage the group to first discuss and draw ideas thinking about the shock-absorbing system as they design their landers (you could show the group how to make a spring by folding the index card with an accordion fold as an option for their shock-absorbing system).

Practitioner reflections

Creating space landers in groups was a great activity for developing the young people's teamwork and communication skills as they voice their ideas and listen to ideas from others in their group. The activity encourages the groups to get creative with their lander and to experiment with new ideas as well as building up their resilience to failure if their ideas don't work out how they expected.