

Base Camp

6 Week STEM Clubs



Aim

Children are introduced to the challenges facing space engineers by engaging in an open-ended design task to create a sturdy and stable habitat but from lightweight materials and using simple construction methods

Introduction

Plans are now in place for the first human mission to Mars sometime after 2030, but first, space engineers need to trial their deep-space systems in a Moon mission called Artemis. This will put humans on the lunar surface as early as 2024, with plans for a longer-term presence on the Moon, called the Artemis base camp, that would sustain as many as four astronauts.

The materials launched from Earth and used to build this base camp need to be lightweight to escape Earth's gravity and be easy to assemble by astronauts once they arrive. Space engineers are currently developing and testing their designs as part of this Artemis lunar mission.



Useful links

- What is Artemis? <https://tinyurl.com/1vxdku47>
- Meet the Artemis Team <https://tinyurl.com/1eytmfqk>
- What's an airlock? <https://tinyurl.com/3ff6uhvu>



In association with

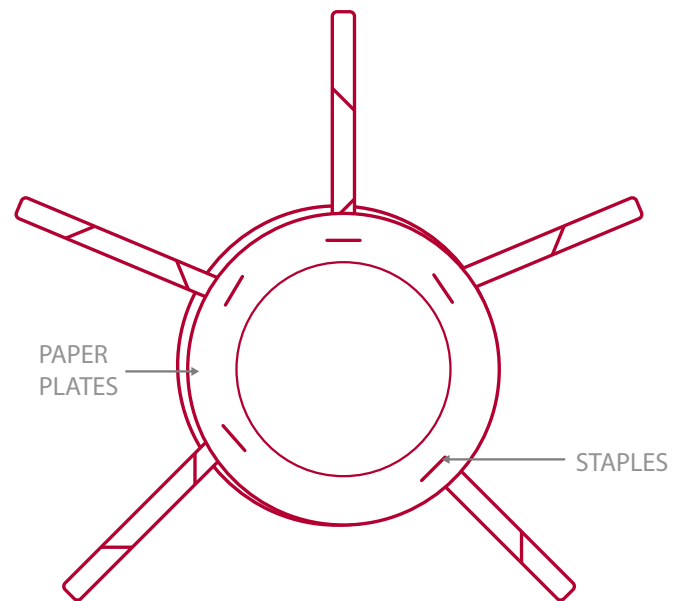
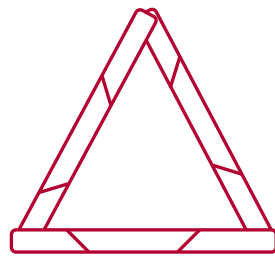
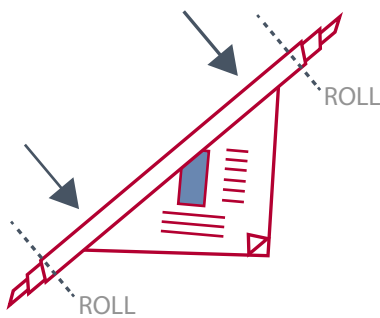
Equipment

- Pencil
- Scissors
- Tape measure
- Sticky tape
- Newspapers
- Paper plates
- Stapler
- Tissue paper
- Dowel / broom handle

Instructions

You are going to design and build a model Moon Base Camp and will construct the framework from a number of paper tubes.

- 1 In your teams, sketch two or more possible designs for your base camp. Remember that engineers will research existing structural designs - strong ones are often built from a number of triangles joined together. Also, consider the benefits of an airlock
- 2 Once your initial designs are complete, total up the number of paper tubes needed
- 3 Then make each paper tube from three sheets of newspaper by firstly laying the sheets out flat, one on top of the other
- 4 Starting at one corner, and going across the diagonal of the paper, roll the sheets around the dowel to form the tube
- 5 Once rolled, use tape to stop tubes from unravelling, then trim each end equally, making all the tubes a standard length appropriate for the sizes of your newspaper sheets
- 6 Start to construct the framework, jointing the tubes together by flattening the ends, positioning appropriately and, under supervision, stapling the ends together
- 7 Your structure can be made even more secure by placing paper plates each side of the joints and stapling together
- 8 Once your base camp is constructed, add walls by taping tissue paper, or more newspapers, across the overall structure



Next steps

- Invite other teams to inspect your base camp, give them a tour and explain your 'designer thinking'
- Take photos of your design and create a presentation that highlights the parts of the task that were most challenging and how you would like to modify and extend your design next time
- Conduct your own independent research of Artemis Base Camp and present your finds as a poster