

Inflatable Space Station

THE CHALLENGE

Imagine the following. With precision movements, an overhead crane swings a huge building block into position. Then, workers move in, climbing onto the structure and using hand and power tools to bolt the pieces together. It is a workday scene that could be found on almost any city street corner, but this construction site is 400 kilometres above Earth, in space, where conditions alternate hourly between freezing cold and searing heat. In this case, the construction workers are astronauts, the cranes are a new generation of space robotics and the skyscraper taking shape is the International Space Station (ISS). The ISS has several core components, without which it could not function. These include:

- Cylindrical modules, which are the main building blocks of the station (i.e. habitat module, laboratory or scientific modules).

- A bridge-like linear structure called a truss, which acts as the track or attachment point for the various modules. These include the Canadian Mobile Servicing System, the photovoltaic arrays (provides electricity for the station) and radiators (used to control the temperatures of the various parts of the ISS).
- Nodes, which are the connections between the various modules of the International Space Station. Cub Scouts will identify the various components of a space station, will gain an understanding of their separate functions and will build an inflatable space station that they can walk through.

PLAN

Part 1: Inflatable Space Station

The Pack Scouters and Sixers will:

- Photocopy additional Space Station Function Challenge cards if the ones in the kit are not enough for the whole pack.
- Photocopy additional copies of the inflatable space station construction guide as needed.

- Find a source to borrow a box fan, a leaf blower, or an industrial blower.
- Source and buy the plastic sheets and duct tapes
- Inform Cubs that they are going to build a model space station and learn about its different components

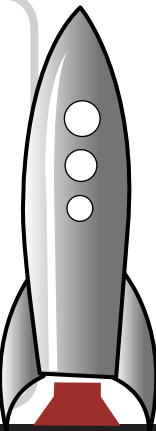
DO

Part 1: Inflatable Space Station

- The Pack will be divided in two groups. One group will receive the Space Station Function Challenge Description cards and the other groups will receive the Space Station Function Challenge Name and Image cards. Each Cub should try to find his or her matching card from the other group. When all the Cubs are matched up, each pair will describe its Space Station part and the part's functions to the rest of the Pack.
- The pack gets together to work on a large space station model that Cubs can actually walk through. To make the space station, Scouters and Cubs cut out sections out of a plastic sheet role, use duct tape to tape the sheet in the shape of cubes and tunnels, and use an industrial blower to fill up the station. Duct tapes can also be used to patch any holes that

are discovered as the space station is inflating. The Pack should follow the instructions on the Inflatable Space Station Instruction Guide sheet to build the model.

- The cubs work in small groups to build different parts of the station. As the model is inflating, the Pack can start identifying different parts of the space station based on what they have learned in the previous activity (note that the model is not an exact replica, but the Cubs can identify the nodes, and the trust, and some of the modules).
- When the model is inflated (which takes about 20 minutes), Cubs can walk through the space station. This will be the loud and active part of the activity as the Cubs will probably be excited to actually go into the model.



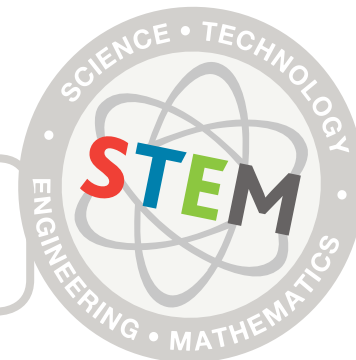
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STEM Program – Space Exploration Kit



It starts with Scouts.

Inflatable Space Station



REVIEW

- What did you learn about the space station?
- What was the most challenging part about the inflatable space station?
- What did you like and did not like about this activity?
- How would you do it differently next time?

ACTIVITY	TIME
Set up time	10 minutes
Presenting the problem and the material	5 minutes
Space Station Function matching game	10 minutes
Inflatable Space Station Activity	60 minutes
Review	10 minutes

Safety note: Do not try this activity at home without the supervision of the adults. Working with large pieces of plastic can be dangerous.

MATERIALS NEEDED:

- Space Station Function Challenge cards
- Measuring tape
- Scissors
- 30 meters of plastic sheet in a roll about 2-3 meters wide
- About 60 meters of duct tape (It is best to have multiple roles so that Cubs can work at the same time)



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