

The engineering club splashed yesterday during the challenge. As a follow-up to our NASA field trip where we learned that one of the many jobs of astronauts is that of mechanic, performing maintenance and fixing the manmade objects in space. In order to do this work, astronauts must exit the durable spacecraft and perform the dangerous work of extravehicular activity (EVA) activities that take place outside their spacecraft.

There are more than 500,000 pieces of debris, or “space junk” in orbit of Earth, traveling at speeds of up to 17,500 mph. At these speeds, even small pieces of debris can cause damage to satellites, spacecraft, and their human occupants.

Our Challenge:

Design an outfit for your water balloon astronaut that will protect it from the effects of being hit by small space debris moving at high speeds.

The Constraints:

- Protective wear must fit snugly on the astronaut.
- No adhesives may be used.
- Maximum of four individual layers may be used. (no double or triple wrapping)
- Must be flexible.
- Must consist of at least three different materials.



Testing: Two large, sharp nails were dropped down a 9 foot PVC pipe pointed-side fist down the pipe. **A successful design is represented by an intact balloon.**

Materials per team of 3-4 Engineers:

- Rubber bands, • String, • Plastic grocery bags/trash bags, • Tissue paper, • Aluminum foil, • Paper towels, • Newspaper, • Wax paper, • Scissors, • Paper grocery bags

Four teams were eventually awarded prizes as designs were modified, improved and tested at the discretion of the Judge and the peer involvement/critique of the other teams. Any violation of the constraints or safety rules or getting Mrs. Schiffer wet disqualified a team.



A picture gallery to follow includes, Senior Tim Shell holding the test setup, an impaled astronaut, multiple teams testing and inspecting and freshman Joseph Fallon wearing his new Captain America prize.



BALLOON ASTRONAUT DESIGN CHALLENGE



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https://www.thetech.org/sites/default/files/pdfs/Design-Challenge-Learning-Lessons/Balloon_Astronaut.pdf