



MISSION TO KENNEDY SPACE CENTER
Field Investigation #6 – Beam Me Up, Scotty!

Crew Members Present for Investigation:

Date of Investigation: _____

Problem: Can you build a truss beam (similar to one on the International Space Station) that will be lightweight but strong?

Scientific Background: The International Space Station consists of approximately 100 major components. The largest components of the ISS are the truss beam and solar panels. The truss beam extends to the right and left of the station as it orbits around Earth. It is joined to the U.S. Destiny Module, a cylindrical laboratory in which astronauts do their work. Attached to the ends of the beam are large solar panels for making electricity from sunlight. Also attached are thermal radiators for exhausting waste heat from the modules into space. The truss beam also holds the robotic system that can travel its length.

The truss beam consists of an open structure of girders that are arranged in the shape of a hexagonal prism. Diagonal girders crisscross the structure to form many rigid triangles. It is 100 meters long. The open structure reduces the weight of the truss beam and the triangles give it strength to maintain its shape. Strength is important for the beam but not because of the weight of the structures it has to support.

Materials: old newspaper, masking tape, paper cup, string, weights such as coins or washers

Procedure:

1. Roll and tape newspaper girders for truss beams.
2. Tape girders together to be 1 meter (39 inches) long
3. Place ends of truss beams on equal stacks of books
4. Punch hole in paper cup. With string, hang from center of truss beam.
5. Add weights until truss beam fails. Record weight in Journal.
6. Rebuild and try again!

Journal: _____

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Details, diagrams, and photography of the ISS trussbeam are available at this web site:

<http://spaceflight.nasa.gov/station/reference/index.html>

