

Robotic Arm Challenge

This activity was originally designed by Let's Talk Science for the 2013 All Science Challenge

The Challenge:

Build a robotic arm with a minimum of 3 working joints that can grasp an asteroid (rock) from space (the floor) and deposit it in the cargo bay of the space station (the tabletop).

MATERIALS

- 10 tongue depressors (or 16 craft sticks)
- 3 meters of masking tape
- 2 furniture pads
- 2 earplugs
- 1 meter of string
- 1 coffee filter

RULES

1. Time to design and build *will not exceed 30 minutes*.
2. Only incorporate the products provided.
3. The **asteroid (rock) starting position** will be on the floor
4. Allowable tools are scissors (for cutting only) and the table surface to attach the robotic arm. Scissors may not be incorporated into the design.
5. The robotic arm **must be attached to the table only**. It may not be supported by a student or an external object or furniture in the room.
6. The cargo bay is the table surface. The asteroid (rock) must be **deposited directly behind the arm attachment on the table**.
7. The robotic arm must incorporate all of **the following Design Criteria**:
 - a. Robotic arm must be **operated without directly touching the arm**. No fingers or body parts touching the arm itself! A product may touch the arm, but you must operate the arm without touching the actual arm structure (i.e., craft sticks) with your hands. Be creative!
 - b. Include a **minimum of 3 working joints**. A joint is an **attachment point between two parts that is flexible, movable or articulating**. Think about the joints and ligaments in your body!
 - c. The arm must **grasp and let go** of the asteroid. No fingers touching the rock! The rock should **not be taped or stuck** to the arm.
 - d. The **deposit** of the asteroid **must be a controlled drop**. No flinging the rock! In space it would keep moving forever!