



## Scope Statement Mechanical Arm



### Need:

Mechanical device for the harvesting of space trash.

### Scope Statement:

- The device must be able to grab pieces of trash no matter what they're made of.
- The device must be able to grab pieces of trash for which the longest side is at least 5 cm and at most 1m long.
- The tools and materials used to build the device must be chosen from the lists below.
- It must be possible for the device to be operated by a single user, without assistance.
- The device must come with a guide showing the user how to operate it.
- The device must allow the user to grab a piece of trash that is at least 1 m away.

### Available Materials:

- Cardboard tubes
- Wooden sticks
- String
- Cardboard
- Plastic bags
- Plastic containers
- Trombones
- Brass fasteners
- K-Nex gears

### Tools

- Scissors
- Glue
- Adhesive tape
- Saw
- C-clamps
- Nails
- Hammer
- Pencils and crayons





# Scope Statement Magnetic Arm



## Need:

Magnetic device for the harvesting of space trash.

## Scope Statement

- The device must grab pieces of trash by using the force of magnetic attraction.
- The device must not contain any permanent magnet. Given the great quantity of trash in orbit, a permanent magnet would end up covered in trash in a matter of minutes! The device must therefore include an electromagnet and a switch.
- The tools and materials used to build the device must be chosen from the lists below.
- It must be possible for the device to be operated by a single user, without assistance.
- The device must come with a guide showing the user how to operate it.
- The device must allow the user to grab a piece of trash that is at least 1 m away.

## Available Materials:

**ELECTRIC SHOCK HAZARD:** Do not use more than 4 batteries per device!

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|------------------------|-------------------|
| • Sheated copper wire  | • Brass fasteners |
| • 1,5 Volts battery    | • Cardboard       |
| • Iron or steel screws | • Cardboard Tubes |
| • Trombones            |                   |

## Tools

- |                 |                       |
|-----------------|-----------------------|
| • Scissors      | • C-clamps            |
| • Glue          | • Nails               |
| • Adhesive tape | • Hammer              |
| • Saw           | • Pencils and crayons |

**Device Diagram:**

**User Guide:**

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