

GearInsertion Protocol

Overall task summary

The purpose of this task is to solve the NIST #1 gear insertion task. There are 3 gears and they all need to be inserted onto the gear pegs.

Full Video: <https://www.youtube.com/watch?v=hDs8n7X4v7U> (PLEASE WATCH FIRST)

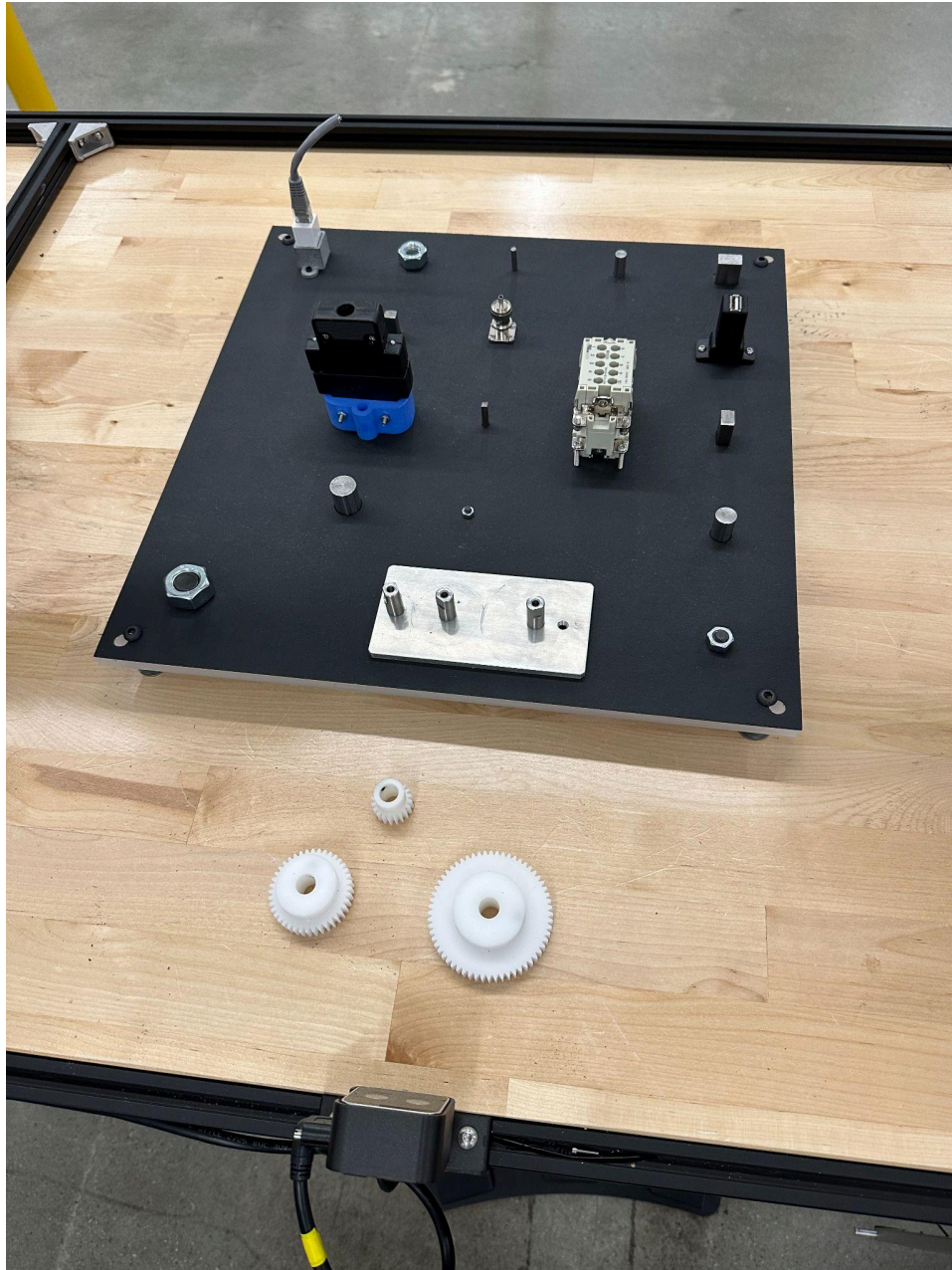
Required props:

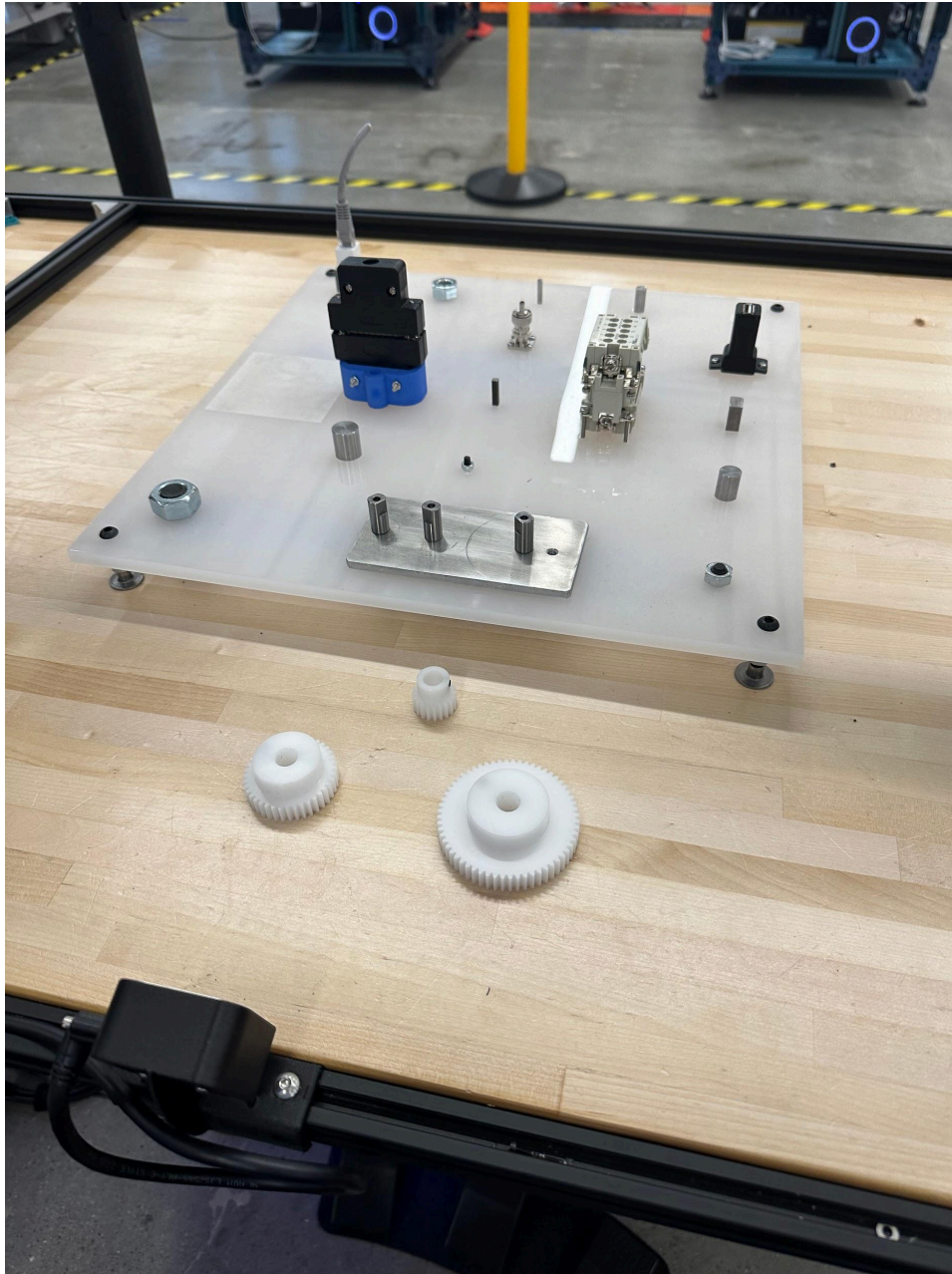
- NIST #1 board.
- NIST #1 board gears (3 of them).

Resetting the scene

NIST #1 board placed roughly in the center of the workcell. Please also have the pegs inserted. Place the gears in random locations at the bottom of the board.

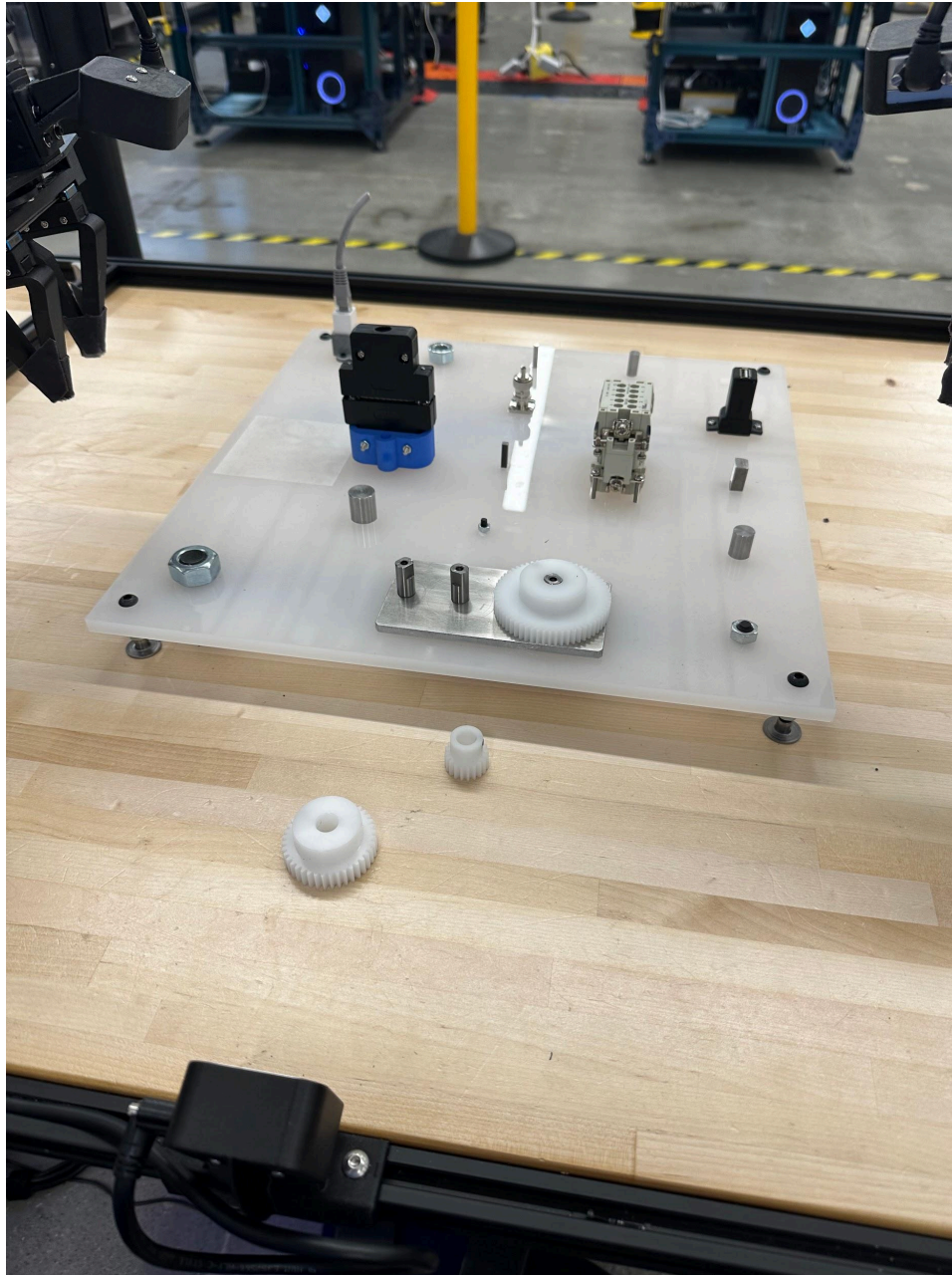
Note: the board is either white acrylic or black plastic over white acrylic (both styles shown below).



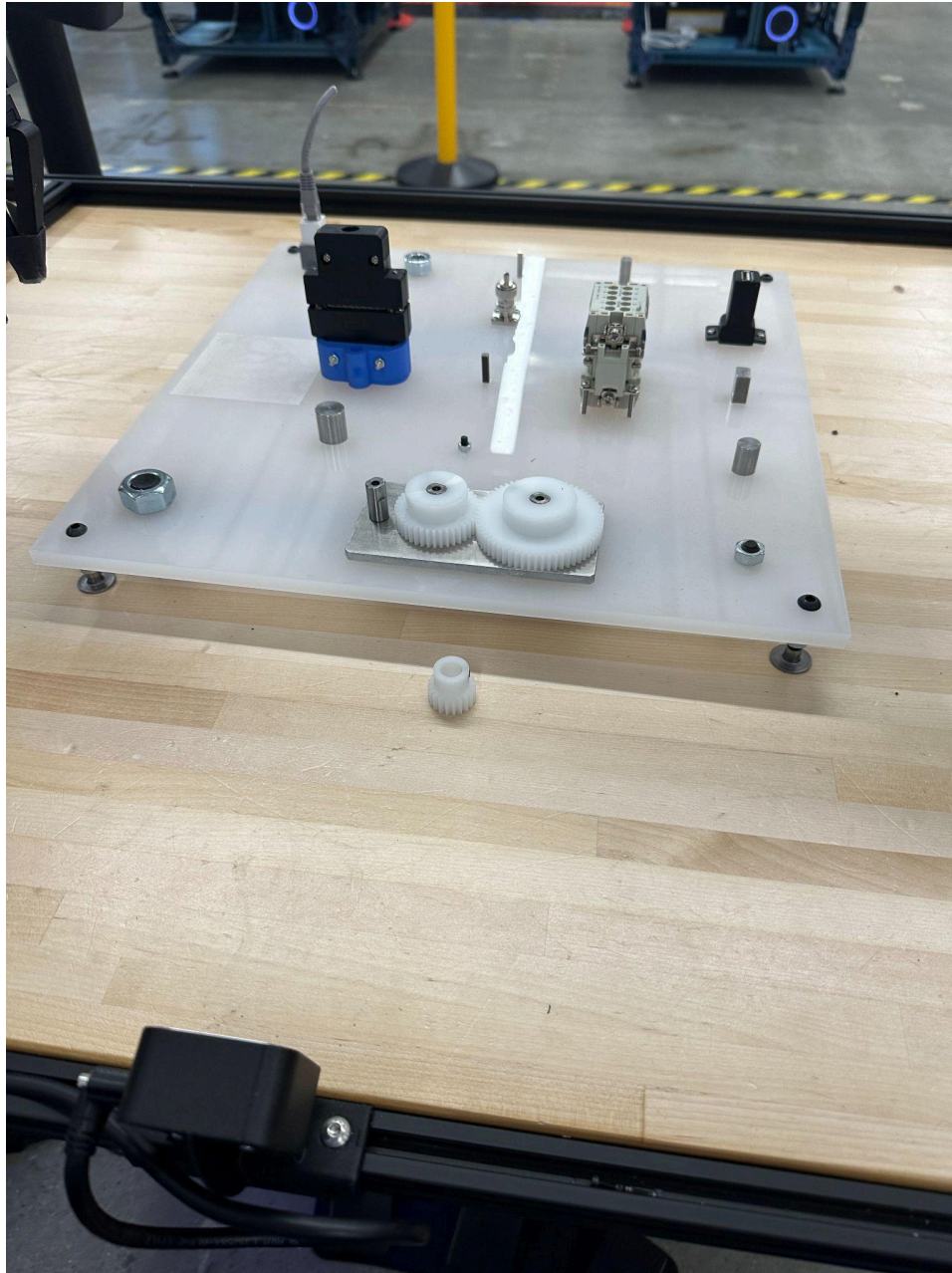


Step by Step Instructions

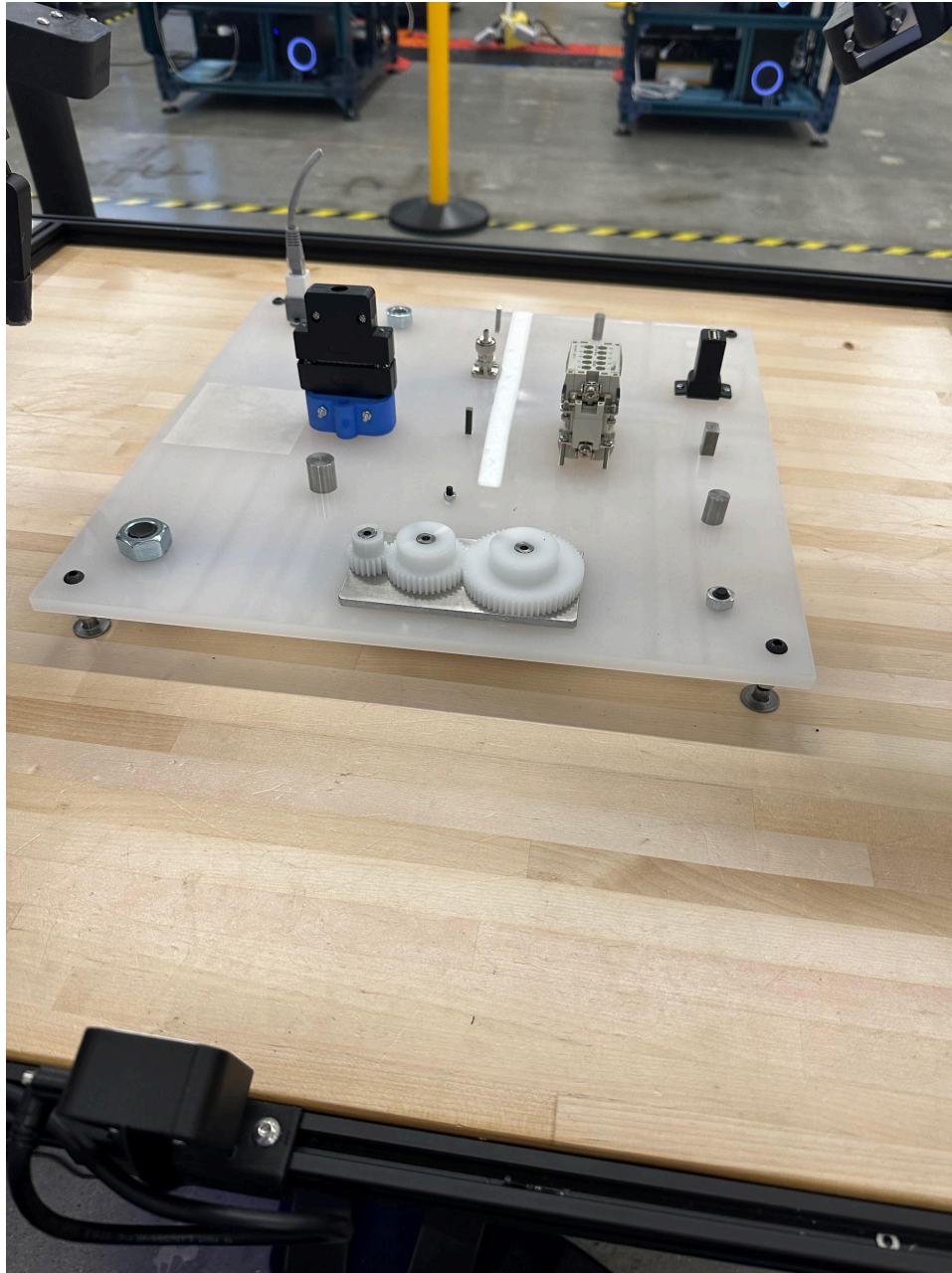
1. Using the **right arm only** pick up the largest gear and put it on the right most peg.



2. Using the **right arm only** pick up the middle size gear and put it on the middle peg.
Note: the gears must be meshing so that both gears are sitting flat against the metal plate (as in the image below).



3. Using the **right arm only** pick up the smallest gear and put it on the left peg. Note: the gears must be meshing so that both gears are sitting flat against the metal plate (as in the image below).





Failure Modes / FAQ

- What if a gear isn't meshed with another gear.
 - When inserting the gear you should push down and twist so the gear meshes.
- How to reset in case of failure?
 - Reset the episode by pressing the left footpedal. Arms will reset to their starting positions at which time you can manually reset the scene with your hands.
- What if an item drops, but stays in the scene?
 - Pick it up and continue the episode if the drop is minor.
 - Unless you continuously fail, in which case reset.

- What if an item drops and rolls/bounces out of reach?
 - Reset the episode using the left footpedal
- What if the board slides around too much?
 - If the movement is within ~2cm, finish the episode and on the next reset put it back into the center.
 - If the board slides > 2cm, reset the episode with the left footpedal and try again.