

PROJECT TWO: MILESTONE 3 – COVER PAGE

Team Number:

Thurs-12

Please list full names and MacID's of all *present* Team Members

Full Name:	MacID:
Couper Smith	smitc25
Yuvraj Sandhu	Sandhuy
Eric Hitsman	hitsmane
Chegnyao Liu	liuc169

MILESTONE 3 (STAGE 1) – PRELIMINARY SOLID MODEL (MODELLING SUB-TEAM)

Team Number: Thurs-12

You should have already completed this task individually prior to Design Studio 9.

1. Copy-and-paste each team member's screenshots of their preliminary solid model on the following pages (1 team member per page)
 - Be sure to clearly indicate who each model belongs to

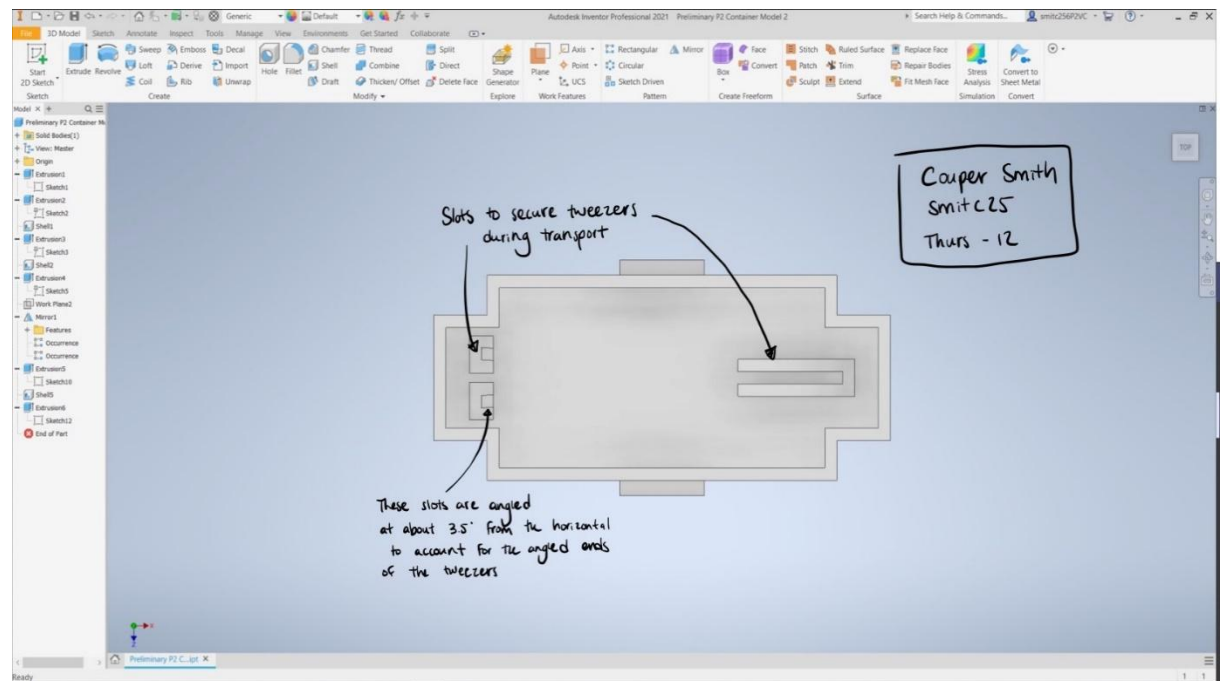
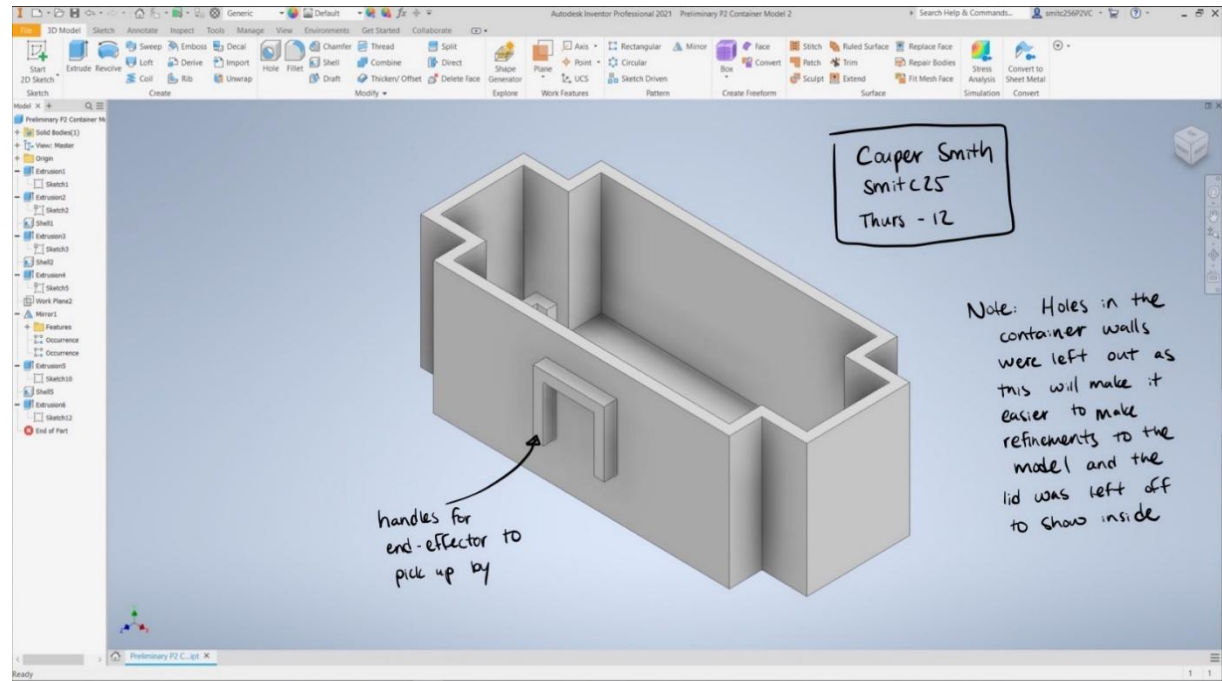
We are asking that you submit your work on both worksheets. It does seem redundant, but there are valid reasons for this:

- Each team member needs to submit their solid model screenshots with the **Milestone Three Individual Worksheets** document so that it can be **graded**
- Compiling your individual work into this **Milestone Three Team Worksheets** document allows you to readily access your team member's work
 - This will be especially helpful when completing **Stage 3** of the milestone

Team Number: Thurs-12

Name: Couper Smith

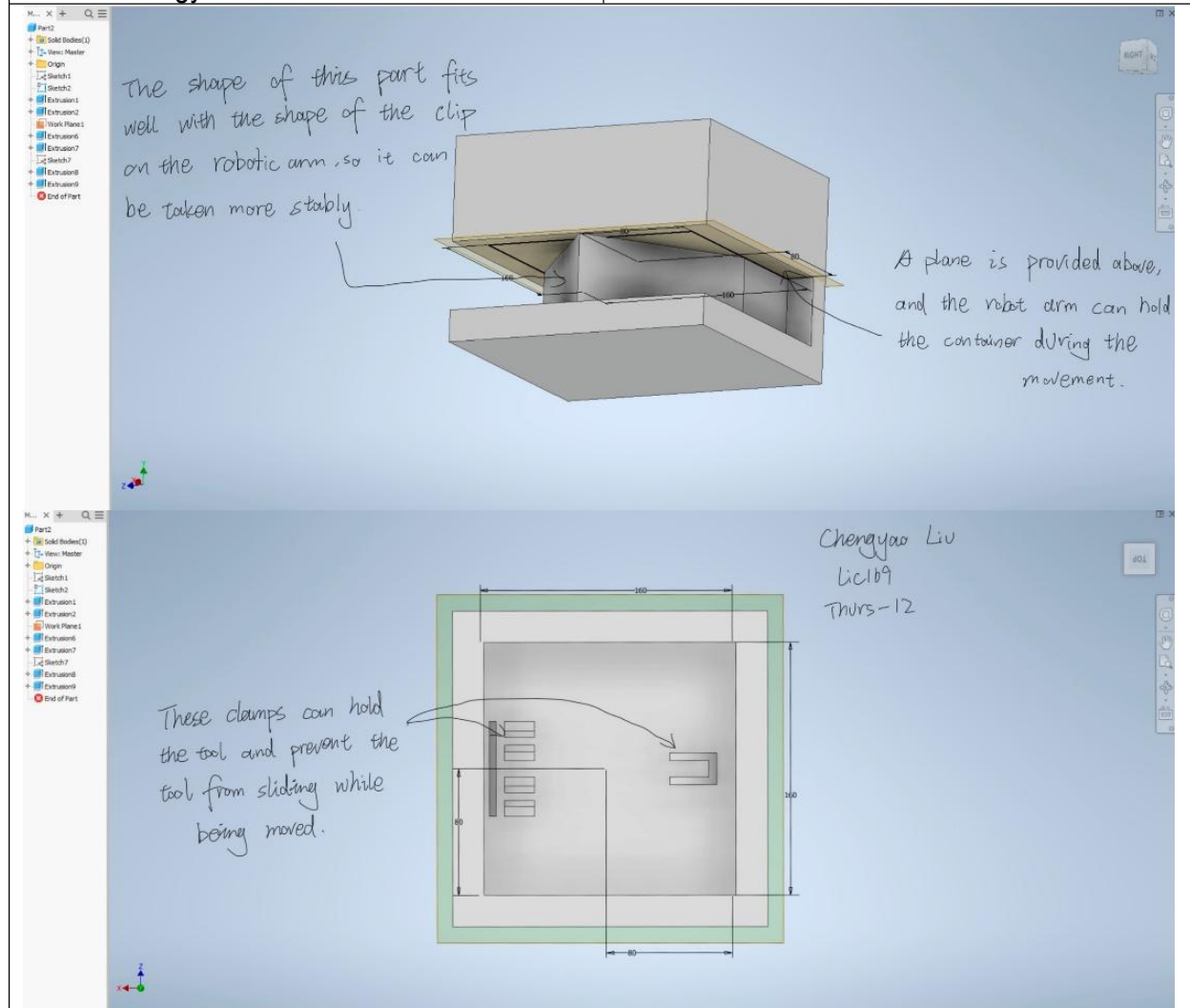
MacID: smitc25

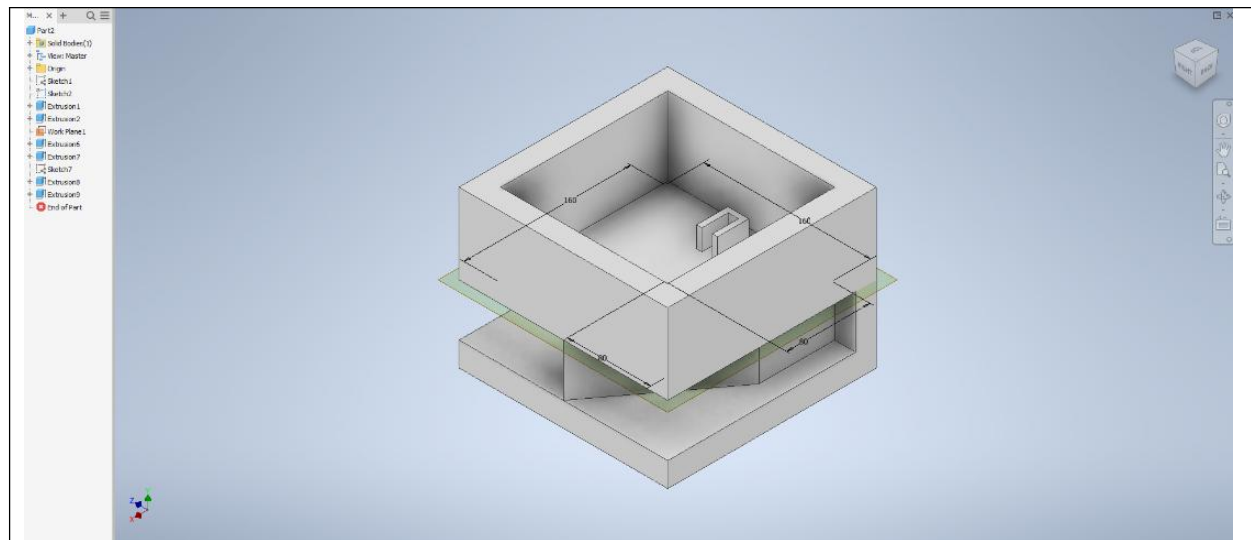


Team Number: Thurs-12

Name: Chengyao Liu

MacID: liuc169





*If you are in a sub-team of 3, please copy and paste the above on a new page

MILESTONE 3 (STAGE 2) – PRELIMINARY PROGRAM TASKS (COMPUTATION SUB-TEAM)

Team Number: Thurs-12

You should have already completed this task individually prior to Design Studio 9.

1. Copy-and-paste each team member's code screenshots on the following pages (1 team member per page)
 - Be sure to clearly indicate who each code belongs to

We are asking that you submit your work on both worksheets. It does seem redundant, but there are valid reasons for this:

- Each team member needs to submit their code screenshots with the **Milestone Three Individual Worksheets** document so that it can be *graded*
- Compiling your individual work into this **Milestone Three Team Worksheets** document allows you to readily access your team member's work
 - This will be especially helpful when completing **Stage 4** of the milestone

Team Number: Thurs-12

Name: Yuvraj Sandhu

MacID: Sandhuy

```
# Sandhuy
# Yuvraj Sandhu
# 400319134
# Task: Move End-Effector

home_pos = [0.4064,0,0.4826]

def Move_bin(bin_location, color):

    arm.move_arm(bin_location)

    time.sleep(2)

    if color == 'blue':
        arm.open_blue_autoclave(True)

    elif color == 'red':
        arm.open_red_autoclave(True)

    elif color == 'green':
        arm.open_green_autoclave(True)

    time.sleep(2)

    arm.control_gripper(-45)

    time.sleep(2)

    arm.move_arm(home_pos)

def Move_pickup(pickup_location):

    arm.move_arm(pickup_location)

    time.sleep(2)

    arm.control_gripper(-45)

    time.sleep(2)

    arm.move_arm(home_pos)
```


Team Number: Thurs-12

Name:Eric Hitsman	MacID: hitsmane
<pre>def get_bin_locations(): x = int(input ("Which dropoff would you like: small green = 1, small red = 2, small blue = 3, large green = 4, large red if x == 1: y = (0.0, -0.6726, 0.4261) return y elif x == 2: y = (-0.6096, 0.2843, 0.4261) return y elif x == 3: y = (0.0, 0.6726, 0.4261) return y elif x == 4: y = (0.0, -0.4064, 0.4826) return y elif x == 5: y = (-0.3683, 0.1718, 0.4826) return y elif x == 6: y = (0.0, 0.4064, 0.4826) return y else: print ("That is not a valid dropoff id")</pre>	

*If you are in a sub-team of 3, please copy and paste the above on a new page

MILESTONE 3 (STAGE 3) – PUGH MATRIX (MODELLING SUB-TEAM)

Team Number: Thurs-12

1. As a team, evaluate your designs for the sterilization container in the table below

- List your Criteria in the first column
 - You should include a minimum of 5 criteria
- Fill out the table below, comparing your designs against the given baseline
 - Replace “Design A” and “Design B” with more descriptive labels (e.g., a distinguishing feature or the name of the student author)
 - Assign the datum as the baseline for comparison
 - Indicate a “+” if a concept is better than the baseline, a “–” if a concept is worse, or a “S” if a concept is the same

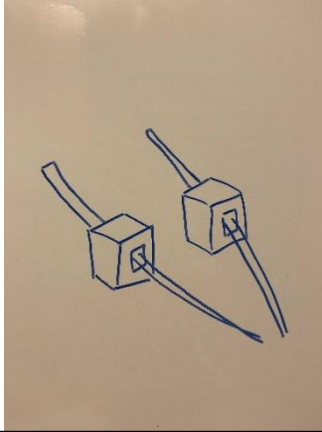
	Datum	Couper’s Design (smitc25)	Chengyao’s Design (liuc169)
<i>Facilitate Sterilization of Surgical Tool</i>	S	S	S
<i>Securely Hold Tools During Transport</i>	S	-	-
<i>Easy to Move/Carry</i>	S	+	+
<i>Sturdy Design</i>	S	S	S
<i>Design Fits within the Assigned Footprint</i>	S	+	S
<i>Features are all Minimum of 4mm</i>	S	+	+
Total +	0	3	2
Total –	0	1	1
Total Score	0	2	1

*For a team of 3, click the top-right corner of the table to “Add a New Column”

2. Propose one or more suggested design refinements moving forward

As next steps or areas in need of improvement, we concluded that both had similar weaknesses. For starters, both designs we concluded didn’t do as well securely holding the surgical tools in place as the datum did. This is because our designs just have the tool resting in a groove. To improve this, we need to further minimize the likelihood of the tool slipping out. Some ideas we had included tilting the sides of the clips inwards to make it more difficult for the tweezers fall out or by making the clips encircle the tweezers but move them more to the centre of the container

(see sketch below for visual). Another design refinement that we think both prototypes could benefit from is increasing the thickness of the walls. Right now the walls are only 4mm thick which could become a problem as this will make the design less sturdy. If dropped or if the end-effector grasps the container with too much force, this could cause the container to break.



MILESTONE 3 (STAGE 4A) – CODE PEER-REVIEW (COMPUTATION SUB-TEAM)

Team Number: Thurs-12

Document any errors and/or observations for each team member's preliminary Python program in the space below

Identify Autoclave Bin Location Task	Team Member Name: Eric Hitsman
<p>Observations:</p> <ul style="list-style-type: none">• Does not have comments to explain code• Showcases full coordinates instead of variables that contain the coordinates• Asks for user inputted values to direct the claw to the bin location <p>Errors:</p> <ul style="list-style-type: none">• A better way of troubleshooting the code would be adding print statements at the end of each if/elif statement to make sure the right coordinates are outputted• Input Question is not very spaced out and gets messy• Needs to be commented for better understanding and for peer-review editing	
Move End-Effector Task	Team Member Name: Yuvraj Sandhu
<p>Observations:</p> <p>Requires input for pickup location, bin location, and colour</p> <p>Controls gripper by itself</p> <p>Opens autoclave door by itself</p> <p>Errors:</p> <p>Needs to have threshold assigned for muscle sensor</p> <p>Needs to be commented for easy understanding</p> <p>Splits the function in 2</p>	

MILESTONE 3 (STAGE 4B) – PROGRAM TASK

PSEUDOCODE (COMPUTATION SUB-TEAM)

Team Number:

Thurs-12

As a team, write out the pseudocode for each of the *remaining* tasks in your computer program in the space below.

Control Gripper

If L reading is bigger than or equal to threshold

Pinch gripper by 45 degrees

Elif L reading is smaller than threshold

Release gripper by 45 degrees

Open Autoclave Bin Drawer

If L and R are both > threshold

If color is equal to blue

Command to open blue drawer

If color is equal to red

Command to open red drawer

If color is equal to green

Command to open green drawer

Continue or Terminate

Each loop z has 1 added to it

If z = 6

terminate the program

Else

continue