U3DP

Online Printing Manual

1. Prepare 3D CAD Model

CAD software, 3D scanning or download from Online website

2. Prepare the *Plate Sliced file*

Prepare a sliced file on Bambu Studio Software

3. Submit the file

Submit the sliced file at U3DP or online
https://u3dp.polyu.edu.hk/eBooking/eBookingIndex.php

4. Receive email with payment notifications

Receive email with payment notifications for settling the payment

5. Settle Payment and Collect printing parts

Settle payment by either:

A. Paying at the Finance Office's Cashier Counter (located at VA205).
B. Paying at W501 using Octopus.

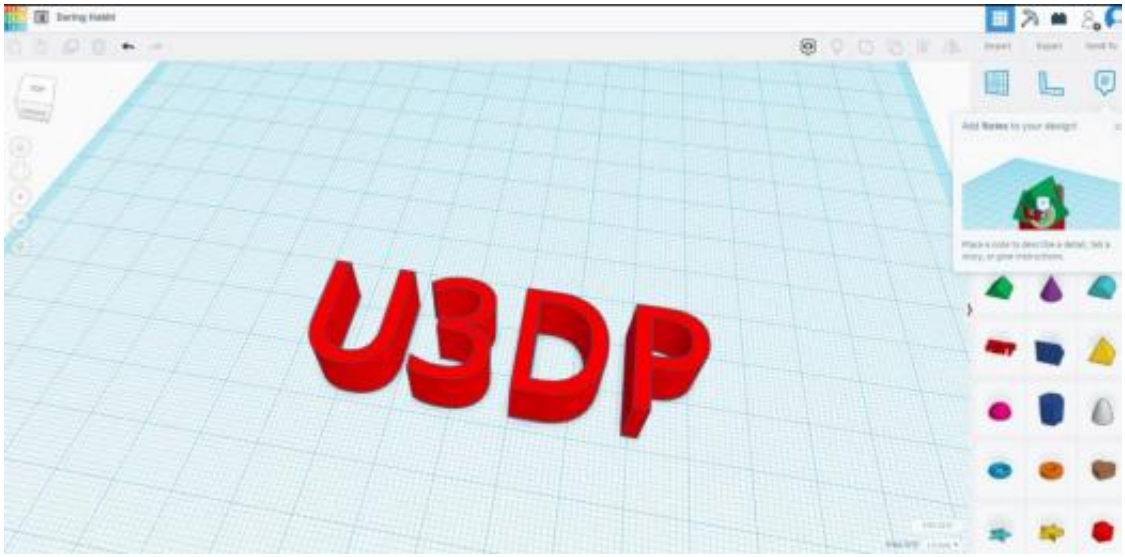
1. Prepare 3D CAD Model

3D CAD model can normally be achieved by:

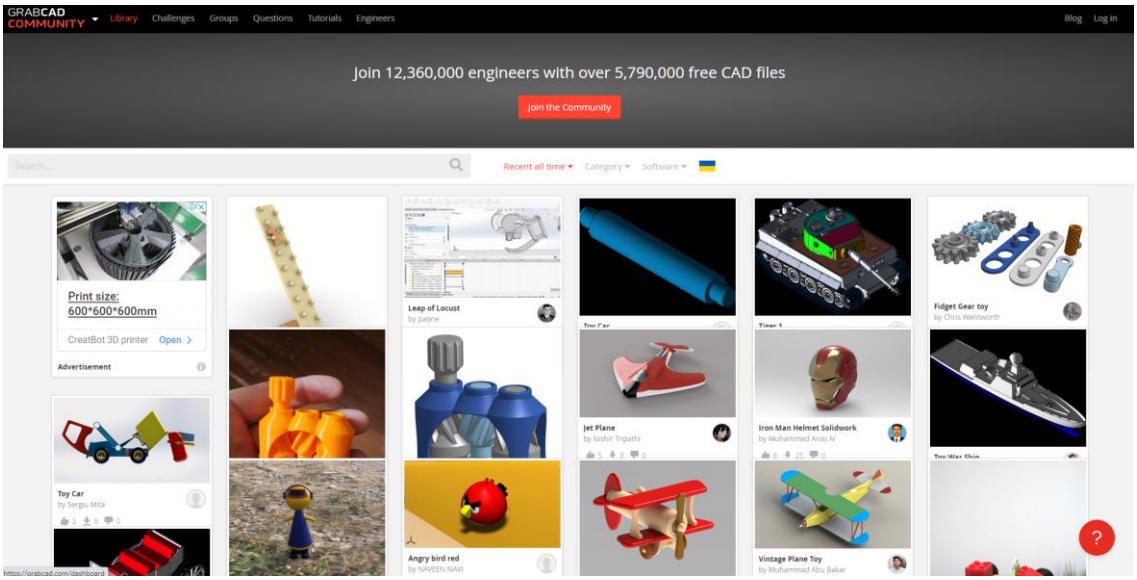
1. CAD software, i.e. Solidworks, Tinkercad, Rhino, etc.

2. 3D scanning (*You may seek for 3D scanning support from IC at Room W503c)

3. Download from On-line sites, i.e. GrabCad Community Library, Thingiverse, Yeggi, Pinshape, etc.



Tinkercad



GrabCAD Community Library

2. Prepare the Plate Sliced file

You need to download Bambu Studio via below link.

https://bambulab.com/en/download

The steps for preparing the slicing basically include:

A. Select type of Printer:

Bambu Lab X1 Carbon 0.4 Nozzle & Cool Plate / PLA Plate

B. Import model: 3mf / stl / stp / step / svg / amf / svg / obj format file

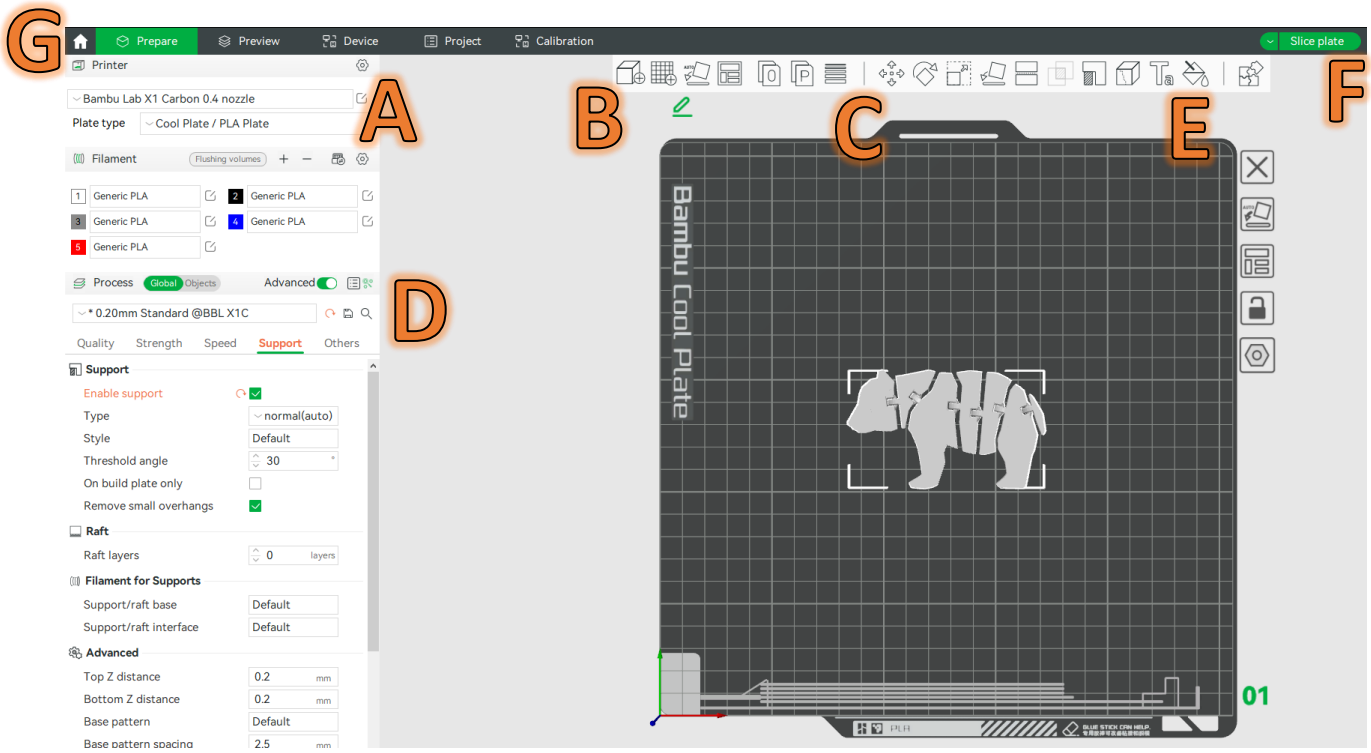
C. Model placement (i.e. how to place your part on the platform)

D. Print Setting (Apply SUPPORT on model with overhang position)

E. Model Colors Painting

F. Slice and Preview

G. Export the plate sliced file



A. Select Type of Printer

Bambu Lab X1 Carbon

Print Technology: FDM, Fused Deposition Modelling

Build Plate: Cool Plate / PLA Plate

Build Volume: 256 x 256 x 256 mm^3

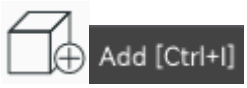
Layer Resolution: 0.2 mm

Material Diameter: 1.75 mm

Material: PLA

B. Import Model

Import a Model to Your Virtual Build Plate



You can import a model to your build plate in a few ways. You can drag files on the build plate or go to Import > File or Folder.

Supported File Types : *3mf / stl / stp / step / svg / amf / svg / obj*

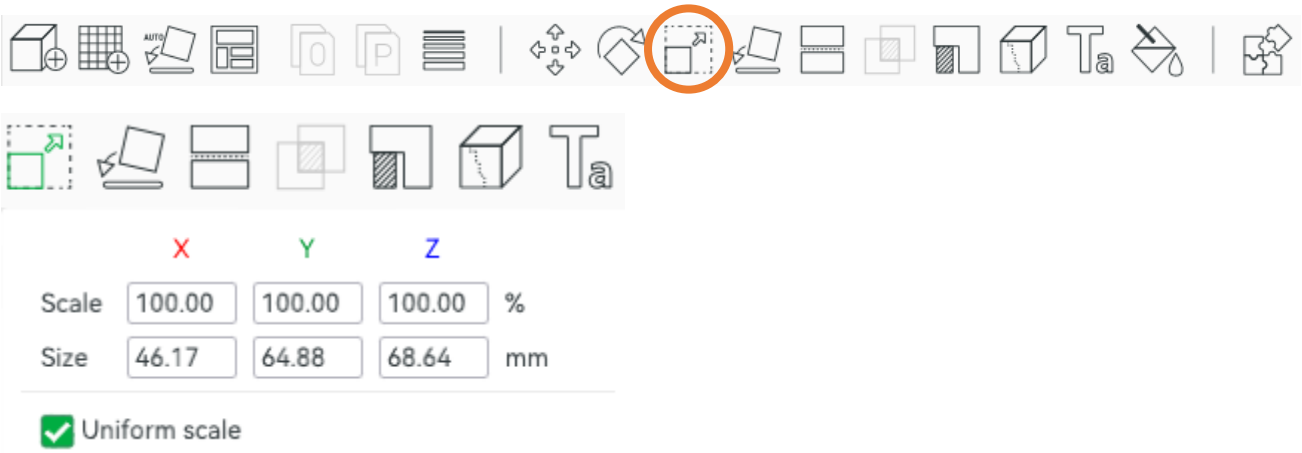
C. Model Placement

Orientation

Select ***Auto Orient***  to automatically re-orient a selected model to use the least amount of support material

Select ***Lay on Face***  to rotates model to align selected face to build plate

Select ***Rotate***  to rotate your model by 45 degrees or by a specific number of degrees along the x-, y-, or z-axis



Scale

Select ***scale***  to adjust the scale of your model by entering the percentage or the actual size you wanted.

-Select Uniform Scaling to adjust the scale of your model equally along the x-, y-, or z-axis.

-De-select Uniform Scaling to scale the model by a specific amount along the x-, y-, or z-axis.

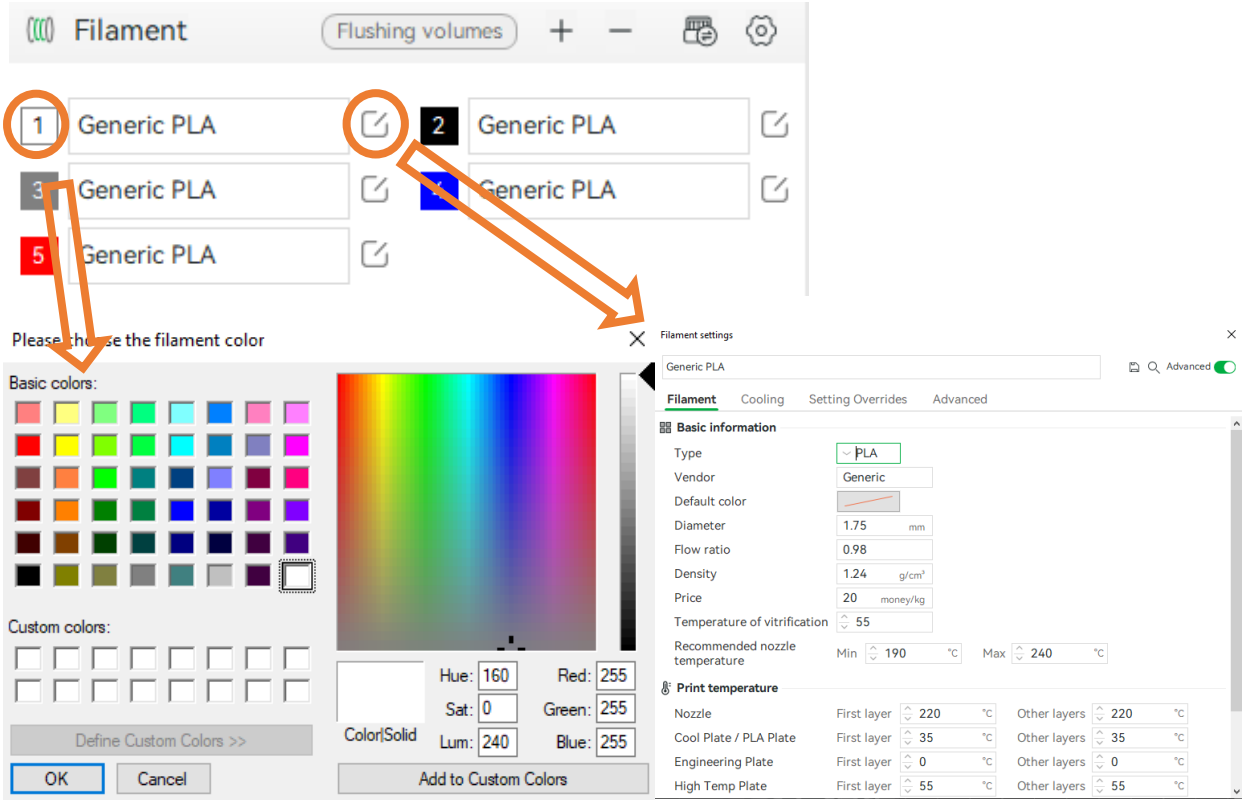
Move

Select ***Arrange All Objects***  to automatically arrange objects on selected plate

Select ***Move***  to manually move the objects by x-, y-, or z-axis

D. Print Setting

Material Setting

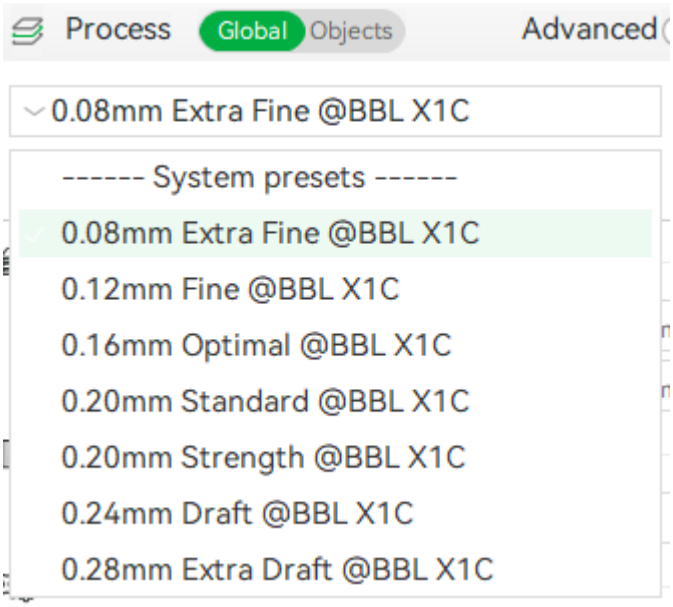


Select the filament material and colours

Default Material : PLA

Default colour : White / Black / Grey / Blue / Red

Printing Parameter



There are total 7 default setting according to the levels of durable

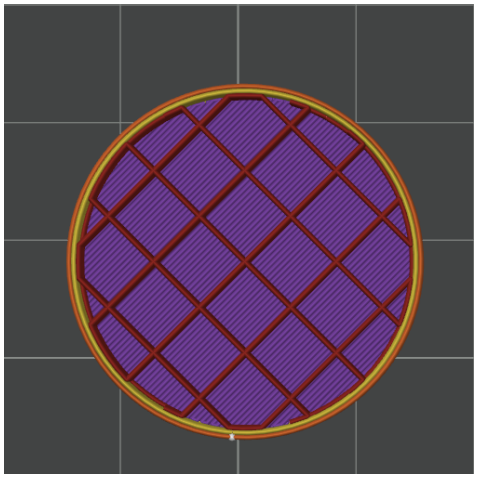
Default Setting : *0.20mm Standard @BBL X1C*

Seam Position

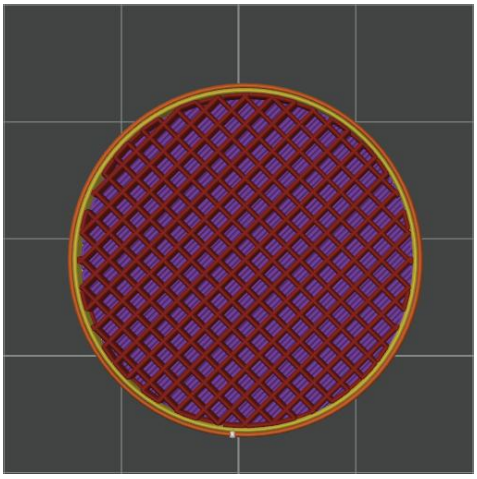
Align Random Nearest Back

Seam will be visible if your part without any sharp corner, there are four types of seam position of the model

Sparse Infill Density



15 % Infill

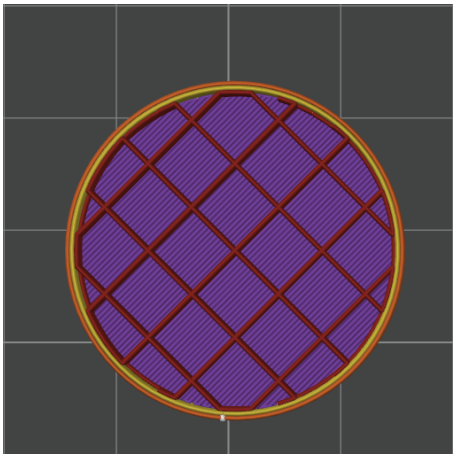


50 % Infill

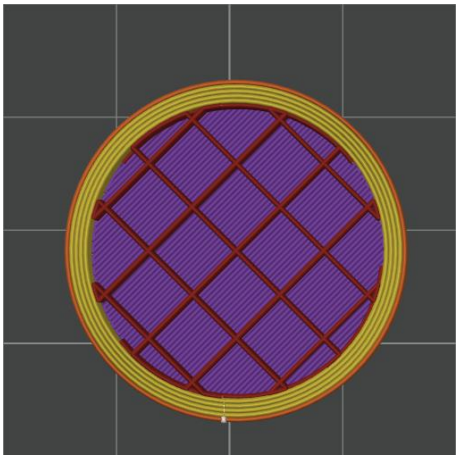
Infill Density: Adjusts the density of the infill on the inside of the print. If the top of the model is collapsing during a print or the model feels too brittle, increasing the infill density may help. Increasing the density will increase print time.

Default setting: 15%

Number of Wall loops



2 Wall loops

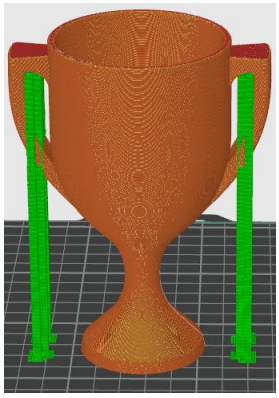


5 Wall loops

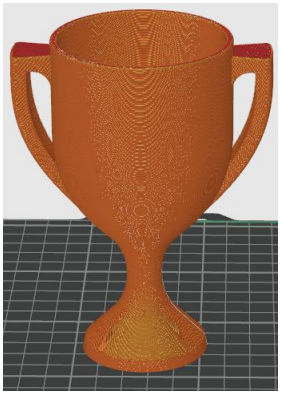
Number of Loops: The number of outermost layers of the printer model. Increasing the number of loops creates thicker stronger walls, but slower prints.

Default setting: 2

Support



With Support



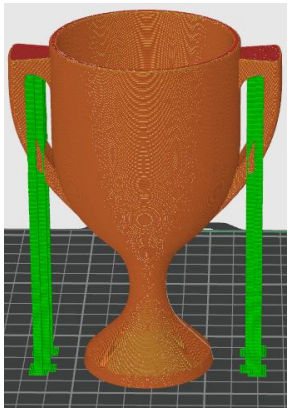
Without Support

Support: Select the Supports checkbox to have your model print with support structures. Bambu Studio will automatically generate supports for any overhanging sections of your object. Supports will be easily removable once you remove your finished object from the build plate.

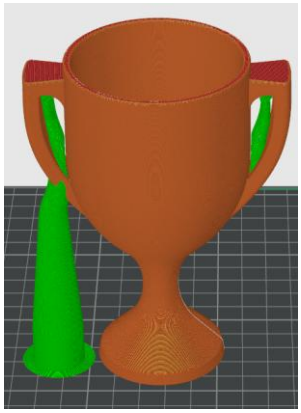
There are 2 basic types of support: Normal and Tree

Normal support **:** Directly projects the overhangs down to the heat bed, and gets the support body

Tree support **:** Sampling the overhangs to get nodes, each node is represented as a circle. And then the nodes are propagated down to the heat bed. During propagation, the circles may be enlarged to get better strength and may be moved away from the object so the supports are less likely to collide with the object



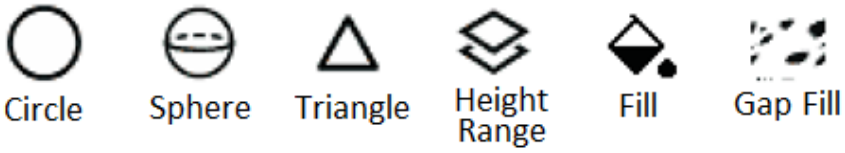
Normal

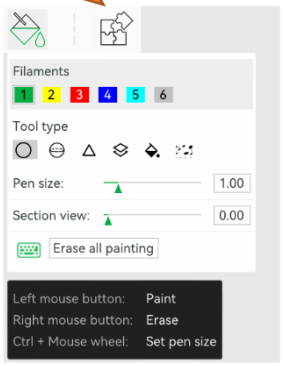


Tree

E. Model Colors Painting

6 painting tool types are provided:



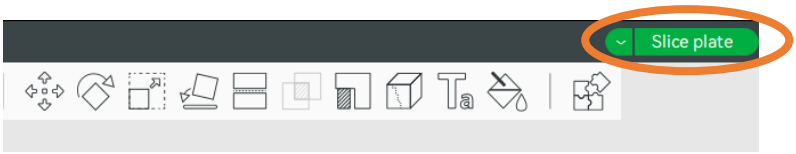


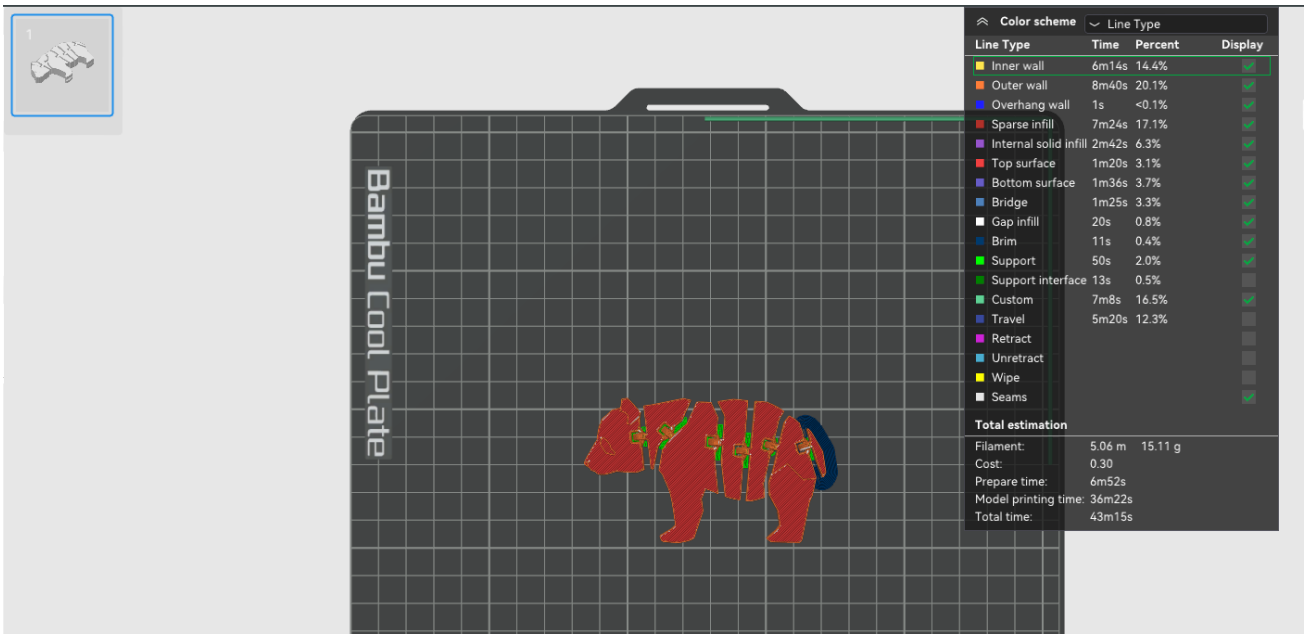
Circle:	Circle tool is a circle-shape pen tool that is used to draw any curves on the model's surface
Sphere:	The sphere is similar to Circle, but it will colorize all facets inside the sphere rather than only the visible facets
Triangle:	The triangle tool colorizes the triangle pointed by the mouse pointer. Click to colorize a single triangle facet and drag to select a list of triangle facets.
Height Range:	The height range tool colorizes all facets between a given height range, even though they may lay in disjointed regions
Fill:	The Fill Tool colorizes a bucket of connected facets propagated from the facet pointed by the mouse pointer. The propagation stops when reaching a facet that has a different colour. If "Edge detection" is on, the propagation will also be stopped when reaching a corner that is sharper than the threshold.
Gap Fill:	Painting with the above tools often generates gap areas. They may look ugly and increase (expensive) filament changes. The gap fill tool will detect small gaps and auto-fill them with the colour from a neighbour facet group.

The ***Pen Size*** and ***Section View*** Function might help you finish the painting effectively.

Choose **Maximum 2 Colours** out of 5 total colours (White / Black / Grey / Blue / Red) in a single print.

F. Slice and preview

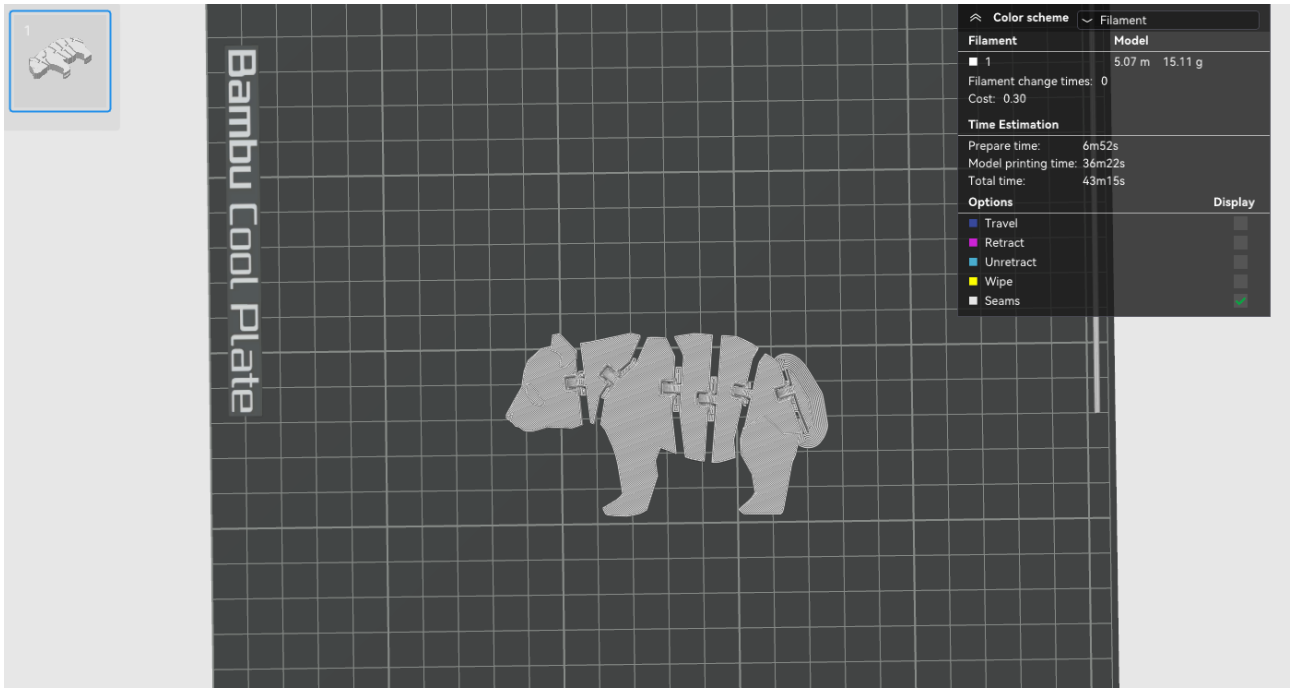




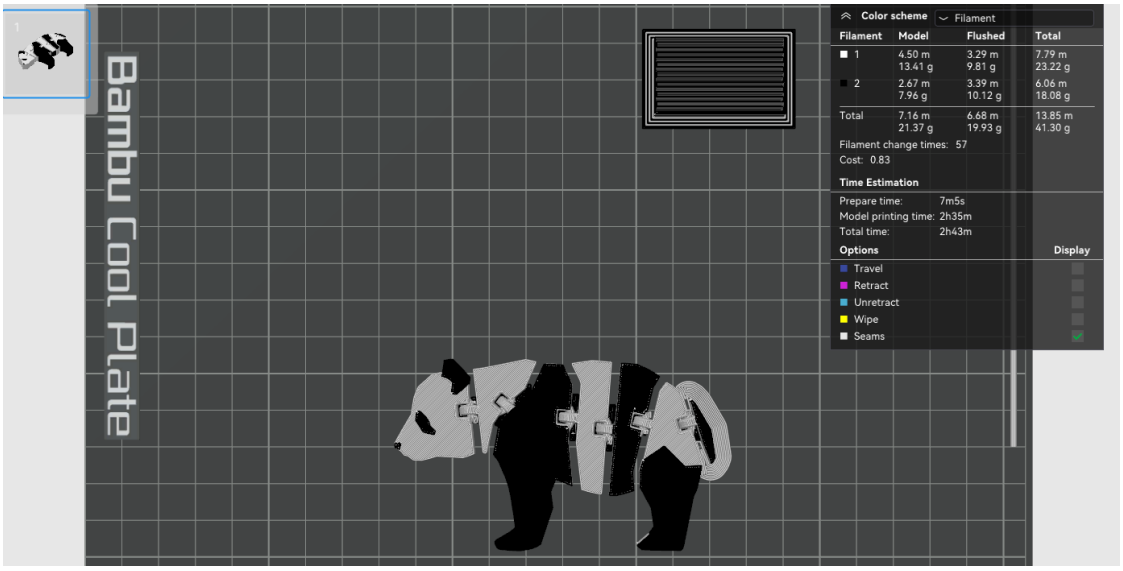
After slicing, the estimated print time and material usage will be displayed, along with the printed-out model that includes support.

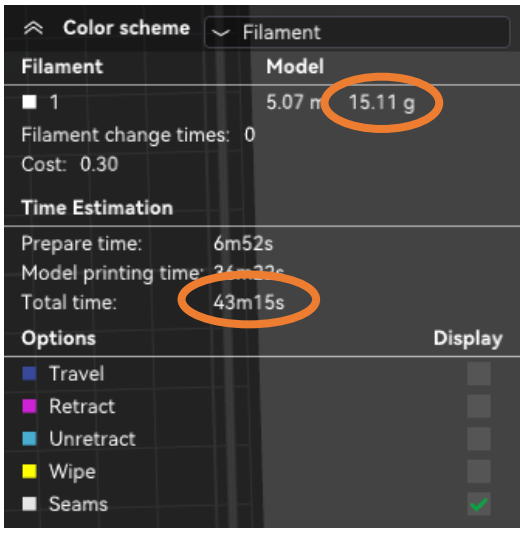
Sample

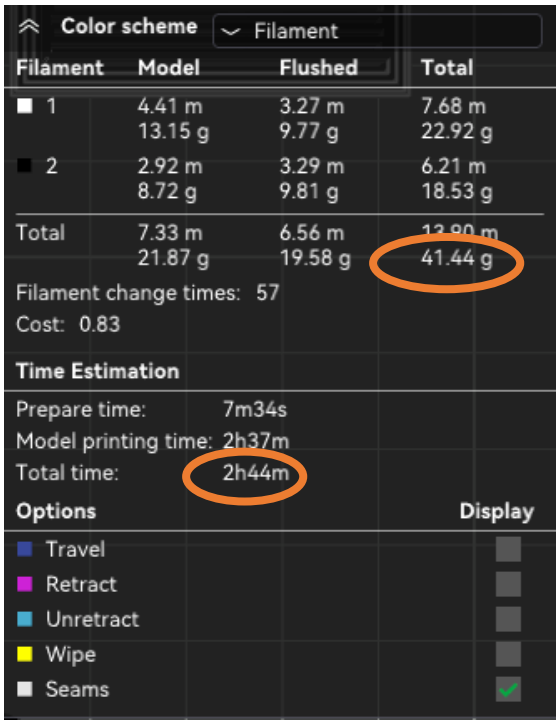
Single Colour:



Multi-Colour:







	Material Usage	Print Time	Cost
Single Colour :	15.11 g	43m 15s	$35
Multi-Colour :	41.44 g	2h 44m	$61

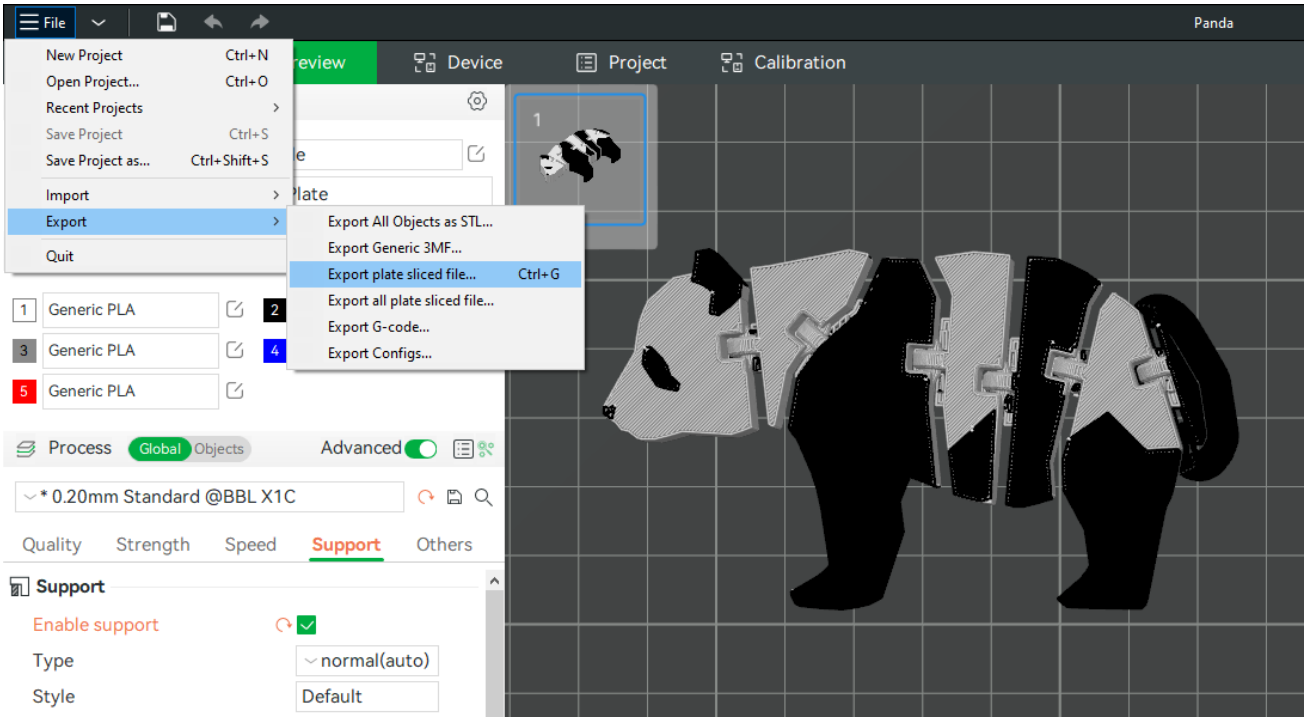
Given that the models are Same

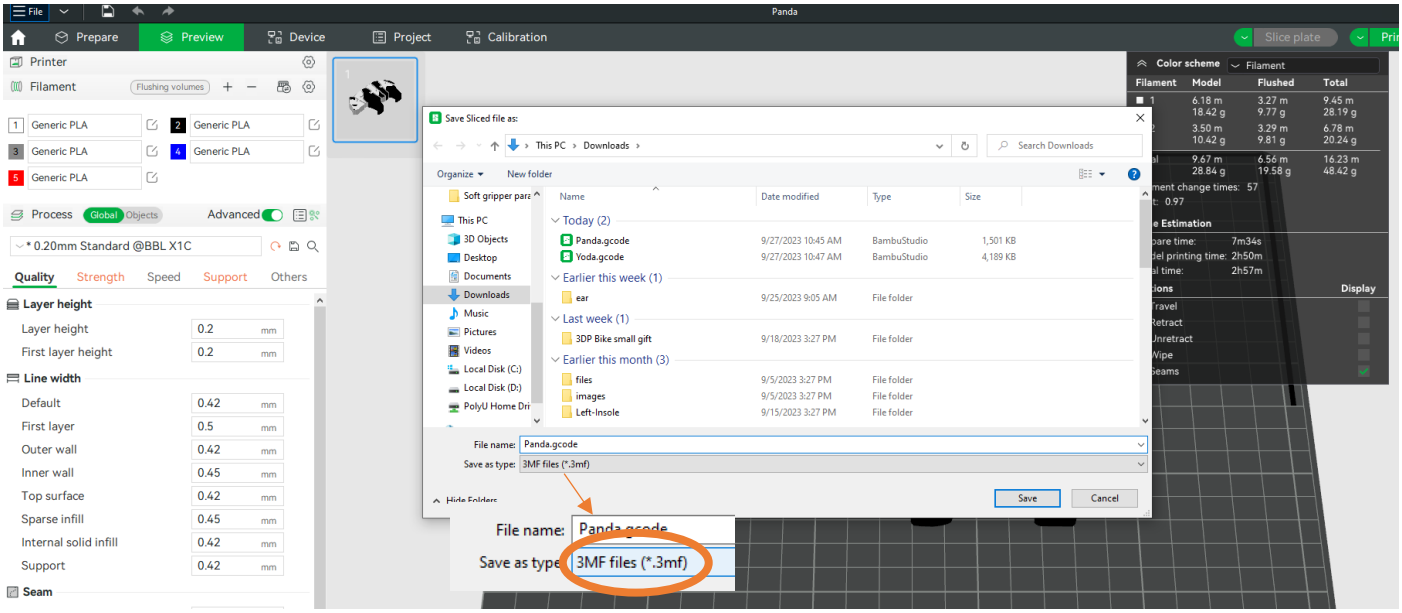
Multi-Colour Model requires **More PLA filament and Printing time** than single colour model

The **Cost** of multi-colour will also be **Higher**

Printing Cost = $1 per gram + $20 operation charge

G. Export Plate Sliced File



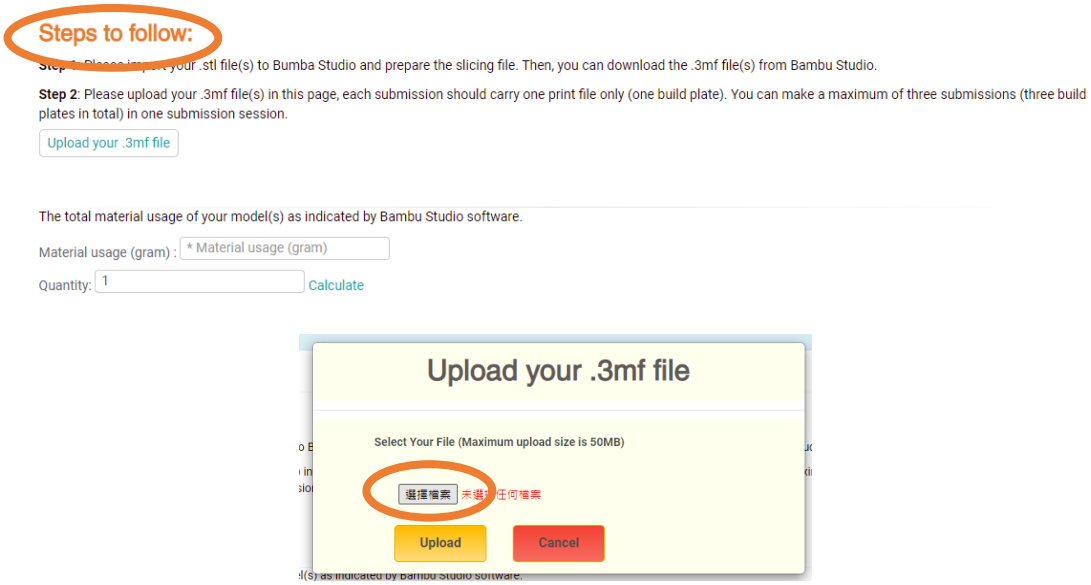


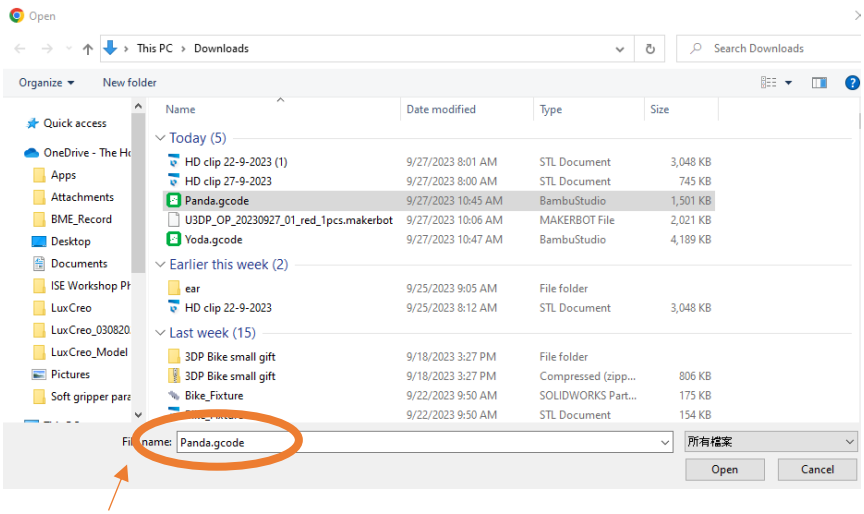
Next, you are required to log in to our printing service via the link below and import your file for printing preparation. You will be able to see the total weight and estimated printing time of your model. The printing cost will be calculated based on the total weight of your model.

3. Upload the file to U3DP booking system

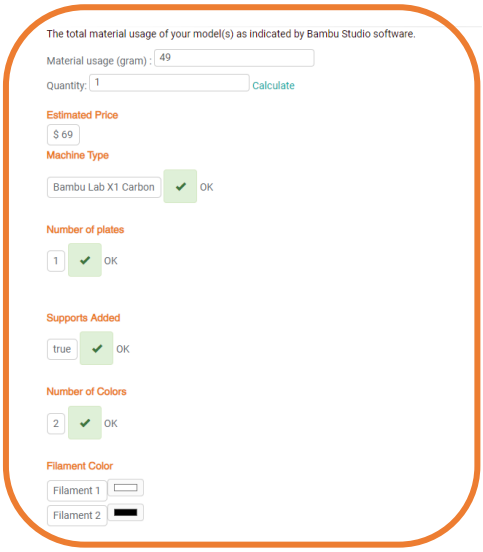
Go To :

https://u3dp.polyu.edu.hk/eBooking/eBookingIndex.php





Select the file you saved before



Basic Printing Information

Step 3: Select the colour swatch of material.

Note: The actual printed colour may deviate slightly from the colour swatches.

First Color Region from the model uploaded

Choose the color by clicking the plate

(Red / Blue / White / Grey / Black)

Second Color Region from the model uploaded

Confirm your order if you agree to the cost. After submission, you will receive a confirmation email for reference. We'll begin processing your printing request after reviewing your file. The print will take time to complete based on your model and the current load of the 3D printers.

4. Receive email with payment notifications

You will receive a “3D Printing Complete” email with a payment notification once the printing is finished. Please show the email to the staff and settle the payment by either paying at the Finance Officer’s cashier counter at VA205 or at W501 using Octopus. Please note that W501 only accepts payment via Octopus.

3D Printing Complete

Dear staff/student,

Your request has been successfully completed. Please show this email to the staff at Finance Office's cashier counter at VA205 and settle the payment. Please bring along the FO payment slip and come to the U3DP W501 Help Desk counter to pick up your part(s), thanks for using our service.

PAYMENT NOTIFICATION

	Tab Cheng
Name of client:	
Payment Method:	
Payment Amount (HKD):	31
Payment Details:	Departmental material
Payment Due Date:	06/04/2022
Charge Accoun t:	1.2D.0M.973L
U3DP Ref#.:	U3DP_OP_20220330_03
FO Ref#:	

If you have any queries, please call our hotline at 3400-3131.

This is a system-automated message, please do not reply to this email.

Best Regards,
University Research Facility in 3D Printing
The Hong Kong Polytechnic University

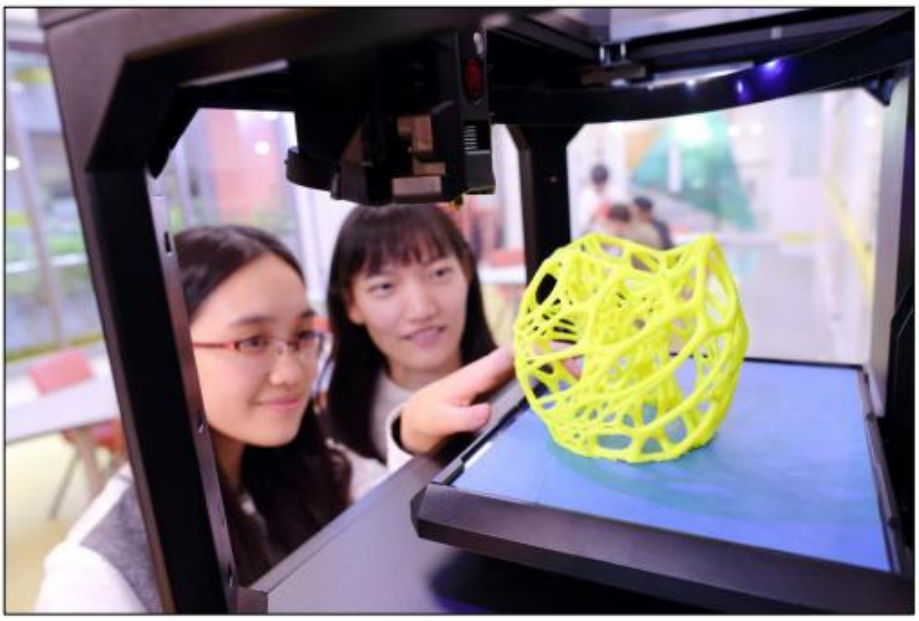
Receive an email with Payment notification after *3D Printing Complete*

5. Settle Payment and collect printing parts

Settle the payment by either:

A. Paying at the Finance Officer's cashier counter at VA205. Present and upload receipt to collect your printed parts at W501.

B. Paying at W501 using Octopus and collect your printed parts.



THE END