

Woollahra
Libraries



3D Printing User Guide



[www.woollahra.nsw.gov.au/library]



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1. Quick Guide

Woollahra Library at Double Bay now offers a Flashforge Creator 3 printer **for library members**

Members who have not used a 3D Printer before can attend the workshop: **Intro to 3D Printing (12+)** that is held every two months.

- The workshop covers:
 - History of 3D Printing, presently and future
 - About the Material
 - How to select a design and download from Thingiverse
 - How to use Flashforge Creator 3, adjust print settings and save the model for 3D Printer
 - Session booking and cost

Members who want to know more about 3D Printing can attend the workshop: **Extended 3D Printing Workshop - Level Up Your Skills!** that is held every two months.

- The extended workshop covers:
 - How to Repair a Mesh
 - The Anatomy of a 3D printer
 - The Pros and Cons of Print Materials
 - Common Print Problems and Solutions
 - Post Printing Process

Book via the library Events page <https://www.woollahra.nsw.gov.au/events> or call 02 9391 7100.

2. Specifications and filament

- Designs can be printed from .STL files with a maximum built volume of 300 x 249 x 200 mm.
- 3D printing will use PLA or PETG filament (One type of filament at a time)
- PLA filament are available in white, red, black, and blue.
- PETG filament are available in black, white, silver, pink, yellow, grey, brown, gold, purple, traffic red, orange and natural.

3. Printing times

- Once attended, Members (only) can reserve a session via: <http://elibrary.woollahra.nsw.gov.au/ComputerReservation/>
Monday to Friday between 10am -5pm
- 7 Hours max printing time and prints cannot exceed after library operation hours
- During the booked session, members must process their 3D Model using FlashPrint and save it in .gx Format on USB
- Staff will assist in submitting the print and determine approx. time and cost as well as confirming what filament colour the member wants to use
- Members must pay before they can start the print via the MonitorBM Kiosk
- Please see a staff member on Level 2 before commencing your 3D Print. The staff member will confirm cost and time.

- Staff rostered on Level 2 will take the job out of the printer when it is finished and hand it back to the member otherwise leave at the Returns Room with Member's details. If there is a shift change during the printing, the staff should advise new staff of update.

4. Safety Caution

Please read the safety cautions carefully before using the product, and use the product appropriately.

- This document is provided to ensure the safety of users and to prevent property damage.
- Since the printer generates a high level of heat during operation, there is the risk of burning if you place your finger or another part of your body or fixtures inside the printer during operation. Place the body part or fixtures only after the operation is terminated and the printer has been sufficiently cooled.
- The printer has a number of moving parts, including the motor, belt and gear. There is the risk of injury or property damage from being trapped if a body part or fixtures are placed inside the printer during an operation.
- Penetration of water or other liquids as well as the metal pieces or other conductive foreign substances inside the printer can cause fire or electric shock. Please take care to avoid operating the printer with wet hands, as this can cause fire or electric shock.
- The printer and its parts have sharp edges. Be careful to avoid injury or printer damage.
- Since the filament used in the printer can cause fire or injury, do not heat it or deform it with another piece of equipment. Carefully handle the outputs and filament scraps, as swallowing them can cause suffocation, etc.
- Never use a volatile substance with the printer, as it can cause a fire or explosion. In addition, remove ignition materials or flammable materials around the printer as they can cause fire.
- The printer uses a high brightness LED for illumination. Do not look at it directly in order to protect your eyes.
- Do not destroy or alter the printer's power cable or USB cable, and make sure that only the rated voltage is supplied.
- To move the printer, stop the printer operation and disconnect the power cable and USB cable after the internal parts are sufficiently cooled and the printer is turned off.
- Do not place a filament or object in an empty space inside the printer, as it can cause printer damage and fire.
- If an unauthorized filament or part is used with the printer, it may damage the product and/or violate the conditions of the product warranty. Any problem caused as a result will not be covered by the warranty.
- Do not disassemble or alter the printer except as specified in the Operation Manual, as it may cause the injury or printer damage. Any problem caused as a result will not be covered by the warranty.
- Do not apply excessive force or impact to the printer, as it may cause injury or printer damage. Read the caution in the Operation Manual carefully before using the printer.

5. 3D Printing Workshop

The 3D printing workshop: **Intro to 3D Printing** is organised by the library and is available every two months. Attending the workshop will be beneficial for both novice and experienced users as it will cover the following:

- The History of 3D printing, present and future plans
- Information of material usage
- How to select and download designs from Thingiverse
- How to load files on FlashPrint, adjust/amend the design and Print settings
- Information on Printing Duration, Session Booking and Cost.

The extended workshop: **Extended 3D Printing Workshop - Level Up Your Skills!** is held every two months. The extended workshop will cover:

- How to Repair a Mesh
- The Anatomy of a 3D printer
- The Pros and Cons of Print Materials
- Common Print Problems and Solutions
- Post Printing Process

Please check library Events page <https://www.woollahra.nsw.gov.au/events> and search for **Intro to 3D Printing (12+)** or call 02 9391 7100 to book

6. Reserve a 3D Printing session

You can book a printing session from home or from the one-stop self-service computers in the library. If you are booking from home:

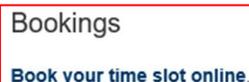
- Go to the library website <http://www.woollahra.nsw.gov.au/library>
- Select **Using the Library** from the menu on the left-hand side
- Select a **3D printer** link in Book section:



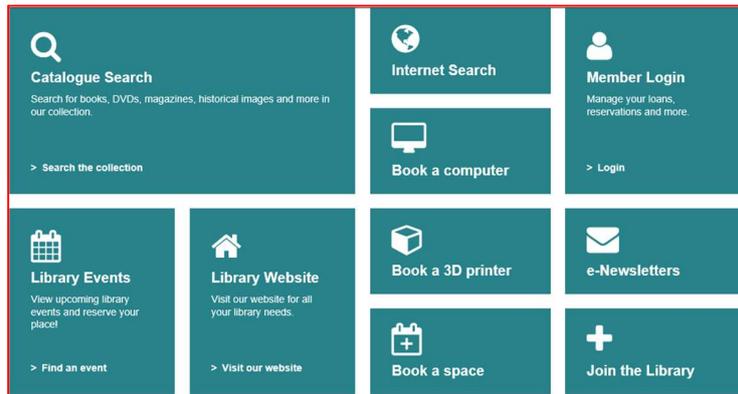
- Expand **3D printing** section:



- Scroll down to Book your time slot online link:



Alternatively, if you are booking from the library one-stop self-service computer you can
Select **Book a 3D printer** menu



- Expand **3D printing** section:

+ 3D printing

- Scroll down to Book your time slot online link:

Bookings
[Book your time slot online.](#)

- Enter your library card number and password:

- Select **Reserve a Computer / 3D Printer** button

- Followed by **Continue** that will display Scheduled Reservation.

- Select Location Level 2 | 3D Printer, and followed by Day
- Click Submit button
- You will receive reservation confirmation on the screen **(as well as an email)**

Reservation Confirmation

Your request for computer reservation has been completed as follows:

Location: Woollahra Libraries - Double Bay - Level 2 | 3D Printer

Schedule: Thursday, 23 Nov, 2017
2:00 p.m. (with 10 minutes login grace period)

Duration: 1 hour

PC: Level 2 3D Printer PC

What you can do:

[Modify](#)

Please make sure that you arrive to the library before the booking starts. Maximum wait time permitted will be 10mins otherwise session will be cancelled.

7. Login on a 3D printing public computer on Level 2

- Please use your card number and password to login, click **Accept** in Terms and Conditions and then click **Ok** in Welcome Screen.

Level 2 3D Printer PC

Level 2 | 3D Printer

10:56 AM
22 Nov 2017

This computer is reserved for
10620060.

Account Information

Please enter your Library Card / Guest Number

10620060

Please enter your Password:

OK Cancel

Time remaining to log in: 03:53

8.0.0.44

Terms and Conditions

Terms and conditions template for website usage

Welcome to our website. If you continue to browse and use this website, you are agreeing to comply with and be bound by the following terms and conditions of use, which together with our privacy policy govern [business name]'s relationship with you in relation to this website. If you disagree with any part of these terms and conditions, please do not use our website.

The term [business name] or us or we refers to the owner of the website whose registered office is [address]. Our company registration number is [company registration number and place of registration]. The term you refers to the user or viewer of our website.

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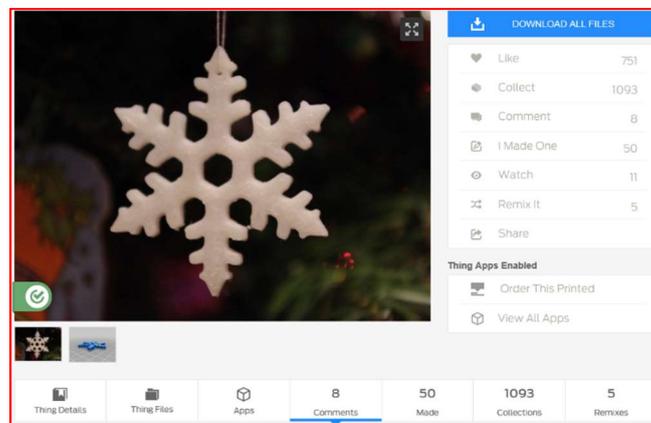
Accept Decline

8. Download a 3D model to print

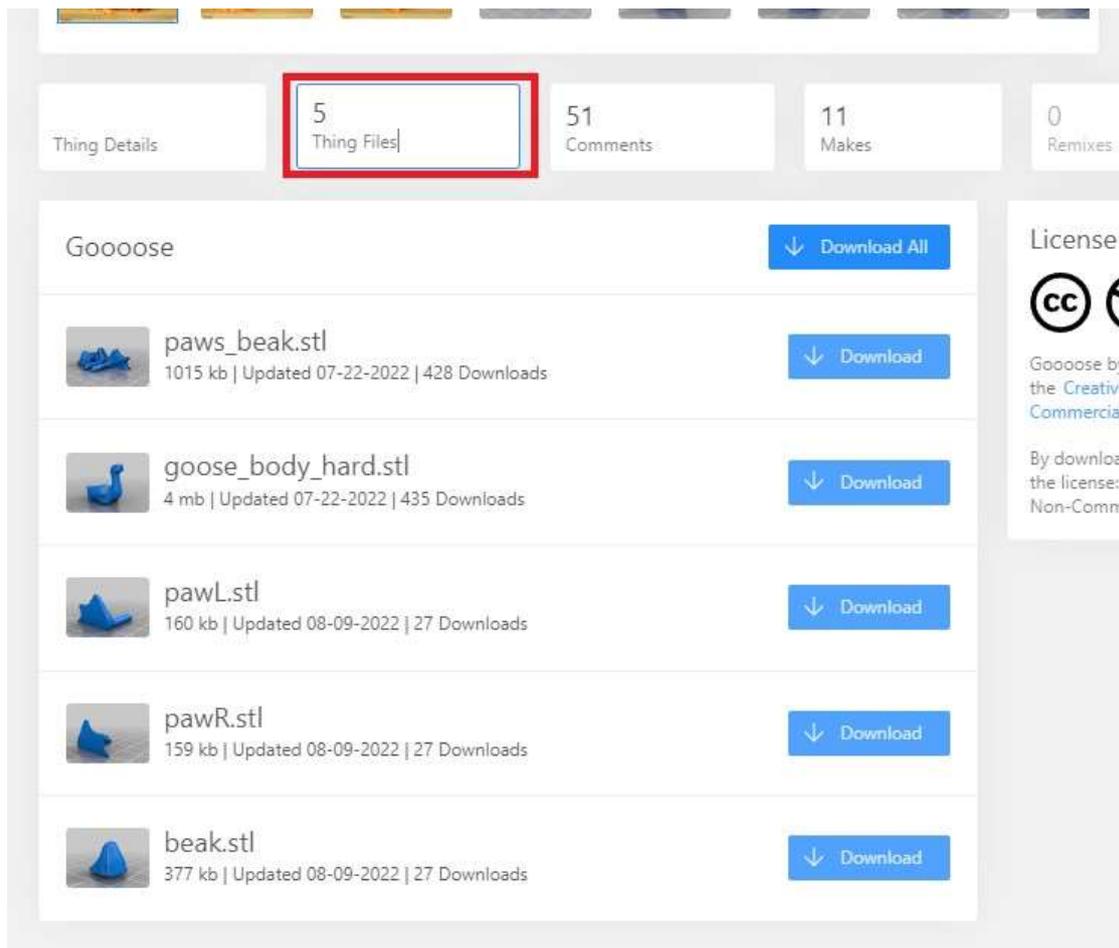
If you are looking for a model that you can print, you can find one on www.Thingiverse.com. Otherwise, if you have your 3D model in .STL file on your USB, skip this and proceed to **step 9**.

Thingiverse is an online design community where you can discover 3D printable designs via search, explore via categories, get free education and register to become part of the community.

If this is your first 3D printing experience, choose something small and simple that will not take too long to print. We recommend to read Comments and number of People who have used that design to assess the quality of the 3D model. The library is not responsible for any flaws in design nor the end result. Refunds (credit to Members Library Cards) will only be issued in case of staff error or 3D Printer malfunction.



- Once you selected the design, scroll down and click **Thing Files** button. Choose the STL file you want to download.



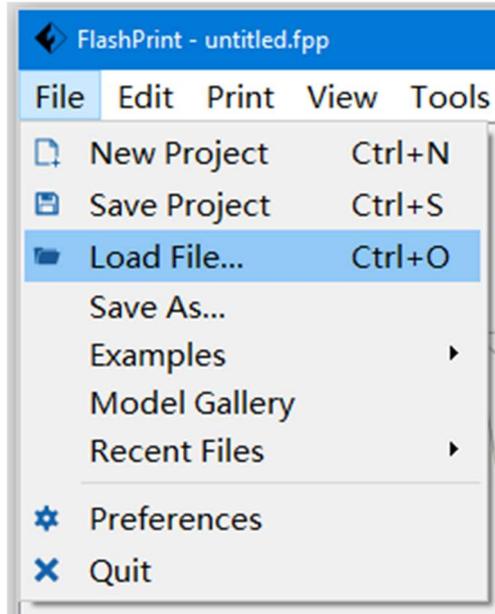
- Once the files are downloaded, you will need to extract them from the archive (zip file) so we can load the **.STL** file to be processed by slicing software.

9. Open the .STL file within FlashPrint 5

- FlashPrint can be accessed via the Desktop shortcut (as shown on the right).

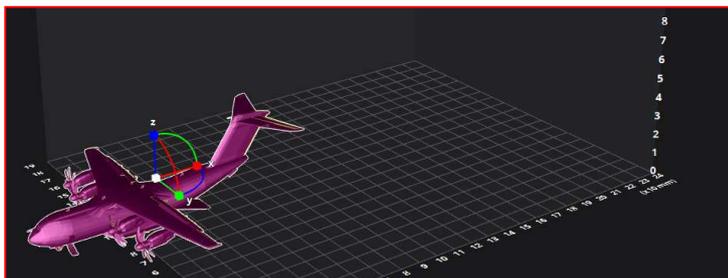
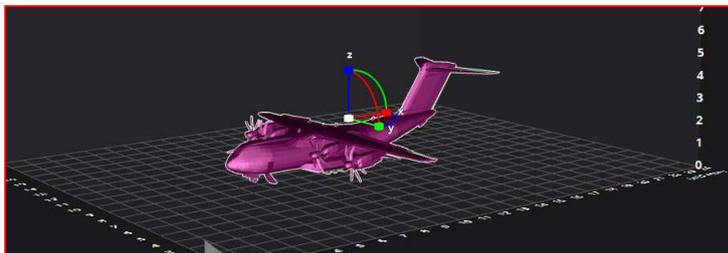


- You can load your 3D file .STL via **File > Load File** or by using the Load icon as shown below. Browse to the file location and press **Open** to load the file.



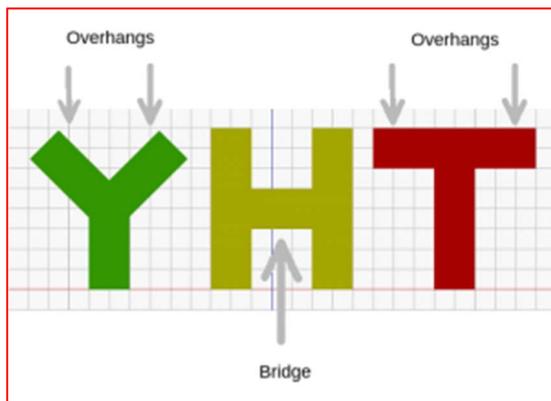
10. Position and Size

All supported files will automatically fit within the Gridlines as set out for the Flashforge Creator 3 Printer. If the model is enlarged or taken off the gridline then the final print will result in an error.



11. Support Structure

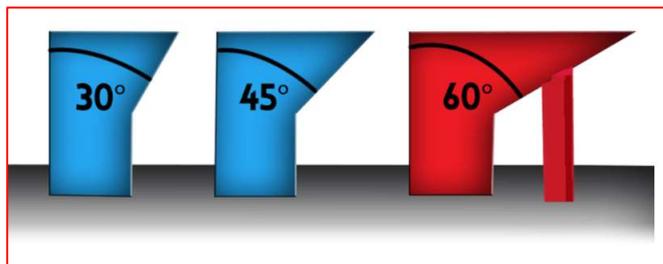
Models that have an overhang or bridge design and sit in a vertical position will require support structures to be implemented.



images from <https://all3dp.com/1/3d-printing-support-structures/>

However, not all overhangs need to be supported. The general rule of thumb is:

If an overhang tilts at an angle less than 45 degrees from the vertical, then you may be able to print that overhang without using 3D printing support structures.



images from <https://all3dp.com/1/3d-printing-support-structures/>

If a bridge is less than 5mm in length, the printer may be able to print it without requiring 3D printing support structures. To do this, the printer uses a technique called bridging – where it stretches the hot material for short distances and manages to print it with minimal sagging.



images from <https://all3dp.com/1/3d-printing-support-structures/>

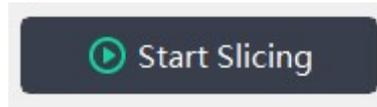
Support Structures can be selected Automatically via **Edit > Supports**, or using the shortcut menu on the right. It will open Supports Options windows. From there, you can choose to add support automatically or manually.

We recommend users to seek support from experts in the field as the library staff will not be able to assist.

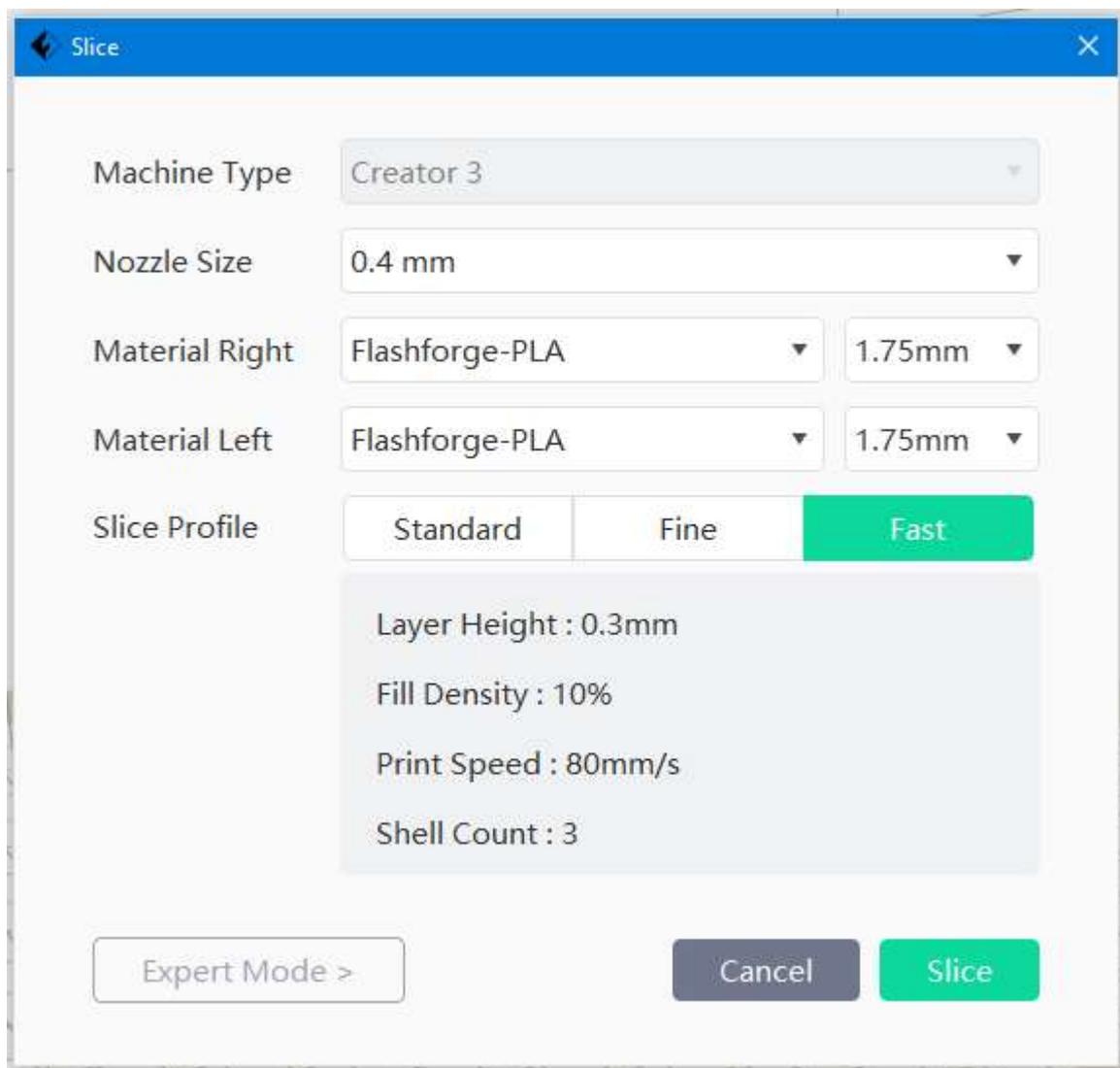


12. Adjust Print Settings

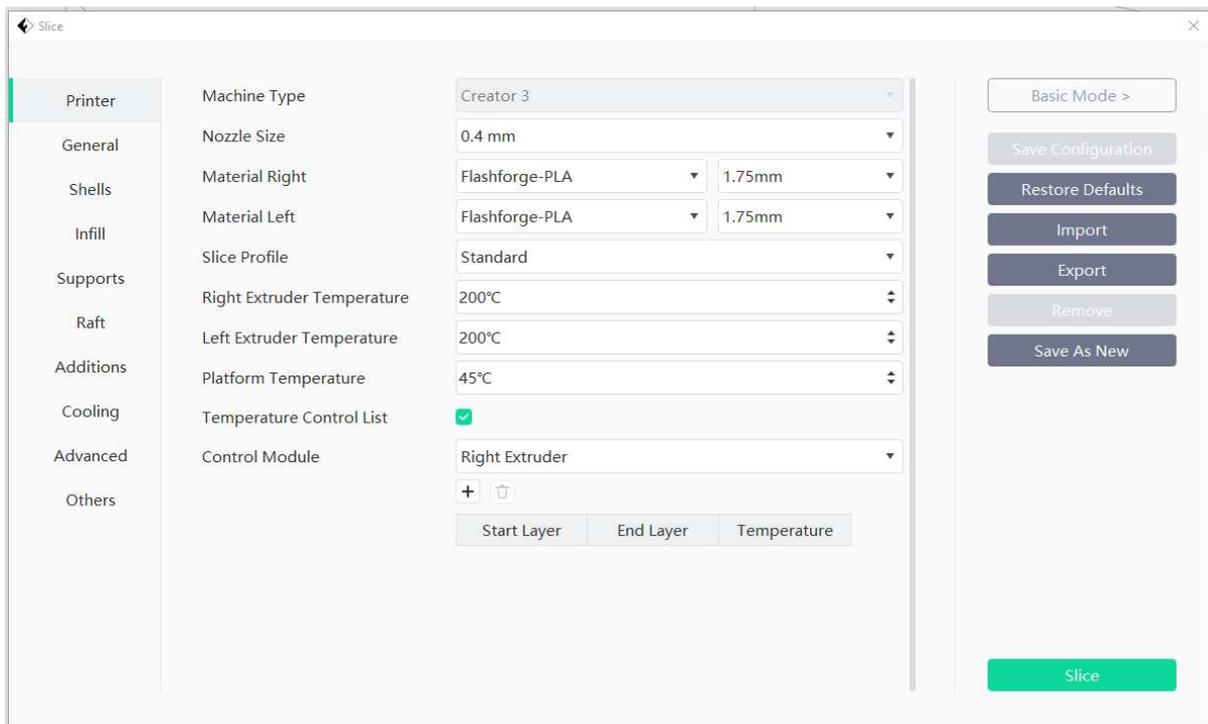
- Click **Start Printing** icon at the top of the window as seen below:



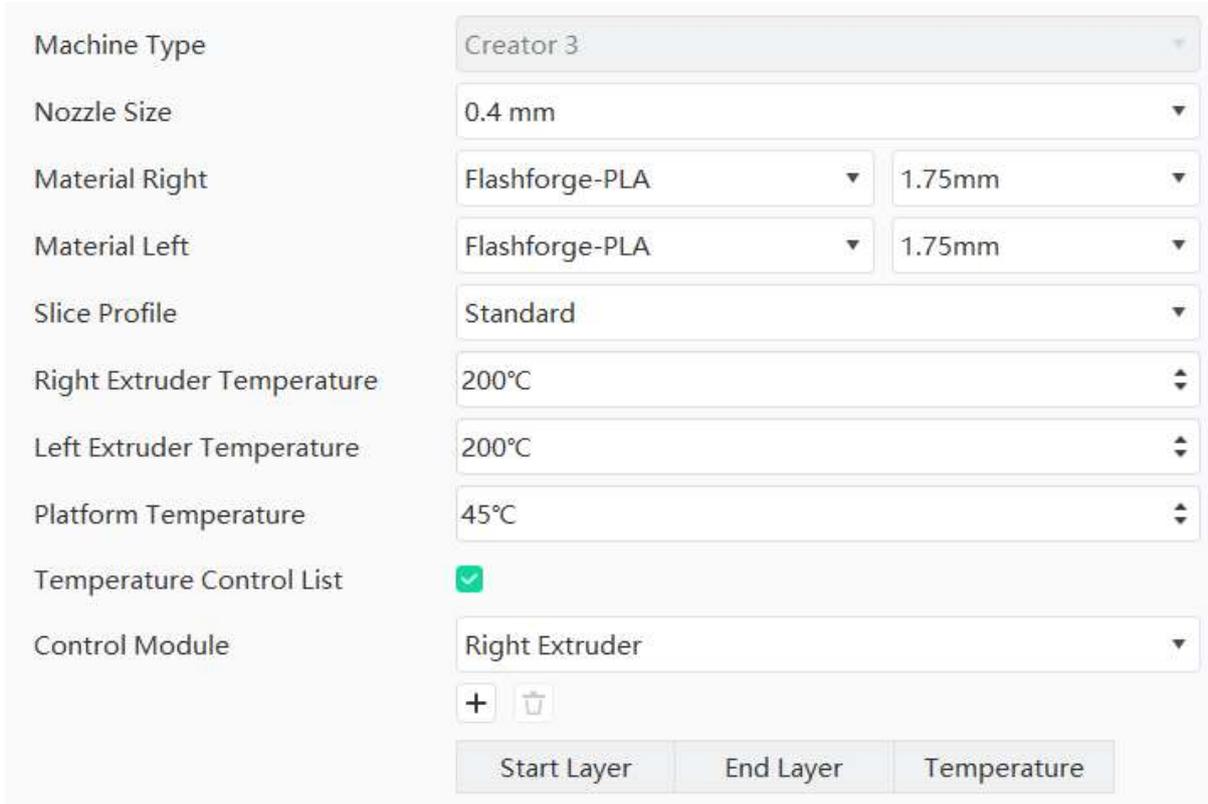
- Slice Option window will open in **Basic Mode** as seen below:



- Whereas the **Expert Mode** (see below) let you adjust settings in details.



- Make sure that you choose the correct filament. The platform and extruders temperature should be automatically set when you change the filament material.
- If you are using the Expert Mode, the temperature for PLA is:



- And the temperature for PETG is:

Machine Type	Creator 3	
Nozzle Size	0.4 mm	
Material Right	Flashforge-PETG	1.75mm
Material Left	Flashforge-PETG	1.75mm
Slice Profile	Standard	
Right Extruder Temperature	235°C	
Left Extruder Temperature	235°C	
Platform Temperature	80°C	
Temperature Control List	<input checked="" type="checkbox"/>	
Control Module	Right Extruder	
	<input type="button" value="+"/> <input type="button" value="🗑"/>	
	<input type="button" value="Start Layer"/>	<input type="button" value="End Layer"/> <input type="button" value="Temperature"/>

13. Save Print-ready File

- After you sliced the print, click the download icon the top of the window as seen below:



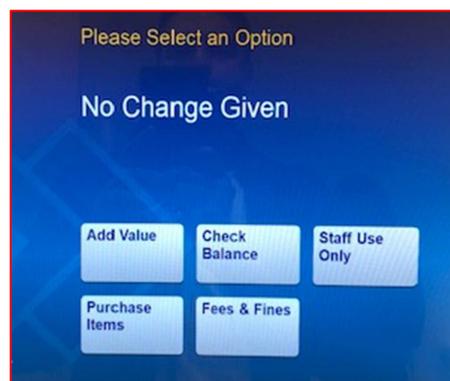
- Save the print file (.gx) on a USB.
- Click on Print Preview. It will show the estimated print time and weight of filament that you will need to pay. (see below.) **Please show the Print Preview to a staff member before you print.**



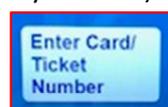
14. Payment

3D printing cost \$10.50 and filament cost is \$0.30 per gram. Before proceeding you will need to pay via the Monitor Kiosk located on Level 1 and Level 2. A staff member can help you to pay for the 3D print job using a kiosk in the library.

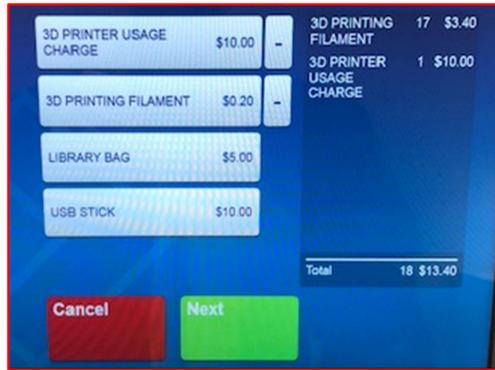
- Tap **Purchase Items**



- Enter **Card/Ticket Number** (or swipe your card) followed by Password



- Select **3D PRINTER USAGE CHARGE \$10.50** and add the number of **3D PRINTING FILAMENT \$0.30** required. From the message displayed previously of Filament Cost: 6.42g we will round up to 7g.



- Select **Next** and then choose method of Payment (By Cash, By Eftpos and By Library Card).

Reminder: Members are responsible for the cost associated with errors in the file, incorrect files, and breakage of parts due to insufficient strength or mishandling. Fees for failed prints due to staff error or hardware failure of the 3D printer can be refunded as a credit to the customer's library card only.

15. Discuss pick up time for your print job with library staff member

A staff member will be able to estimate a time when the job will be ready for pick up. All items will be held at the Returns Room with member's details.

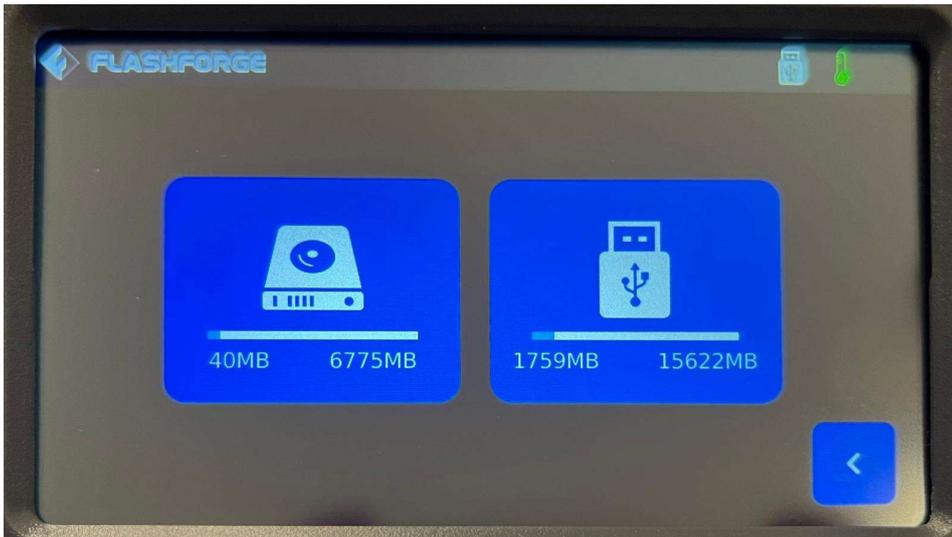
NOTE FOR STAFF: *Members may request to print on a specific colour or may not be aware of the options, please notify them before starting the print*

16. Submit your job to printing

- Insert the USB with the print file created in Step 13 into 3D printer. Select **Print** menu on the 3D printer touch screen.



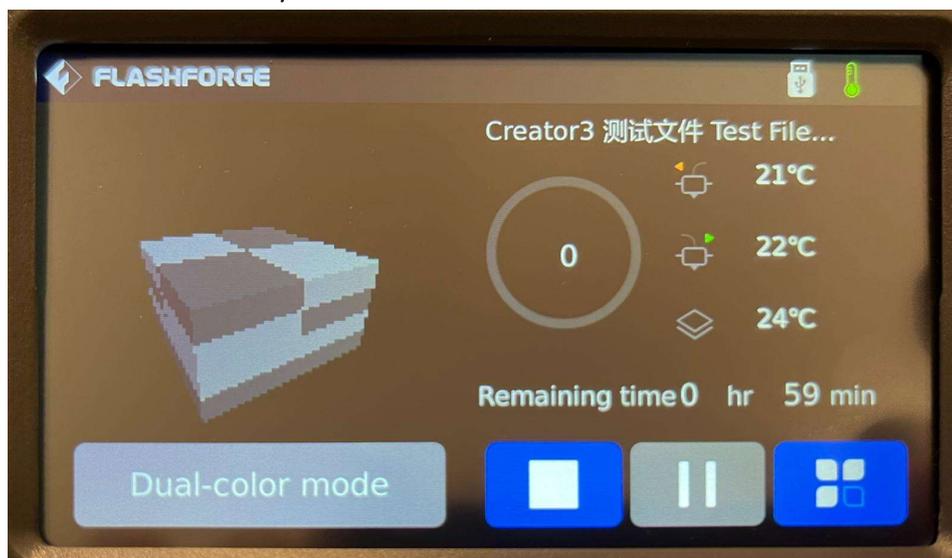
- Select **USB** and Navigate to the file



- Press **Print**.



- The printer will heat up to the required temperature and auto calibrate before the printing is started. You can remove your USB after around 5 minutes.



It is recommended that you wait before the printing actually starts and check your job again after 10 Minutes of printing to make sure that there are no problems with the model.