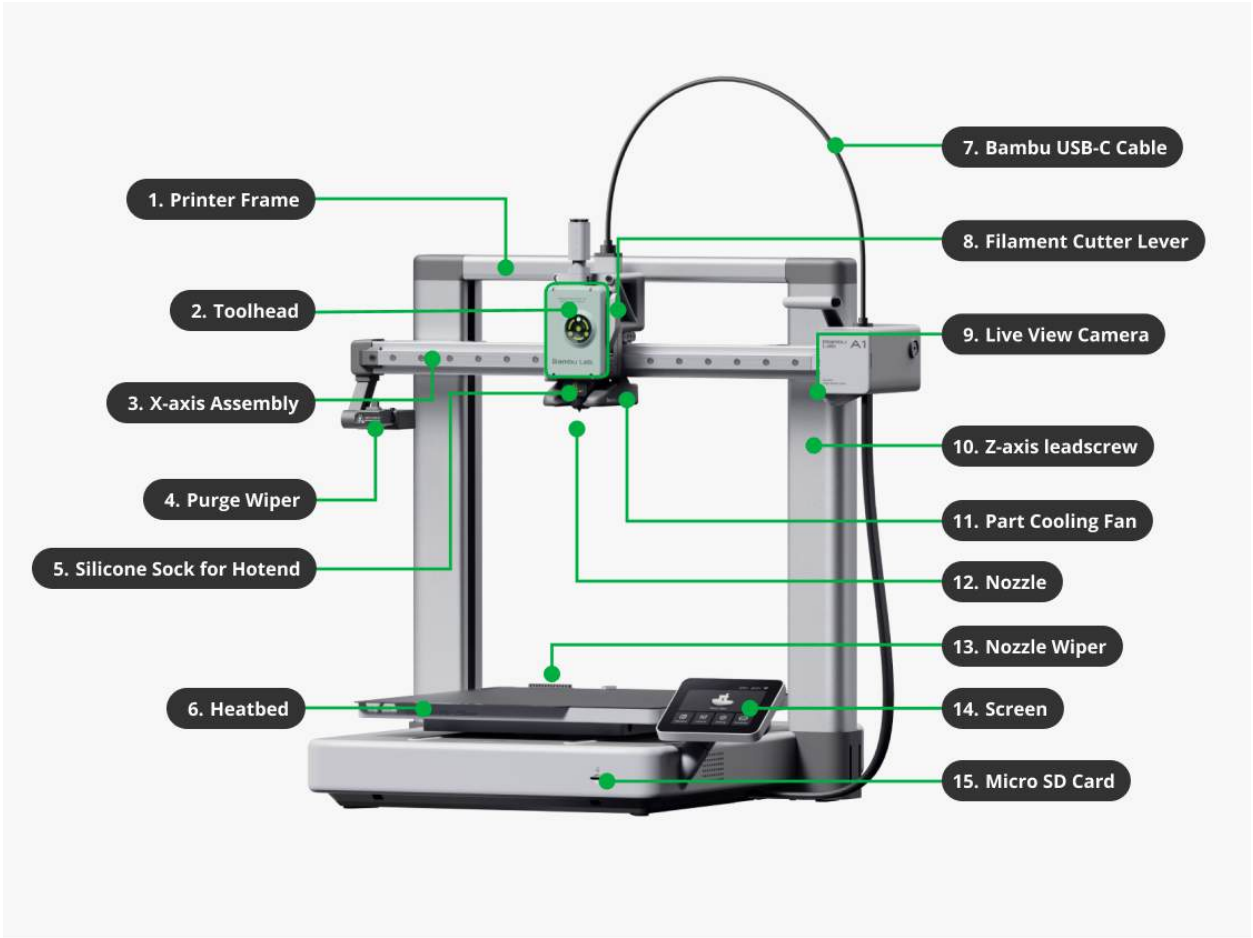
3D Printer Badge: Bambu Lab A1

Age: Grade 6-Adult

Printer Parts and Functions



1. **Frame**
2. **Toolhead:** Houses the hot end, the extruder, sensors, and cooling fan.
3. **X-axis:** The toolhead moves left and right along this assembly.
4. **Purge Wiper:** When the printer changes filament or starts a job, it extrudes a tiny amount of filament. The wiper ejects the purged filament from the nozzle.
5. **Hotend sock:** Insulates the hotend so it does not drop below extrusion temperatures.
6. **Heatbed:** Where the prints are built. Moves back and forth along the Y-axis. Does not require any glue or other adhesive.
7. **USB-C Cable:** Connects the toolhead to the printer's mainboard.
8. **Filament cutter lever:** Automatically cuts the filament when changing it out.

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9. **Live View Camera:** Capable of capturing real-time footage and time-lapse video of prints.
10. **Z-axis leadscrew:** The toolhead moves up along the Z-axis as the print proceeds.
11. **Part cooling fan:** Cools the filament after it is extruded.
12. **Nozzle:** Where the filament is extruded from.
13. **Nozzle wiper:** Cleans the nozzle automatically at the start of every print.
14. **Screen:** Where you can load and unload filament, adjust printing speed, and pause or stop the print job.
15. **Micro SD Card Slot:** Stores a micro SD card that captures past models as well as footage from the camera.

OTHER TERMS:

.STL File—Commonly used file format for 3D models.

Bowden Tube – Guides the filament from the spool into the toolhead.

Textured PEI - The material the removable heatbed is made of.

Safety Guidelines

- Do NOT touch any part of the printer other than the screen while the printer is in motion.
- The extruder is HOT (250 degrees Celsius or 482 degrees Fahrenheit). Don't ever touch it, even to remove strands of filament; the machine will autoclean the nozzle before the print begins.
- The heatbed will be very warm after a print completes. Ask a staff member to remove the print for you.

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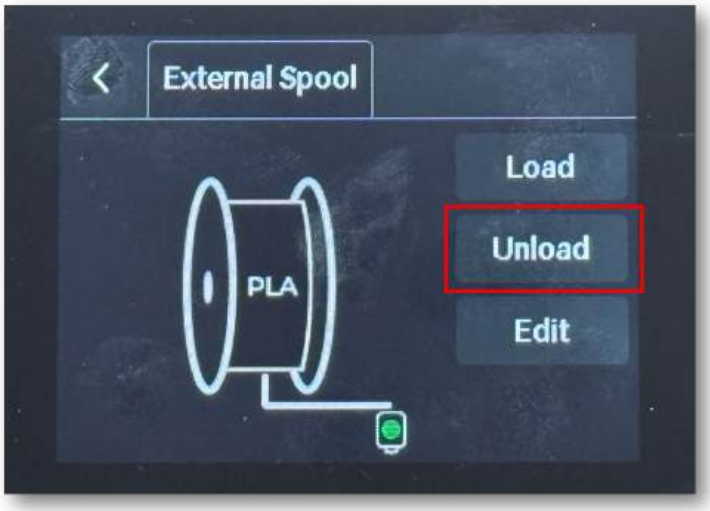
Unloading and Loading Filament

Unloading

1. Tap **Filament** on the touchscreen.

2. Tap **Unload**:



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3. The printer will heat the nozzle to 250 degrees C.

4. The toolhead will move from its home position to the right side of the X-axis and press against the filament cutter.

5. When the toolhead returns to its home position on the heatbed, you may gently remove the filament by rotating the spool backwards until the filament has fully been removed from the bowden tube.

Loading

1. From the filament screen, tap **Load**:

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2. Wait for the nozzle to heat to 250 degrees C.

3. When the touchscreen reads **Push new filament into the extruder**, load a spool of filament onto the filament holder so that the filament is coming off the top. Gently push it into the bowden tube until you feel resistance.

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4. On the touch screen, tap **Filament Extruded, Continue**.

5. Watch the nozzle to make sure the old filament is coming out.

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6. When the old filament has been completely extruded, the screen will read **Load Completed**. Tap the screen to dismiss this message.

7. Back on the Filament screen, tap **Edit**:

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8. Tap on **Filament**:

9. Choose your manufacturer - your filament must be from one of the listed manufacturers: Bambu Lab, PolyLite (aka Polymaker and Panchroma), Overture, or eSun. Other brands are not permitted.

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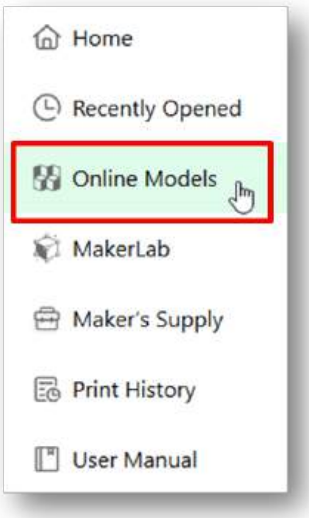
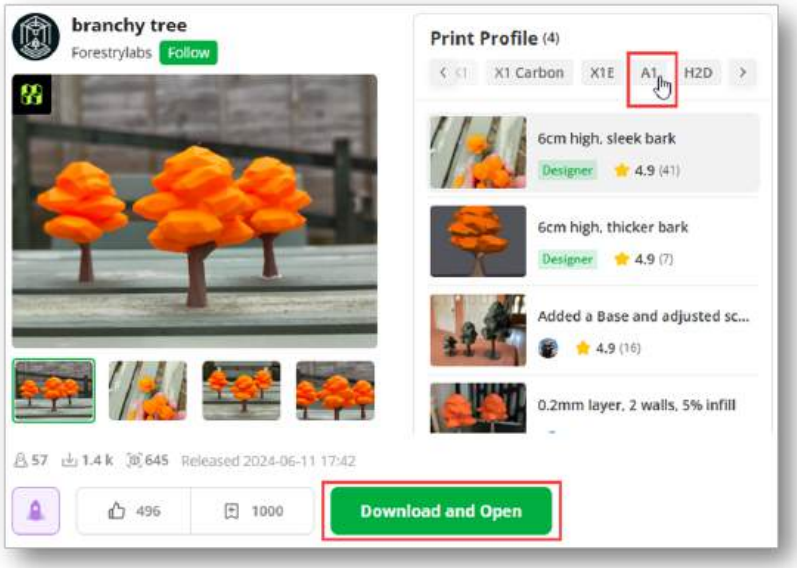
Selecting a Model to Print via Makerworld

1. Open Bambu Studio and click on **Online Models** on the left side of the window:



2. Search for a model to print
3. Choose the A1 Print Profile; click Download and Open



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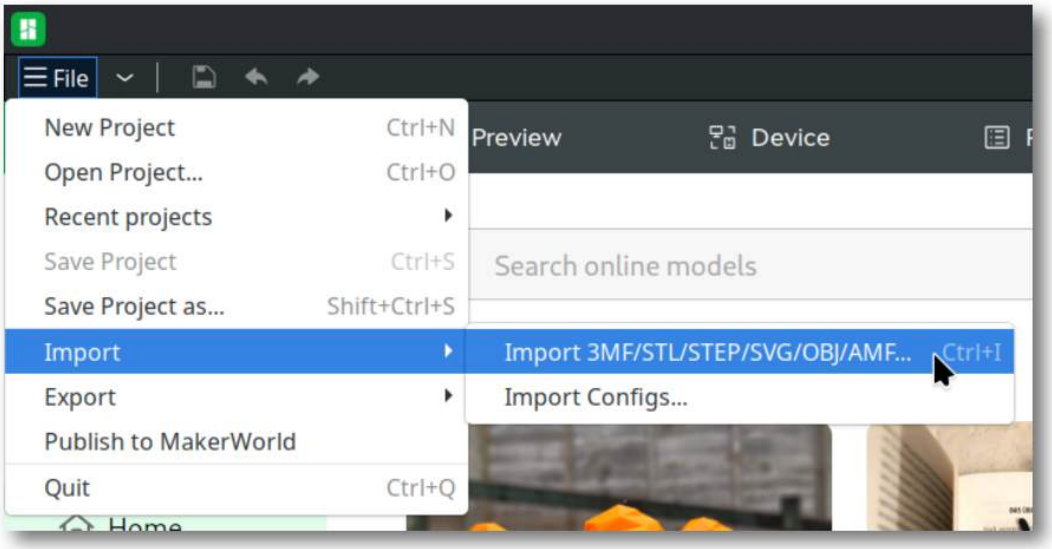
Importing Your Own 3D Model

In Bambu Studio, go to the File menu, choose **Import SMF/STL/STEP/SVG/OBJ** and open your file from the file explorer window



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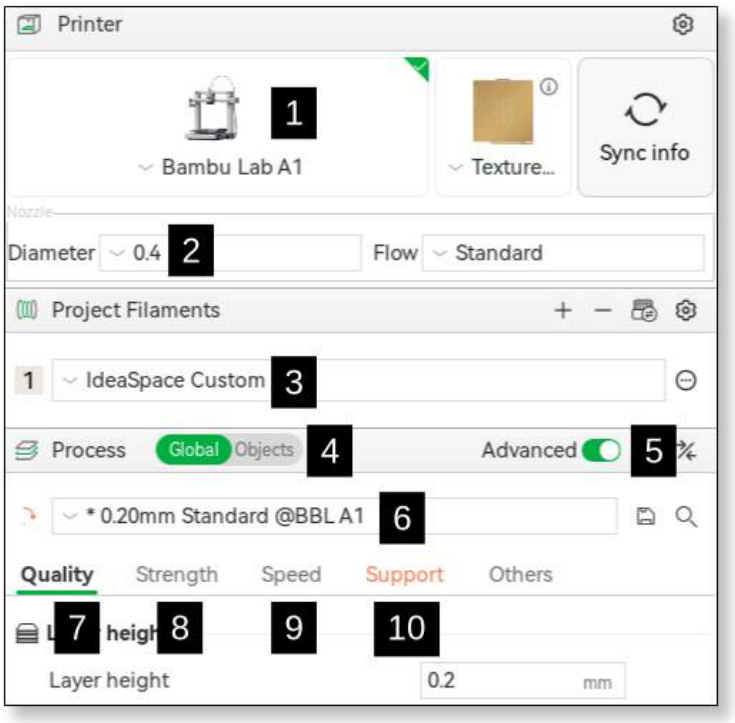
Bambu Studio Layout

Printer Settings



1. Printer Model - always set to **Bambu Lab A1**
2. Nozzle Diameter - always set to **0.4**
3. Filament type - always set to **Custom → IdeaSpace Custom**
4. Global vs Objects - always set to **Global** to make changes to ALL objects on the build plate at once.
5. Advanced Options - toggle **ON**
6. Print Quality - The lower the number, the higher the quality. Do not set beyond **0.12 High Quality**. Higher quality jobs will take longer to print.
7. Quality settings - ignore
8. Strength settings - ignore
9. Speed settings - ignore
10. Support settings - See next section for more details.

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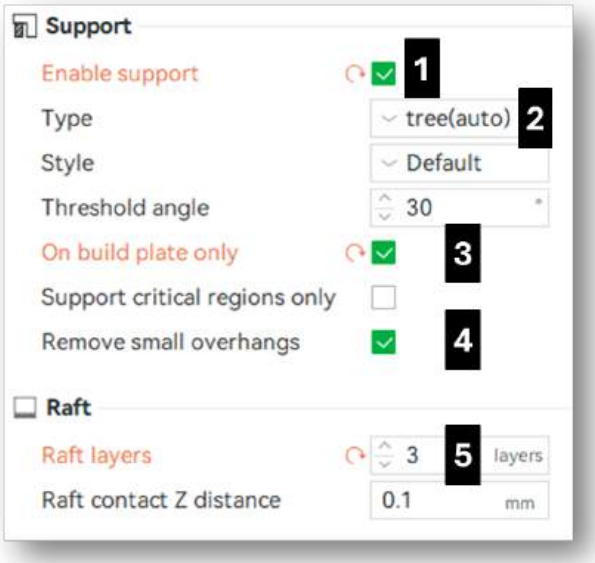
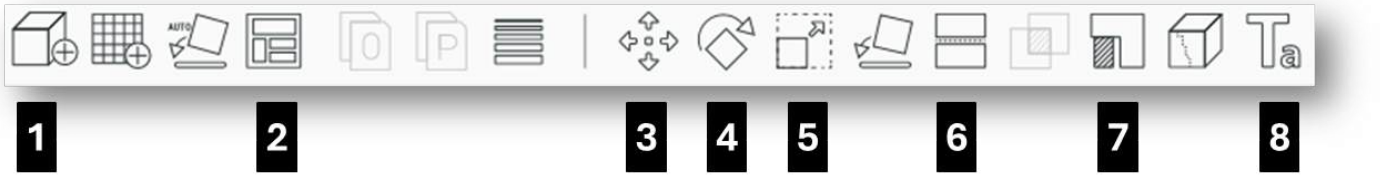
Supports Settings



1. For models with overhangs like the tree above, enable supports.
2. Set support type to **tree (auto)**.
3. To minimize contact with the model, check **On build plate only**.
4. Remove supports from small overhangs that might not need them.
5. For narrow objects, set a 3 layer raft

Object Controls



1. Add an additional object to the heatbed. Multiple files may be printed at once, but do not add more than one at a time or they will be grouped together.
2. Automatically arrange objects on the heatbed.
3. Move the object on the headbed.
4. Rotate the object - may be necessary for ideal positioning.
5. Scale the object - increase or decrease its size along each axis.
6. Cut the object in half - ideal for large prints.
7. Paint supports - manually add and ignore supports on your model; supports must be set to **tree (manual).**
8. Add text to your model - best suited for geometric models.

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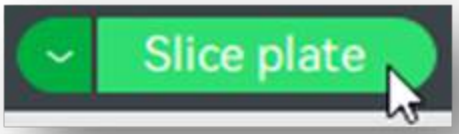
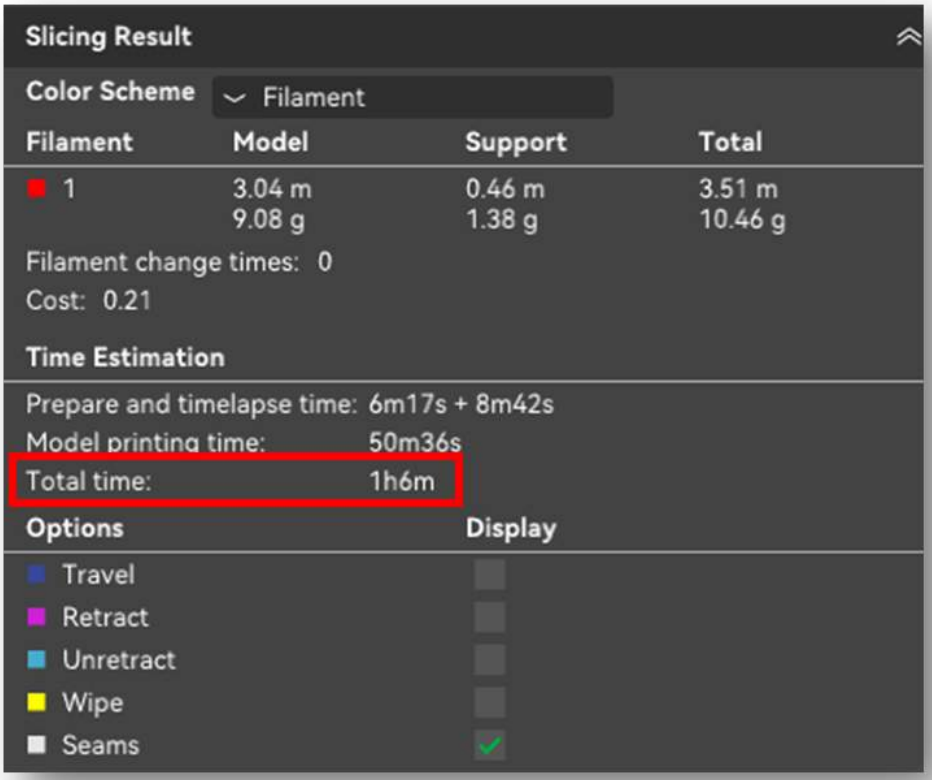
Slice and Print Your Model

1. Click **Slice Plate** in the upper-right corner:



2. Look over the slicing results. Make sure the **Total Time** will let your print be done by the next time IdeaSpace opens. If not, you will have to adjust either the size or number of models on the plate, or lower the quality of the print to reduce the amount of time needed.



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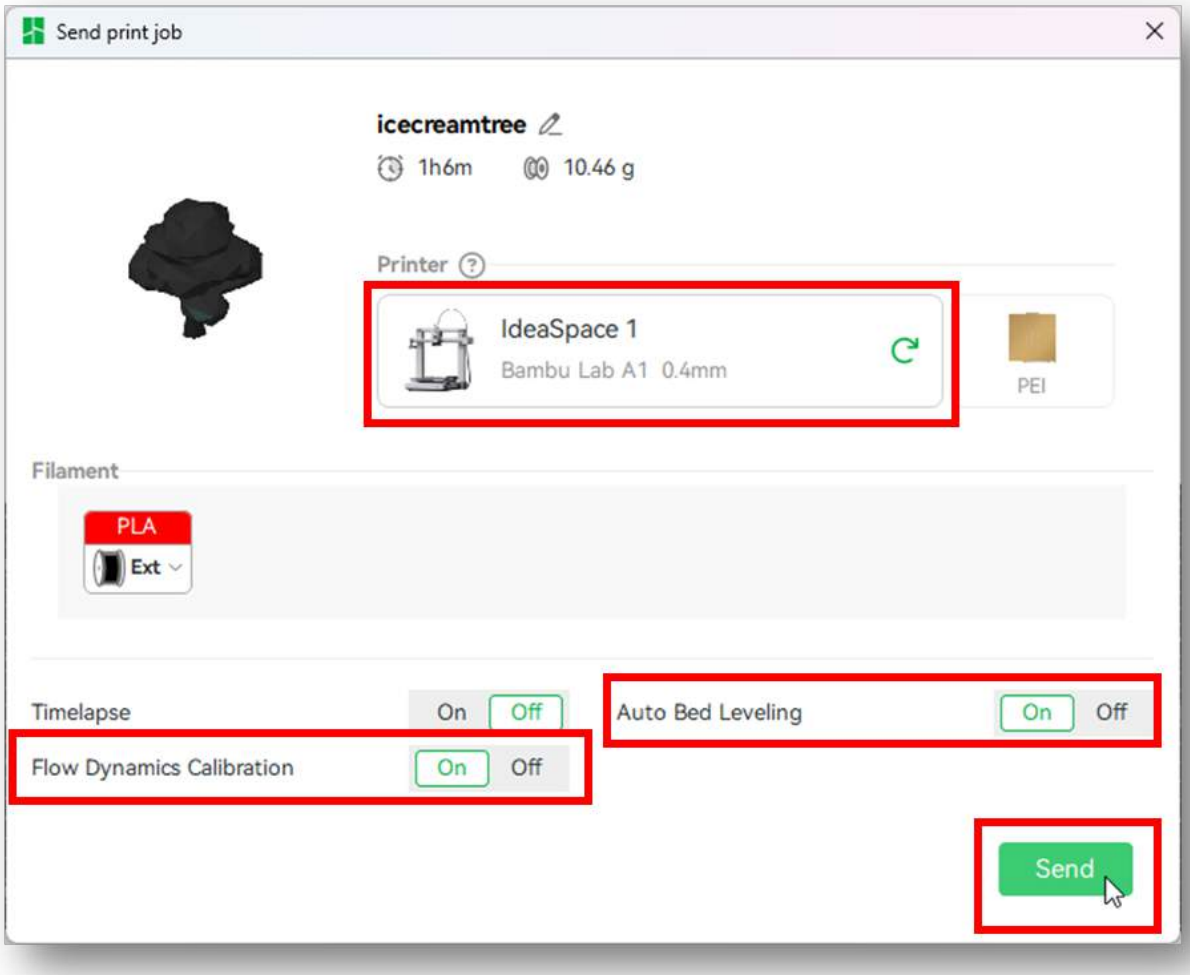
3. Click **Print Plate**:

4. Set **Timelapse** to OFF and **Flow Dynamics Calibration** and **Auto Bed Leveling** to On. Make sure your assigned printer is selected (IdeaSpace 1, 2, 3, or 4) and click **Send**.



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Troubleshooting Tips

- **IMPORTANT:** If the machine is malfunctioning, please notify the desk staff immediately.
- **Pause or Cancel a print in progress**
  Press the pause or cancel button on the touchscreen.
- **Clicking sound?**
  Means there is a snag. Pause the print and run out the spool until you've exposed and eliminated the snag.
- **Filament not extruding?**
  Push the filament extra hard into the bowden tube, then attempt to reload it.
- **Filament is dragging**
  The Z-offset may need to be adjusted in the slicer settings. Speak with a staff member for help.
- **Toolhead is breaking off supports by moving too fast**
  Tap the touchscreen → Control → 100% → 50%. This can be done mid-print.
- **Bambu Support:**
  https://bambulab.com/en/support

  IdeaSpace provides access to the **A1** model.

Safety Precautions

- When the printer is in motion: DO NOT touch the printer or jostle the work area.
- The toolhead is extremely hot. DO NOT touch it at any time.
- Always ask a staff member to remove your print from the heat bed
- Only CRRL-provides filament is allowed
- The cover over the time lapse camera must remain in place at all times. DO NOT remove it.
- Children younger than 6th grade are not allowed to use the printers
- Failure to observe these precautions could result in the loss of 3D printer privileges.

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Permitted PLA Filaments Manufacturers for Bambu Lab A1:

- Bambu Lab: http://bit.ly/49xYkYX
- eSun: https://bit.ly/3X5n8js
- Polylite: https://bit.ly/3JE2Nig
- Overture: https://bit.ly/43HaHOB
- Panchroma: https://bit.ly/47xI0ou
- Creality/Ender: https://store.creality.com/collections/materials

Notes on 3D Printer Filament

- Our 3D printers will work with any type of PLA from the manufacturers above, including variants like PLA Silk, PLA Tough, and more. However, other filaments like ABS, TPU, and PETG are *not permitted*. **Filament spools may weigh no more than 1kg with filament having a diameter of 1.75mm**.
- PLA Silk is very pretty and available in a large array of dual, triple, and color-change varieties. However, it is VERY brittle. It should not be used with any print that will result in a large number of supports, as the supports will generally break very thin sections of the print. The scarring left behind from a support removal will also be more obvious than other types of PLA and sanding PLA Silk is not recommended. It is also not recommended for lattice work and especially thin prints.
- PLA filament, and PLA Silk in particular, gets brittle after being exposed to the open air for too long. We recommend storing it in a cool, dry container with silica desiccant packets to maximize its freshness. Do not open a package of filament before you get ready to use it to maintain its freshness. You may also find that a filament dryers are a good investment.

Permitted PLA Filament for Ultimaker s5 Pro

The Ultimaker S5 Pro uses a proprietary filament than can only be purchased from store.ultimaker.com. As with the Bambu Lab printers, **only PLA** is permitted in IdeaSpace's Ultimaker. **Filament diameter must be 2.85mm and may weigh no more than 750 g.**

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Free 3D Design Software

- https://www.tinkercad.com/ - online basic 3D modeling for beginners.
- https://www.blender.org/ - advanced open source 3D modeling software that supports the entire creative pipeline.
- https://www.freecad.org/ - open source parametric modeler.

Learn more about 3D printing

- Coursera: https://www.coursera.org/courses?query=3d%20printing
- YouTube:
  - https://www.youtube.com/@3DPrintingNerd/videos
  - https://www.youtube.com/@MAKE
  - https://www.youtube.com/@MadeWithLayers