Introduction to 3D Printing

TIPS AND TRICKS FOR PRINTING

intelitek

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For successful printer use, it is essential to review your 3D printer's official documentation before beginning work with the printer.

The information below provides a selection of tips and tricks to help you overcome some common initial challenges, as well as advice on how best to use the printer in the classroom.

SAFETY

CAUTION	
Avoid injury:	
Burn Hazard	The nozzle and platform become hot enough to cause burns.
Cutting Hazard **Flying debris hazard**	Removing and post-processing printed models can cause injury from sharp tools and flying debris
Always wear the proper personal protective equipment (PPE) as recommended by the manufacturer when operating, maintaining and working near the printer.	

THE NOZZLE

If the printer nozzle becomes clogged, follow the manufacturer's recommendations for cleaning.

To avoid clogging the nozzle:

Keep the nozzle clean.

Residual hardened filament on the nozzle can obstruct or misdirect the flow of material out of the nozzle.

- Inspect the nozzle periodically for build-up of residual material. If you notice residue forming, follow the directions in the manual to clean the nozzle.
- Extrude filament prior to printing to ensure filament is flowing freely. If the filament does not flow freely, clean the nozzle.

Figure 1: A 3D Printer's Nozzle

Properly set the nozzle height.

- Operating the printer with the nozzle height set too close to the platform will increase the likelihood of clogging the nozzle.
- When auto-detecting the nozzle height, ensure that the nozzle is free of any residual filament which can interfere with the height reading.

THE WORK PLATFORM

Ensure that the print surface is free of hardened filament. Follow your printer manufacturers instructions for how to clean the surface.

Figure 2: Removing filament from a perfboard

Locate and size the model with sufficient clearance around the perimeter of the build surface.

Be aware of the clips that may secure an additional board such as a perfboard or glass plate to the platform. Ensure that the nozzle will not contact any clips during printing.

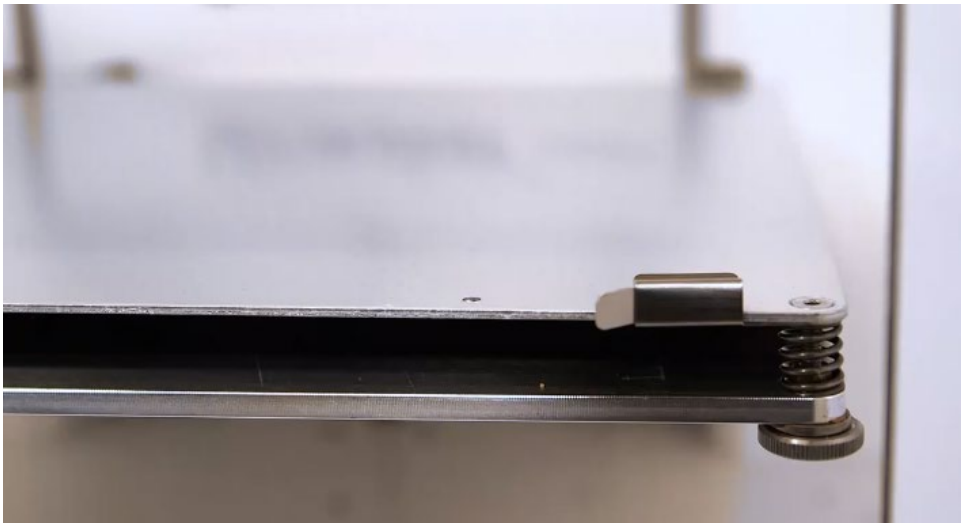

Figure 3: A platform clip

When printing multiple models, avoid overlapping rafts (below left). Either place multiple models with enough space between them or merge the models (In many 3D printing applications there is a Merge option) to produce one raft for all (below right).

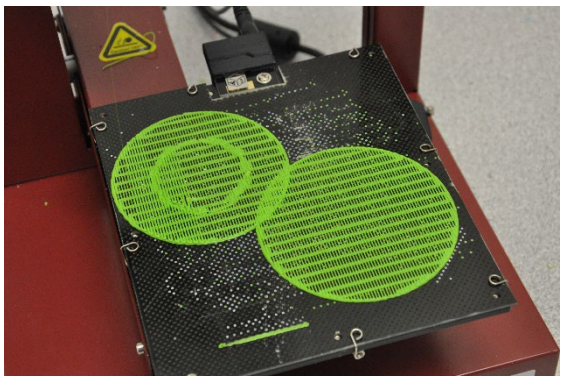

Figure 4: Overlapping rafts

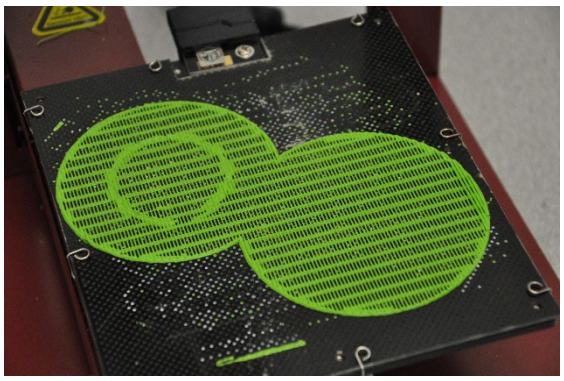

Figure 5: Merged raft

When removing models from platform:

Remove the print surface from the platform before attempting to remove a model.

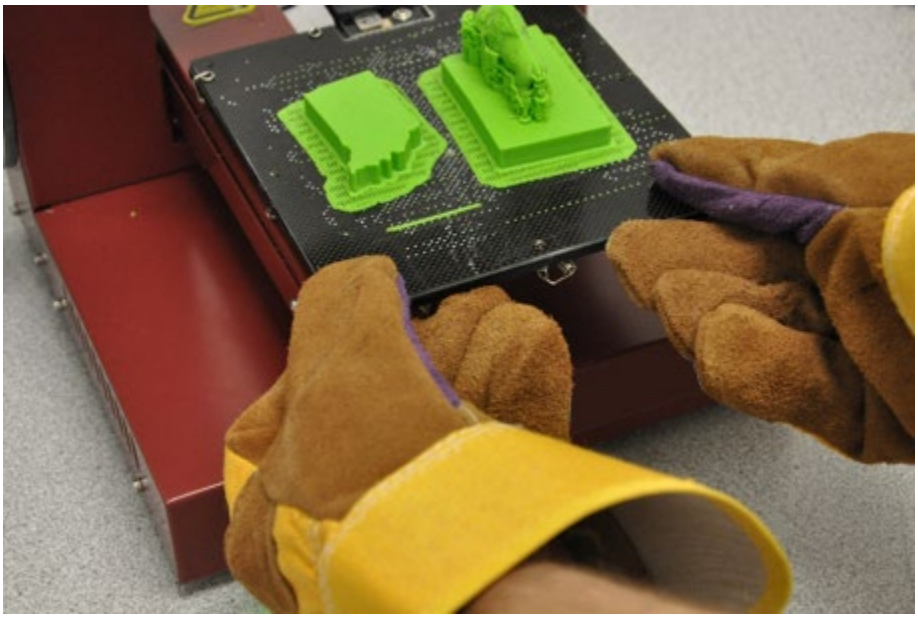

Figure 6: Removing a perfboard

For some printers, you may have to remove models before the material and platform cools. Once cooled, the material hardens and becomes more difficult to remove. See your specific printer's user guide for instructions on when to remove the models.

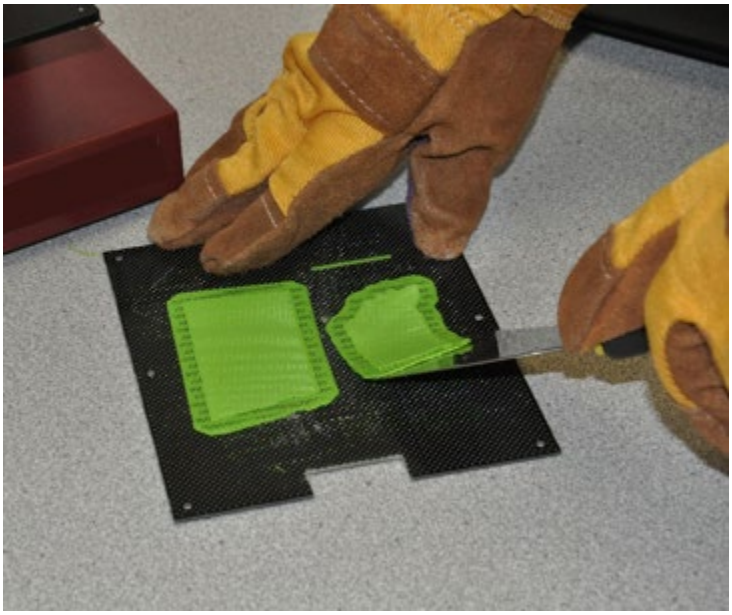

Figure 7: Removing material

To avoid damaging the model, try separating the model from the raft (if any) before removing the raft from the platform. Be careful not to separate the bottom layer of the model.

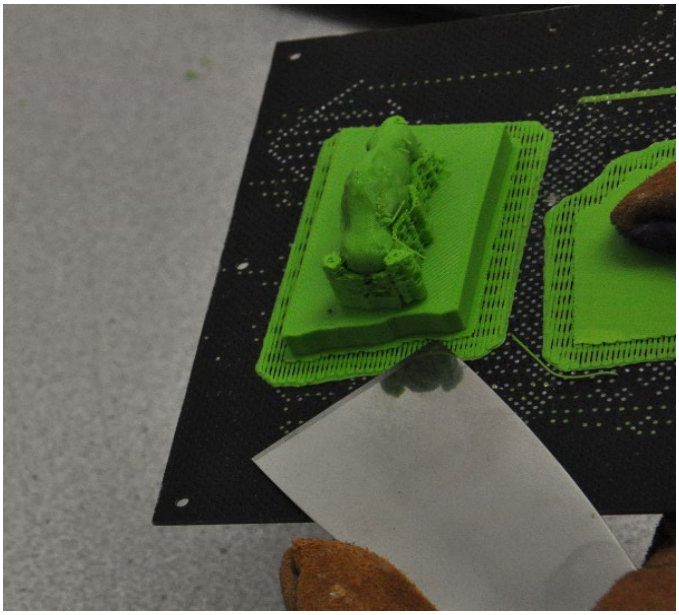

Figure 8: Separating a model from the raft

WHEN YOUR MODEL DOES NOT ADHERE TO THE PLATFORM:

If your model does not stick to the platform during printing it may become distorted or fail to print. Common causes of a lack of adhesion include the following:

The Platform is not level.

- Complete the manufacturer's procedure to level and calibrate the platform.

ⓘ *Note: Do not rely on the auto-level function. This function is only effective when the platform has been physically levelled according to the manufacturer's instructions.*

The nozzle height is too high.

- Re-check the nozzle height.

The material cools too fast.

- Be sure the platform is fully pre-heated before the print starts.
- Keep the printer away from cold areas and drafts or air flow from air conditioning units or vents.
- Place models as close to the center of the platform as possible.
- If the printed model will extend to the edges of the build surface, allow extra time to pre-heat the platform.