FDM 3D Printers

DT Workshop Equipment Reference — D&T / STEM resource for school workshops | 3D Printing, Laser & CNC

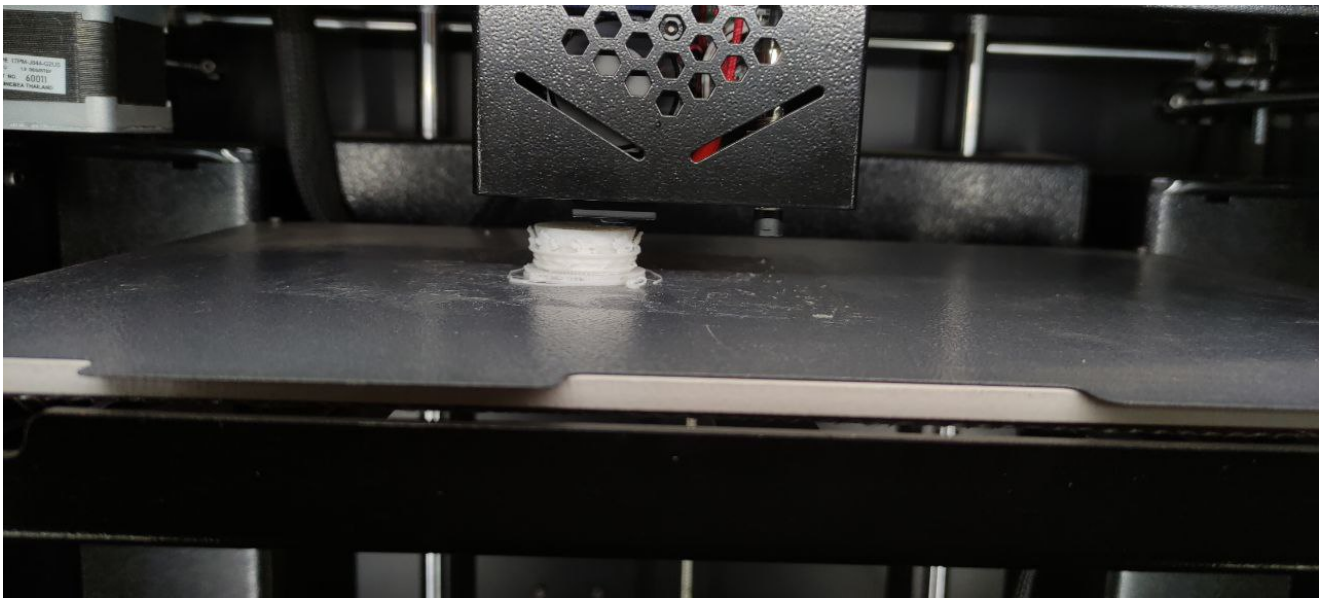

Photo: HRostamani — CC BY-SA 4.0 — via Wikimedia Commons (3D_Printing_an_Object_using_FDM_Printer.jpg)

An FDM 3D printer builds parts layer by layer from melted plastic filament, usually PLA or PETG, extruded through a heated nozzle onto a build plate. It is the most common 3D printer in schools for producing prototypes, jigs, enclosures and mechanical parts directly from CAD models.

Key Features

- Build volumes typically 180 x 180 x 180 mm to 300 x 300 x 400 mm
- 1.75 mm filament, 0.4 mm standard nozzle
- Heated, often magnetic PEI build plate
- 0.1-0.3 mm layer heights for detail vs speed
- Auto bed levelling on most current models

Typical Uses in the Workshop

- Print prototypes to test fit and function before final making
- Produce gears, brackets, enclosures and custom parts
- Make jigs, formers and moulds for other processes
- Print spare parts and upgrades for workshop equipment

Safe Operation

1. Check bed level and surface cleanliness before printing
2. Slice the STL with supports and brims as needed
3. Load filament and purge a small test line
4. Watch the first layer stick before leaving the printer
5. Remove parts only when the bed has cooled

SAFETY NOTES

- Keep fingers away from the nozzle and bed when hot
- Ensure the printer is on a stable, fire-safe surface
- Do not leave prints running unsupervised overnight in class
- Vent the room; ABS needs good ventilation or an enclosure
- Store filament dry and away from direct sunlight

Maintenance & Consumables

- Clean the nozzle and bed with isopropyl alcohol regularly
- Retract and remove filament at the end of the day
- Check belts, pulleys and frame screws monthly
- Replace the PTFE tube and nozzle when worn
- Keep the firmware and slicer up to date

Specification & Buying Notes

Choose a printer with a closed frame, heated magnetic PEI bed, auto-levelling and a community following (Prusa, Bambu, Creality). Buy spare nozzles, a filament dry box and first-layer test files. Print speed matters less than reliability for classes.