



3D Printing

3D Printers
3D Printing Guide

7
4

3D Scanning
Consumables

9
7

MayKu
Vacuum Forming

10
10

Full range of 3D Printing products available at:
www.rapidonline.com

3D Printing Guide



Designing a model

Don't fall into the trap of merely demonstrating the process by downloading and printing files from the internet. 3D printers can form an invaluable part of the design process, but you will need to be able to create 3D models using one of the many pieces of 3D CAD software that exist on the market if you are to get the most from your printer.

The good news is that the software doesn't have to cost anything. There is a wealth of CAD tools available that are free to use and that will give you all the features that you will ever need. The other good news is that the days of needing high-powered workstation computers for CAD are also a thing of the past which means you have probably already got everything you need to start using this kind of software in your school.

If you have no CAD experience at all, Tinkercad is a great place to start. It runs in your browser window and allows you to "borrow" other Tinkercad users projects and modify them, which is a great way to see how others create 3D models and work your way up to creating your own designs from scratch. For those that fancy something a bit more high-end, have a look at Fusion360 – industry-level CAD software which still has a shallow enough learning curve to make it accessible to novices.

www.tinkercad.com

www.autodesk.com/education



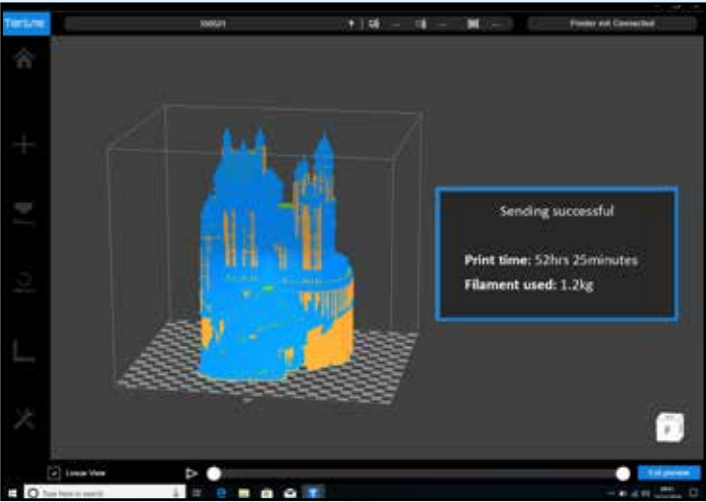
3D printer comparison chart

Model	Order Code	Price	Build Volume (mm)	Layer Thickness	Heated bed	Filament Material	
UP Mini 2 ES	25-0234	£569.00	120 x 120 x 120	0.15mm to 0.4mm	Yes	ABS/PLA/Nylon	
UP 300	25-0233	£1,708.90	205 x 255 x 255	0.05 to 0.4mm	Yes	ABS/PLA/Nylon/Flexible	
Dremel 3D45	25-0536	£1,136.09	150 x 255 x 170	0.05 to 0.3mm	Yes	PLA/ECO-ABS/Nylon	
Flashforge Adventure 3	25-0142	£345.00	150 x150 x 150	0.05 to 0.4 mm	Yes	PLA/ABS	
Flashforge Inventor IIs	25-0143	£649.00	150 x 140 x 140	0.05 to 0.4 mm	No	PLA/TPU 95A	
Flashforge Creator Pro 2	25-0144	£649.00	200 x 148 x 150	0.05 to 0.4 mm	Yes	ABS/PLA/PVA/HIPS	
Flashforge Guilder IIs High temperature version	25-0145	£1799.00	280 x 250 x 300	0.05 to 0.4 mm	Yes	ABS/PLA/PC/PA/HIPS/ASA/PETG/PA-CF/PA-GF/PAHT	
Flashforge Creator 3	20-0146	£2199.00	280 x 250 x 200	0.05 to 0.4 mm	Yes	PLA ABS/PA/PC/PVA/HIPS/PETG/Wood/ASA	

Time

The process of 3D printing is quite slow, especially when using the extruded plastic filament style machines which are the type most commonly used in schools. If you are creating a particularly large piece, it’s not unheard of for prints to take 20 hours and with a class of 20 students in a D&T workshop, you could be looking at weeks of print time to get through everybody. Because of this, it’s important to get your students to design objects that can be 3D printed in a set time frame.

The Airineers Micro Drone project is excellent for this – frame designs can usually be printed in less than 2 hours.



Make parts, not entire objects

Once you have mastered CAD, it’s tempting to make some extremely complex models to print. However, 3D printers lend themselves to making parts much better than making entire objects. For example, if you were making an architectural model of a building, rather than trying to 3D print the entire design, use laser or hand cut modelling board for large flat expanses like walls, but use 3D printed parts for items such as corbels, buttresses, staircases or other intricate shapes.

Think about the process of 3D printing when you are deciding what is the best tool for producing your part. To minimise post-production work, you want your model to require as little support material as possible which can be helped by choosing the optimal orientation on the bed when printing the part or minimising the number of overhangs where the angles are greater than 45 degrees, since most printers can happily print 45 degrees or less with no support material at all.

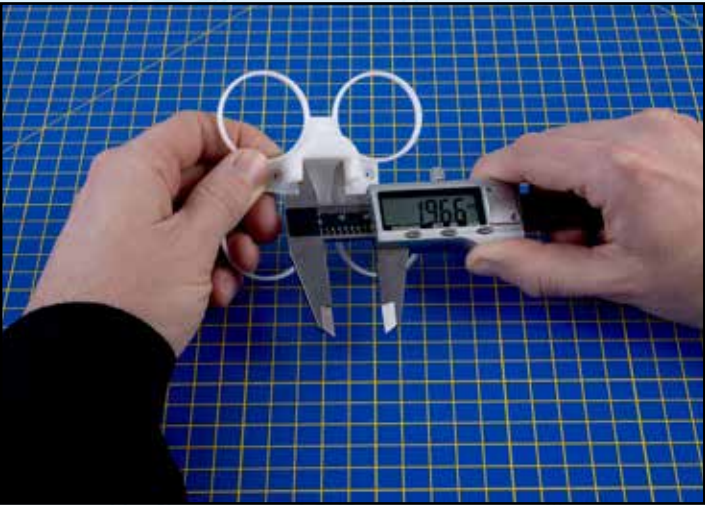
A question of capacity

When selecting a 3D printer, the vast ranges of different machines and specifications can make choosing the right one a daunting task. One of the factors that needs to be considered is the build volume which controls the maximum size of object that you can produce. Printers with a bigger build volume tend to be more expensive but bigger is not always better, especially in a classroom environment. Sometimes, having a larger number of smaller machines can be more beneficial than one large one because whilst you can place lots of different models on a large bed to be produced at the same time, you need to wait until all the models have finished printing before the students can get their hands on their designs. Why is this a big deal? Because design is always an iterative process and you probably won’t get it right first time. By having a greater number of smaller machines, you maximise the amount of availability for starting new prints which means students can get their designs manufactured as soon as the next iteration is ready.

The UP Mini 2 is perfect for this. At £465, you can have three machines and plenty of spools of spare filament for less than the price of a larger machine like an Ultimaker 2+.

Get to know your 3D printer

Make sure you experiment with your machine so that you know how it is going to perform. This knowledge will help you to give good advice to your students when they are designing parts. How much shrinkage will they need to accommodate? What is the smallest wall thickness it can reliably print? It’s also a good idea to have a few ready-made example models which can be used to demonstrate how long a print of a given size is likely to take.



	Connectivity	Fully Enclosed	HEPA Filter	Calibration
	USB, WiFi, Ethernet, USB memory stick	Yes	Yes	Auto nozzle height, Software assisted levelling
	USB, WiFi, Ethernet, USB memory stick	Yes	Yes	Automatic
	USB, WiFi, USB memory stick	Yes	Yes	Manual
	USB Disk/ WIFI/ Ethernet	Yes	No as an assembly part	Yes
	USB, WiFi, USB memory stick	Yes	Yes	Semi autolevelling
	USB cable, SD card	Yes	No	Manual
	USB Cable / U Disk / Ethernet/WIFI	Yes	Yes	Automatic
	USB Disk/ WIFI/ Ethernet	Yes	Yes	Automatic



FLASHFORGE[®] 3D PRINTER

NEW

ADVENTURER 3

DESKTOP MINIMALIST 3D PRINTER

Adventurer3 is the best choice for family, school, workshop, and 3D printing beginners. The friendly interface design and easy-to-use powerful functions make 3D printing easy.

KEY FEATURES



Minimalist
Design



Detachable
Nozzle



Removeable
Flexible
Platform



150x150x150mm
Print Volume



Filament
Detector

ABS

Support
Filament



Touch Screen
Operation



Cloud
Print



45 db
Ultra-mute
Printing

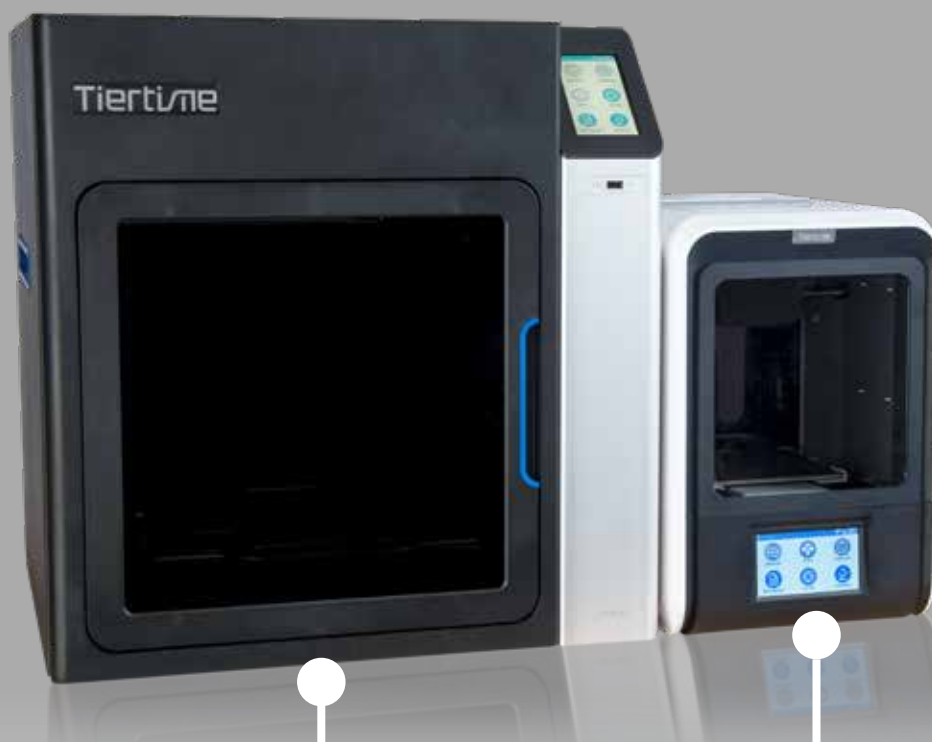


ONLY
£345.00
ORDER CODE
25-0142





Tiertime



UP300

The Tiertime UP300 3D printer has been designed for users demanding a large build volume and consistent performance across different materials.

Each machine is supplied with three different extruders, each optimised for a different type of material meaning each print can be completed without compromise.

- 205x255x225 build volume
- Heated bed
- Automatic nozzle height detection and calibration
- 0.05mm layer thickness
- Includes three extruders for optimum material compatibility
- Colour touch-screen
- USB, WiFi, LAN and USB stick connectivity
- Includes roll of ABS filament, tools and cables

£1708.90
Order code 25-0233

UP mini 2 ES

Based on the original UP mini 2, the UP mini 2 ES 3D printer offers the same benefits that made its predecessor a best-seller with the addition of an enhanced touch screen, ethernet connectivity and the ability to print STL files directly from a USB memory stick without the need for a PC.

- 120x120x120 build volume
- Heated bed
- Automatic nozzle height detection
- 0.15mm layer thickness
- ABS and PLA printing
- Colour touch-screen
- USB, WiFi, LAN and USB stick connectivity
- Includes roll of ABS filament, tools and cables

£569.00
Order code 25-0234

Both models are fully enclosed designs with integrated HEPA filters which are strongly recommended for use in a classroom environment.

High Quality Consumables

ABS and ABS+ 500g Spools

ABS requires a higher operating temperature than PLA but is better for interlocking parts where a little bit of flex is required. ABS+ is stronger and less prone to warping than standard ABS.

- Supplied in packs of 2 spools

ABS	Price	Colour	ABS+	Price
25-0231	£27.99	Red	25-0225	£42.00
25-0232	£27.99	Yellow	25-0224	£42.00
25-0229	£27.99	Green	25-0223	£42.00
25-0228	£27.99	Blue	25-0222	£42.00
25-0227	£27.99	White	25-0221	£42.00
25-0230	£27.99	Black	25-0219	£42.00

PLA 500g Spools

Requires a lower operating temperature than ABS and is more forgiving so can be easier to print with.

- Supplied in packs of 2 spools

PLA	Colour	Price
25-0226	Hawaii Blue	£33.98
25-0217	Rio Green	£33.98
25-0218	Pompeii Grey	£33.98

From as little as
£13.99
per spool





DREMEL®

BIG ON DETAIL

The Dremel 3D45 Digilab 3D printer provides the flexibility and reliability needed to meet the demands of higher education, Maker-spaces and industrial applications that benefit from advanced FDM (Fused Deposition Modelling) 3D printing.

Whether you are making prototypes for biomedical devices or simply producing works of art, the Dremel 3D45 quickly and accurately produces printed models in a safe, easy to use package.

The Dremel 3D45 printer has an improved extruder that minimises distractions and downtime. The extruder is designed to fit all Dremel filament materials without the need of changing any parts before operation.

Changing from one material type to another is simplified by the printer's integrated RFID recognition technology. It automatically adjusts the printer settings to suit the filament type being used and eliminates the need to re-slice files for each type of filament.

With the 3D45's integrated camera, users can monitor the progress of their printing project. For example, teachers can track the three-dimensional printing in real time with their students by accessing the camera's IP address.

Using the WLAN function, users can also start their prints remotely.

3D45 DIGILAB 3D Printer

+ FREE Red, White, Blue & Green PLA Filament

- Fully enclosed chamber for minimum noise
- HD camera for remote monitoring
- Easy filament set-up using RFID recognition
- Heated bed and cooling fan prevents warping
- Easy setup and print control via full-colour touch-screen
- Integrated filter systems for dust and fumes
- 50 micron build resolution
- Fast and accurate calibration with semi-automatic levelling
- Start printing via WiFi, Ethernet or USB flash drive.
- 1 year Dremel warranty
- Supplied complete with a 500g reel of black ECO-ABS filament, a 500g reel of black Nylon filament, 3x build tapes, power cable, USB flash drive, un-clogging tool, glue stick, removing tool and instruction manual
- **PLUS FREE Red, Blue, White & Green PLA Filament**
- Dremel type 3D45 Digilab

Order code **25-0536**

£1,136.09



1.75mm PLA Filament for 3D Printers - 0.75kg Reels

1.75mm diameter PLA 3D printer filament, in a range of colours, suitable for use with Dremel 3D printers. The filament spool contains an RFID tag which can be read by some Dremel 3D printers, allowing them to automatically adjust their settings to suit the filament loaded in the spool holder. The Dremel 3D printer melts and prints the PLA filament layer-by-layer, no thicker than a sheet of paper to provide a very smooth surface for your creation.

The PLA material is plant-based and recyclable, stiff but brittle, odourless, low-warp, eco-friendly and uses less energy to process. It is ideal for cosmetic prints, desk toys and low physical stress applications. PLA is ideal for beginners due to its ease of printing and minimal warp.

- Range of colours
- Filament diameter: 1.75mm
- Approximate filament length: 17.5m
- Supplied on **0.75kg reels** with RFID identification

Colour	Order code	1+
Black	25-0540	22.84
Blue	25-0544	22.84
Gold	25-0548	22.84
Green	25-0538	22.84
Orange	25-0542	22.84
Pink	25-0546	22.84
Purple	25-0543	22.84
Red	25-0541	22.84
Silver	25-0547	22.84
Translucent	25-0553	22.84
White	25-0539	22.84
Yellow	25-0545	22.84

5/09/18

NEW

DREMEL
BIG ON DETAILS

3D40 Idea Builder, Build Tape BT40-02- pack of 2

Using build tape on the Dremel Idea Builder 3D40 printer securely fixes 3D printed objects to the build plate and supports optimal printing of 3D objects. It also makes removing 3D prints from the build plate easier.

The build tape lasts for up to 100 prints and applies easily to the build plate without the bumps or bubbles of adhesive tape. Prints come out better and the build plate is protected from print residue.

- For use with the Dremel 3D40 3D printer
- Ensures stable printing of the workpiece
- Easier removal of the finished print
- Helps to protect the build platform
- Supplied in a **pack of 2**



Type	Order code	1+
Build tape pack of 2	25-0534	15.74

563998



THE TOOL FOR THE DIGITAL CRAFTSMAN

MFS1V2 Desktop 3D Scanner

The new V2 version desktop 3D digital scanner from Matter and Form is the perfect tool for the 3D scanning of objects and creation of 3D printable files.

Using an eye-safe laser scanner and the MFStudio with +Quickscan software you will be able to capture a digital replica of your object with up to 0.1mm accuracy. Suitable for anyone - from beginner to pro - and designed for many applications such as archiving, art, design, modelling, etc. Set up and scanning is quick and easy, with just 65 seconds required for a single scan, and the unit will produce 3D printable files that can be used with all 3rd party 3D printers and modelling programs to produce your amazing models.

The scanner has fully customisable controls and will manage your project workflow. Full documentation and live customer support is provided, so that peace of mind is guaranteed.

Included with the scanner is the MFStudio with +Quickscan software. MFStudio is a powerful scanning application with precise colour texturing and robust cleaning tools, and the +Quickscan addon feature delivers immediately responsive scanning. Together, MFStudio and +Quickscan produce fast, precise results that allow you to quickly set up a scan and see the results in minutes.



Order code
25-0381

£677.44

- Scans as fast as 65 seconds per pass
- Capture scans up to 0.1mm accuracy
- Camera exposure previews
- Adaptive regular scanning
- Windows 7, 8, 10 (64 bit), Mac OSX 10.11 and higher
- Includes power adaptor, USB cable, calibration card, documentation, small plastic toy

For technical specification visit www.rapidonline.com.



www.rapidonline.com/education



A Desktop Vacuum Former to Help You Bring Your Ideas to Life

The Mayku FormBox puts the power of making in your hands. Powered by any vacuum cleaner, it works with a range of materials and helps you to make your ideas real. Whether you're crafting by hand or partnering with your 3D printer, the FormBox forms part of your very own desktop production line.

The FormBox is ideal for home, classroom or small business use. It's safe and easy to operate and can be used to make almost anything. Use food-safe plastics to create customised chocolates or sweets, make your own candles, soaps or plastic parts for your creations. You can cast in plaster, concrete, resin or just about anything else you can think of.

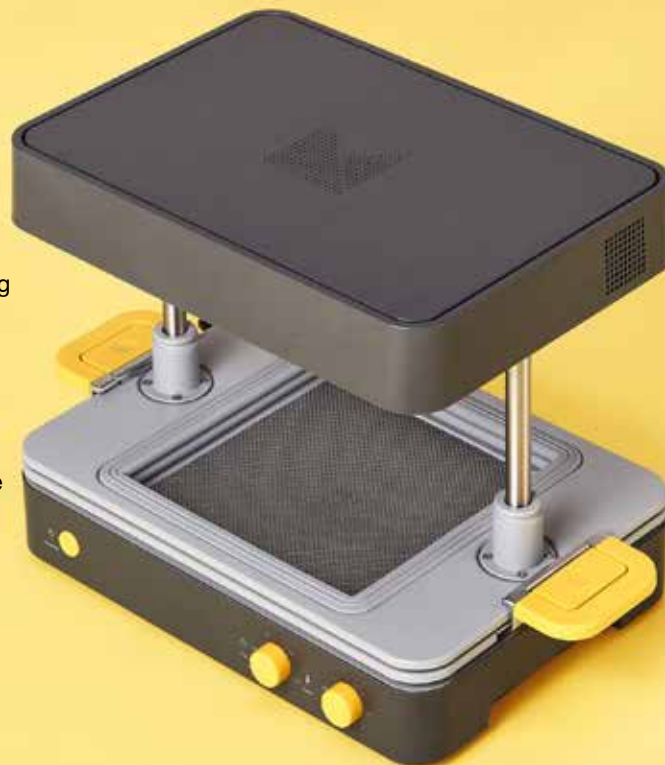
Integrate with CAD/CAM

Design moulds using your favourite CAD software and CAM machine such as a 3D printer or CNC milling machine.

Make moulds by hand

If CAD is not your thing and you prefer crafting by hand, you can make moulds from wood, clay, cardboard or even carved from a potato!

- 200 x 200mm bed size
- 160°C to 340°C heater range
- Compatible with PETg, HIPS, ABS, polystyrene, polycarbonate, polyethylene and acrylic PMMA from 0.25 to 1.5mm thickness
- Desktop machine 466 x 274 x 315mm
- Universal adaptor to fit almost any vacuum cleaner
- Automatically switches the vacuum on when required
- UK mains cable



Mayku FormBox

£479.00

Order code 70-0021

Mayku Cast

Transparent and food-safe 0.5mm sheets for making reusable moulds. The slight flex and non-stick surface that the sheet provides ensures that your templates and casts can be removed with ease.

Fully recyclable and partly made from recycled plastic waste.

- Sheet size 230 x 230mm
- Transparent PETg
- Food-safe
- Supplied in a **pack of 30**

£27.98

Order code 70-0028

Mayku Form

A 0.5mm versatile, easy-to-use white HIPS sheet. Great for product packaging, prototyping and enhancing decorative craft projects. Fully recyclable and partly made from recycled plastic waste.

- Sheet size 230 x 230mm
- White HIPS
- Supplied in a **pack of 30**

£27.98

Order code 70-0029

