Thanks to lower prices and increased availability for desktop 3-D printers—now might be the time to try 3-D printing at home. Here we look at some popular options. (For a look at the frontier of 3-D laser nanoprinting, see p. 28.)

3-D PRINT PROCESSES

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Affordable LCD-based versions now available

**Vat Photopolymerization**

**3-D TECHNOLOGY:** Stereolithography (SLA), digital light processing (DLP)

**CREATING A 3-D OBJECT:** A photopolymer resin in a vat is selectively cured layer by layer, using a UV laser beam for SLA and a digital light projector for DLP

**MATERIALS:** Photosensitive thermoset polymers in a liquid form

**PLUS/MINUS:** Professional-quality smooth surface and fine details possible with high-end models, but generally more expensive than FDM

SLA, invented in 1986, was the first 3-D-printing technology

**Material Extrusion**

**3-D TECHNOLOGY:** Fused deposition modeling (FDM), also referred to as fused filament fabrication (FFF)

**CREATING A 3-D OBJECT:** Melted material is selectively deposited in a pre-determined path layer by layer

**MATERIALS:** Thermoplastic polymers in a filament form

**PLUS/MINUS:** Materials available in wide range of colors, easier to use and less expensive than other methods, but slower and results not as refined as SLA

FDM is the most widely used 3-D-printing technology

**Powder Bed Fusion**

**3-D TECHNOLOGY:** Selective laser sintering (SLS)

**CREATING A 3-D OBJECT:** A laser beam selectively melts and fuses tiny powder particles together layer by layer

**MATERIALS:** Thermoplastics, metal powders and ceramic powders

**PLUS/MINUS:** Professional-quality desktop options being created, but not yet available for home use due to powerful lasers and powders that require a controlled environment

SLS is typically for professional and industrial uses

**3-D COMPARE PRINTERS**

Compare 3-D printers by technology, cost and features

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