Photon upconversion allows us to generate one high energy photon from two incident low energy photons. Using nanoscale encapsulation to add upconversion to a 3D printing resin, we can circumvent the layer-by-layer nature of traditional 3D printing and print without supports or resin flow constraints. Finally, we can utilize this process for nanofabrication, opening new windows in the manufacturing of materials for biological, photonic, and mechanical systems.