



3D Printing Safety

3D Printers and Radiation

3D printers of the type in your classroom do not give off radiation like a microwave. The heating mechanism is a cartridge heater (more compact but similar to the heating coils in a toaster) which uses electrical resistance to heat up. 3D printers are different from microwave ovens, which use magnetrons that convert electricity to microwaves which are then directed towards the food.

3D Printers and Toxic Fumes

Use of different types of printer filaments produce vastly different levels and types of emissions. Important here is the kind of filament being used. The filament we provided (and the kind you already had in your other printer) is polylactic acid (PLA). PLA is biodegradable and is derived from renewable biomass, typically from fermented plant starch such as from corn, cassava, sugarcane or sugar beet pulp. A study conducted in 2016 [“Emissions of Ultrafine Particles and Volatile Organic Compounds from Commercially Available Desktop Three-Dimensional Printers with Multiple Filaments”](#) showed that [printing with PLA produces lactide. Lactide is generally considered non-toxic. Other kinds of filaments, however, produce VOCs that are not safe – that is why using only PLA is recommended for classroom use.](#)

Out of an abundance of caution, it is recommended that the printers be used only in well-ventilated areas and only use PLA filaments.

3D Printers and Burns

Because 3D printers use heat to melt filaments, some parts can be extremely hot. During printing and the time when the printer is heating up and cooling down, caution should be used. Do not touch the heated parts of the printer during that time.

Food Safety

One further topic that is often raised is whether 3D printed objects are food-safe. While PLA is generally considered food-safe, it is usually recommended that the printed objects not be treated as food-safe unless the filament used is specifically labeled as food-safe because typical PLA filaments may contain coloring additives that may not be food-safe.