THE GRC PRESENTS:
3D Design and Printing

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A NOTE ON SAFETY:

It is important to remember that most 3D printers run hot, and you shouldn't put your hands near the nozzle or build plate during printing.

THINGS TO KNOW:
The Additive Process

A printer like ours at the GRC utilizes what's called an additive process, meaning that it lays down slices, or successive layers of material, until the entire object is created. This process usually entails the creation of support structures, called **struts** or **scaffolding**, that snap off after printing. These might make your object look a bit messy during printing, but have no fear… they are just there to ensure that everything works out!

The Print Material

Much like a traditional printer, the 3D printer needs print material. Our printer uses a spool of **plastic filament**, which the printer will heat to an optimal temperature and deposit onto the build plate with its **print nozzle**.

Basic 3D Design Theory

All 3D printed objects, no matter how complex, are actually composed of a bunch of smaller, simple shapes, called polygons, or "poly"s. The lower poly an object is, the less detailed it will be (a cube is the smallest). The higher poly it is, the more complex. For example, characters in animated movies can have a poly count in the millions! The more complex an object, the longer it will take for computers and printers to process.

Each poly that comprises the larger object should have **sides, faces** and **points (vertexes**). This is called the **mesh,** and when you're working in 3D, it is very important that there be no holes in it.

Notes on the Value of 3D in the Library

Modern librarianship seems to be moving in a direction beyond that of merely providing access to resources, into facilitating the creation of new work. If we can promote creativity and innovation by providing 3D Maker Spaces to patrons, then that's just another way we can be relevant and useful. And it's not just public libraries that are adopting these kinds of technology. Academic libraries are incorporating these into their spaces, because they provide excellent opportunities for their outreach, teaching and research programs. The applications are pretty much endless!

A Note on Copyright Issues

Be forewarned: this is a contentious and confusing area when it comes to copyright issues.

There are some perceived inconsistencies amongst MakerBot/Thingiverse/users in terms of sharing. This movement is seen by many as the ultimate example of innovative maker culture, but MakerBot is commercial and proprietary, and it operates under market principles. It has come under fire for things like starting to produce proprietary hardware/software, and for a contentious Terms of Service, which they introduced in 2012.

Some Good Resources

Free 3 Year Student License for Autodesk 3DS Max:

http://www.autodesk.com/education/free-software/3ds-max

Tinker Cad

www.TinkerCad.com

Thingiverse

www.Thingiverse.com

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