SO YOU FINALLY GOT THAT 3D PRINTER - NOW WHAT?

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HOW WE GOT OUR 3D PRINTER
GRANT APPLICATION

• SELCO Community Collaboration Grant
• Rochester Community & Technical College (RCTC) is library partner
PARTNERSHIP WITH LOCAL COMMUNITY COLLEGE

• Mutually decided on model of printer
• Community college got first
• Design students helped teach classes for the public
ABOUT OUR 3D PRINTER
“Ultimaker 2” from the Netherlands – cost $2,500

Not connected to computer or wireless; uses SD Card

Cura software to convert files to make readable
FILAMENT TYPES

- PLA vs ABS
- PLA - plant based (corn starch, tapioca, sugar cane), somewhat biodegradable and less smelly
- ABS - oil based, not-so-biodegradable, smells much worse
• Spools of filament are about $35-$40 each
• 750 grams / 100 meters per roll
• Cura software will calculate how much will be used in print job
• Can print only one color per print job
• Takes about 30-60 minutes for small things (thimble)
• Up to 24 hours or more
• Maximum size for our printer: 9” x 9” x 8” around the size of a soccer ball
• Not for mass production, good for prototypes or replacement parts
• Can print untended
FINDING AND CREATING 3D FILES
FINDING 3D FILES ONLINE

• Online shared free files (thingiverse, etc.,) – copyright is like YouTube
• Search Engine yeggi.com
• Purchase 3D files online
• Create your own
• 3D Scan of existing objects
FREE 3D DESIGN SITES & SOFTWARE

- TinkerCAD (web-based)
- AutoDesk 123D
- SketchUpMake (formerly Google SketchUp)
- Blender – more advanced
3D FILE TYPES THAT WORK WITH OUR PRINTER

- .stl – most common
- .obj
- .dae
- .amf

Cura Software converts to “gcode” for printing
STARTING UP WITH OUR 3D PRINTER
FROM THE BOX
LEVELING THE PLATE
LOADING THE FILAMENT
Welcome to the first startup of your Ultimaker! Press the button to continue.
CONTINUE
3D PRINTING START UP - VIDEO
FIRST PRINT
PRINTING THE PYRAMID – TIME LAPSE VIDEO
PYRAMID INSIDE AND OUT
WHAT WE LEARNED IN THE FIRST 6 MONTHS...
SCALING
SLOWING DOWN SPEED
GOOD UNTIL THE ELBOWS
FIRST “FIX” -PRINTING LAYING DOWN
BETTER FIX – PRINT STANDING UP W/ SUPPORT
PHONE CASE – UPSIDE MATTERS

Outside, curved surface

Inside, flat surface
ADDING “SCAFFOLDING”
EMILY AND LI’L EMILY
HIGHER FILL TO AVOID “PILLOWING”
A PRINTER LEFT UNTENDED... CAN LEAVE A MYSTERY
SOME PRINTS REQUIRE LOTS OF SUPPORT
SOME DESIGNS ARE UNPRINTABLE
3D PRINTER PROGRAMMING (SO FAR)
3D PRINT DESIGN CLASSES

• Design classes – use TinkerCad
  • Youth
  • Teens
  • Adults
“INTRO TO 3D PRINTING” CLASSES

• General intro to 3D printing classes
• Giving presentations to outside groups
FUTURE PROGRAMMING?

• Minecraft
• Scout troops, outside group project for tech badges
• 3D printing club
• Maker Club
CREATING 3D PRINTING POLICIES
CREATING 3D PRINTING POLICIES

- Looked at other libraries’ policies
- Copyright - patrons must sign off
- Unlawful, violations of code of conduct items
- Patrons don’t use the printer
- Policies are subject to revision
PRINTING 3D OBJECTS FOR THE PUBLIC
3D PRINT SUBMISSION PROCESS

• Patrons email us file
• Import into Cura
• Add structure, position, etc.
• Email patrons when done
• Sometimes prints fail
3D PRINTING POLICIES FOR PATRONS

• Prints limited to 4 hours
• Staff prints out in 1-2 weeks
• No cost for prints
• 2 prints per month
• Single color
COLORS FOR 3D PRINTING

- Ultra Marine Blue
- Intense Green
- Standard Black
- Traffic Red
- Fluorescent Green
- Dutch Orange
- Signal Yellow
- Sky Blue
- Chocolate Brown
- Standard White
- Fluorescent Pink
- Grape
- Violet Translucent
- Green Transparent
- Silver
- Natural
- Dark Blue
FEEDING AND CARE FOR YOUR 3D PRINTER
MAINTENANCE (SORRY!)

- Have had to troubleshoot
- Order replacement parts (metric)
- Need to clean parts, keep lubricated
- Lots of online tutorials, forums – little “official” documentation
THE “ATOMIC METHOD”
HELPFUL ACCESSORIES

• Tools for trimming off extra bits
• Digital caliper
• Upkeep tools (hex wrenches, lubricant, glue, etc.)
• Cart with wheels for printer
ADVICE FOR LIBRARIES CONSIDERING A 3D PRINTER
3D PRINTER ADVICE FOR LIBRARIES

• More staff time than you think
• Experiment before you “go public”
• 3D printers draw attention
MORE ADVICE…

• Be ready to tell public what you can print
• Digital scanner needed to replicate existing objects
• Most of the things you print will be frivolous
AND EVEN MORE ADVICE

• Reach out to local experts
• You may become the local expert
QUESTIONS?
SELECTED WEBLINKS

• RPL 3D printing page: rochesterpubliclibrary.org/3D
• Ultimaker – 3D Printer Manufacturer: ultimaker.com
• Yeggi -Search Engine for 3D prints: yeggi.com
• Thingiverse – 3D print sharing site: thingiverse.com
• Tinkercad – Web-based 3D design: tinkercad.com
• Autodesk 123D – 3D design: 123dapp.com
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