

Vision Impaired Resourcing With a 3D Printer

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What is a 3D printer?

- Additive process
- Relatively cheap
- Relatively fast
- Great for 1-offs and small runs

Show 3D Printer, show some of the models that have come off it. Becoming much more common in schools.

What are the models made of?

- 2 types of plastic
- ABS - LEGO plastic
- PLA - Biodegradable

ABS - Hard, somewhat bendable, not biodegradable, bends then breaks, non-renewable.

PLA - Hard, decays with moisture, biodegradable, brittle, does not bend, shatters, renewable.

3D Printed Vision Impaired Resources

- Braille Periodic Table
- Braille Dice
- Human Brain - Work in Progress
- Cells - animal and plant - WiP

There are mine, I do not know of many more. What am I trying to explain by being here today. Not trying to sell you my models, trying to get people thinking about what 3D printing can do for them, I feel it could be a game changer for resourcing.

Why the Periodic Table?

- Current access unacceptable
- Alphabetical list, cannot access all the information easily
- Main goal: accessible in proper format and size appropriate

Had 3D printer, asked staff members what we could use it for, Chemistry teacher flippantly suggested a periodic table for Brad. Discussed with Brad/aide/teacher, came up with plan.

The Process

- Idea - What can a 3D model add?
- Braille can be part of the model, not an afterthought
- Discuss options with student
- Prototype model

Share example of new cell model, was going to do 9 slices moving up through the cell, but how is this different to current access? No different to 9 puffed diagrams, so how can I make it 'better' than that.

The Process Continued

- Check model with student
- Adjust according to feedback
- Repeat until satisfied

Important to work with student, they are the ones using it. It takes time, but the end result is access to something that was missing or incomplete. Well worth the time invested.

Software Options for Design

- 123d Design
- Sculptris
- Google Sketchup

123d - mathematical design, add solids and adjust them to suit needs.

sculptris - 'artistic' design, virtual ball of clay to mould.

sketchup - mathematical design, but IMO clunkier than 123d.

Software Options for Altering Designs

- Netfabb
- Meshmixer
- Meshlab

Going from base model, eg cell moulded in sculptris and adding parts, need to use other software. These 3 are 'mesh' adjusters/combiners/cutters or converting from one format to another to be read by the printer or other software.

Contact Me

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Feel free to contact me with any questions, queries or even requests for models. Main goal here is to improve education for vision impaired students in a cost effective manner. All my models are cost price. eg PT \$30 of plastic and 12hrs print/prep time=\$150, new version probably more expensive due to increased size. Initial estimates for cell are <\$200. 'set' of dice ~ \$40, \$5 plastic, 4hrs print, >2hrs prep.

Thanks for your
time and attention.

Any questions?