Maker Literacy & Digital Humanities

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What you'll learn tonight

- All about makerspaces and maker literacy
- Common maker technology
- How maker literacy can be helpful in digital humanities
- Examples of maker/digital humanities projects
- Intro 3D modeling

Memorable Making Experience

Think about a memorable making experience you had in the past.

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Maker Movement

Makerspaces

What is a makerspace?

A place where people gather together to make things and collaboratively learn about making things together.

Maker Movement Timeline

- 2001 - MIT FabLab created
- 2005 - Dale Dougherty launches Make Magazine and the next year holds the first Maker Faire
- 2005 - RepRap 3D printers - first low-cost, self-replicating 3D printer
- 2011 - Fayetteville Free Library (NY) opens makerspace
- 2013 - present - More and more universities start opening makerspaces

What's the Big Deal?

People have always been makers...so what's so different about the maker movement?

Maker Movement's Inclusion Problems

Leah Buechley

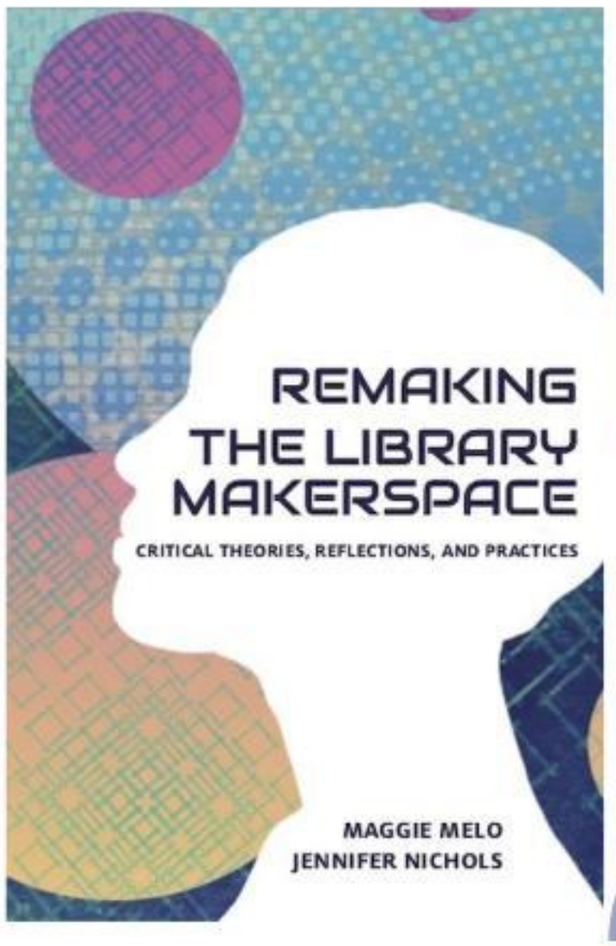
- 2014 talk - Analysis of Make Magazine covers and articles. Over 35 covers, 80% male and NO POC!

Adam Stark Masters

- Analysis of Make's website; demographic data from World Maker Faires.

Inclusivity in the Maker Movement - Future Directions

- Nation of Makers - Culture and Inclusion
- Dr. Maggie Melo's Research
  - Remaking the Library Makerspace
- New publications and work continuing



Melo, M., & Nichols, J. (2020). *Re-making the Library Makerspace*. Library Juice Press. Retrieved March 30, 2021, from https://litwinbooks.com/books/re-making-the-library-makerspace/

Makerspaces in Education

- Public -> K12 -> Higher Ed
- Experiential Learning
- Miami Plan

Maker Learning Frameworks

Agency by Design (K-12)

Agency by Design. (n.d.) *The Framework for Maker-Centered Learning.* http://www.agencybydesign.org/explore-the-framework

Maker Literacies Project (Higher Ed)

Table 2: Maker Competencies

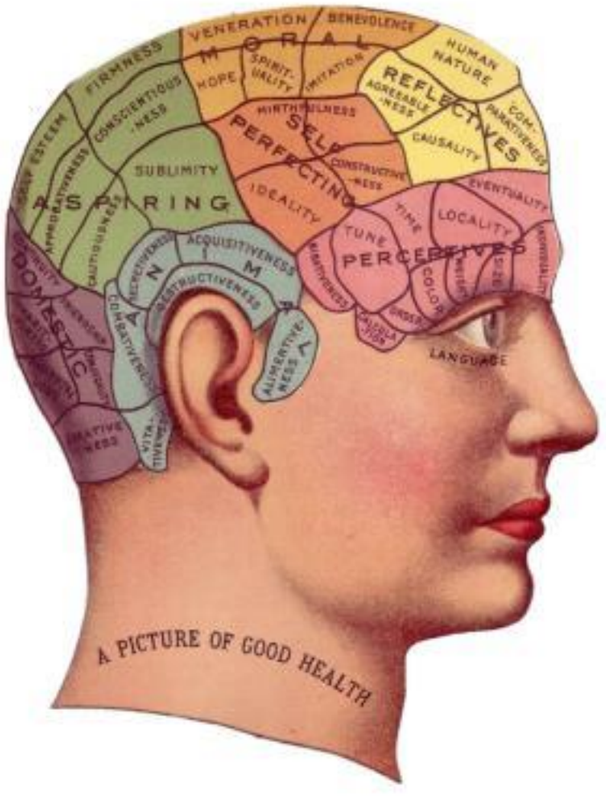
Category	Makers Will…
Ideate	1. Identify the need to invent, design, fabricate, build, repurpose, repair, or create a new derivative of some "thing" in order to express an idea or emotion, to solve a problem, and/or teach a concept.
	2. Analyze the idea, question, and/or problem.
	3. Explore the idea, question, and/or problem and potential solutions.
Create	4. Operate safely.
	5. Assess the availability and appropriateness of tools and materials.
	6. Produce prototypes.
	7. Utilize iterative design principles.
Manage	8. Develop a project plan.
	9. Assemble effective teams.
	10. Collaborate effectively with team members and stakeholders
	11. Employ effective knowledge management practices.
Share	12. Apply knowledge gained into other disciplines, workforce, and community.
	13. Be mindful of the spectrum of cultural, economic, environmental, and social issues surrounding making.
	14. Understand many of the legal issues surrounding making.
	15. Pursue entrepreneurial opportunities.

Boardman, B. S., & Wallace, M. K., & Chivers, M. (2019, July 28). A Makerspace Project for New Transfer Students. Paper presented at the 2019 First Year Engineering Experience Conference, Pennsylvania, PA. Retrieved from https://peer.asee.org/33697

Maker Mindset

What is a maker mindset?

- Consumer → Creator
- Design sensitivity
- Failure-positive outlook
- Empowered to change the world!



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The Makerspace @ King Library

The Makerspace

A hands-on, highly collaborative, and experiential learning space located on the third floor of King Library.

Equipment:

- Lulzbot Mini 2 3D Printers
- Carvey CNC Machines
- Brother Sewing/Embroidery Machines
- Heat Press
- Silhouette Cameo 4 Craft Cutters
- Sawgrass Sublimation Printer
- Glowforge Plus Laser Cutter

The Makerspace

- Currently by appointment only (bit.ly/makerspace-book)
- It is FREE! *while supplies last
- No previous maker experience required
- Carvey machine & Glowforge - must do training w/ staff but we guide you through it
- Self-directed work encouraged, but staff assistance is always available.
- Academic projects are #1 goal, but personal projects are welcome too

Questions?
create@miamioh.edu or email me!

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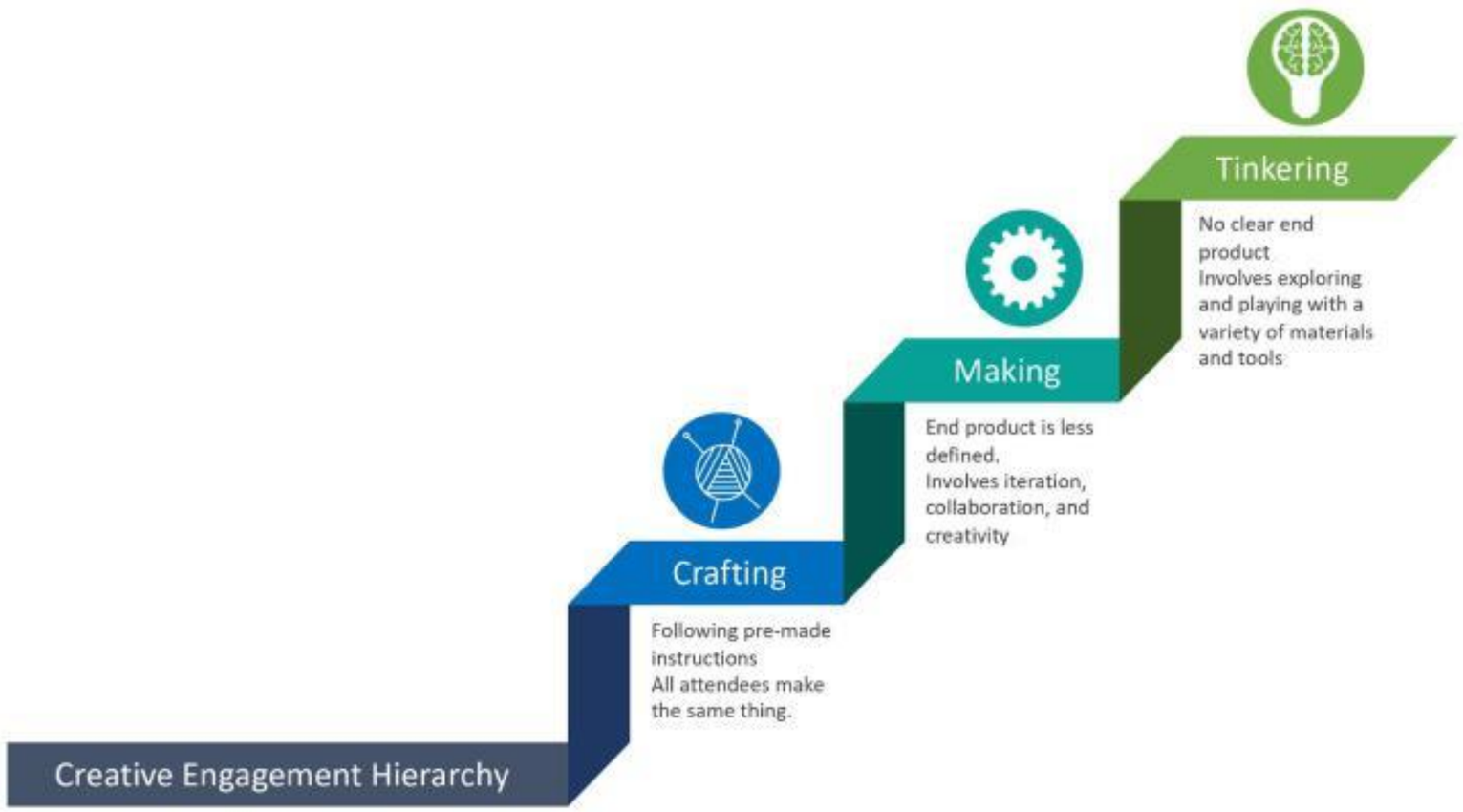
Makerspaces & Digital Humanities

Benefits of Maker Learning in DH

- Makerspace as “liminal space”
- Collaboration/networking
- Student empowerment
- Technology and broader possibilities for work

Inquiry-based Learning

- Creative problem solving
- Ideation
- Tinkering



Nagle, S., & Cox, A (2020) Moving Beyond Craft Programs: Encouraging Creative Confidence in Adult Learners In J Hicks & J Long (Eds.), Makerspaces for Adults Best Practices and Great Projects. Lanham, MD- Rowman & Littlefield.

Tinkering

Ideation Activity

30 Circles

Maker X DH Projects

Kits for Cultural History

Research Goal

Build historical research and foster technology-based learning through tacit engagements with media and mechanisms of the past.

Motivations

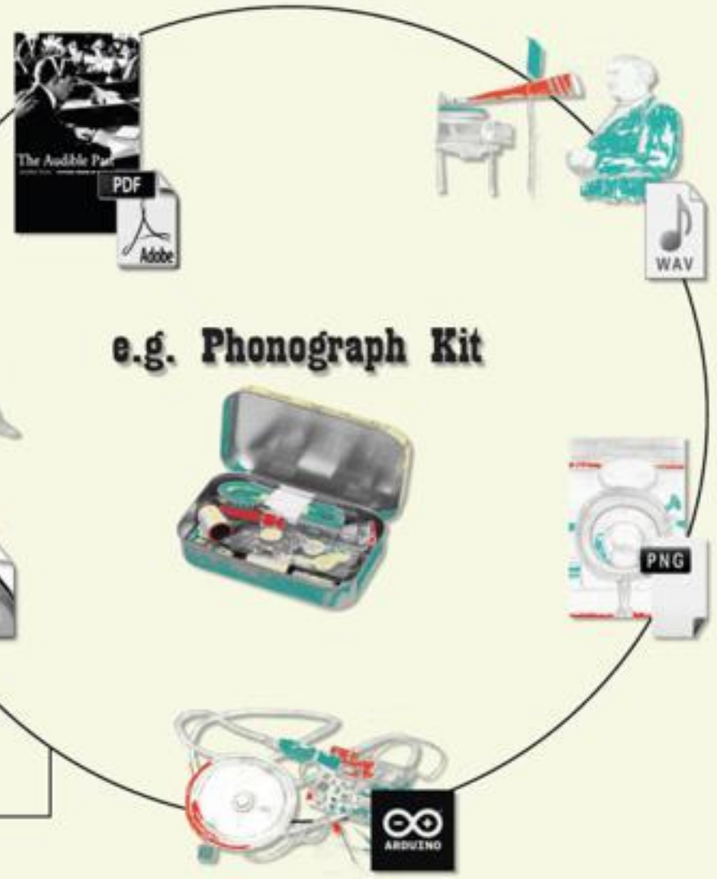
Screen Essentialism

Tacit Knowledge

Media Archaeology

Primary Insight

Physical computing and desktop fabrication can facilitate experimental approaches to history and material culture, with an emphasis on knowing by doing.



Their Words

"the impulse . . . is to go beyond purely documentary states of objects" - Kari Kraus, *Digital Humanities Quarterly*

"intimacy with industrial procedure and fabrication" - Matthew Kirschenbaum, *Mechanisms*

"culture needs to be taken seriously in the practice of technologial innovation" - Anne Balsamo, *Designing Culture*

"different versions and styles of media history do make a difference" - Lisa Gitelman, *Always Already New*

Trajectories

Prototype at least two functioning kits (Year 1)
Build partnerships with GLAM institutions (Years 2-4)
Circulate kits for testing by practitioners (Years 2-4)
Articulate scholarly recommendations for humanities physical computing and desktop fabrication (Years 3-4)

Researchers

Jentery Sayers (University of Victoria)
Maker Lab in the Humanities
William J. Turkel (Western University)
Lab for Humanistic Fabrication

Conseil de recherches en sciences humaines du Canada
Social Sciences and Humanities Research Council of Canada
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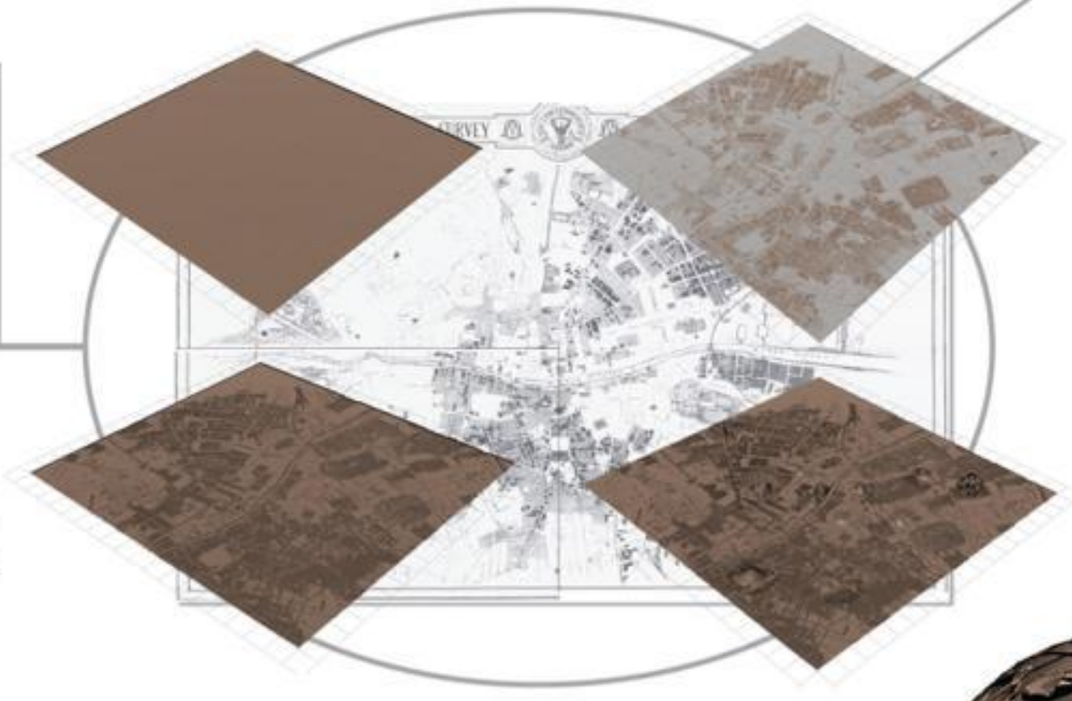
Humanities Fall on the Z-Axis

Research

Exploring forms of visualization that express subjective encounters with data through 3D modeling, prototyping, and desktop fabrication.

Initial Prototype

A map that geolocates reading-time in *Ulysses*. An archival map is used to generate a displacement map, which is then applied to a 3D plane and warped along its z-axis. The z-axis expresses time spent reading.



Z-Axis Methods

- Displacement
- Warping
- Cultural Analytics

Lines of Inquiry

- Digital/Material Convergence
- The Material Histories of Interfaces
- Transforming Algorithmic Criticism
- Built Media as Scholarship

Deepening Data Visualization

How does that which resists quantification inform our encounters with data? On the z-axis, how should we express ambiguity? Change? Personal engagement? Difference?

Researchers

Alex Christie, Jentery Sayers, Katie Tanigawa, and the Maker Lab in the Humanities

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History, Culture, & Technology of Stage Magic

Figure 1: Model of levitation effect.

Photo by William J. Turkel.

Figure 2: Shadows in this photograph indicate the method used to perform a model levitation.

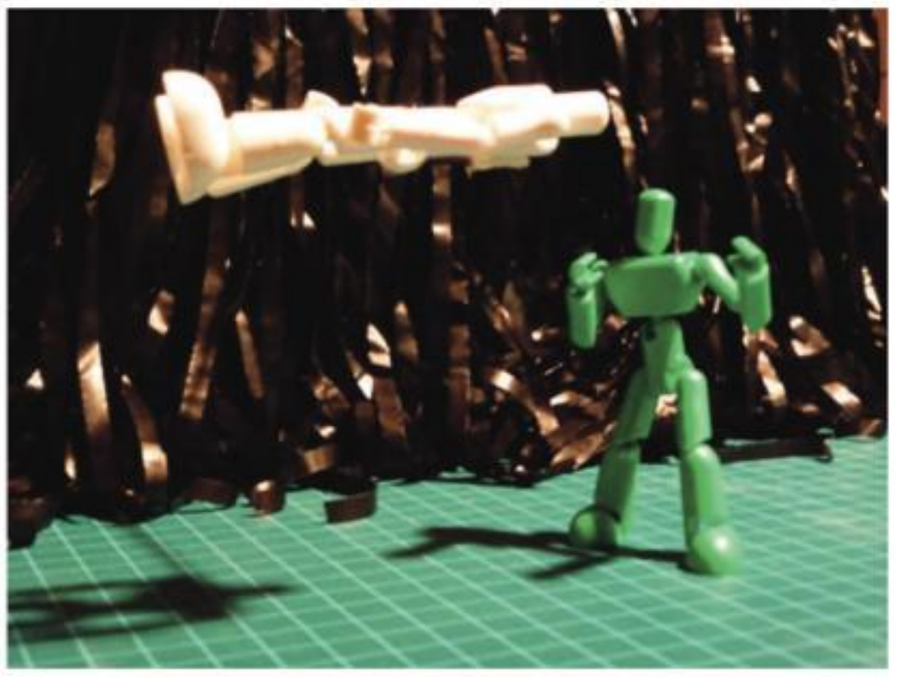

Photo by Devon Elliott.

Elliott, D., MacDougall, R., & Turkel, W. J. (2012). New Old Things: Fabrication, Physical Computing, and Experiment in Historical Practice. *Canadian Journal of Communication*, *37*(1), Article 1. https://doi.org/10.22230/cjc.2012v37n1a2506

Brainstorm

Think of a traditional humanities (writing, research, etc.) or assignment you have done in any of your classes.

→Think about how...

- You could have added a maker element of any type to that project.
- Tinkering, creative problem-solving, and/or ideation could have changed your approach to the project.

→How would adding these elements have impacted the final product of the assignment?

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3D Printing

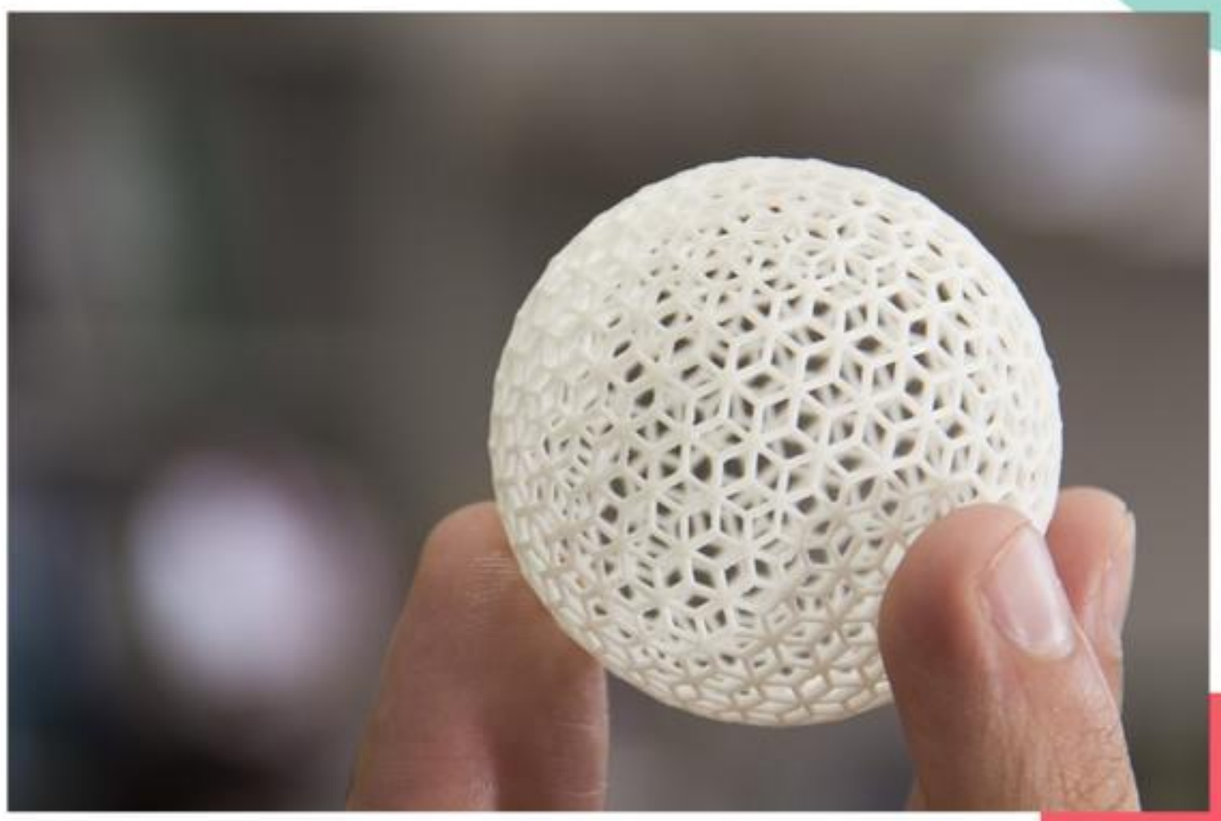
3D Printing: What is it?

Simple definition:

The creation of a physical object based on a 3D computer model, layer by layer, in an additive process.

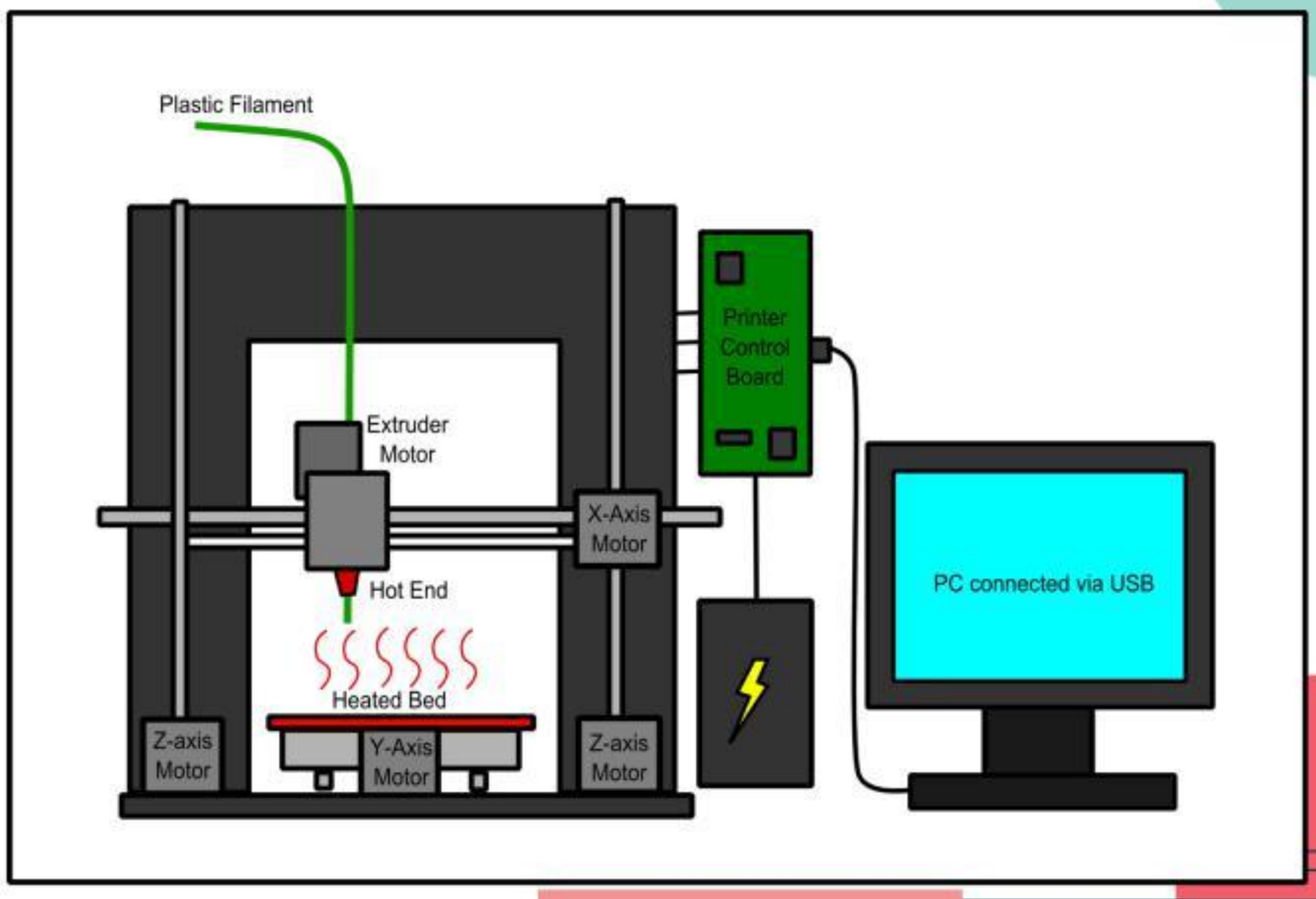
3D Printing: Uses and Benefits

1. Rapid prototyping
2. Easy customization
3. Complex/intricate items
4. Accessibility



Types of 3D Printing: Fused Deposition Modeling

Uses a string of filament and a hot end.



Types of 3D Printing: Stereolithography

Uses vat of resin and a laser!

Finding Pre-made 3D Models

General Repositories

- **Thingiverse**
- **Pinshape**
- **Sketchfab**

Medical/Scientific

- **Embodi3D**
- **NIH 3D Print Exchange**

Cultural Heritage/History

- **Sketchfab - CCO Virtual Collection**
- **Smithsonian 3D**

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3D Modeling Activity!