Academic Library as Makerspace: 3D Printing and Knowledge Creation

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University of Nevada, Reno

Photo by Nick Crowl: http://www.flickr.com/photos/dstl_unr/

Today's discussion:

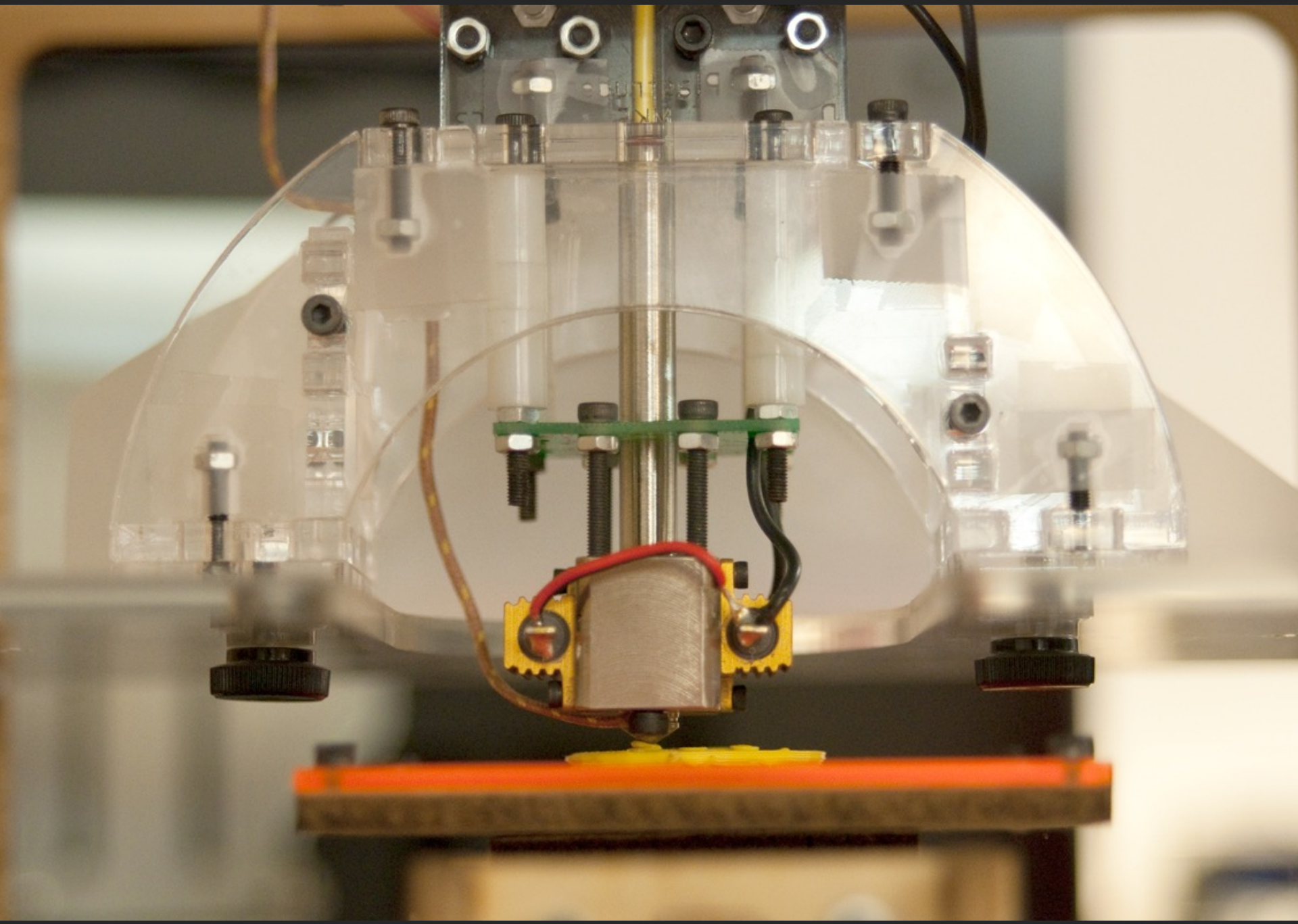
- **What** is 3D printing?
- **Why** is it in the library?
- **Who** uses it and for what purpose?
- **What** are the critical success factors?
- **Where** do we go from here?

What is 3D printing?

Additive manufacturing or **3D printing** is a process of making three dimensional solid objects from a digital model.

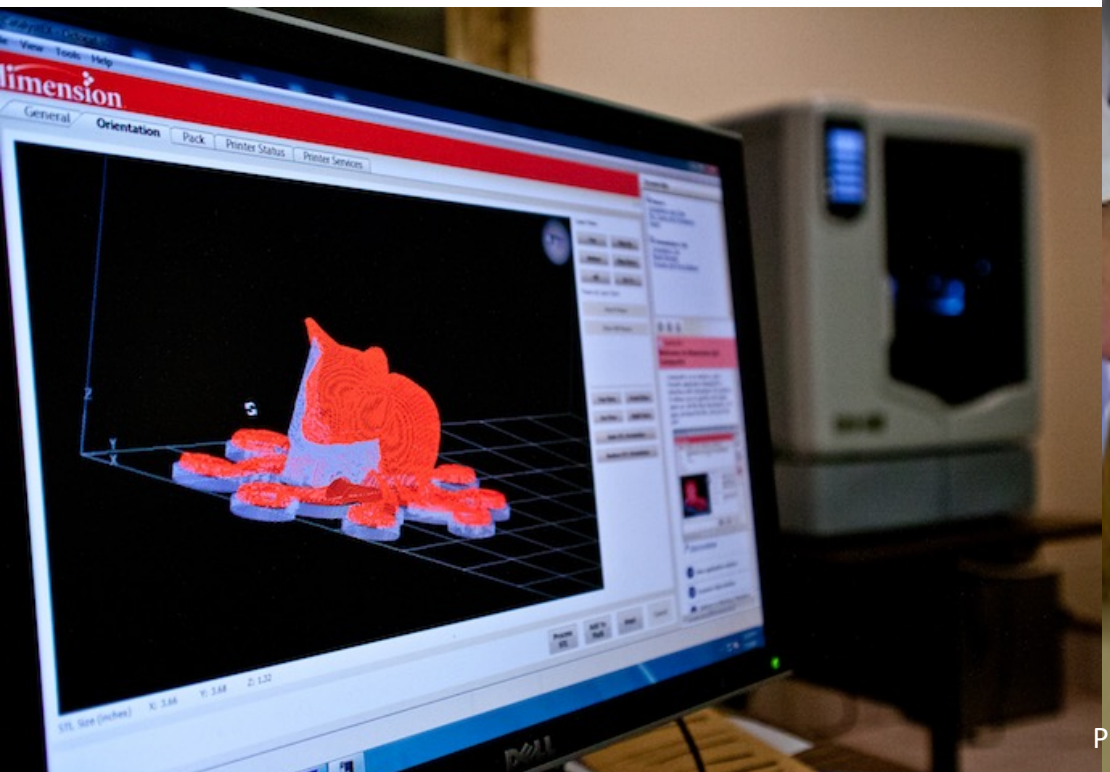
3D printing is achieved using *additive processes*, where an object is created by laying down successive layers of material.

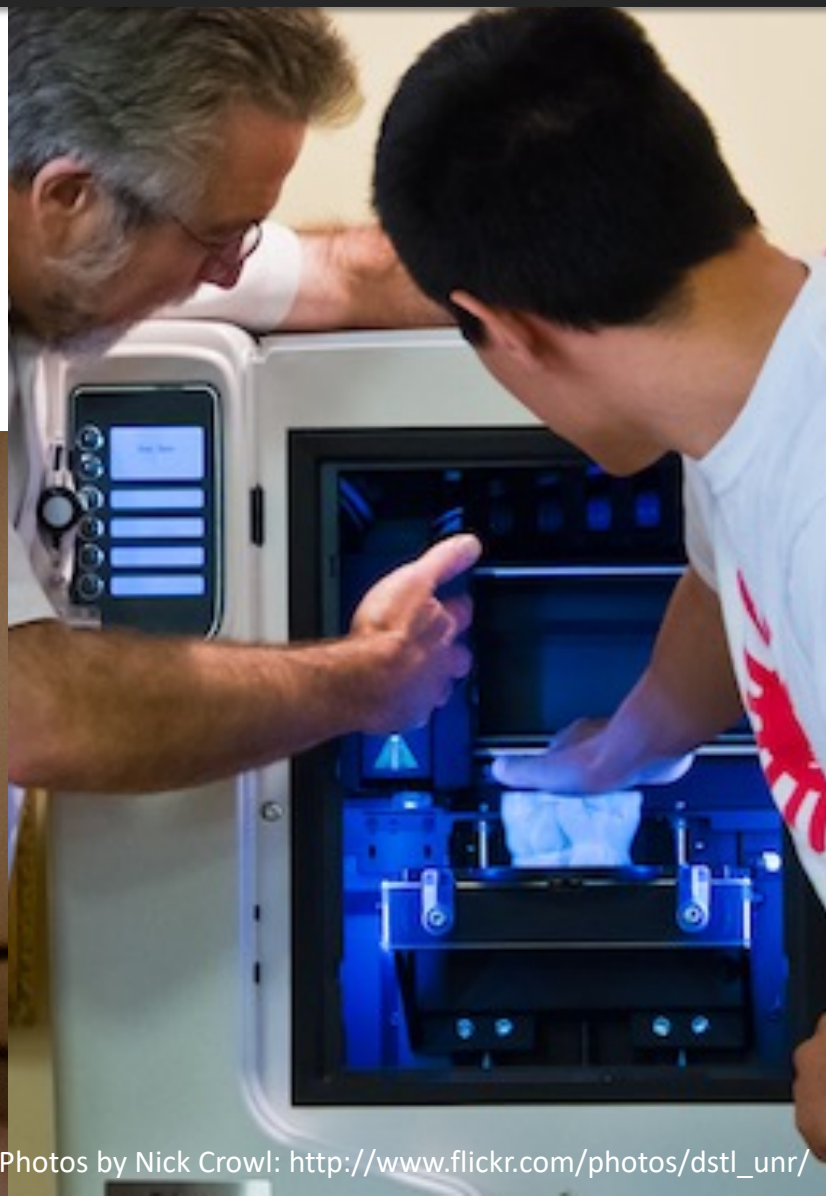
Printing - paper or plastic?



3D printers and scanner

1) 3DTouch
2) Stratasys uPrint SE Plus
3) NextEngine 3D Scanner





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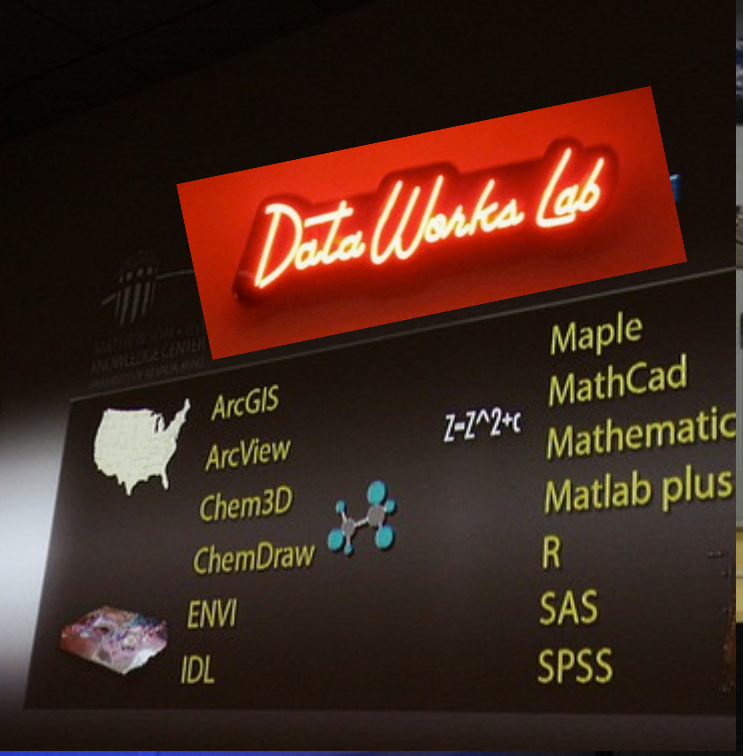
Mathewson-IGT Knowledge Center

"A pioneering information environment designed to nurture creativity and stimulate intellectual inquiry."

"The single greatest intellectual force and competitive advantage in the 21st century is the rapid assimilation of new knowledge to fuel innovation."

"New knowledge, applied to existing tasks, results in increased productivity; new knowledge applied to new challenges and tasks is fundamental to innovation."

"Recognizing this critical interplay between knowledge and innovation, the University of Nevada, Reno has established one of the first centers in the nation built specifically to embrace these dynamics of the 21st century."


Data Works Lab
ArcGIS
ArcView
Chem3D
ChemDraw
ENVI
IDL
z=z^2+c
Maple
MathCad
Mathematic
Matlab plus
R
SAS
SPSS

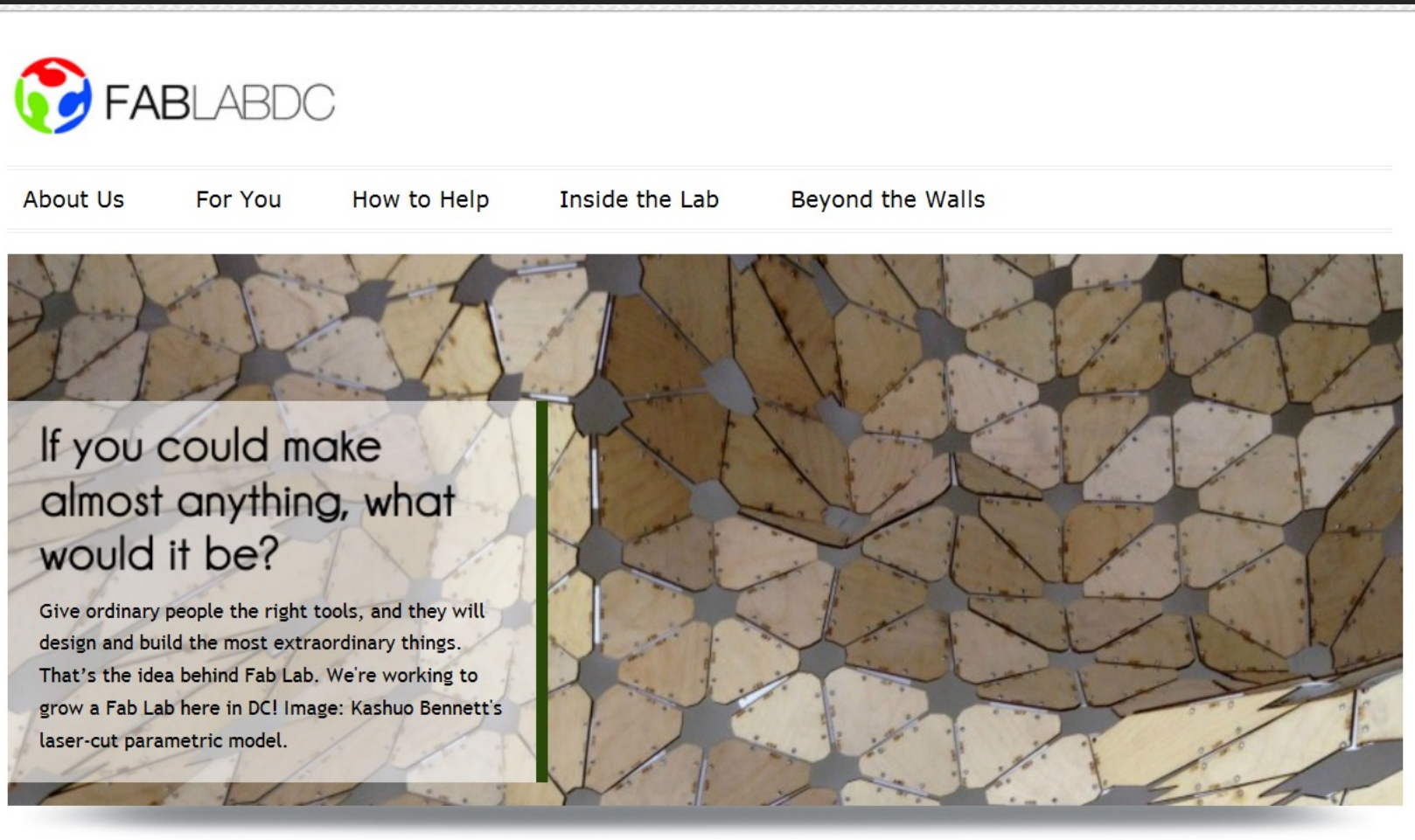
Production

@One

Dynamic Media Lab

Data Works Lab
Maple
ArcGIS
ArcView
Chem3D
ChemDraw
ENVI
IDL
Production
edia Lab

MIT Fab Labs


FABLABDC
About Us
For You
How to Help
Inside the Lab
Beyond the Walls
If you could make almost anything, what would it be?
Give ordinary people the right tools, and they will design and build the most extraordinary things. That's the idea behind Fab Lab. We're working to grow a Fab Lab here in DC! Image: Kashuo Bennett's laser-cut parametric model.
Help Grow Fab Lab DC!

DeLaMare Science and Engineering Library (2010)

walls on every floor painted with whiteboard paint

Photo by Tod Colegrove: http://www.flickr.com/photos/dstl_unr/

whiteboard wall contest!

Like · Comment · Share 1 1 1

105 people saw this post

DeLaMare Science & Engineering Library
May 11

RESULTS ARE IN!

DeLaMare Science & Engineering Library shared Cody Harlan's photo.
May 11

WINNER of the Whiteboard wall contest as the "People's choice" for the most likes.

> Nathan Kyte and Cody Harlan/nakyte@aol.com/communication studies

collaboration and conversation

Photo by Tod Colegrove: http://www.flickr.com/photos/dstl_unr/

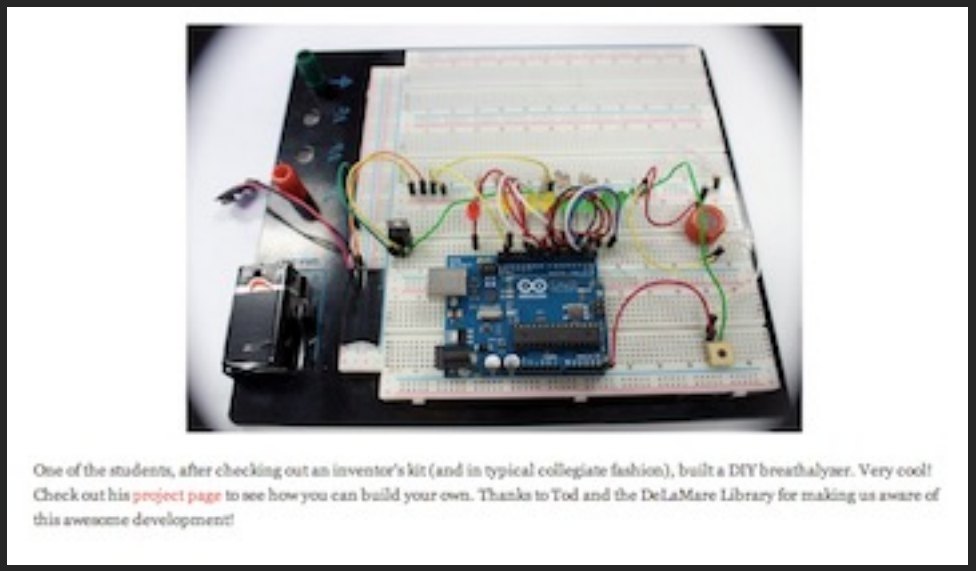
what excites them?

Photo by Tod Colegrove: http://www.flickr.com/photos/dstl_unr/

Kits: Lego Mindstorms, SparkFun arduino, AR.Drones, MaKey MaKey, button maker, etc.

Photo by Nick Crowl:
http://www.flickr.com/photos/dstl_unr/

student project featured on SparkFun



One of the students, after checking out an inventor's kit (and in typical collegiate fashion), built a DIY breathalyzer. Very cool! Check out his project page to see how you can build your own. Thanks to Tod and the DeLaMare Library for making us aware of this awesome development!

http://www.sparkfun.com/news/978

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Ben King, chemistry

"one of the very hard things about teaching chemistry is explaining that molecules have shape. This basically removes that obstacle ... so it will change how we teach chemistry and how we look at molecules on a daily basis. It's also just plain fun."

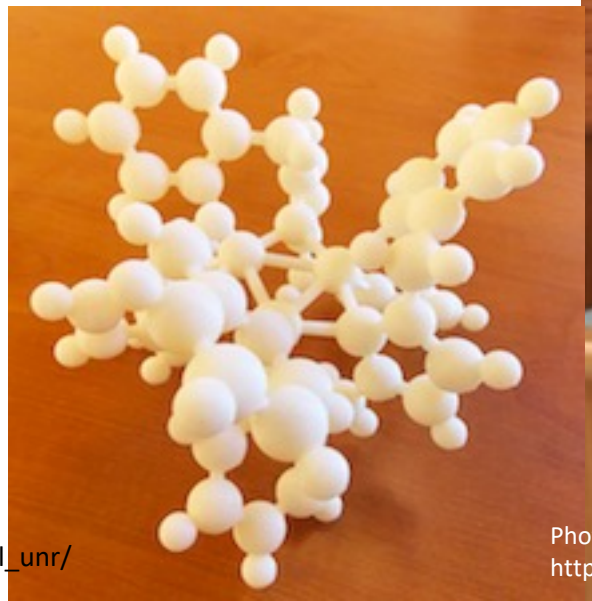
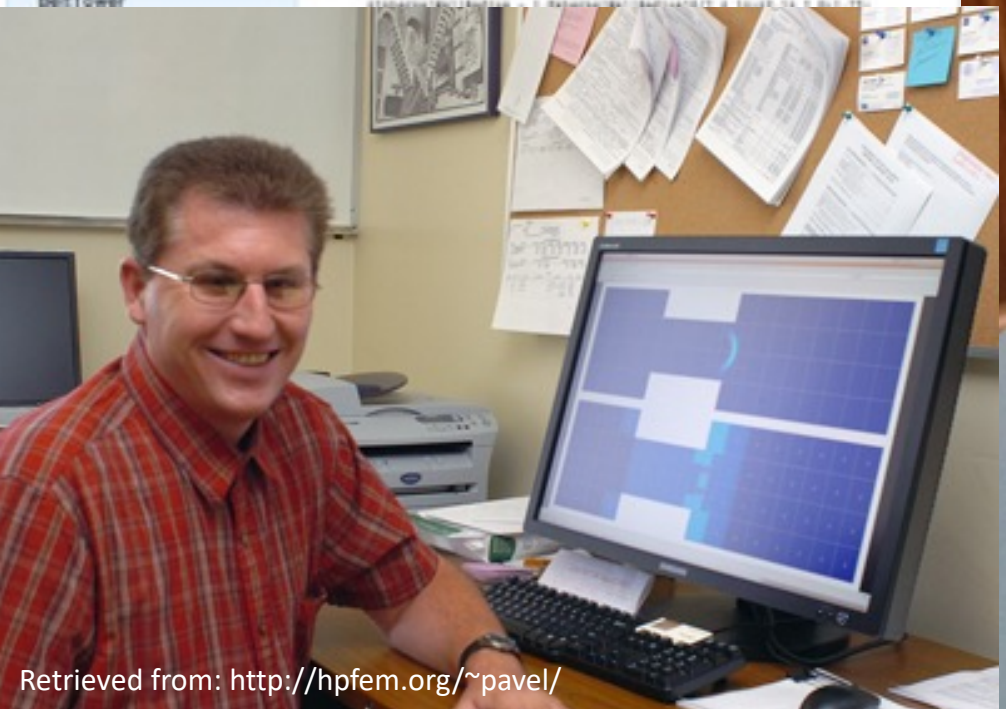


Photo by Tod Colegrove:
http://www.flickr.com/photos/dstl_unr/

Photo of King by Jason Hildago from Engadget:
http://www.engadget.com/2012/10/19/reshaping-universities-through-3d-printing/

Pavel Solin, applied mathematics

Online STEM lab: https://nclab.com/



Retrieved from: http://hpfem.org/~pavel/

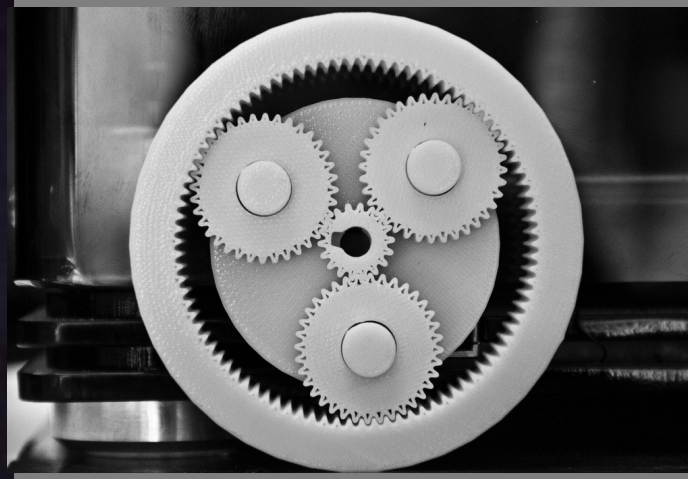
PLaSM

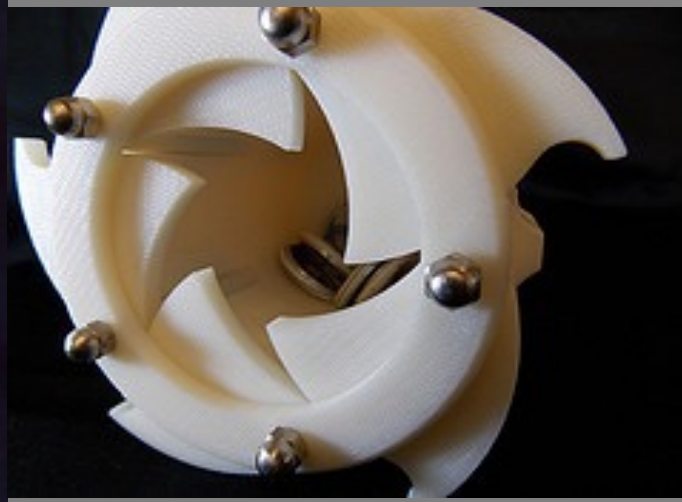
Chris, computer science + theta tau

"I like the networking portion and getting people from other backgrounds together. You get your average engineering types, but it's also nice to see the biologists and the artists coming in here. It allows us to break out of the box and cross-pollinate in ways we normally can't."

Patrick, marketing + psychology (minor)

Photo by Tod Colegrove:
http://www.flickr.com/photos/dstl_unr/





Heather, math education + tutor

"I think 3D printing is awesome. Now if I can't find a [math educational] resource, I can just make one."

Photo by Nick Crowl:
http://www.flickr.com/photos/dstl_unr/

Doug, engineering + art

Nick, library staff + photographer

Tod Colegrove
September 5

Nick Crowl #madeithappen; pure awesome. Built a model of the Mackay statue on the N end of the University Quad – then printed it out in DLM. =D

Like · Comment · Share

Stacie Ledden, William Brinsmead and 4 others like this.

Torbjorn Loken Hah thats awesome. That statue is really great!
September 5 at 7:18pm · Like · 1

Tod Colegrove Agreed Tor! Think Blender was involved?
September 5 at 7:28pm · Like

Nick Crowl 123D By AutoDesk and Blender were the tools of choice in this project. Trying to show off the power of free as well as show a bit of Nevada pride.
September 5 at 7:33pm · Like · 2

Tod Colegrove w00t! Nicely done sir.
September 5 at 7:41pm · Like

Photo by Nick Crowl:
http://www.flickr.com/photos/dstl_unr/

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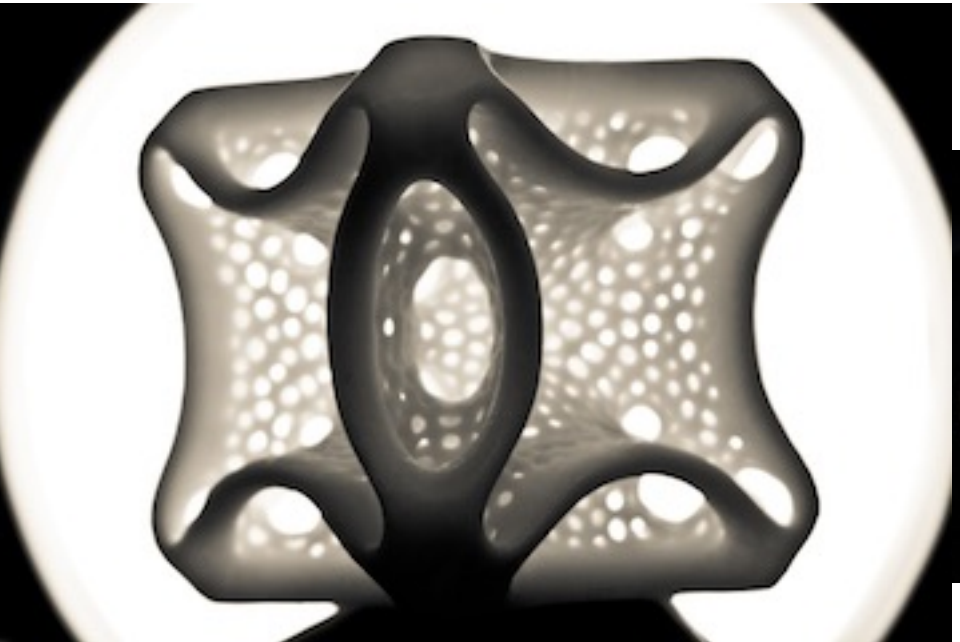
3D resources available on campus

DLM Library: Rhino3D, SolidWorks, Autodesk Inventor
Knowledge Center labs: 3D Studio Max, SolidWorks
Online (free): Blender, SketchUp, Tinkercad



Photos by Nick Crowl: http://www.flickr.com/photos/dstl_unr/

3D printing success requires extraordinary people and a cultural shift

Tod

Lisa

maker break 1.0

wildly popular.

Photo by Nick Crowl:
http://www.flickr.com/photos/dstl_unr/

"There are two critical things to realize. First, play is not trivial, frivolous or non-serious, in fact, quite the opposite. Play can be the place where we do our most serious learning. And second, it is something we do all the time. When we explore, we play. When we experiment, we play. When we tinker or fiddle, we play. Science is play. Art is play. Life, to a great extent, is play. Every great invention of the past hundred years has had an element of play in its creation. So we are using the word in a very deep and serious way."

-John Seely Brown

Retrieved from:
http://henryjenkins.org/2011/01/a_new_culture_of_learning_an_i_1.html

assimilate them (in a good way)

Bridgewire collaboration

Photo by Nick Crowl: http://www.flickr.com/photos/dstl_unr/

Reno Collective collaboration

Retrieved from: http://hack4reno.com/

DEVELOPERS & DESIGNERS

HACKING OPEN DATA

HACKING FOR GOOD

HACKING FOR PRIZES

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retrieved from: makerspace.com

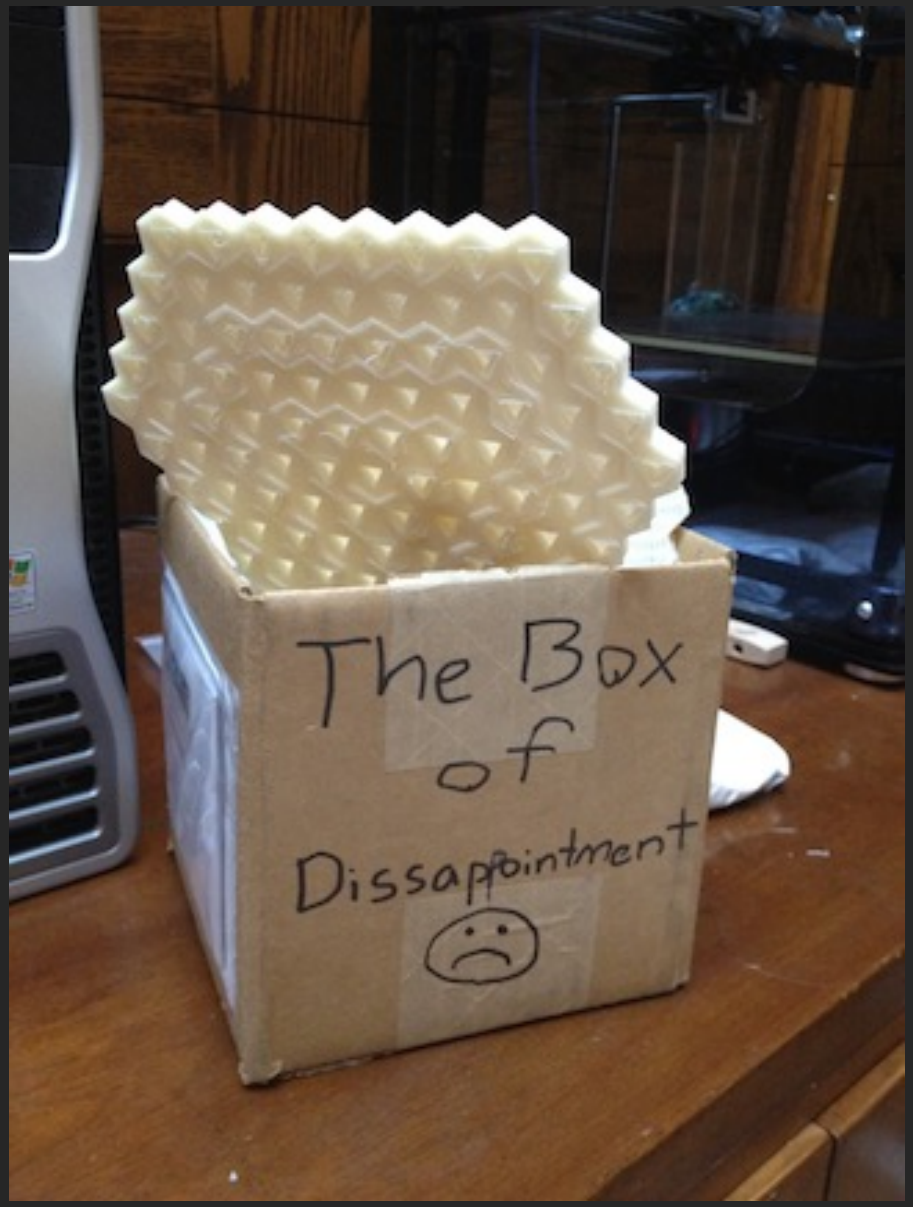
embrace the maker ethos

3D printing enriches learning and promotes knowledge creation

Photo by Nick Crowl: http://www.flickr.com/photos/dstl_unr/

Right 2 Photos by Will Kurt

it's okay to fail. expect to.



Chris Anderson, ex editor of *Wired*:

"3D Printing Will Be Bigger Than The Web"

Questions?

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