If You Build It, They Will Come

Reflecting on the Successes (and Failures) of Building the HCIL Hackerspace

HCIL Brown Bag Lunch
September 12th, 2013

Human Computer Interaction Laboratory

@jonfroehlich
Assistant Professor Computer Science

University of Maryland

If You Build It, They Will Come?

If You Build It, They Will Come?

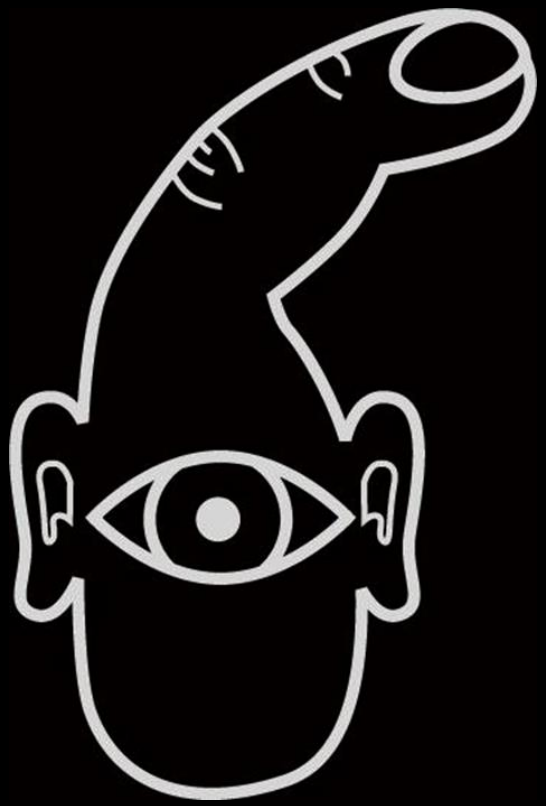
If You Build It, They Will Come?

How?

What?

Who?

How computers have traditionally seen us



O'Sullivan and Igoe, Physical Computing, 2004, p. xix

That is the old world of computing.

Things have changed.

O'Sullivan and Igoe, Physical Computing, 2004, p. xix

for

example

Ryokai *et al.*, I/O Brush: Drawing With Everyday Objects as Ink, CHI2004

Seamlessly couple the dual worlds of bits and atoms by giving physical form to digital information

— Professor Hiroshi Ishii
MIT Media Lab
A Founding Father of Tangible User Interfaces
http://tangible.media.mit.edu/vision/

why

now?

1. **The recent emergence (or reemergence) of the DIY/Makers movement,** which has led to widespread opportunities to interface and work with hardware that has rather low barriers of entry (*e.g.*, the Arduino)

The Maker Movement: Forming the Next Tech Tidal Wave

Posted by Ashish Arora on June 25, 2013 at 9:06am View Blog

With a wealth of unprecedented tools and resources, it has never been easier for people to explore their own personal creativity. Technology is adding simplicity and removing barriers, allowing for a fuller range of creative expression, something particularly true in the emerging maker movement.

For the unfamiliar, the maker movement is a tech-infused subculture of do-it-yourself (DIY) culture. So where one would engage in a creative project – jewelry making, scrapbooking, fashion, etc. – a maker would leverage technology to complete it. Think using a cutting machine instead of scissors. It takes manual processes and makes them automatic, resulting in more professional-looking, high-quality work.

While perhaps best known by its use of 3-D printers, maker culture also consists of traditional arts and crafts, robotics, electronics and metalworking and woodworking. Its parent DIY culture is a burgeoning one, no longer confined to hardcore creative types. The rise of dedicated e-commerce platforms like Etsy and social services like Pinterest are contributing to a formidable industry, one to the tune of $29 billion.

So what has created this sleeping giant? There are a number of factors. The first, and most obvious, is advances in technology that streamline and simplify everything. Not a novel concept, but let me provide an example that illustrates what I mean.

Prior to Cricut, I worked at Logitech. While the Logitech name was synonymous with innovative keyboards and computer mice, we wanted to gain entry into the living room and establish our footprint there. If you remember in the mid-2000s, remotes were out of control – there was one for the television, the cable box, the DVD player, the stereo receiver, the game console...the list goes on. I led a team of researchers to observe in-depth how people watch television, consume content and control their entertainment system. 20,000 research hours later, we delivered one of the company's most successful and well-received products – the Logitech Harmony One, a universal remote that added convenience and eliminated confusion by replacing people's dozen-plus remotes.

As I look at the DIY industry and maker movement, I see a similar change under way, with easily digestible user interfaces and intuitive design humanizing technology. This is allowing the industry to attract a wider audience who may not consider themselves tech savvy. The movement has gained further momentum as the millennial generation, who are all "digital natives," matures. Technology is not a foreign, unapproachable concept to them, but already integrated into every aspect of their everyday lives.

Maker culture

From Wikipedia, the free encyclopedia

The **maker culture** is a contemporary culture or subculture representing a technology-based extension of DIY culture. Typical interests enjoyed by the maker culture include engineering-oriented pursuits such as electronics, robotics, 3-D printing, and the use of CNC tools, as well as more traditional activities such as metalworking, woodworking, and traditional arts and crafts. The subculture stresses new and unique applications of technologies, and encourages invention and prototyping.[1] There is a strong focus on using and learning practical skills and applying them creatively.

Silicon Valley billboard

Contents [hide]

Hackerspaces [edit]

Main article: Hackerspace

The rise of the maker culture is closely associated with the rise of hackerspaces, of which there are now over 100 in the United States, and many around the world.[2] Hackerspaces allow like-minded individuals to share ideas, tools, and skillsets.[3][4] Some notable hackerspaces which have been linked with the maker culture include Noisebridge, NYC Resistor, A2 Mech Shop, Pumping Station: One, Artisan's Asylum,[5] and TechShop. In addition, those who identify with the subculture can be found at more traditional universities with a technical orientation, such as MIT (specifically around "shop" areas like the MIT Hobby Shop). As maker culture becomes more popular, hackerspaces are becoming more common in universities.[6]

Media [edit]

Some media outlets associated with the subculture include *MAKE* (a magazine published since 2005 by O'Reilly Media) and the popular weblog Boing Boing. (Boing Boing editor Cory Doctorow has written a novel, *Makers*, which he describes as being "a book about people who hack hardware, business-models, and living arrangements to discover ways of staying alive and happy even when the economy is falling down the toilet".[7])

Maker Faire [edit]

Since 2006 the subculture has held regular events around the world, Maker Faire, which in 2012 drew a crowd of 120,000 attendees.[8] Smaller, community driven Maker Faires referred to as Mini Maker Fairs are also held in various places where an O'Reilly-organised Maker Faire has not yet been held. [9][10][11][12] Maker Faire provides a Mini Maker Faire starter kit to encourage the spread of local Maker Faire events.[13]

Everything old is new again [edit]

Hobbyists have made custom things for a long time. Evidence is in ham radio and RC modelling where very early innovation came from the garage, the shed or the loft. Similarly, the evolution of hobbies into for-profit businesses has a long history.

A famous example is in the relationship between the Homebrew Computer Club and Apple Inc., in which Steve Jobs became involved in the maker subculture through his early interest in Heathkit electronics kits. "The kits taught Steve Jobs that products were manifestations of human ingenuity, not magical objects dropped from the sky", writes a business author, who goes on to quote Jobs as saying "It gave a tremendous level of self-confidence, that through exploration and learning one could understand seemingly very complex things in one's environment".[14]

"Maker-Culture" re-brands pursuits and processes that extend into prehistory — making things and communicating how. That re-branding helps shift focus onto the *new* pursuits and processes enabled and reshaped by recent innovations: Internet, open-source memes & means, and the growing ubiquity of computing tools in smaller, faster, cheaper, more flexible forms.

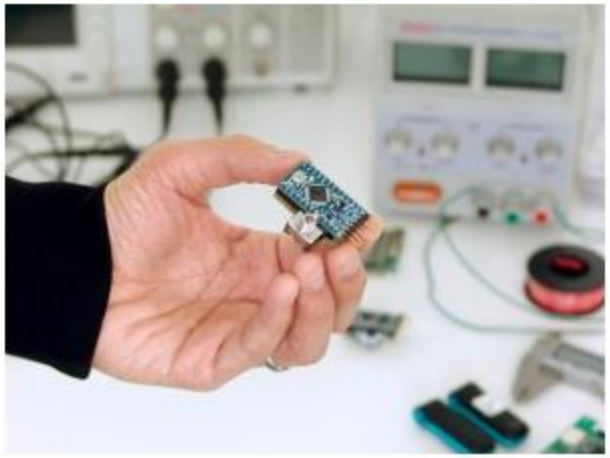
Greater emphasis on some memes distinguishes the newer "Maker-Culture":

« Tiny Femtoduino, The Smallest Arduino Compatible Board

Lions and Farmers and Arduinos! Oh My! »

FitBit: Arduino in the workplace

FitBit is a company that makes a nifty little activity tracking device that lets you track your walking, running, sleeping, and general activity based on movement. We had a nice note from Shelten Yuen to say "We've been using Arduino for rapid prototyping for a few years now. It's been a great tool for us in trying things out quickly." It's always nice to hear how people use Arduino at work as well as in their hobbies. Thanks Shelten and thanks Christine Brumback for the intros.



Shelten also mentioned that FitBit is hiring.

DIY Muscle Sensor / EMG Circuit for a Microcontroller

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Author: Gundanium (Advancer Technologies)

Brian Kaminski Owner - Advancer Technologies Brian graduated from North Carolina State University with a BS in Biomedical Engineering with a concentration in Biomechanics in May, 2006. While at North

more »

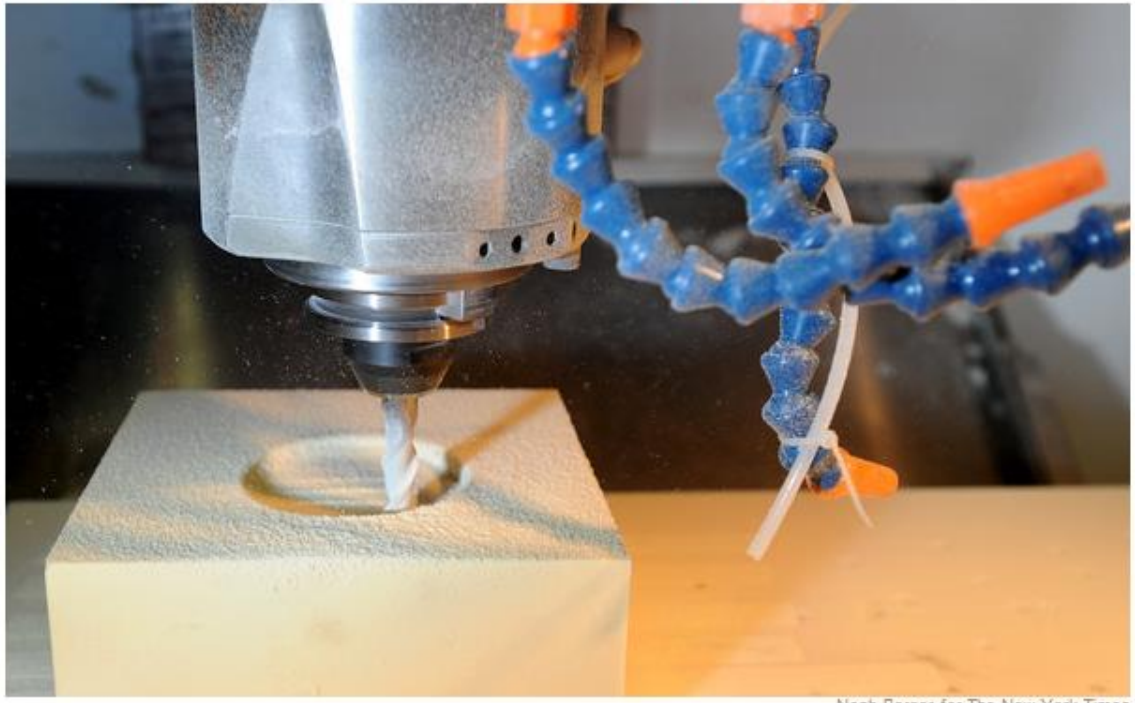
1. **The recent emergence (or reemergence) of the DIY/Makers movement,** which has led to widespread opportunities to interface and work with hardware that has rather low barriers of entry (*e.g.*, the Arduino)

2. **The pervasiveness of powerful, sensor-rich mobile computers** in the form of smartphones and tablets that are constantly on and nearly constantly with us

3. **The rise of inexpensive 3D-printing and CNC machines** for easily forging new industrial forms and artifacts rapidly in the lab;

4. **The "hardware renaissance" in Silicon Valley** (and other places) that is fostering a renewed culture of hardware-oriented products and ideas such as the FitBit,, the Lytro, the Pebble Smartwatch, Nest, Microsoft's Kinect, theNike Fuelband, and low cost flying drones such as the AR.Drone.

A Hardware Renaissance in Silicon Valley

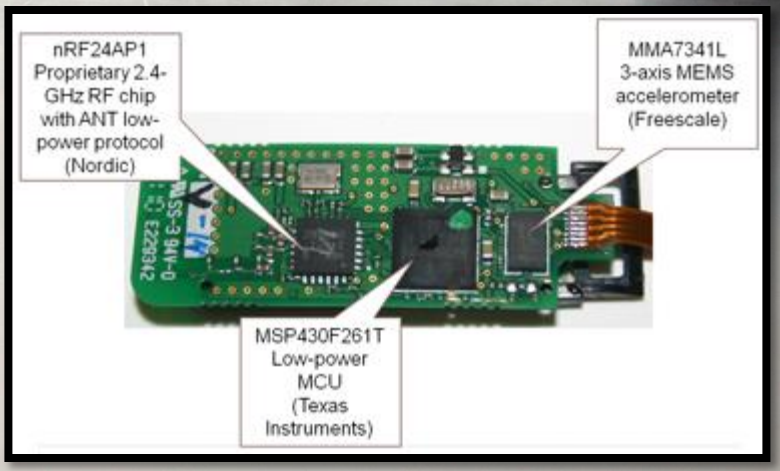


Noah Berger for The New York Times

A move toward hardware development, and away from an obsession with dot-com services and Web-based social

FitBit

FitBit


nRF24AP1
Proprietary 2.4-GHz RF chip with ANT low-power protocol (Nordic)
MMA7341L
3-axis MEMS accelerometer (Freescale)
MSP430F261T
Low-power MCU (Texas Instruments)

I want(ed) to make the HCIL Hackerspace…

A place to inspire creativity
A place to encourage and allow for serendipitous interaction between HCIL members
A place where students *want* to come
A place for playfulness and fun
A place to try and fail and try again
A place to build community and imbue a spirit of collaboration
A place to rapidly prototype physical computing designs
…


Collaborative Making

Collaborative Working

HCIL students Matt and Michael

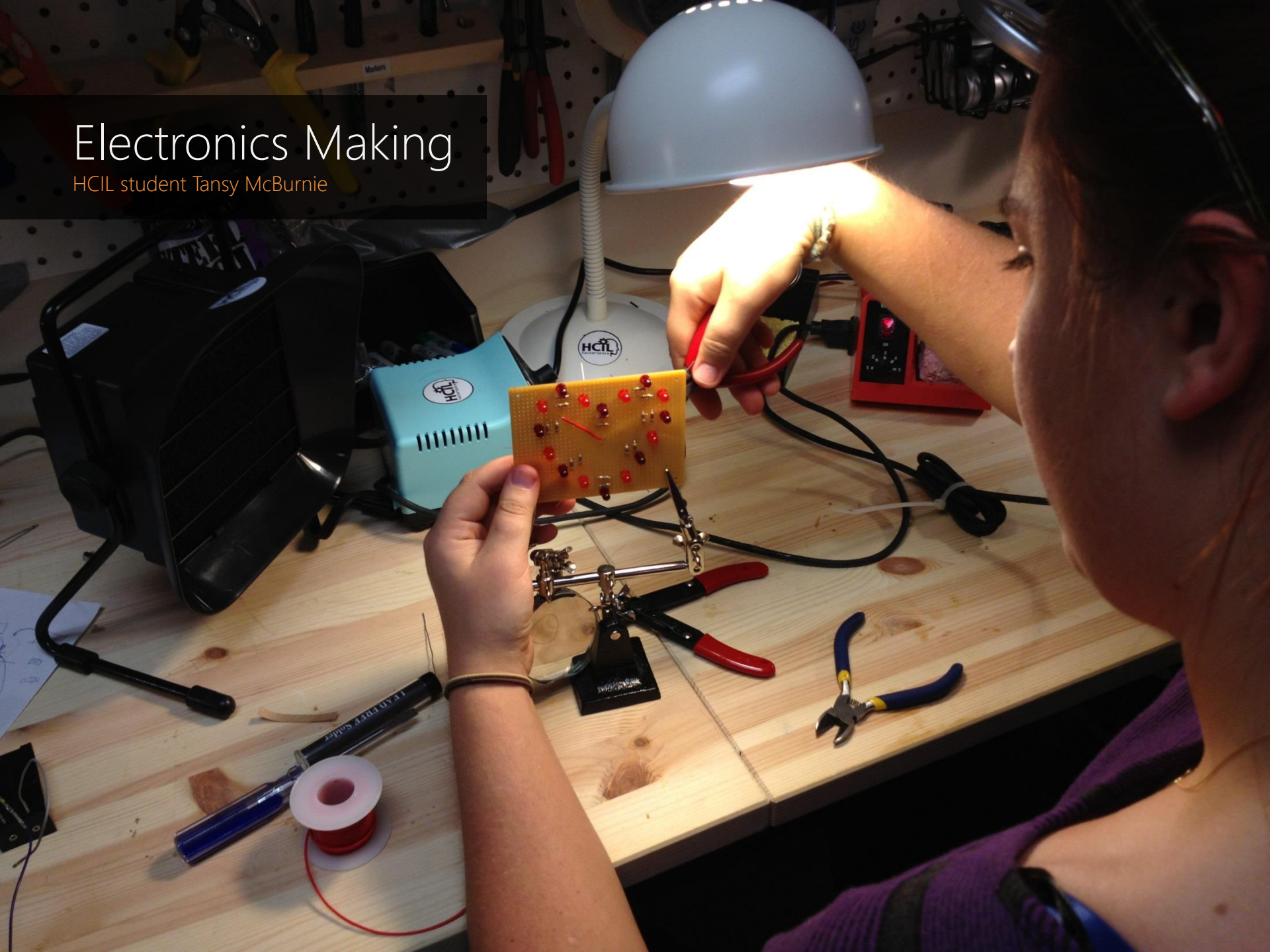

Collaborative Working
HCIL students Joseph, Cy, Matt, and Jonah


Collaborative Working
HCIL students Yi-Chun, Michael, & Sean

Physical Making

Physical Making

HCIL Student Leyla Norooz

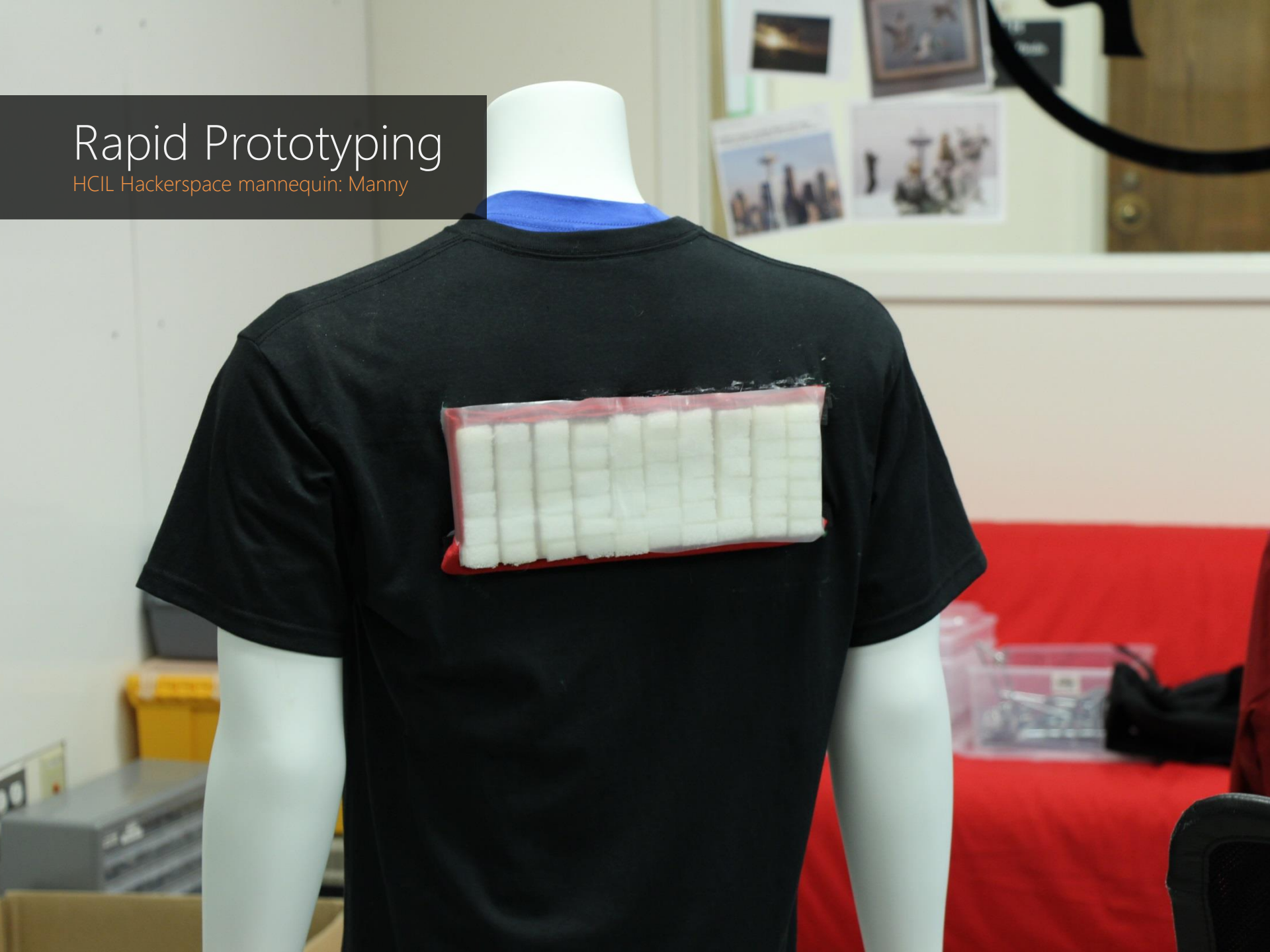

Electronics Making
HCIL student Tansy McBurnie

Curiosity & Inquiry

HCIL students Anders, Leyla, and Matt

Rapid Prototyping

HCIL Hackerspace mannequin: Manny



Rapid Prototyping

Paper prototype of BodyVis v. 2.0

Creative Making

HCIL Student Michael Gubbels showing SFF

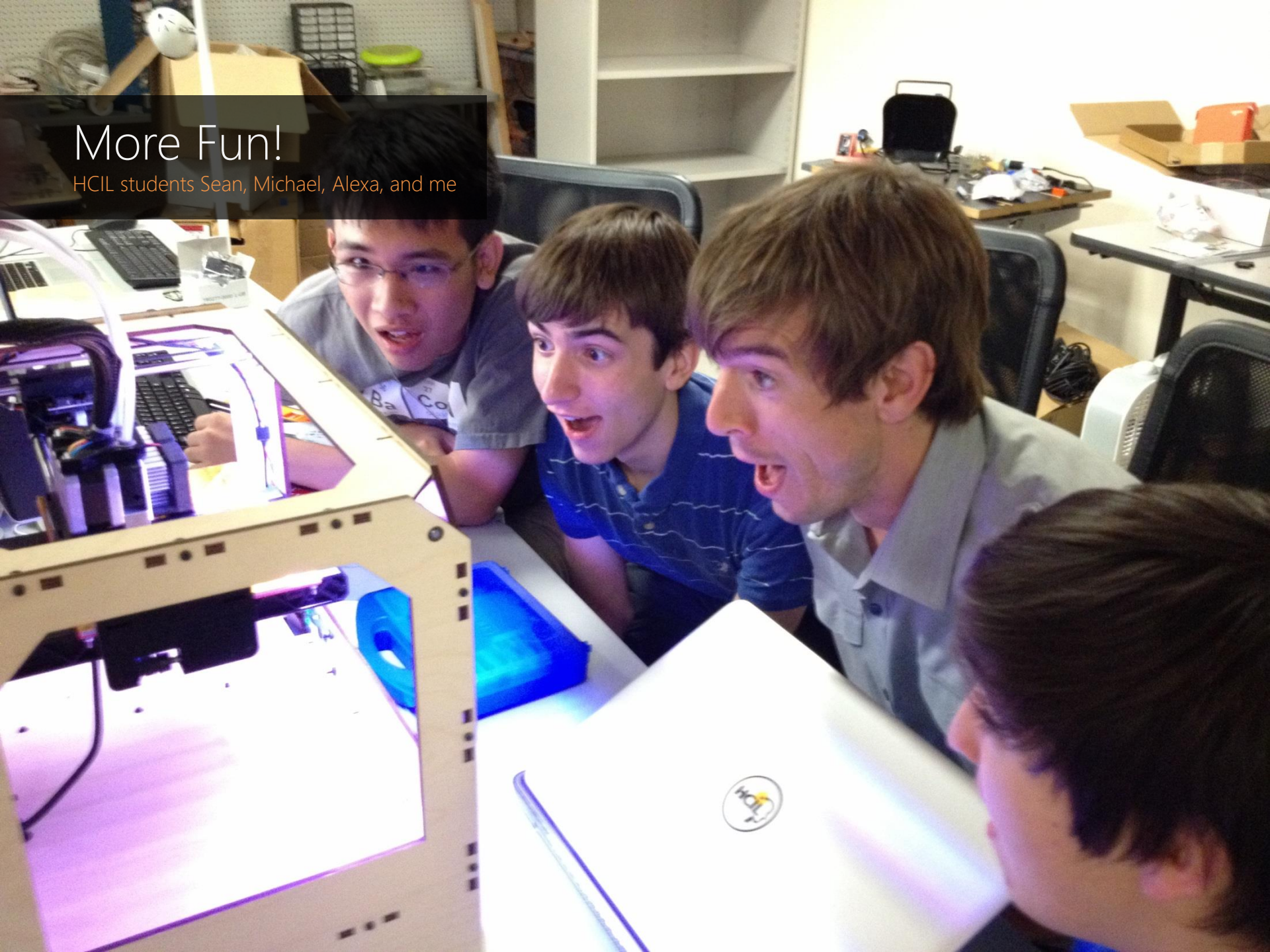
Zany Making

HCIL student Leyla wearing BodyVis v. 1.0


Matt Sewing
HCIL student Matt sewing
Crayola
MARKERS

Fun!

HCIL students Kotaro Hara and Allan Fong


More Fun!
HCIL students Sean, Michael, Alexa, and me

Play With What You Make

Playing a driving game with a 3D-printed steering system

Given this, what can /should we do? How?

Space can have a profound impact on thought, creativity, and collaboration.

Not a new idea, of course

Stanford d.school Proves You Really Can Design a Space for Innovation

BY LINDA TISCHLER | 04-26-2010 | 12:00 PM

"Space matters." That's the mantra at the Stanford d.school, where students and staffers have spent six years figuring out how to tweak an environment to make it a more fertile breeding ground for ideas. Now they're going to find out if those ideas work.

The boxes were unpacked in late March, in time for the start of the university's third quarter. But the official ribbon-cutting on the 40K square foot new building (which houses both the d.school and all other design programs at Stanford) isn't until May 7. *Fast Company* got a sneak preview, and we'll be giving you a guided tour (along with photos, videos and critiques of the space from the students themselves) in the days ahead. We'll go behind the scenes to show how every nook, cranny, and fungible wall system has been smartly designed to maximize collaboration.

The school, which is officially known as the Hasso Plattner Institute of Design, began in a

Reinvents The Office Chair, Aiming To Cure Sitting Disease

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How Serial Innovators Find The Best Problems To Solve

Dude, This

ALLISON ARIEFF | July 18, 2011, 8:30 pm | 103 Comments

Beyond the Cubicle

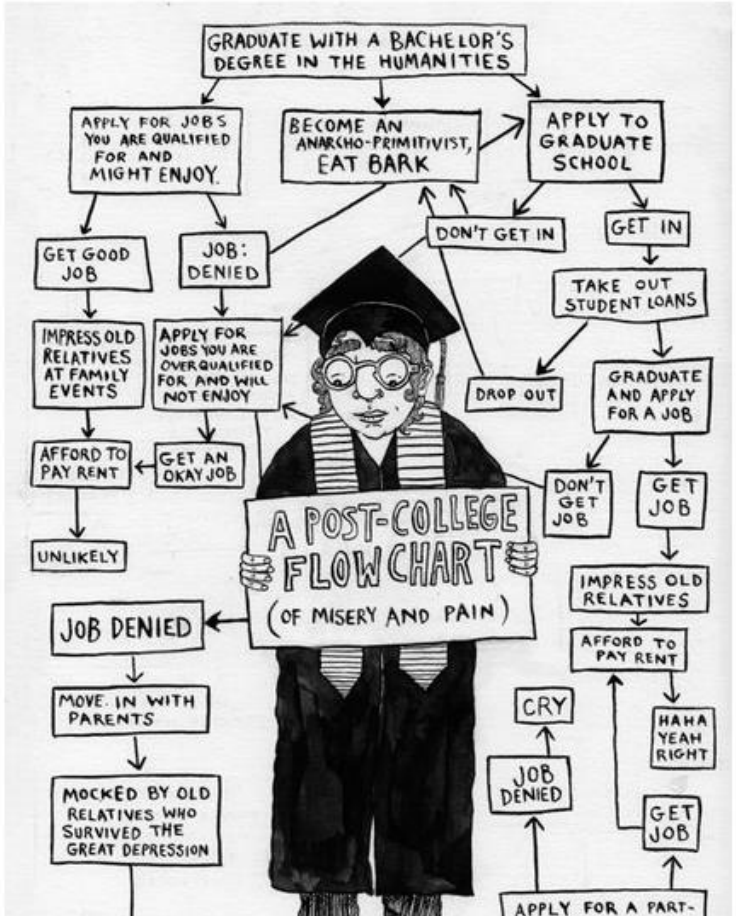
By ALLISON ARIEFF

Allison Arieff on design and architecture.

TAGS:

OFFICE DESIGN, WORKPLACE

Most talk of work these days revolves around the latest unemployment figures, the difficulties of getting and/or holding onto a job and/or how we are all working more hours for less money and less vacation time, or the bleak prospects for newly minted college grads (starkly rendered by cartoonist Jenna Brager in the new anthology "Share or Die: Youth in Recession.")



PREVIOUS POST
Media and Mistrust: A Response
By JASON STANLEY

NEXT POST
A Better Sort of Pig
By MARK BITTMAN

Allison Arieff is editor and content strategist for the urban planning and policy think tank SPUR. She writes about architecture, design and sustainability for Wired Design and The Atlantic Cites. The former editor in chief of Dwell magazine, she is co-author of the books "Prefab" and "Trailer Travel: A Visual History of Mobile America."

INSIDE OPINIONATOR

JEFF SCHER
EZEKIEL J. EMANUEL
THE STONE
DRAFT
THE GREAT DIVIDE
MORE CONTRIBUTORS

July 29, 2013
'Tunnel Vision'
A short impressionistic film shot from New York City subway trains.

October 12, 2012
'Leaf and Death'
A short film celebrating fading (but somehow glowing) leaves.

More From Jeff Scher »

GRAY MATTER

Engineering Serendipity

Lisa Hanawalt

By GREG LINDSAY
Published: April 5, 2013

WHEN Yahoo banned its employees from working from home in February, the reasons it gave had less to do with productivity than serendipity. "Some of the best decisions and insights come from

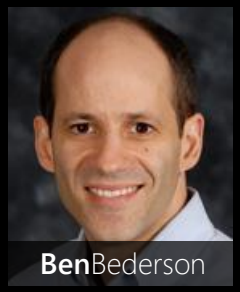
My Approach

Most importantly… have supportive colleagues

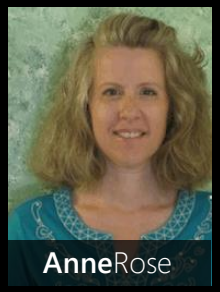

LeahFindlater


JenGolbeck


BenShneiderman

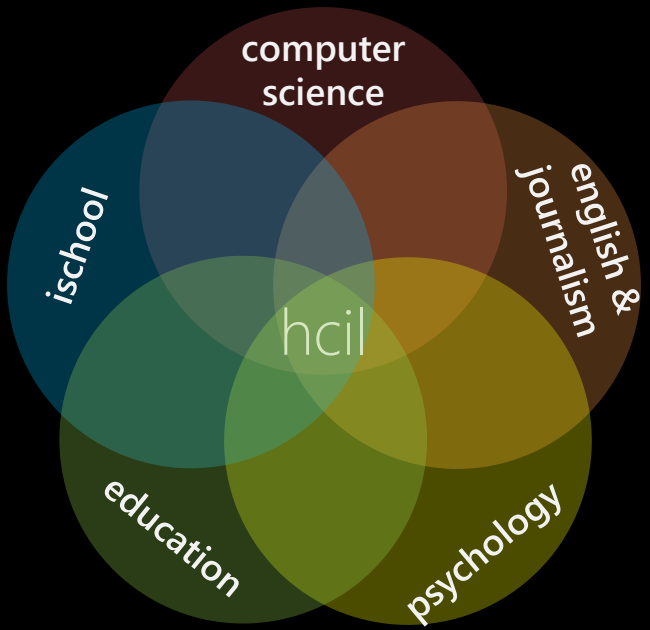

BenBederson


JonFroehlich

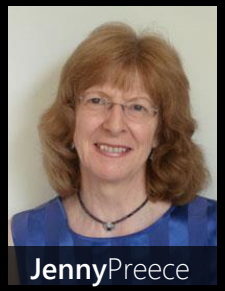

AnneRose

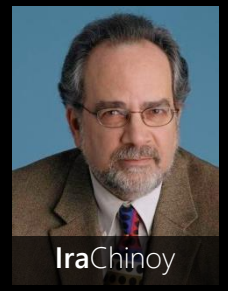

CatherinePlaisant


MarshiniChetty


computer science
ischool
english & journalism
hcil
education
psychology


KariKraus

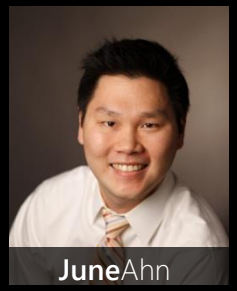

JennyPreece

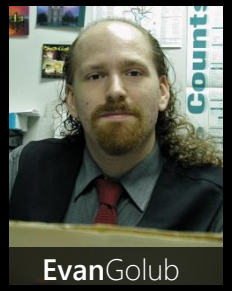

IraChinoy

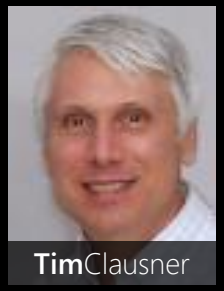

AllisonDruin


MonaLeighGuha


TammyClegg


JuneAhn

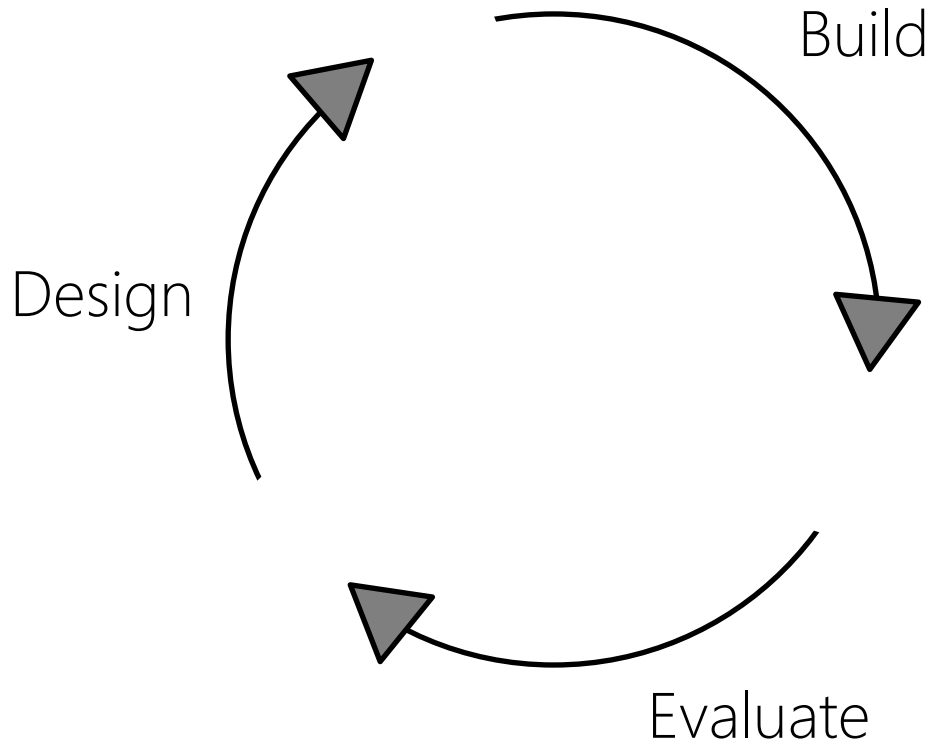

EvanGolub


TimClausner


KentNorman

Human-Centered Design

Iterative Design



My Approach

Read.
Learn.
Remix.
Design.
Sketch.
Communicate.
Get Feedback.
Revise.
Build.
Use.
Iterate.
Use.
Iterate.
...

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Use.
Iterate.
Use.
Iterate.
...

I am a **creative kleptomaniac**. I'm interested in stealing things that really mean something to me. The things [ideas] that I can actually use in my work.

Austin Kleon
Author / designer

Quote from the TEDx talk: *Steal Like An Artist*, http://youtu.be/oww7oB9rjgw

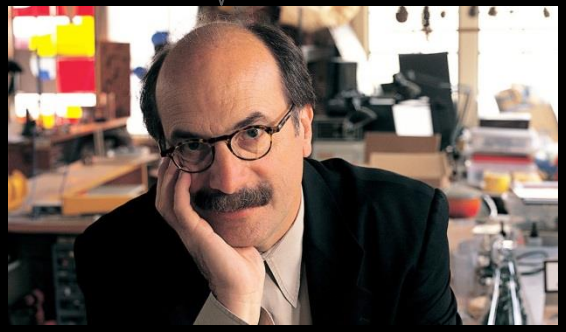
My Kleptomania


IDEO Workspace & Culture
ABC News Nightline, July 13, 1999
abc

Being playful is of huge importance for being innovative.

[Re: DC3 Wing]. That's décor. That's ambience. That says, we're weird and we're proud of it.

Try stuff and ask forgiveness instead of asking permission.



David Kelley
Founder of IDEO & Hasso Plattner Institute of Design
Professor at Stanford

Stanford d.School

Make A Space For Innovation


Null Space Labs
Los Angeles Hackerspace


Noisebridge
San Francisco Hackerspace

Unknown

Unknown


Taubman College of Architecture & Urban Planning
University of Michigan


Mono Mpls
Advertising Agency in MN

Innovatrium

Ann Arbor, MI

Oktavilla

Stockholm Design Firm

Design by Front

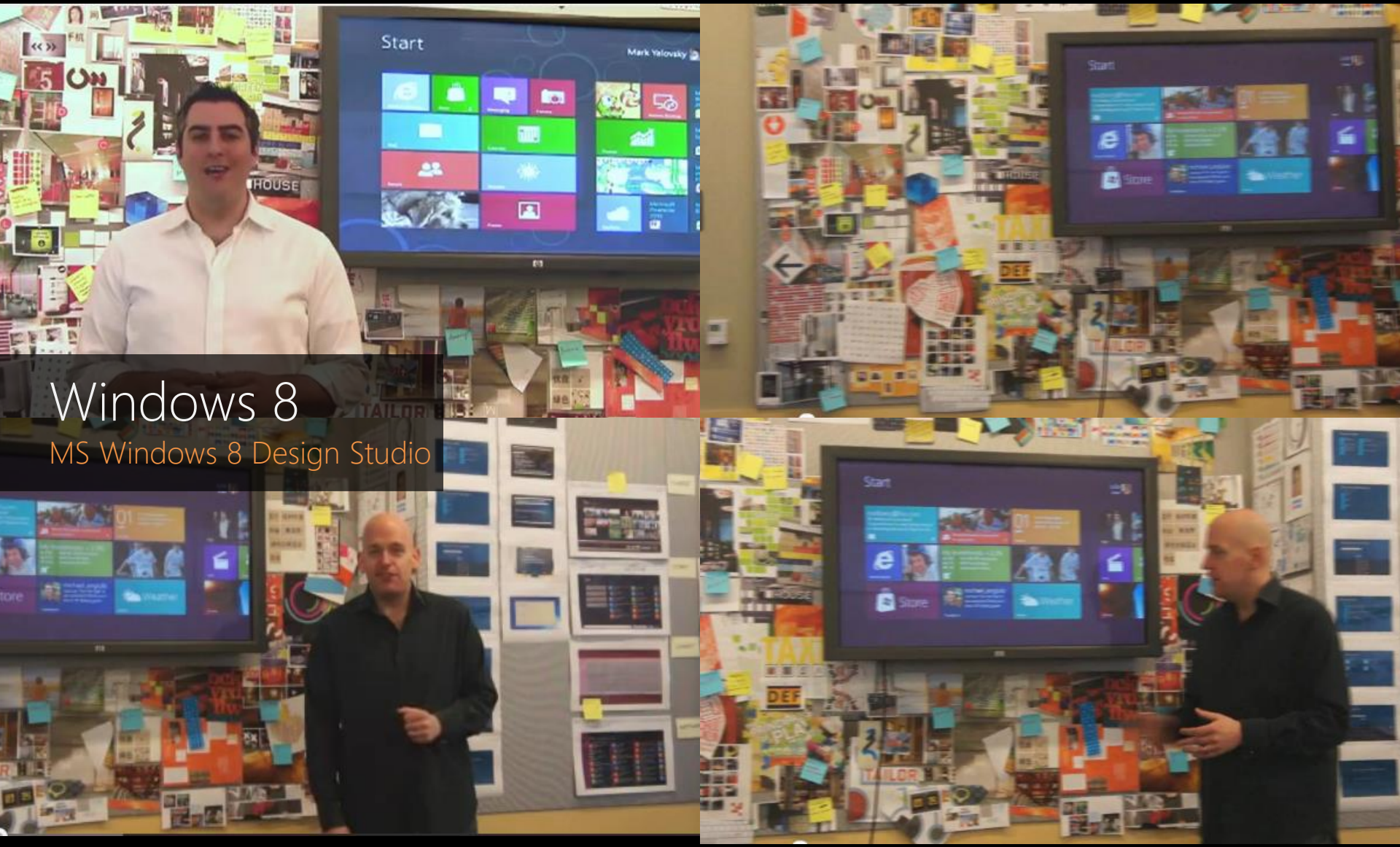
Ireland U/X Design Firm


Teehan Lax
Toronto U/X Design Firm

Invoke Canada

Media and U/X Design Firm


Parliament
Portland Design Firm



Windows 8

MS Windows 8 Design Studio

Woodworking Shops

Pay attention to storage, workbenches, arrangement of equipment, open space, etc


WOOD CUTTING
DELTA

My Approach

Read.
Learn.
Remix.
Design.
Sketch.
Communicate.
Get Feedback.
Revise.
Build.
Use.
Iterate.
Use.
Iterate.
...

My Approach

Read.
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Remix.
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Sketch.
Communicate.
Get Feedback.
Revise.
Build.
Use.
Iterate.
Use.
Iterate.
...

roughly 9' ceilings

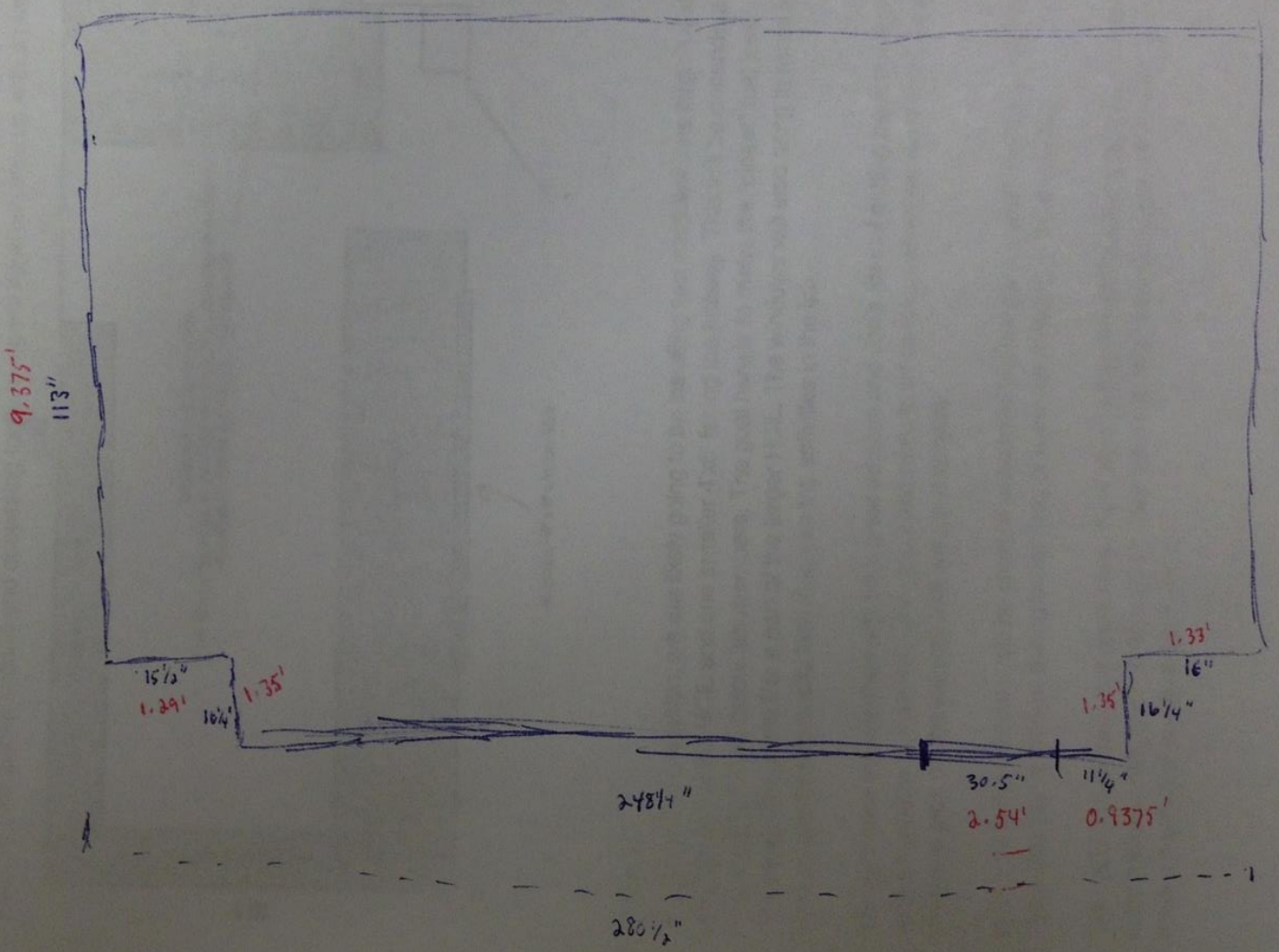
Rear:

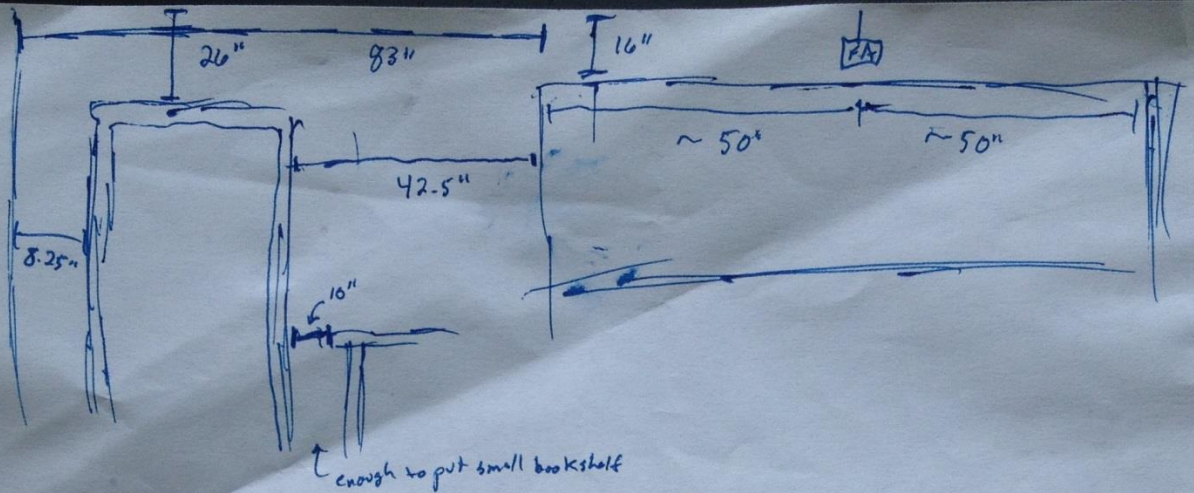
30.5"

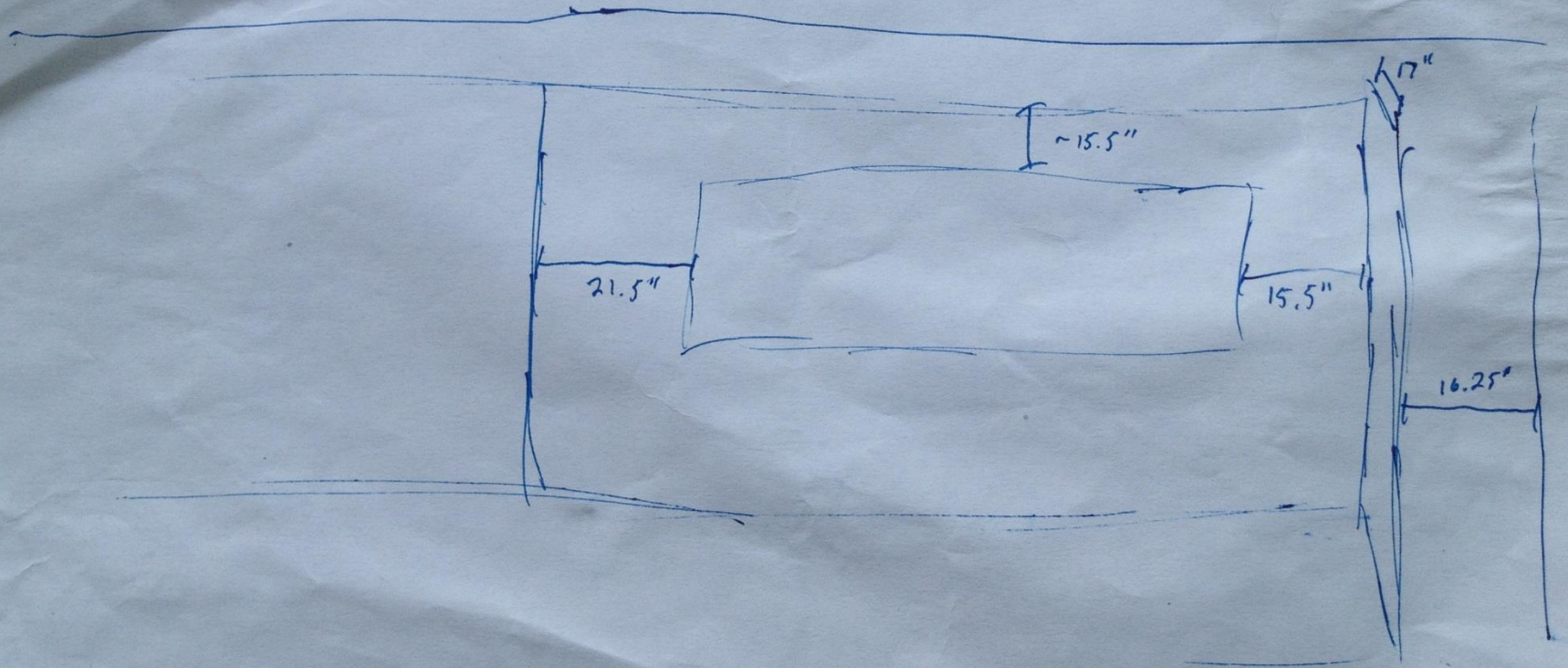
78.5"

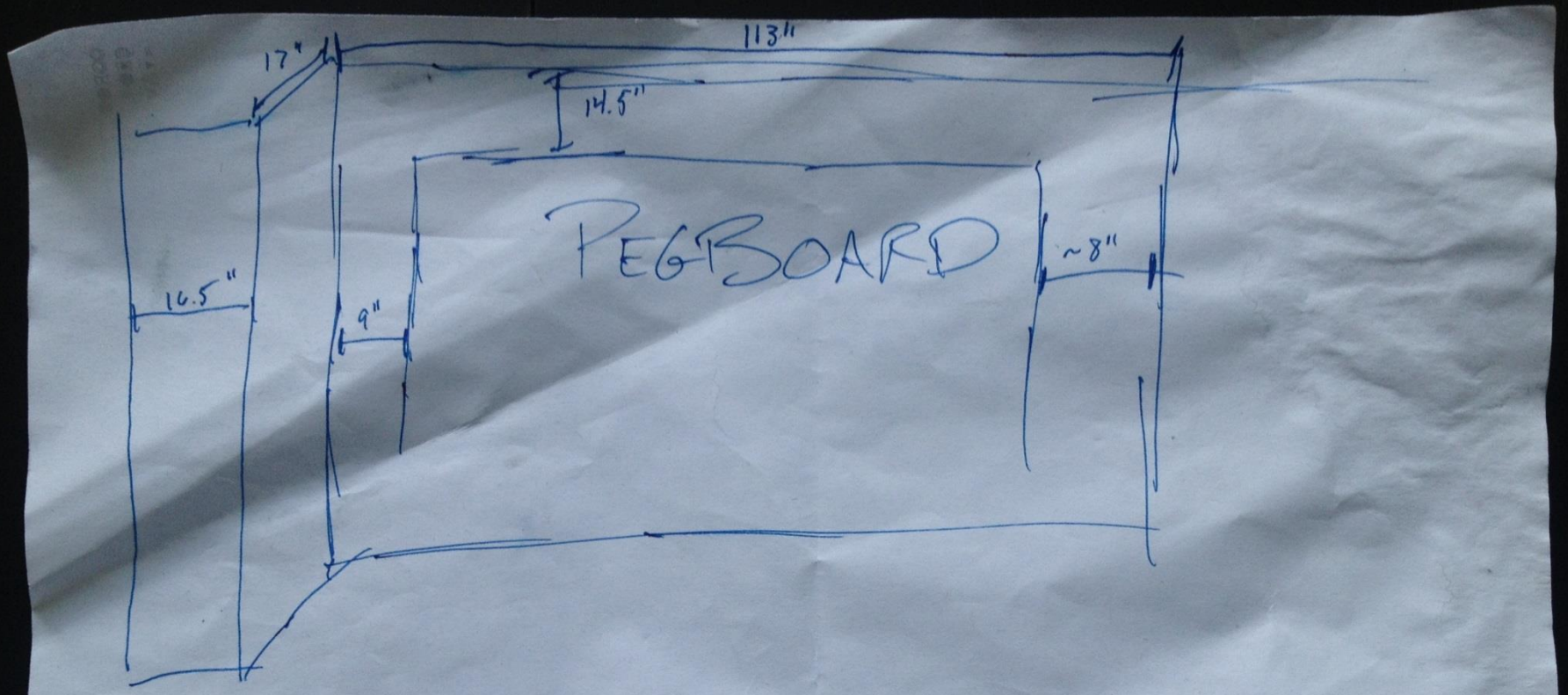
23.5'

282"




26"
83"
16"
FA
~ 50"
~ 50"
42.5"
8.25"
10"
enough to put small bookshelf


17"
~15.5"
21.5"
15.5"
16.25"



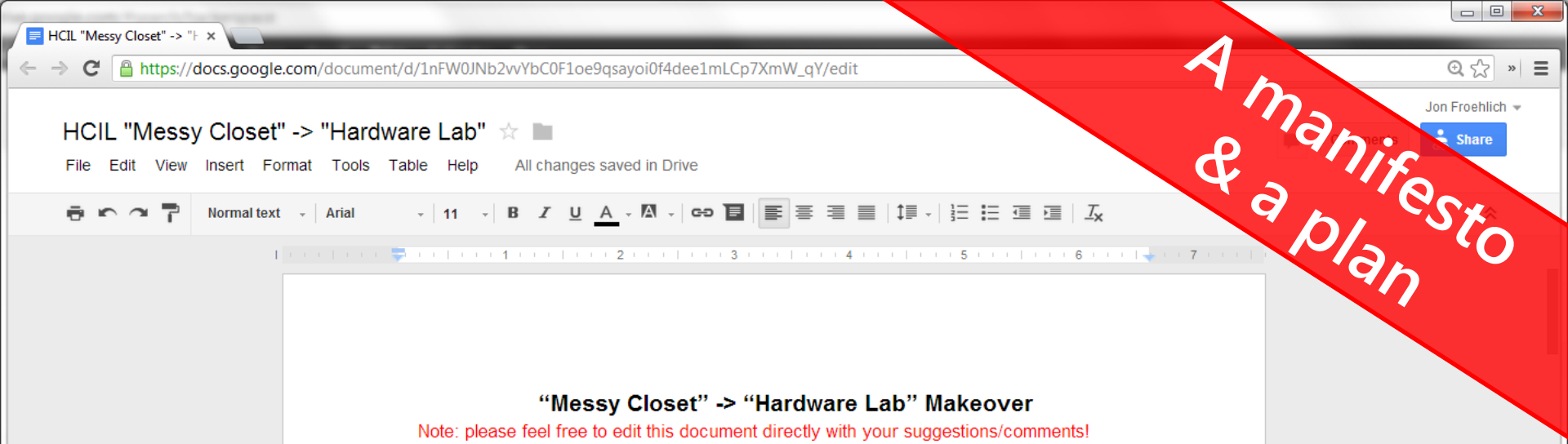
- [ ] whiteboard slot 39
- [ ] whiteboard slot 2 ~~41.5~~ 41.5"
- [ ] lots of gray stack boxes (HusKy)
- [ ] 113" black shelving above peg board
- [ ] 83" black shelving above doorway
- [x] Big gray boxes

- [ ] Big Drill bit?
- [x] longer screw tips for drill
- [ ] More storage Bins from that Storage Bin Place
- [ ] IKea colored carpet
- [ ] Whiteboard on wheels
- [ ] Pillow / lap laptop holder
- [ ] Pico Projector
- [x] More L ~~Brace~~ bars (long) for shelf

Drawers underneath 3D printer table?

- [x] Wood Glue Aisle 5

Thrifty White Pegboard
SKU 346-428



"Messy Closet" -> "Hardware Lab" Makeover

Note: please feel free to edit this document directly with your suggestions/comments!

We are in the midst of planning the "Messy (Closet) Lab" makeover, which involves transforming this closet-like space to a nice, creative hardware workspace for students, faculty and staff alike! The HCIL will have a place to hack and build together. Fun, fun! Now, we are just in the planning stages for this. As such, we are seeking input from HCIL members on what they'd like to see from this space as well as to ensure that we accommodate everyone who currently relies on the "Messy Lab" for storage and other things. I'm hoping this can be largely a collaborative effort--though one that I am spearheading. This seems to follow the spirit of the HCIL culture.

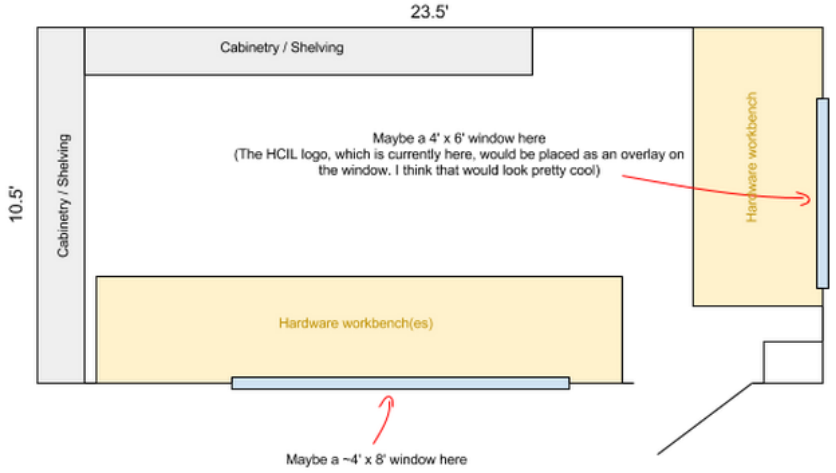
An Overview of the Plan

There are four parts to the plan:

1. **"Messy lab" cleanup**: This involves throwing out old and unnecessary items and organizing/categorizing important content. My guess is that, at the very least, Evan, Mona Leigh, Allison, Charley, people with old research materials in the messy lab, and maybe some graduate students would want to be involved in this.
2. **Layout and furniture purchasing:** In my mind, we can purchase cabinetry and shelving to move many of the items that are on tables and on the floor up to

Layout and Decor

The layout below is only a sketch and not definitive. The overall goal here is to maximize workspace while still allowing for sufficient storage. The 4'x8' window, which looks into the larger HCIL space would be replacing, in part, the peg board. Evan notes that the peg board is useful, however, for quickly storing and accessing tools so we will have to come up with a plan here.



Windows

As part of this transition, we are likely going to be installing two windows: one largish 4'x8' window facing the HCIL and one smaller 4'x6' facing the hallway. This will be dependent on cost and feedback from fellow lab members. The goal here is to make the "closet" feel less cavernous and more like a part of the larger HCIL. The windows will also bring in more light and allow passerbys to briefly look in to see the activities in the lab.

Allison: I think the windows will be a great addition and Jon's idea of putting back the logo on the hallway window is inspired. Jon- you'll just need to let us know when we need to take down the shelf and pics on the lab wall that will get a window.

Krist: I think the windows will be great. A minor addition maybe a curtain that you can

HCIL "Messy Closet" -> "Hardware Lab"

https://docs.google.com/document/d/1nFW0JNb2vvYbC0F1oe9qsayoi0f4dee1mLCp7XmW_qY/edit

Jon Froehlich

HCIL "Messy Closet" -> "Hardware Lab"

File Edit View Insert Format Tools Table Help Last edit was yesterday at 10:26 PM

Comments Share

Normal text Arial 14 More

Windows

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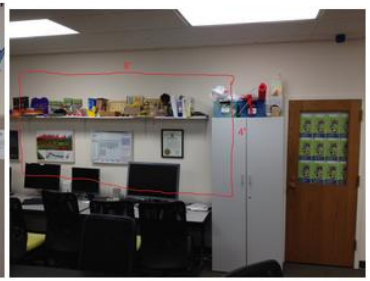
Krist: I think the windows will be great. A minor addition maybe a curtain that you can cover the "hardware lab" windows during brown bag or a private meeting in the main lab.

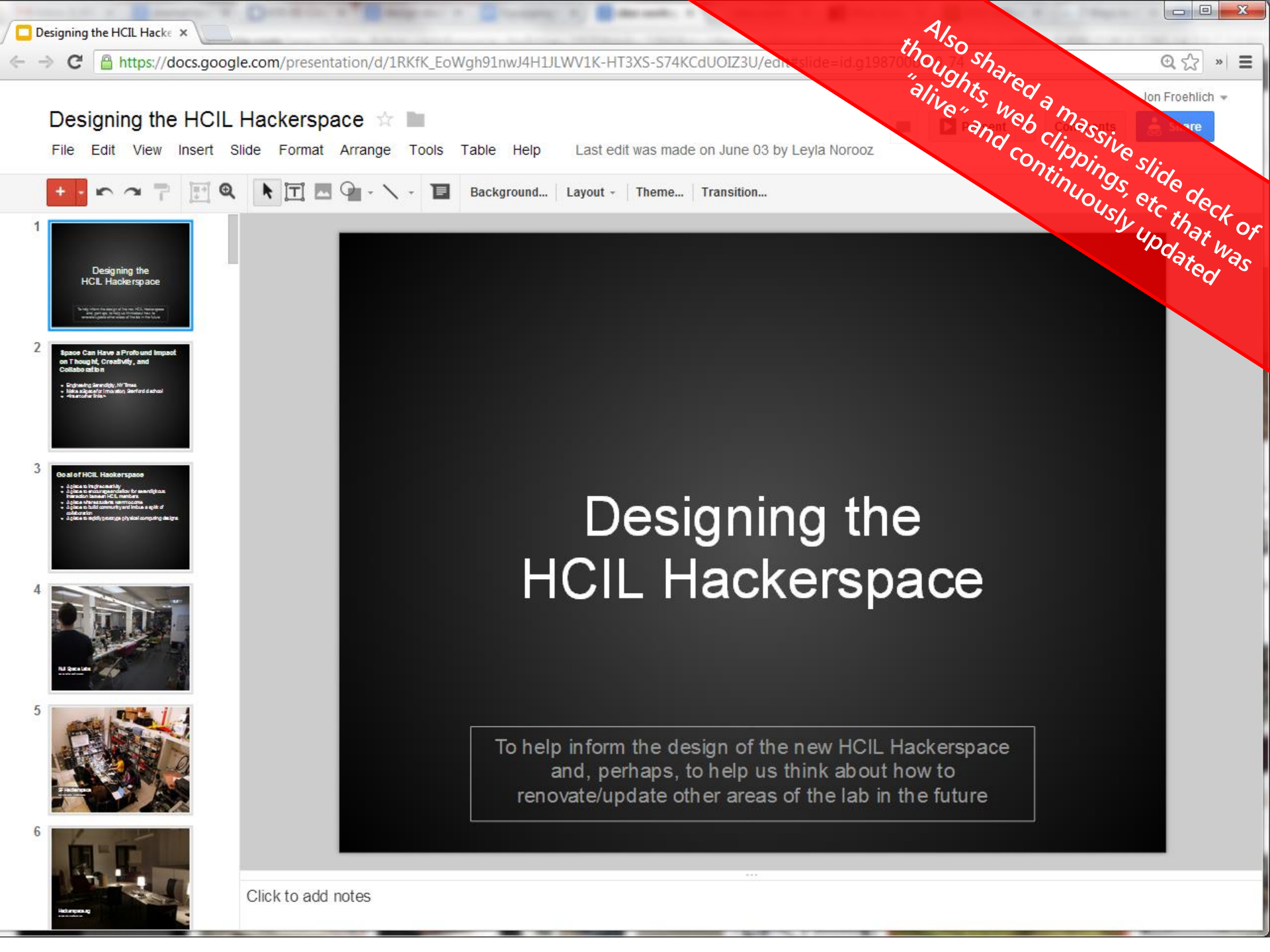
Tak : Adding windows is a great idea. How about a big twin glass door which can make the room feel much bigger? With a glass door the room may look like a part of the lab. But of course it will cost much more money.



Configuring the Space for Creative Work

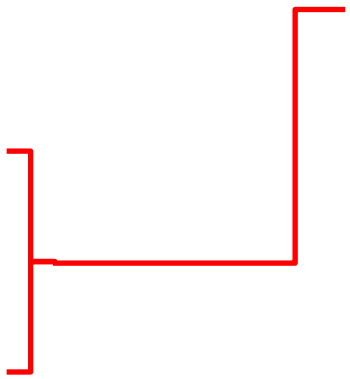
I'm a huge believer in how space, architecture, and the overall flavor of a place can influence creativity and thought. I want the hackerspace (and the HCIL area as a whole) to inspire creativity, free thinking, and imagination. I also want the space to be equipped with the tools necessary to support creative work

Google Docs enabled multiple parties to easily provide feedback and even make their own edits to the planning doc


Designing the HCIL Hacke
https://docs.google.com/presentation/d/1RKfK_EoWgh91nwJ4H1JLWV1K-HT3XS-S74KCdUOIZ3U/edit#slide=id.g198700
Designing the HCIL Hackerspace
File Edit View Insert Slide Format Arrange Tools Table Help
Last edit was made on June 03 by Leyla Norooz
Jon Froehlich
Background... Layout Theme... Transition...
Designing the HCIL Hackerspace
To help inform the design of the new HCIL Hackerspace and, perhaps, to help us think about how to renovate/update other areas of the lab in the future
Click to add notes
Also shared a massive slide deck of thoughts, web clippings, etc that was "alive" and continuously updated

My Approach

Read.
Learn.
Remix.
Design.
Sketch.
Communicate.
Get Feedback.
Revise.
Build.
Use.
Iterate.
Use.
Iterate.
...



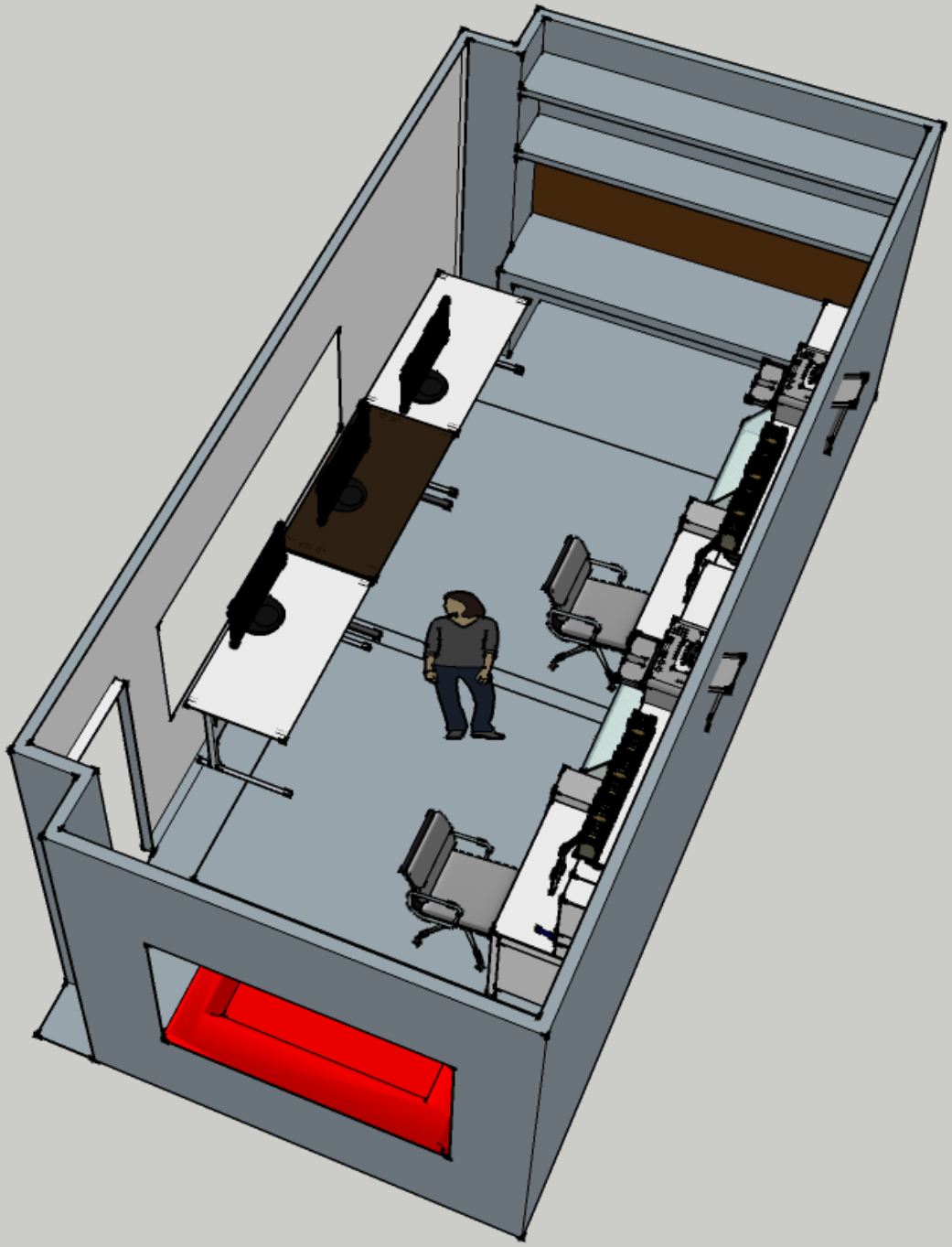
After sketches, sharing design docs, getting feedback, I made more "hi-fidelity" prototypes of the space

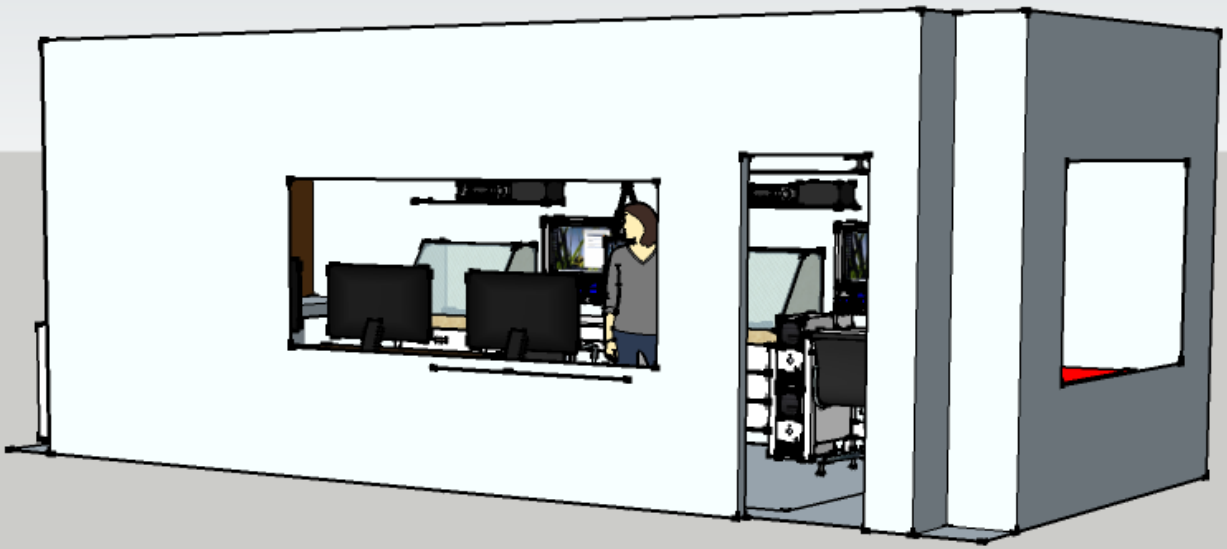
The easiest way to draw in 3D

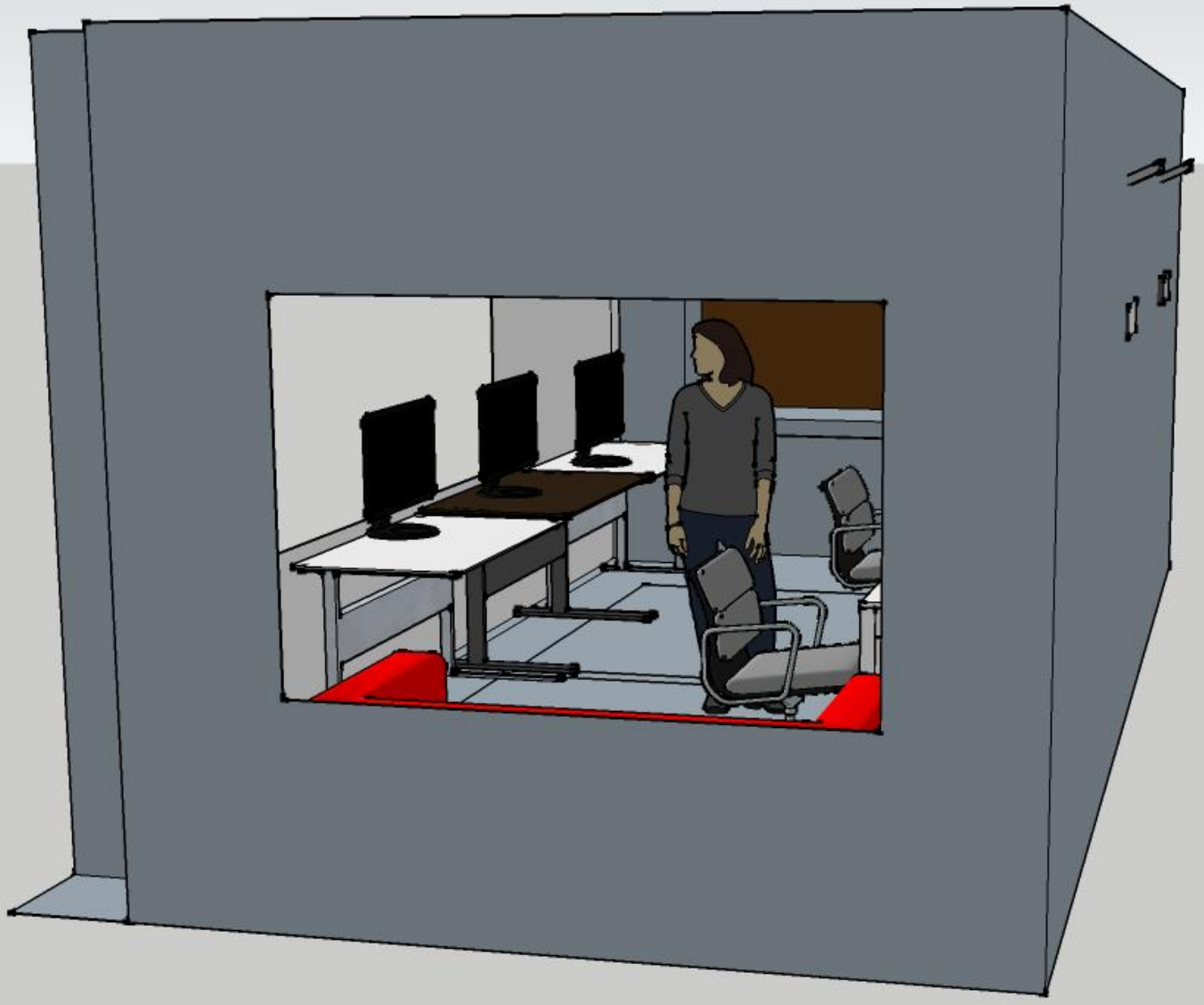
You love what you do. Now love how you do it.

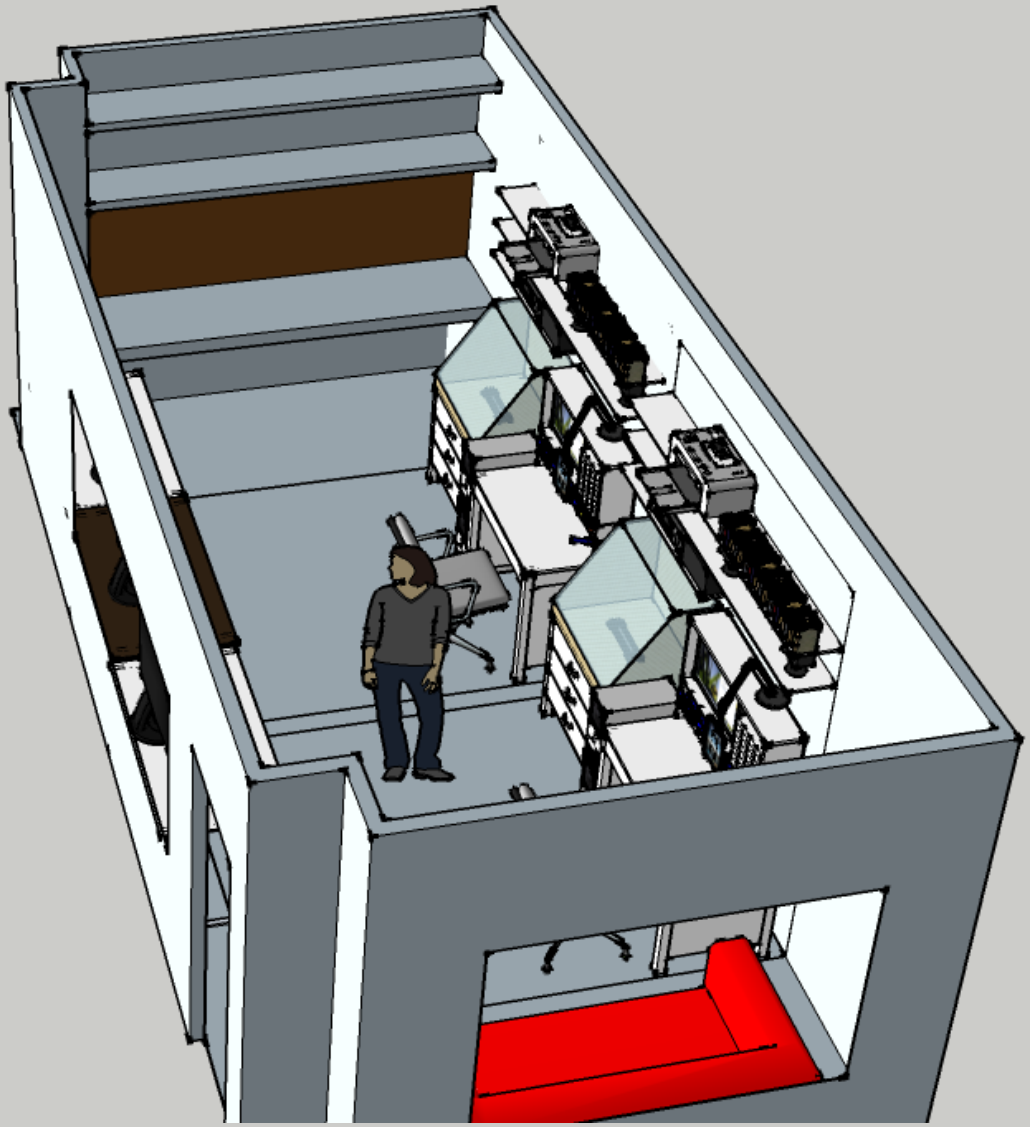
Download SketchUp

What's new in SketchUp 2013?









Implementation

Hard Work

Ingredient #1

Money

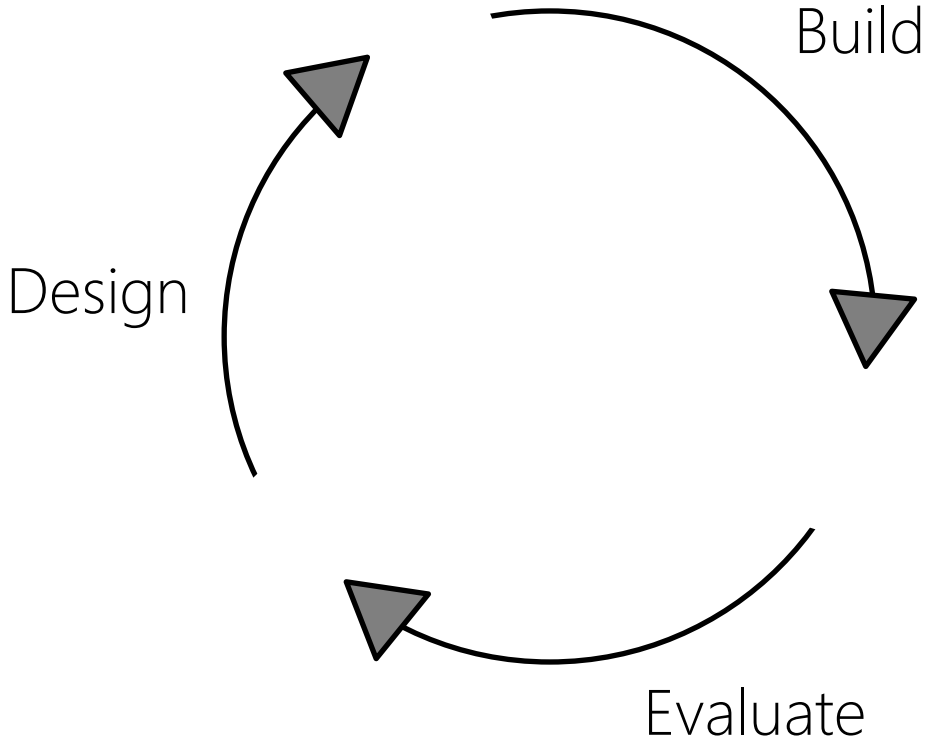
Ingredient #2

People

Ingredient #3

Iteration

Ingredient #4



People

Ingredient #5

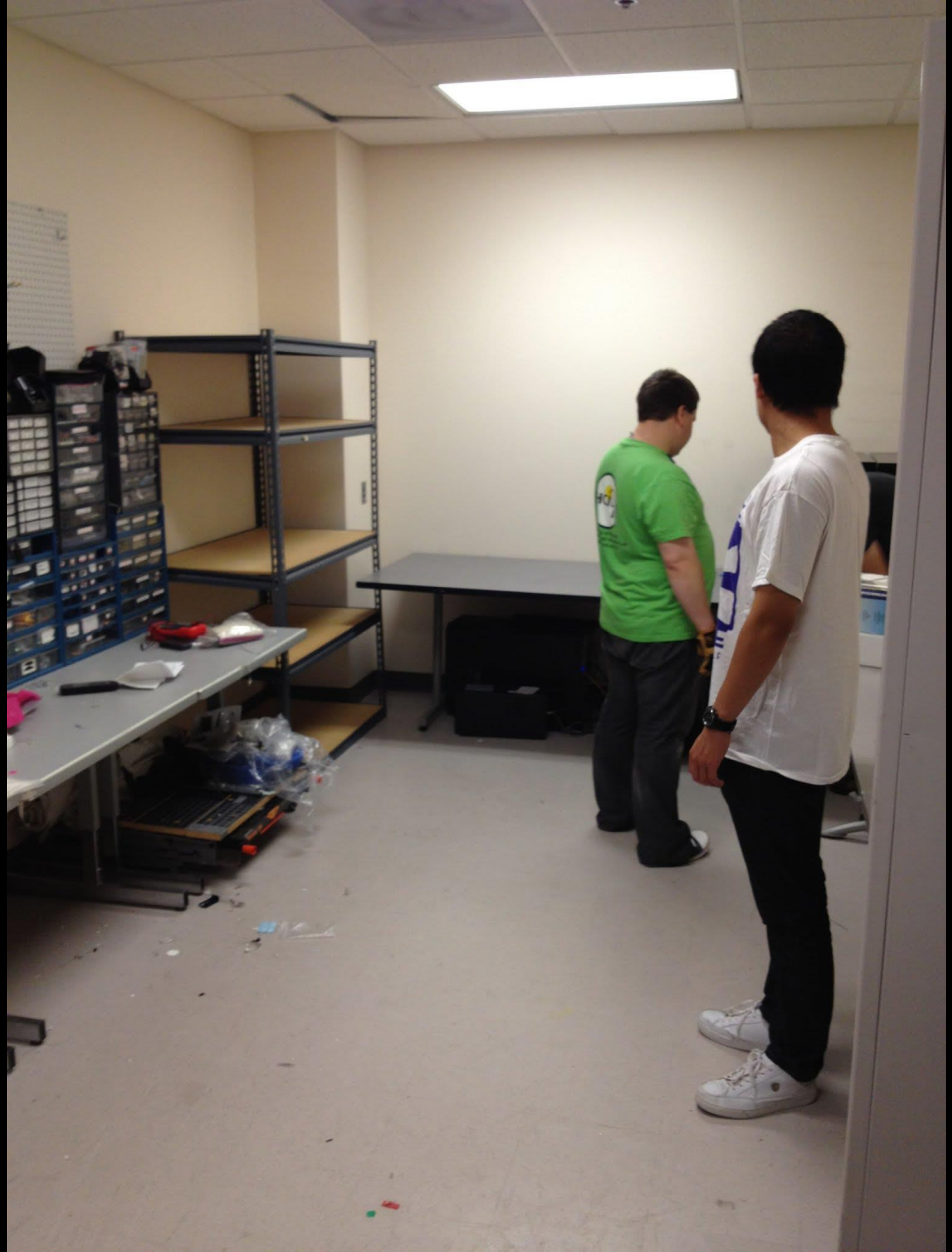
People

Ingredient #6

Transforming the Space


Deloitte
MARSHM
homelife


Deloitte



The Windows


HCIL
HCIL
Google


6'
Glass window
HCIL
4'
Logo will be shrunk and
reprinted to fit window.
Should look awesome! ☺
Google

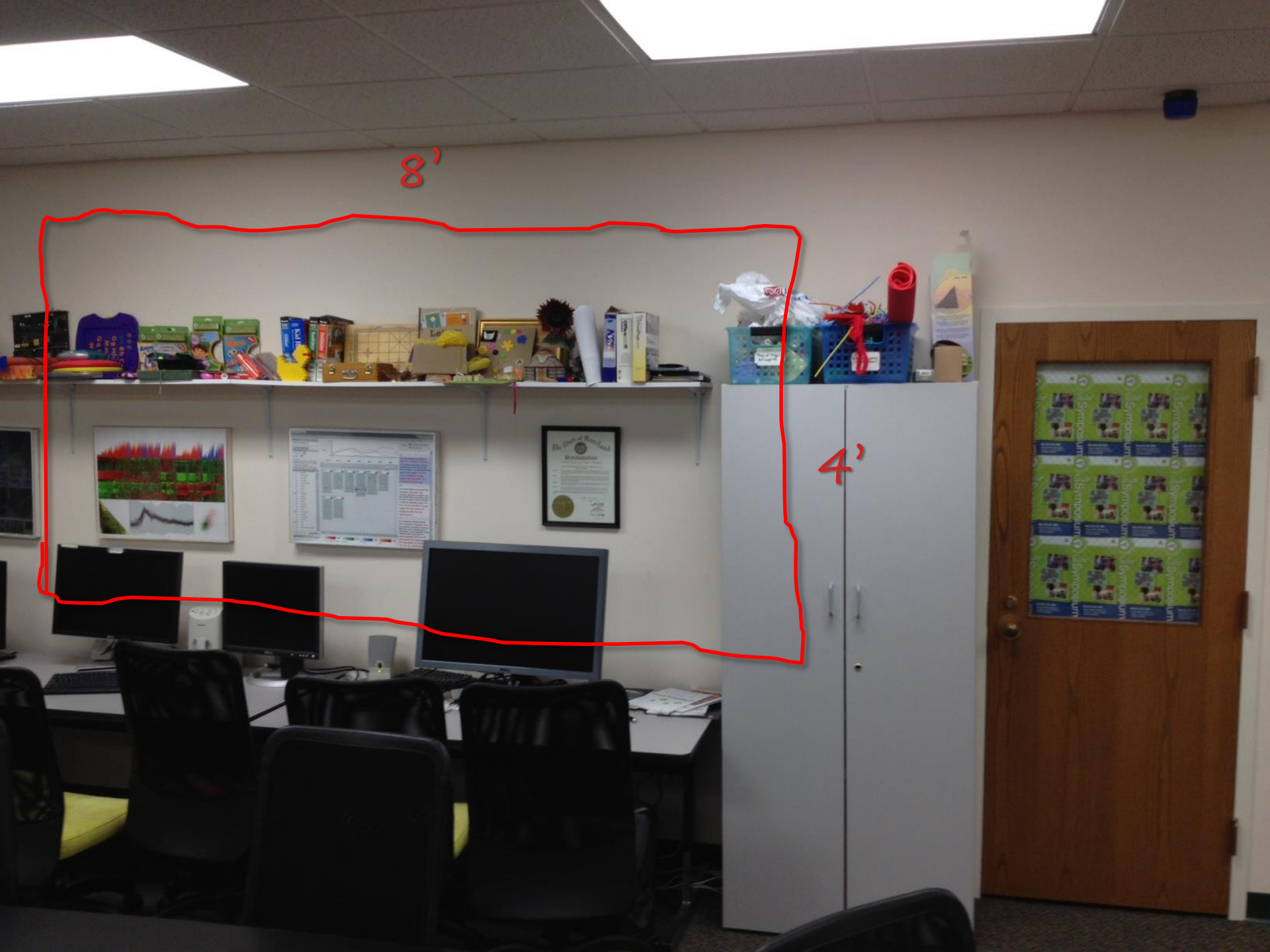

HCIL
2105


HCIL


HCIL


HCIL


HCIL
FREE TO
GOOD HOME!


8'
4'

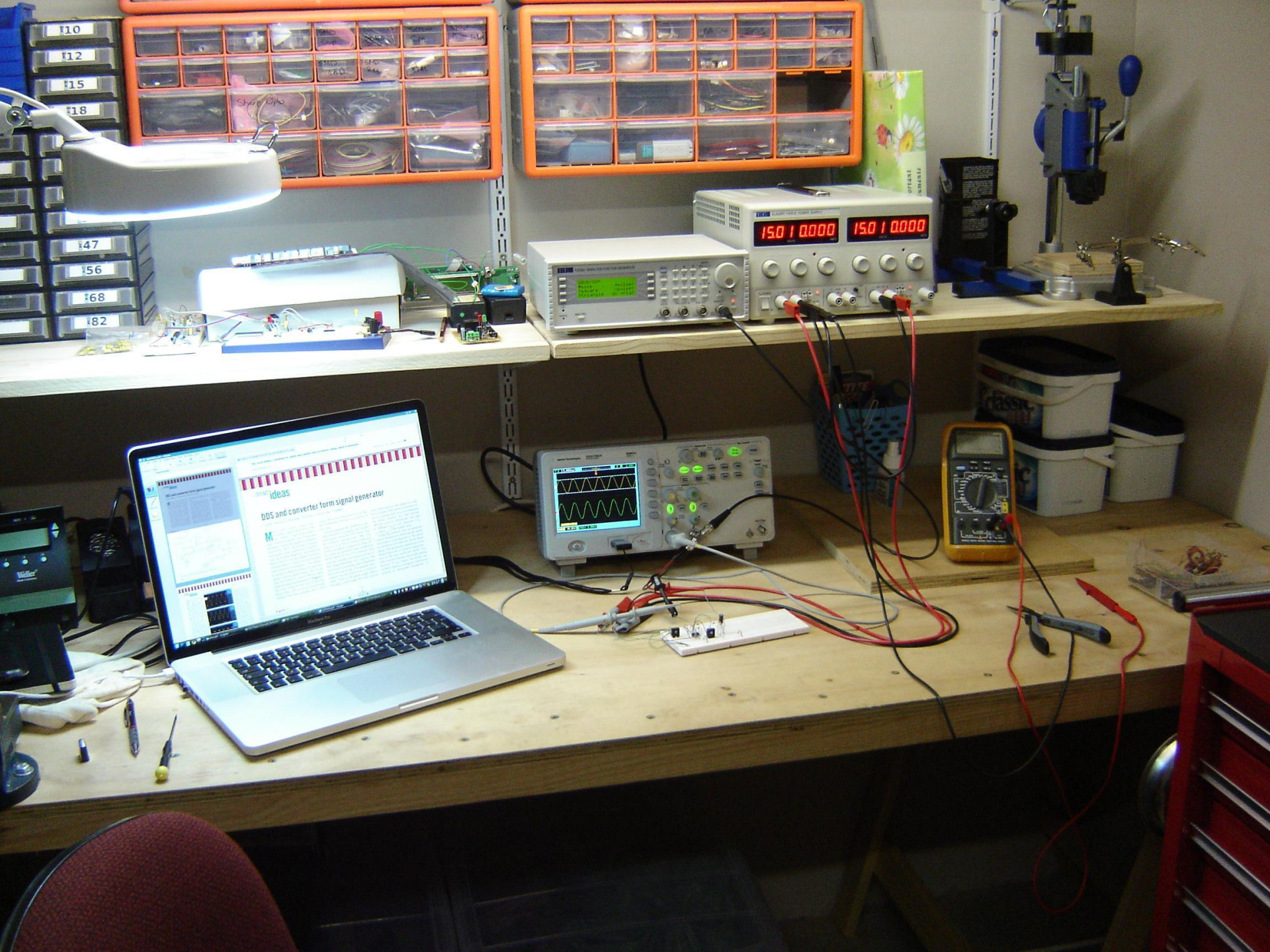

2018
2023
QueryKids
HUSKY

Designing, Building, & Installing the Workbench


VOLT
VOLT
VOLT
VOLT

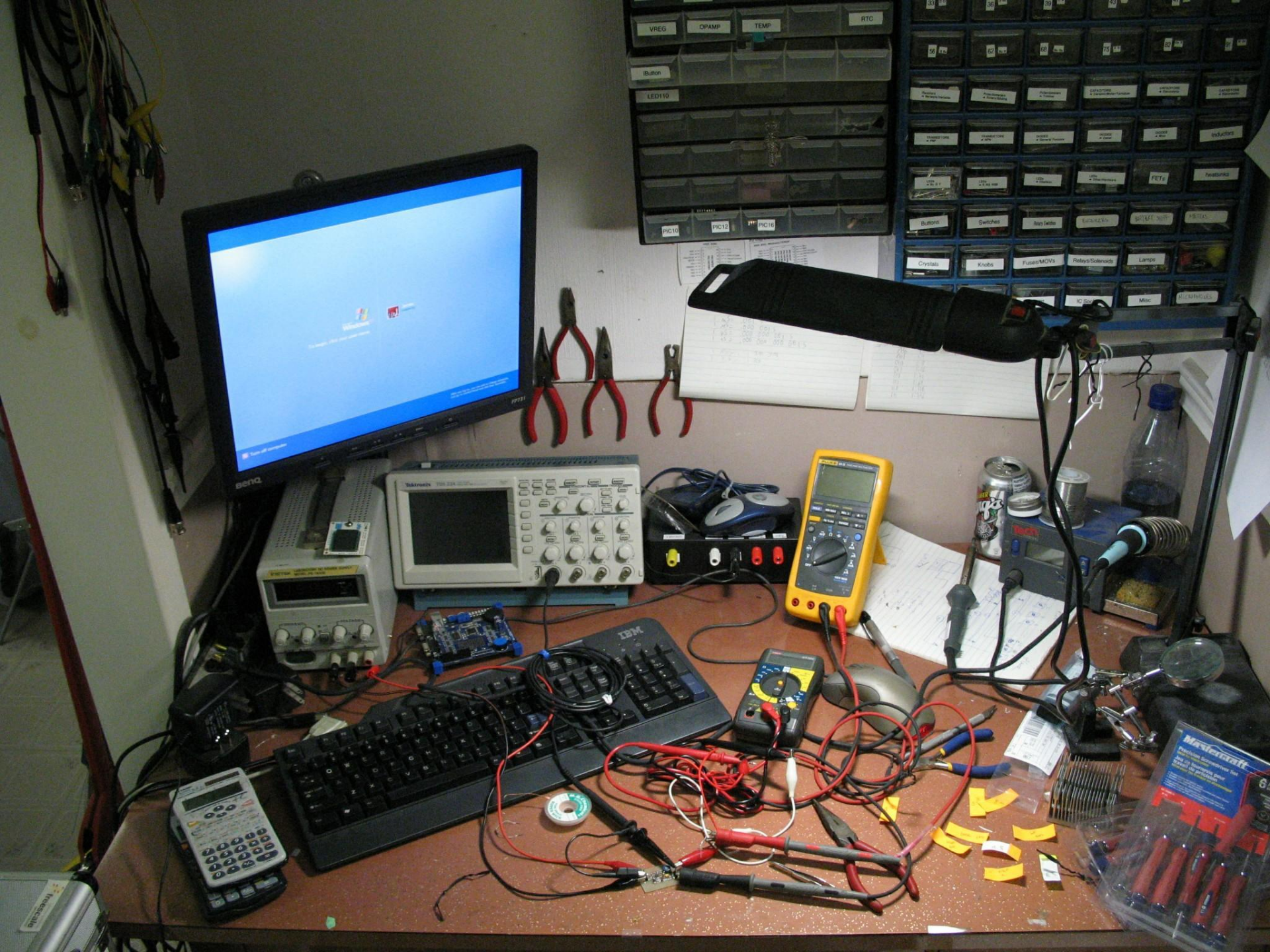

HANDBOOK


RIGOL
12 x 750ml
Weller
element14
DONAU
OKI


ideas
DDS and converter form signal generator


C-17
GLOBEMASTER III
Guardian Angels.
K3TEN
K3TEN
SPECTRUM ANALYZER


PERONI
NASTRO AZZURRO
MODEL RAILWAYS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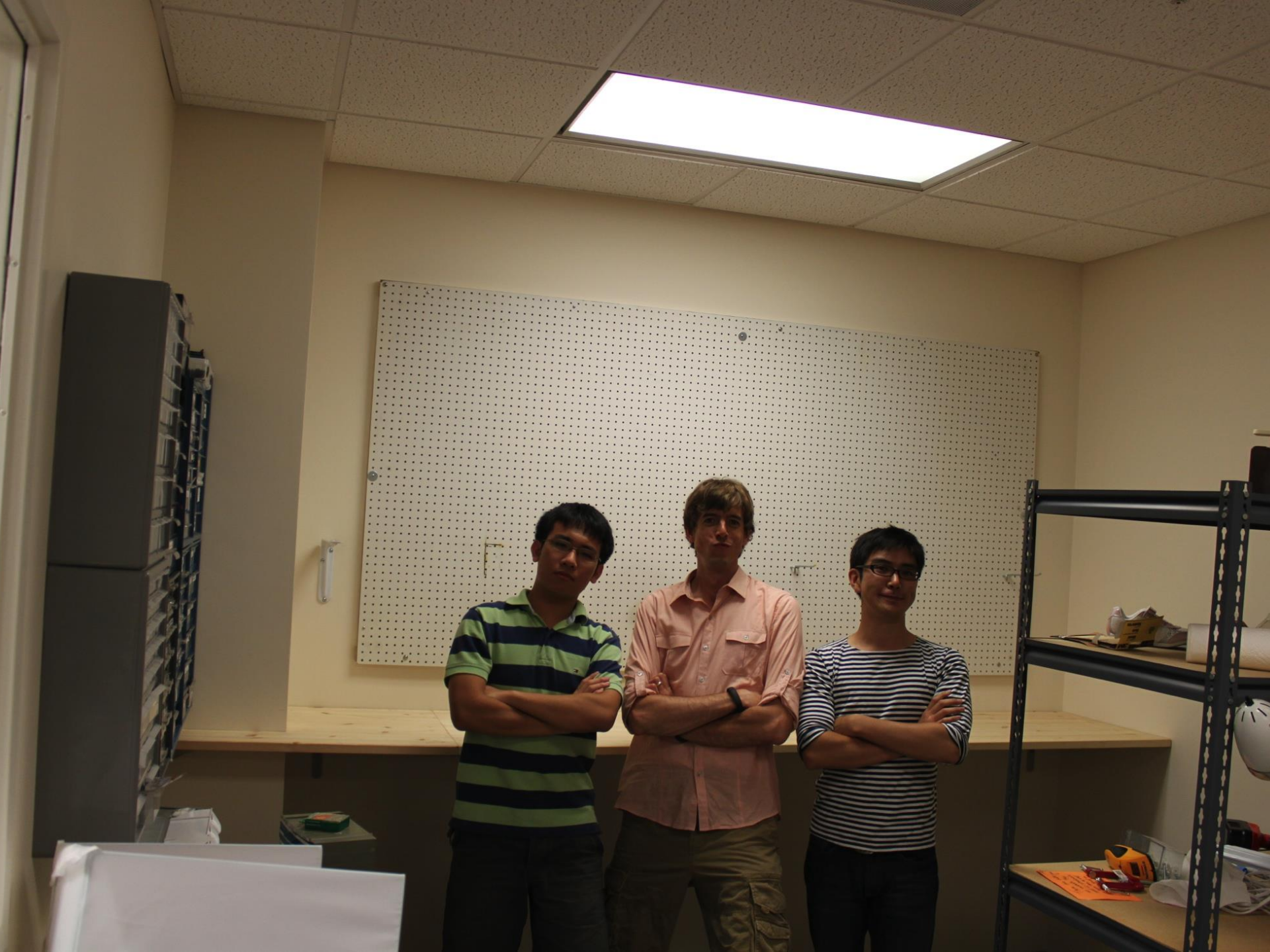
OPAMP
TEMP
RTC
iButton
LED110
PIC10
PIC12
PIC16
Buttons
Switches
Relay Sw
FETs
heatsinks
Inductors
Crystals
Knobs
Fuses/MOVs
Relays/Solenoids
Lamps
Misc
benq
IBM
Tektronix
Fluke
Mastercraft


FLUX-OFF
TUNER

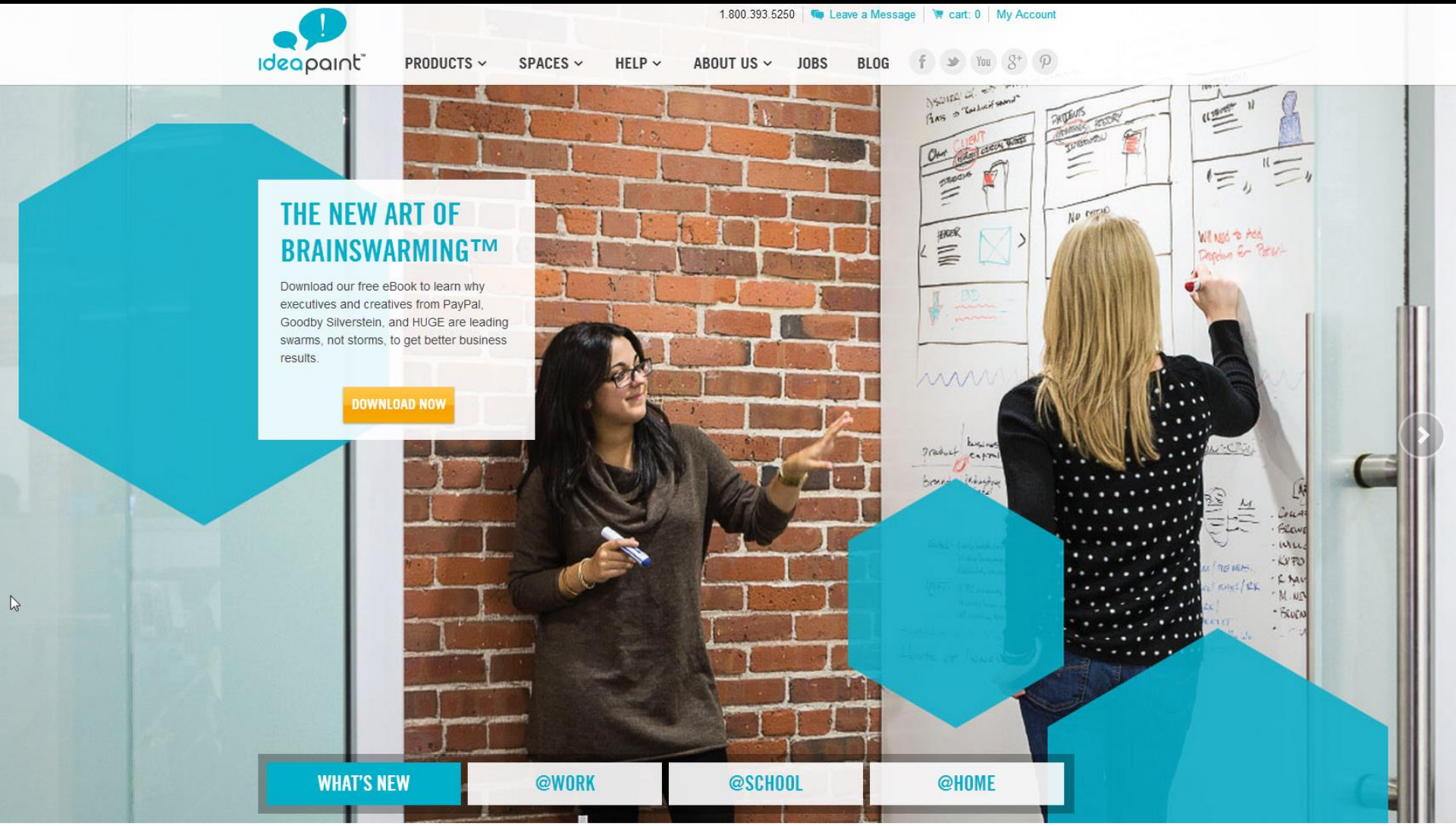

FELIX RUSU
C++
CALCULUS


IKEA


EXIT



Building & Installing the Whiteboards



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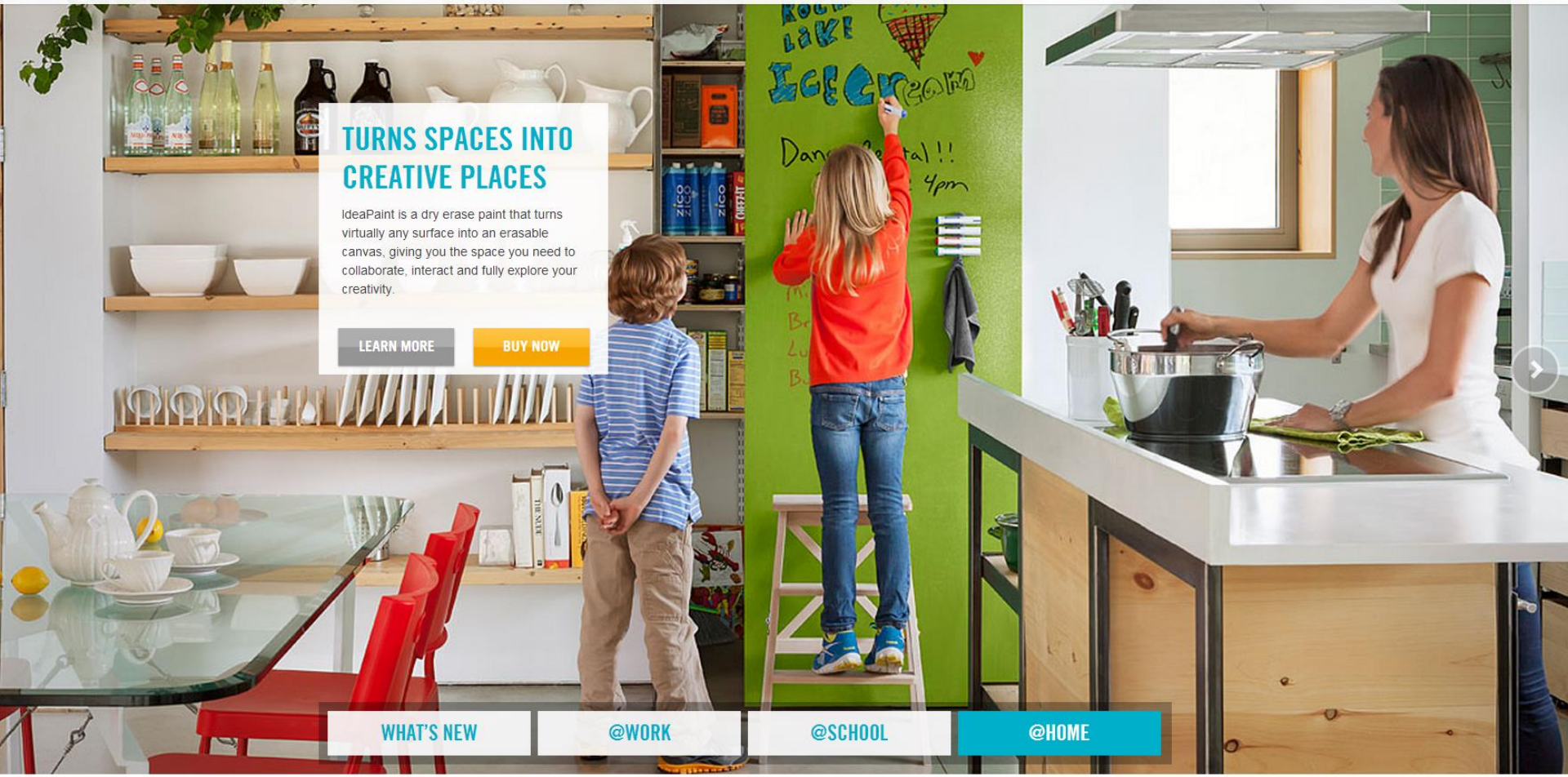
BIG IDEAS BLOG

WHY IDEAPAINT?

READ OUR COLLABORATION eBOOK



BIG IDEAS BLOG

WHY IDEAPAINT?

READ OUR COLLABORATION eBOOK

Reebok Design Studios

IdeaPaint Marketing Video, 2011

Paint one wall: ~ 210 sq ft

$$\frac{\$190}{50\ sq\ ft} * 210\ sq\ ft = \$798 + \$15\ shipping$$

=$813

whiteboard 4x8 - Google S

https://www.google.com/search?q=whiteboard&rlz=1C1CHFX_enUS480US480&oq=whiteboard&aqs=chrome.0.69i57j0l2j5j69i62l2.1396j0&sourceid=

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Google whiteboard 4x8

Jon Froehlich 4 + Share

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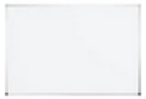
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$307.99
Quill


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$575.99
BizChair


Ghent Harmony - H...
$439.00
AllWhiteBoards


Porcelain Board, 4x8...
$401.16
TigerDirec...

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Amazon.com: Quartet **4 x 8** Feet Total Erase Classroom **Whiteboard** (TEA408): Office Products.

How to Make a Custom Dry Erase Board or **White Board** for under ...

www.youtube.com/watch?v=EgqrQqhghw4
Sep 7, 2009 - Uploaded by Whiteboardsorg
This video shows you how I made a **4'x'8'** dry erase **white board** for $35. It shows the parts to get at ...

4x8 Whiteboard | eBay
www.ebay.com › ... › Presentation, A/V & Projectors › Dry Erase Boards
$248.61 - In stock
5+ items - Find great deals on eBay for **4x8 Whiteboard** in Office Dry Erase ...
NEW Claridge 4'x8' LCS Deluxe Whiteboard LCS2048R. $399.00.
Lorell Aluminum Frame Dry Erase Board - 4' x 8' - White Board. $239.11.

Thrifty White 32 sq. ft. Hardboard Panel Board

Model # 709106 Store SKU # 346428

★★★★½ (9) | Write a Review

$13.65 / each

Store Only

Buy Online, Pick Up In Store Today

Check Store Inventory +

Zoom | More Views

Quantity: 1

Item must be picked up in store

Pick Up In Store
Free

Available TODAY
28 In Stock
at NE Washing...
(Change Pick Up Store)

+ ADD TO CART

+ ADD TO MY LIST

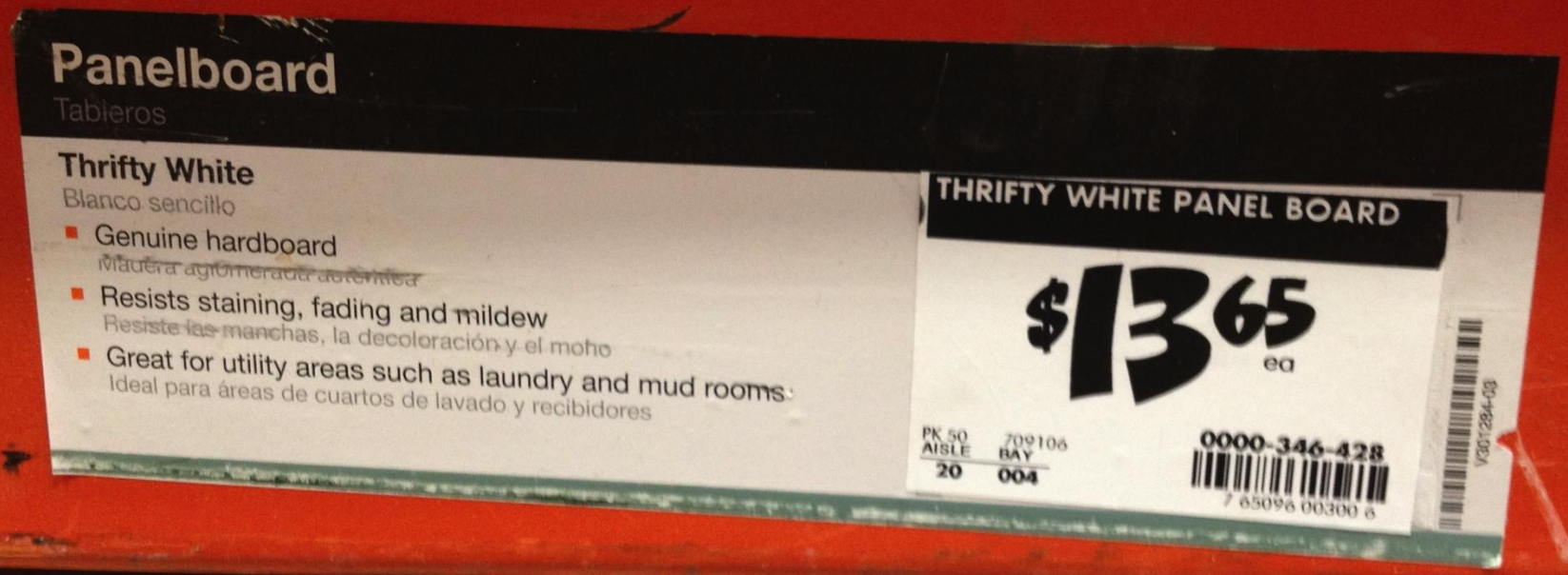
Product Overview | Specifications | Customer Reviews | Shipping Options

PRODUCT OVERVIEW

The Thrifty White 32 sq. ft. MDF Panel Board can be used to add style to more functional spaces in your home, such as laundry rooms, utility rooms and mud rooms. The acrylic coating resists staining, fading and mildew for long-lasting use.

California residents: seeProposition 65 information

- MDF construction
- Acrylic coating resists staining, fading and mildew
- Smooth white finish
- Use in utility rooms, laundry area and mud rooms


Panelboard
Tableros
Thrifty White
Blanco sencillo
Genuine hardboard
Madera aglomerada auténtica
Resists staining, fading and mildew
Resiste las manchas, la decoloración y el moho
Great for utility areas such as laundry and mud rooms
Ideal para áreas de cuartos de lavado y recibidores
THRIFTY WHITE PANEL BOARD
$13 65 ea
PK 50
AISLE 20
709106
BAY 004
0000-346-428
7 65096 00300 6
V3G1284-03


SPACE
Things to get
- Double sided copper tape
- small magnets
- velcro
V=IR
Smart Shoe
ADC
Our piezo
2.2kΩ
V=IR
Free Arm Sewing Machine
brother
BAD BATTERIES
1A3
HCII


Dremel tool with
Mini Saw attachment


Wood glue

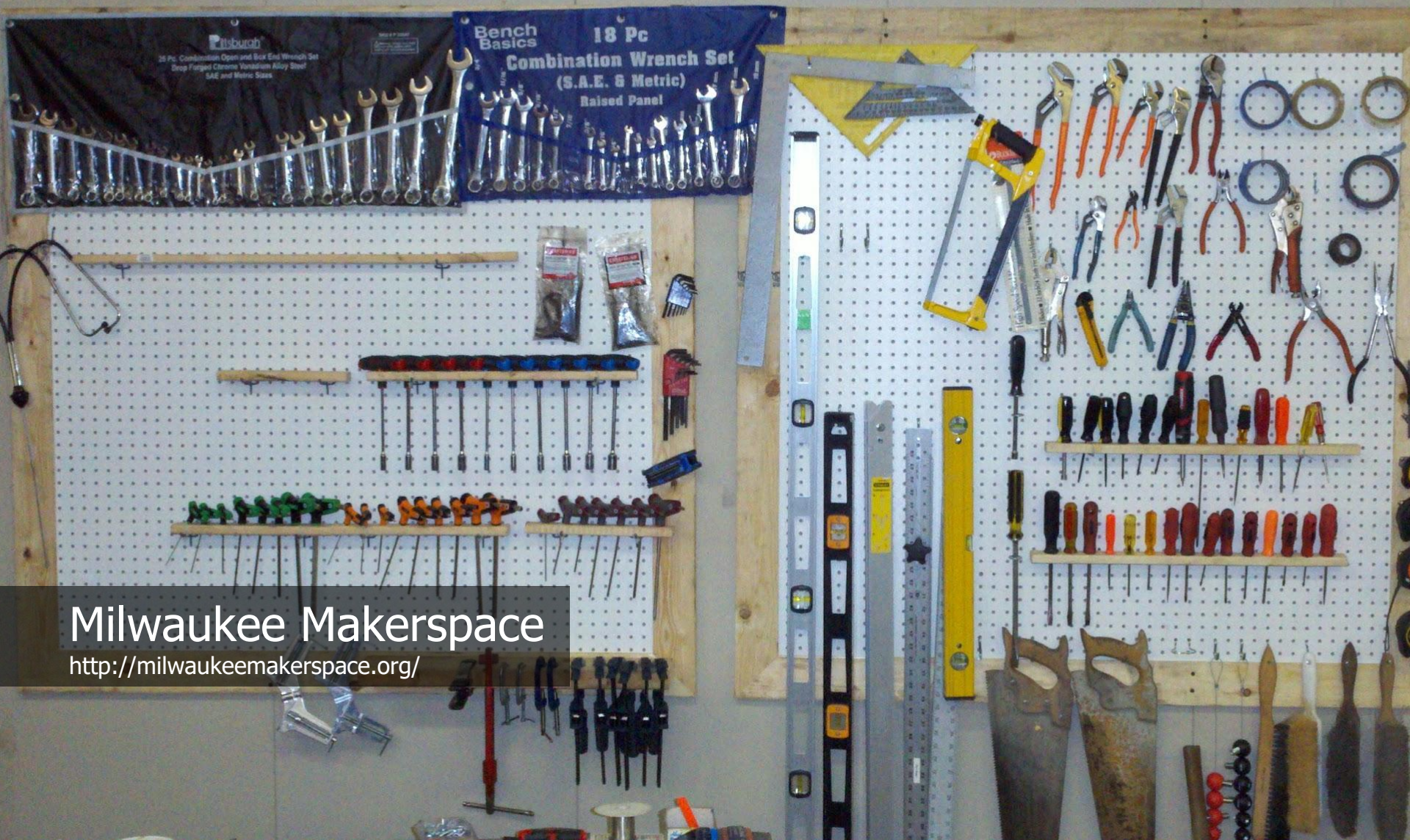

Long arms


Long arms

Storage & Tools Ready At Hand

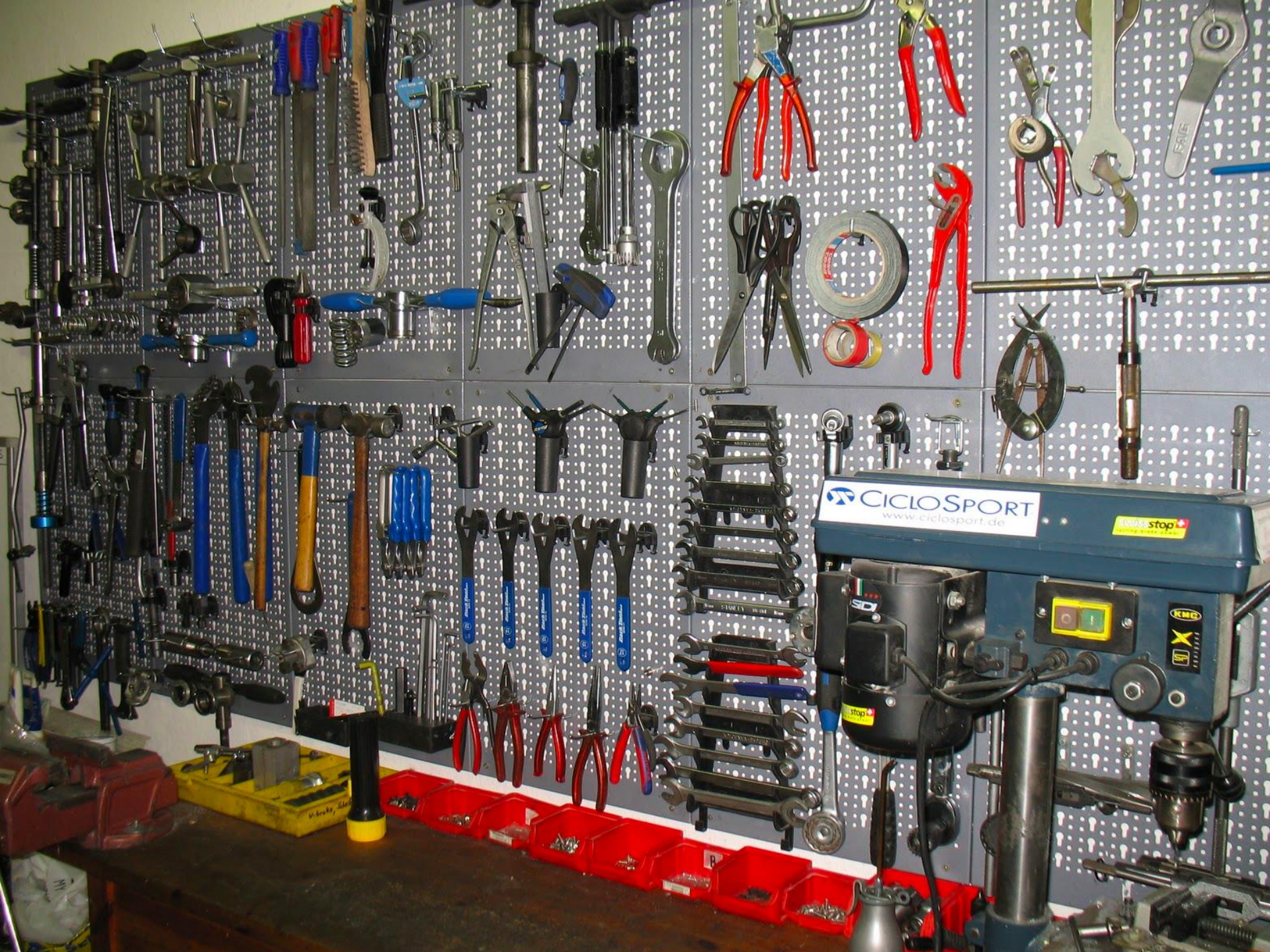
Making things visible but not overwhelming...


HACK
SHELF
BANKERS BOX



Milwaukee Makerspace

http://milwaukeemakerspace.org/


CICLOSPORT
www.ciclosport.de


3 9

Stanford d.School

http://goo.gl/PKLwt8

Equipment

Tags

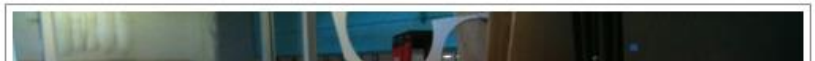
Edited Aug 2, 2011 6:11 PM by Adam RoyaltyÖ

Materials List

At the d.school

Here are some supplies that we keep handy.

Click for full-size image



The idea is to use low-resolution nimble materials that can be manipulated quickly.

We use this with the Wallet, Gift Giving, Mechanic and other 1 hour design challenges.

Closures

Velcro

zip ties

Magnets

snaps

masking tape

duct tape (color would be ideal)

scotch tape

glue sticks

paper clips, (asst colors ideal)

decorative brads (square, crystal)

Tools

hole punch

scissors

stapler (with staples)

hot glue/glue guns

rulers

Base Material

assorted fabric swatches

plastic

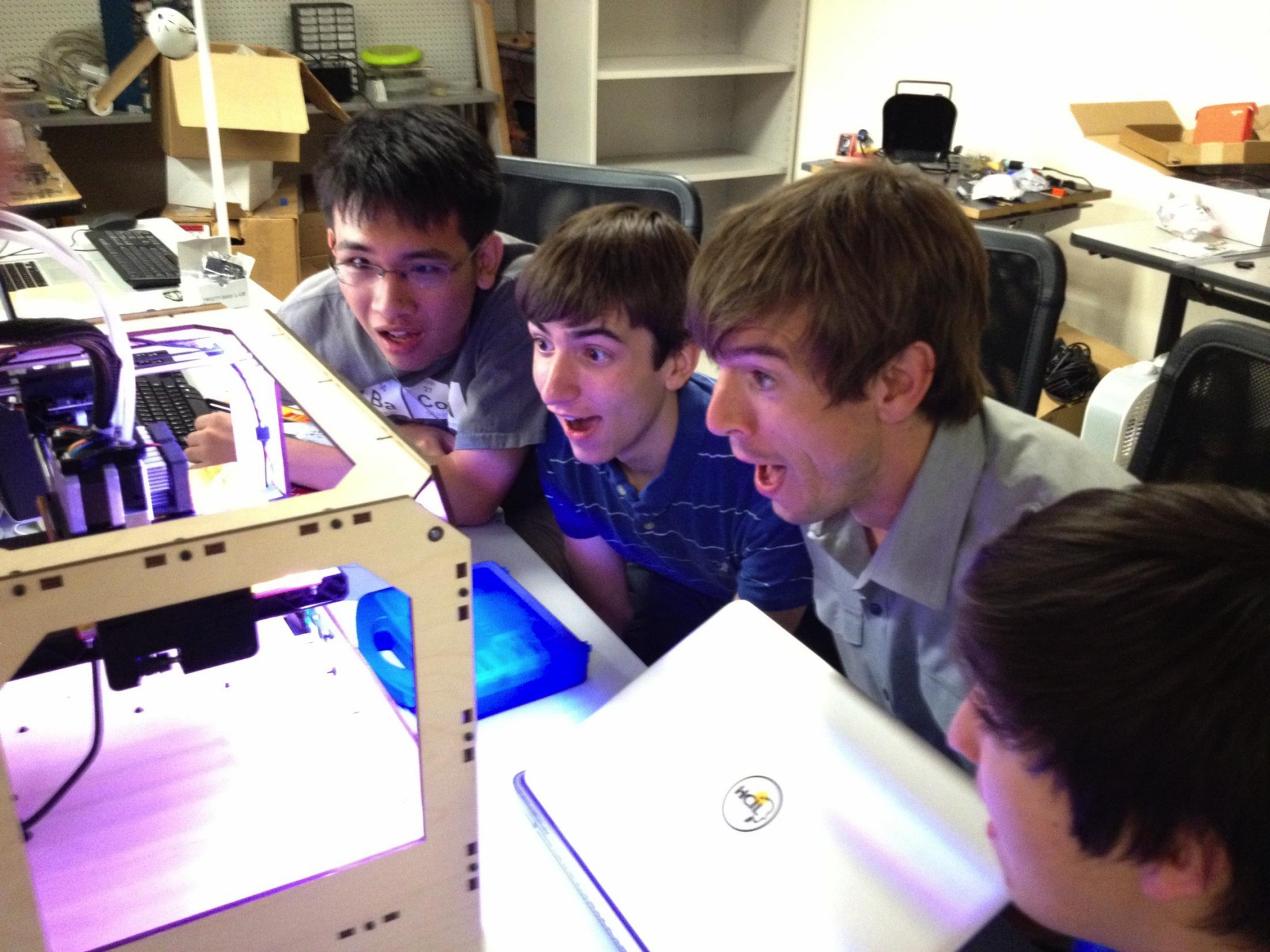
textured cardstock

Equipment

3 soldering stations with carbon filter
High quality oscilliscope
4 digital multimeters
2 AR Drones
E-textile station w/2 mannequins, sewing machine, & materials
12 Kinects
Multiple Arduino platforms
Beaglebone, Raspberry Pi, .NET Gadgeteer
3D-Printer
Multiple tablets, smartphones
Various electronic equipment (sensors, actuators, etc.)

Should be getting a CNC soon!


MakerBot
FRAGILE
MakerBot




ARM CORTEX-M0

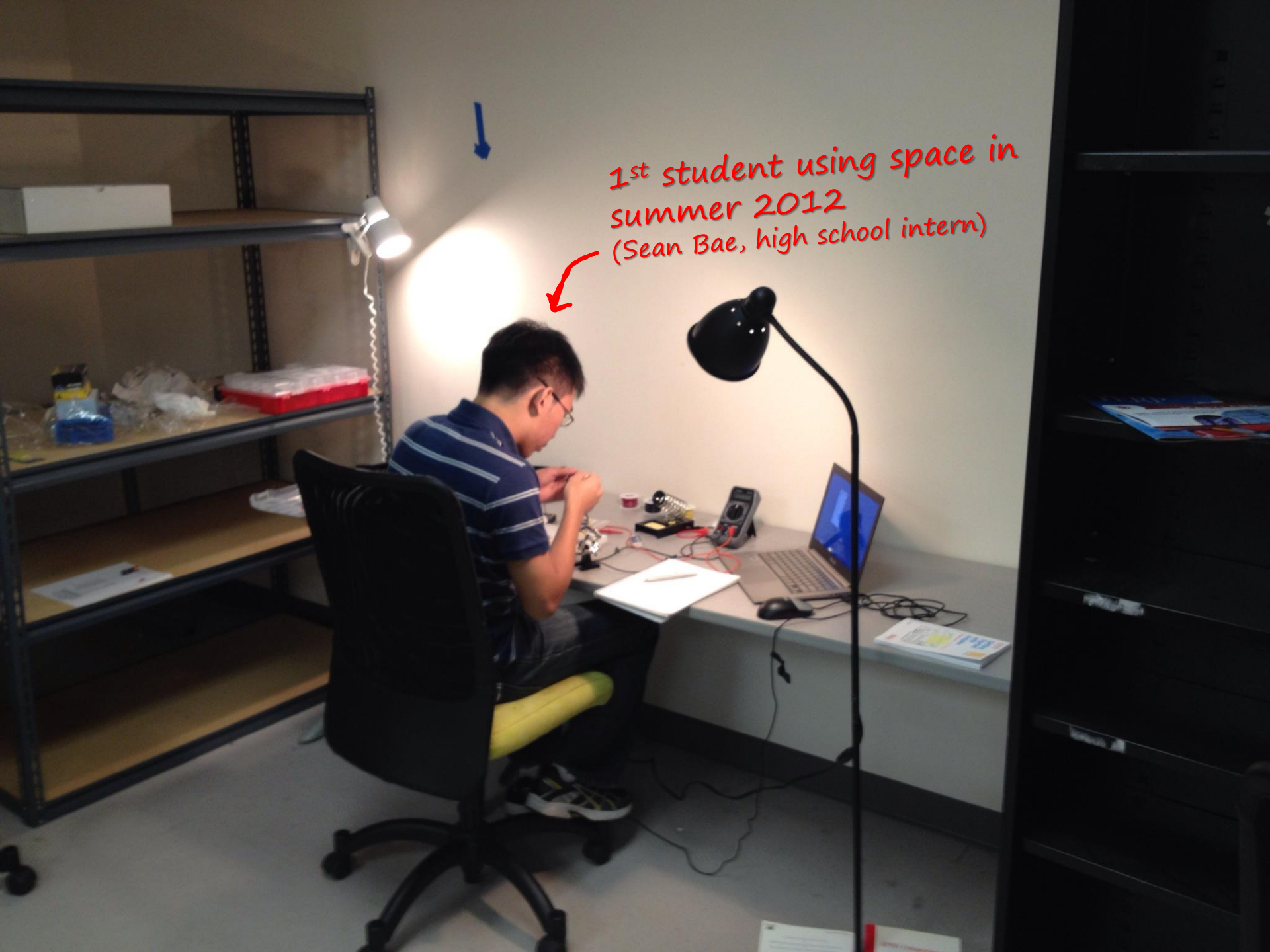
My Approach

Read.
Learn.
Remix.
Design.
Sketch.
Communicate.
Get Feedback.
Revise.
Build.
Use.
Iterate.
Use.
Iterate.
...

My Approach

Read.
Learn.
Remix.
Design.
Sketch.
Communicate.
Get Feedback.
Revise.
Build.
Use.
Iterate.
Use.
Iterate.
...

Hackerspace 0.1 Completed


1st student using space in summer 2012
(Sean Bae, high school intern)

Hackerspace 1.0 Completed


HCiL
hackerspace


HCIL
FREE TO
GOOD HOME!

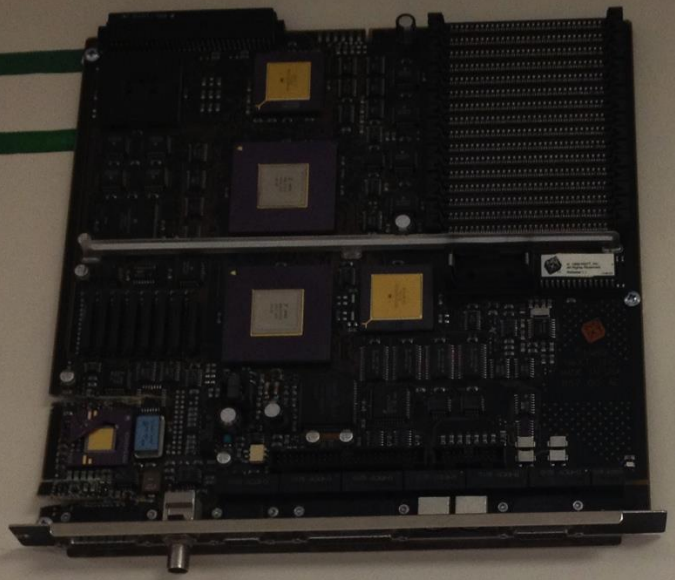
Hackerspace 2.0 Completed


SLACKER


CHI 2014
SLACKER
2 in → .914 w
3 in → 1.372 w
5 in → 2.286 w ×4
6 in → 2.743 w ×3
19.659 w
matt
mike


2018
2023


2018
2023



NeXT MOTHERBOARD (1989)

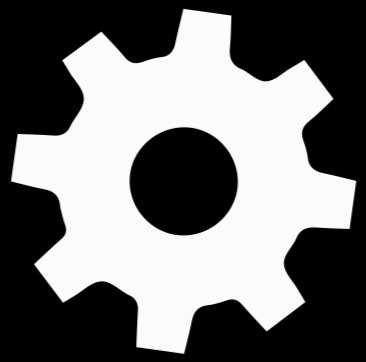
TI BEAGLEBONE (2012)

Hackerspace Branding


HCIL
hackerspace


HCIL

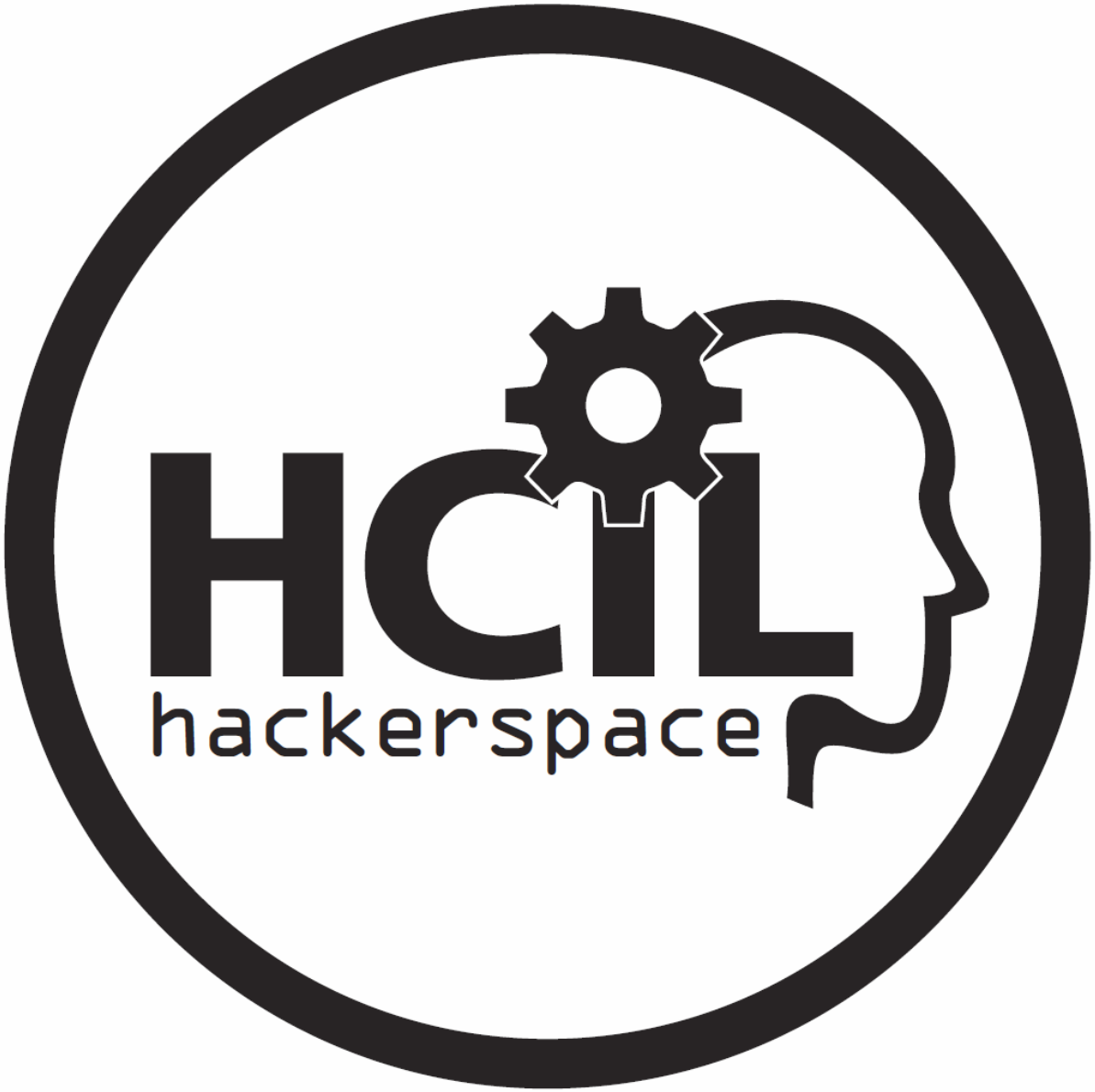

HCIL
hackerspace



Hackerspace Fridge


Danby
DBC120BLS
Danby
120 CAN* BEVERAGE CENTER
Fan forced cooling for improved temperature control
Free-standing application only
12 month warranty with in home service


2018
2023


HCIL
hackerspace


HCIL
snackerspace


HCIL
snackerspace


3. Encourage wild ideas
4. Build on the ideas of others
5. Go for quantity
6. One conversation at a time
7. Stay focused on the topic
Please
Danby


75 MHz SURFACE USE ONLY
HCIL
snackerspace

In Closing

MGM Presents

"SOYLENT GREEN"

Panavision® & Metrocolor

If You Build It, They Will Come

Reflecting on the Successes (and Failures) of Building the HCIL Hackerspace

HCIL Brown Bag Lunch
September 12th, 2013

Human Computer Interaction Laboratory

@jonfroehlich
Assistant Professor Computer Science

University of Maryland

End-User Design & Customization

Leah Buechley, CRAFT Meets Tech at MIT, http://youtu.be/XrNz9deYlJU

Sparkfun Wall

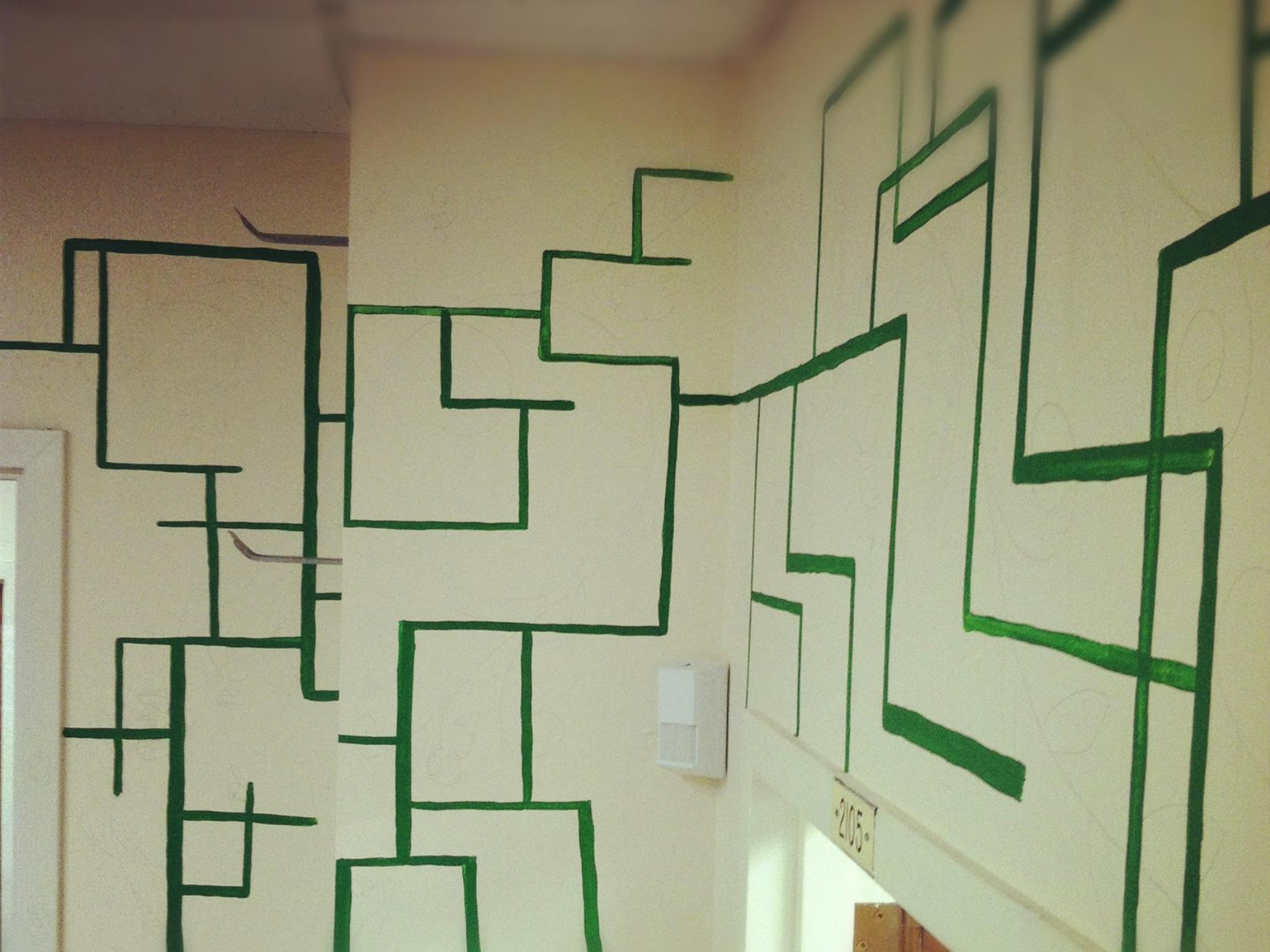
By Dia Campbell

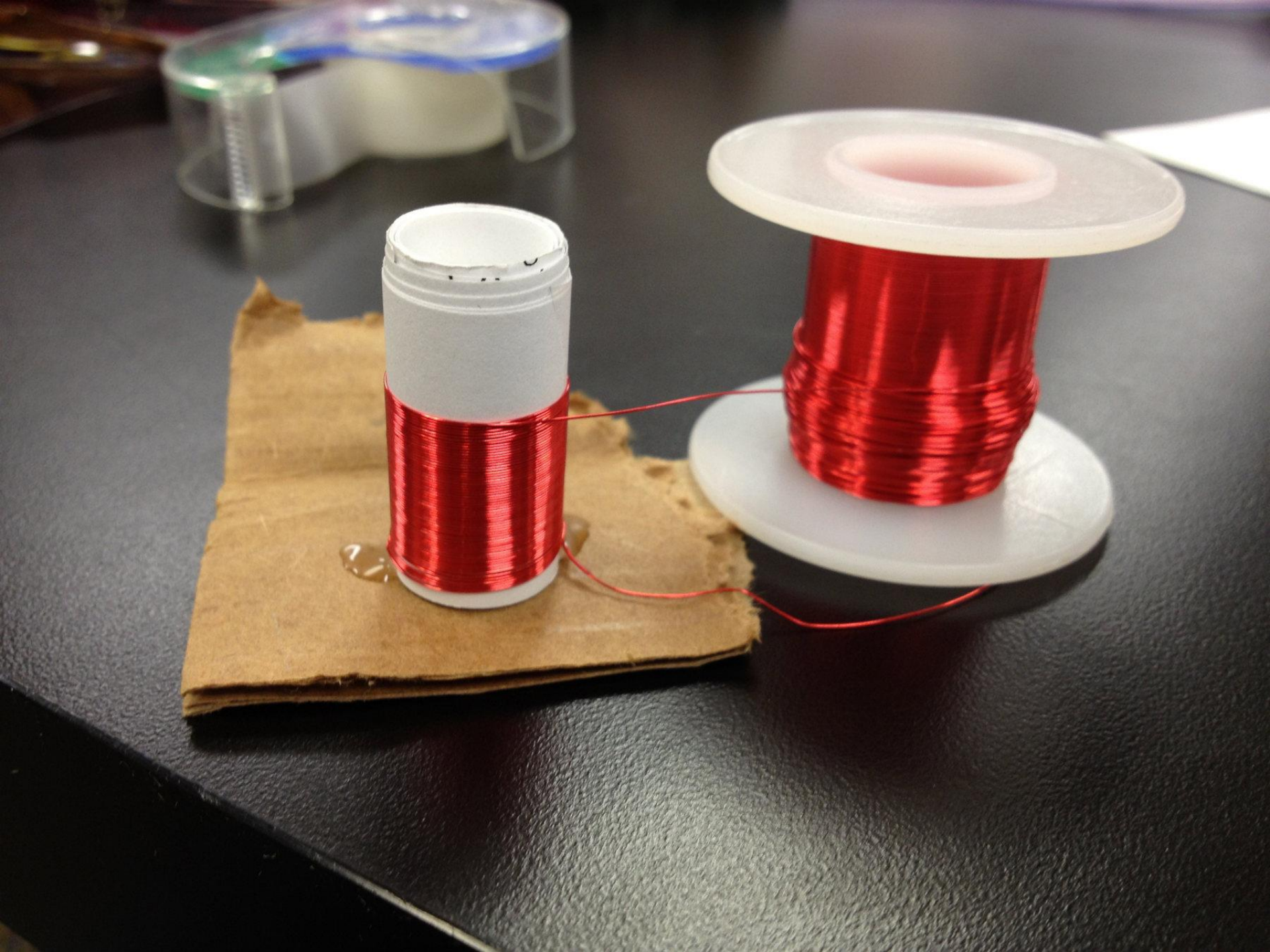
Sparkfun Wall

By Dia Campbell

Sparkfun Wall

By Dia Campbell

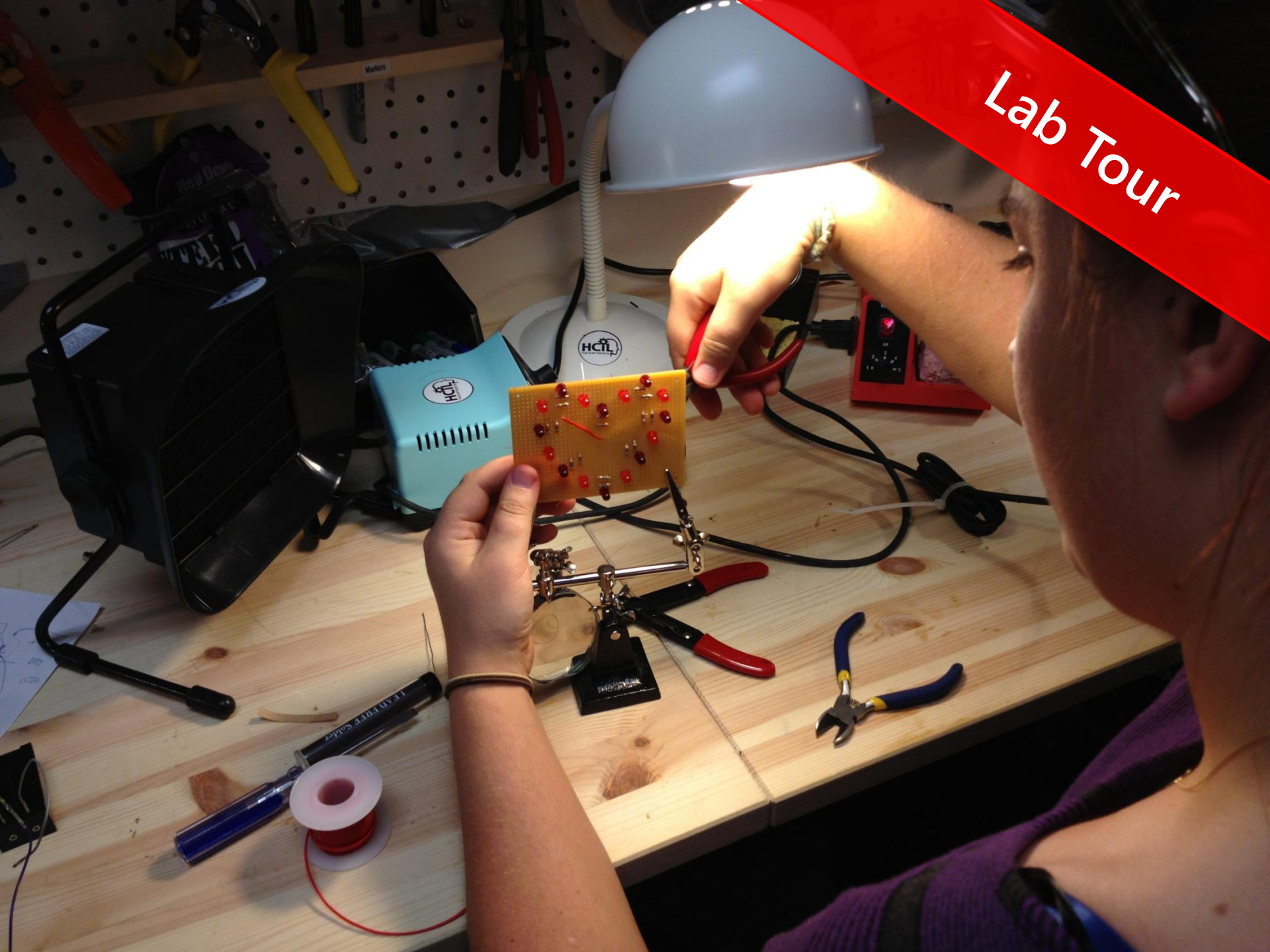

205




SELECT
Garlic
PASTA SAUCE


EXIT
2105
HCIL


2105
HCTL


Lab Tour

PRODUCTS

New Products [99]

Android (6)
▼Arduino (63)
Boards & Packs [17]
Shields [34]
Accessories [12]
BeagleBone (23)
Bunnie Studios (9)
FLORA (25)
FPGA (1)
mbed (12)
NETduino (14)
▶Raspberry Pi (84)
XBee (9)
▶More Dev Boards (30)

BoArduino (8)
Brain Machine (1)
Clocks & Watches (18)
Drawdio (4)
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Microtouch (5)
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How To Start A Hackerspace: Part 2 – A Place To Hack All The Things

Photo by Tomi Knuutila

Now that you have a concrete idea of who your hackers are, you also know what kind of space needs they'll have. Next, narrow down what will be done in the space. Don't forget: there's plenty of room to grow your space to include many different kinds of hackers as your Hackerspace matures (covered in later sections of this "How To").

Talk to the people you're starting the space with and make the most detailed list in a shared spreadsheet of what different hackers need to do their hacking (and keep in mind that you'll probably be adding to this list as you get into your space).

Here's an example of physical needs you may have on your list:

- 220 power
- Running water
- Ventilation
- Concrete floor
- Natural light
- Darkroom and darkroom supplies (have your photo hacker make a list)
- Air conditioned room for servers
- Area for physical hack projects
- Sound proof room for audio/video recording/editing
- 24/7 Access
- Spray paint booth
- Place to put a car lift
- Etc, Etc, Etc...

Once you have your list now you'll need to go to the next step: **How To Start A Hackerspace: Part 3 – A Home For Your Hackerspace** Stop back tomorrow!

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Lighthouse: Roadblocks and reflection

By Aaron Vanderwerff On May 11th, 2013 ⟩ Add Comment

A couple months back, Cynthia and Flavio were very frustrated. As a matter of fact, they were about ready to give up. A key element of their ìPapapa Party Shirtî (a shirt that will blink to the beat of the music) was a light organ kit, but it was incredibly glitchy and the [...]

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Pilot Profile: Piner High School Makers

By Stephanie Chang On May 3rd, 2013 ⟩ Add Comment

Dante DePaola is a biology teacher at Piner High School in Santa Rosa, California, and part of our initial group of Makerspace schools. He also happens to run a successful motorcycle business on the side. His interest in making ñ especially with regards to the rich, relevant experiences it provides for his students ñ is [...]

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Three Transformative Tools: From Old Tech to New at Analy HS (part 1)

On April 19th, 2013 By Stephanie Chang

Editorís Note: This post comes from Casey Shea, who teaches math and a

WikiSeat: Standing Up for Education

On April 15th, 2013 By moolombo

The WikiSeat website About a month ago, I took the time to chat with WikiSeat co-founder Nicolas Weidinger, as a

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Want to make a makerspace?

Check out our playbook. It covers many of the challenges involved in creating a space.

Makerspace News

Kamal Jain: What Integrity Means in Massachusetts - GoLocal Worcester

Entrepreneur aims to set up Makerspace project - Salisbury Journal

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Scott Doorley and Scott Witthoft
with a foreword by David Kelley

If You Build It, They Will Come

Reflecting on the Successes (and Failures) of Building a Collaborative Workspace to Support Creativity, Experimentation, and Making

Human Computer Interaction Laboratory

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Assistant Professor Computer Science

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Could have movie and story of ARDrone: 00007.MTS


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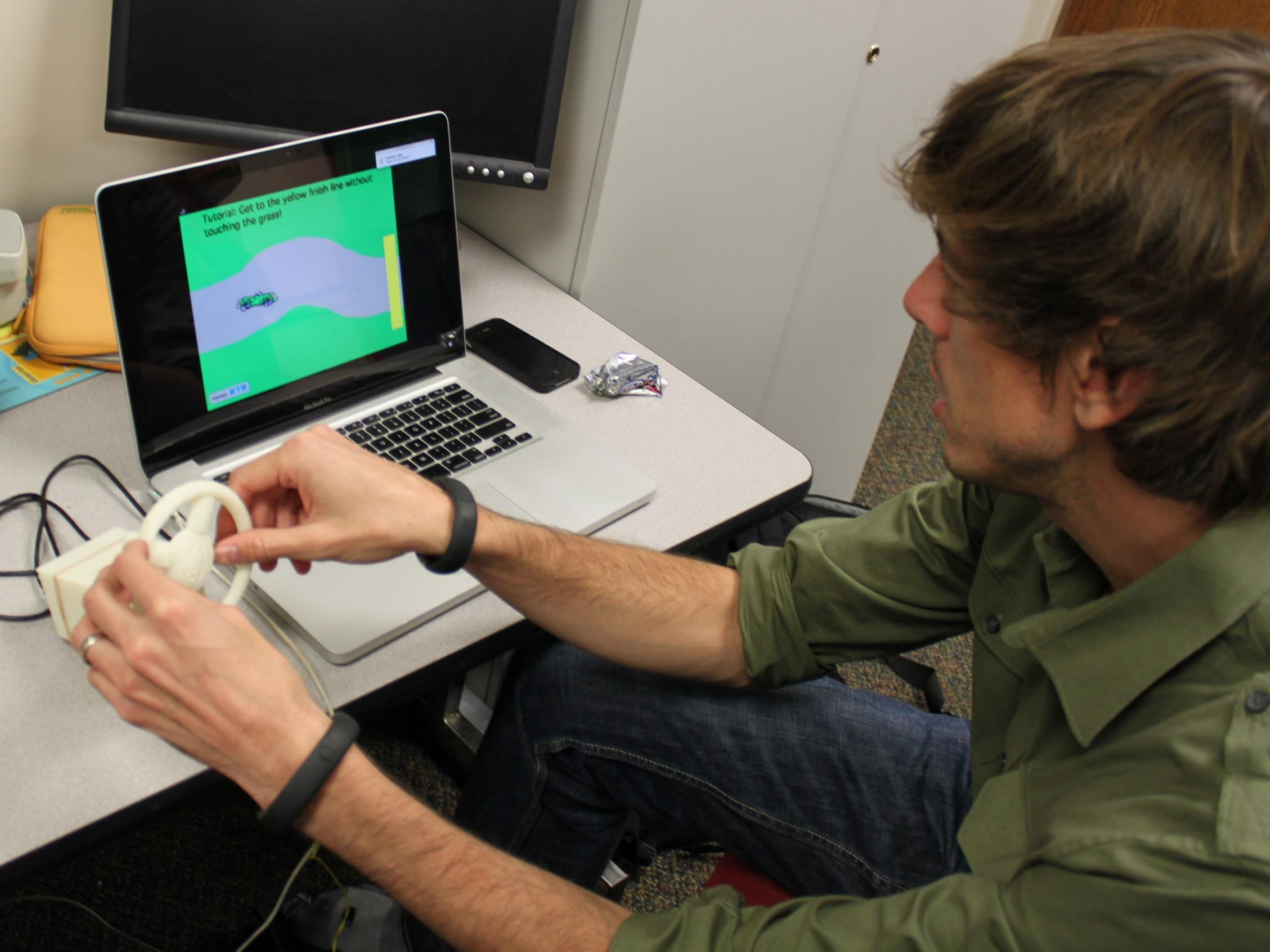
Tutorial: Get to the yellow finish line without touching the grass!

Where did all that stuff go?


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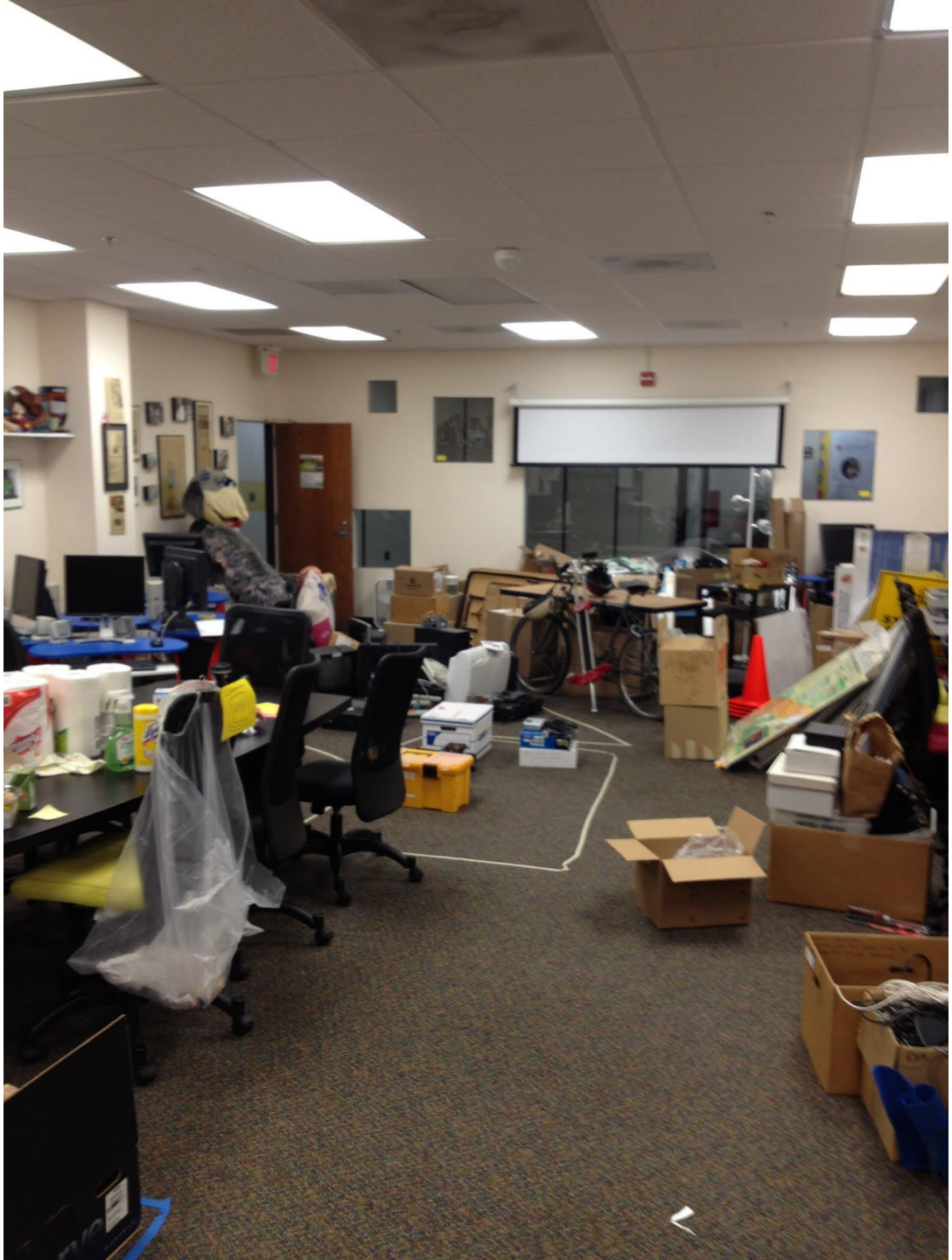


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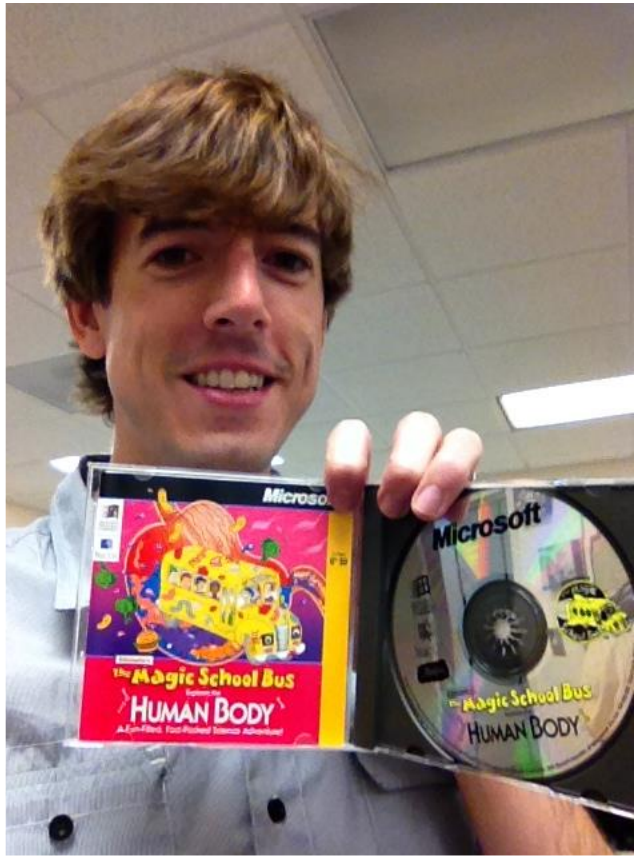
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