

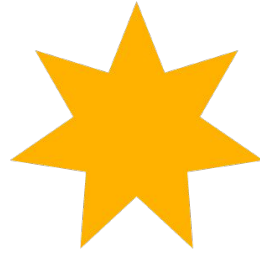
PROTOTYPING AND ITERATING WITH CARDBOARD

ROBBIE TORNEY, LODESTAR
MAY 20, 2016 | 9:00-10:30am



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agenda

- 1) framing our work for today
- 2) prototyping/iterating with cardboard
- 3) why teach/learn/design this way?
- 4) closing



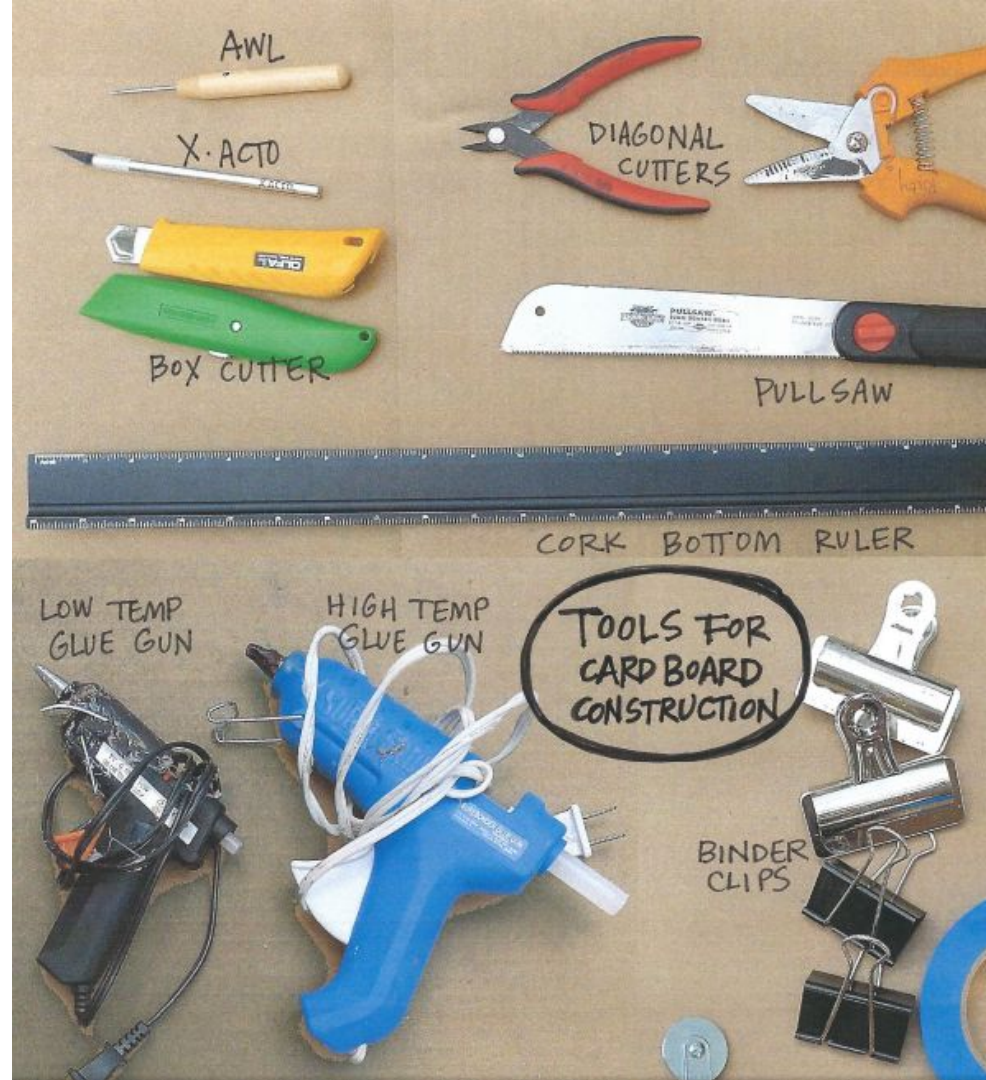
norms

share the air, work, and tools fairly

listen without judgment

speak honestly and courageously

keep in mind the question, “How can others’ perspective broaden my own?”



learning targets

I can explain how prototyping supports successful design.

I can explain how maker-centered education supports personalization.

I can engage positively with others to learn.



prototype 1

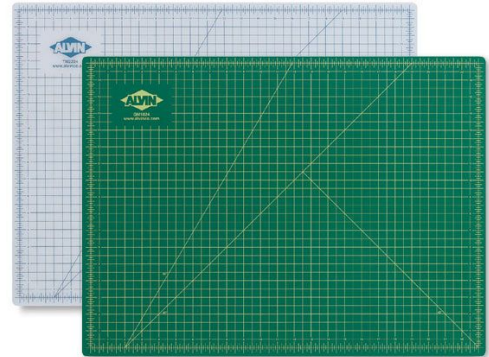
input / reflect

prototype 2

reflect



tools / materials



knife safety



where is your non-cutting hand?



pull towards you.

be patient.

use a cutting mat.

retract blades when not in use.

your task

working in small groups, build a chair*
out of cardboard

requirements

- you may not use a box as a box
- you may only use cardboard and brads (max 15)
- it must be at least 18" tall
- it must hold a person who weighs at least 150 pounds



*doesn't have to look like a
"typical" chair

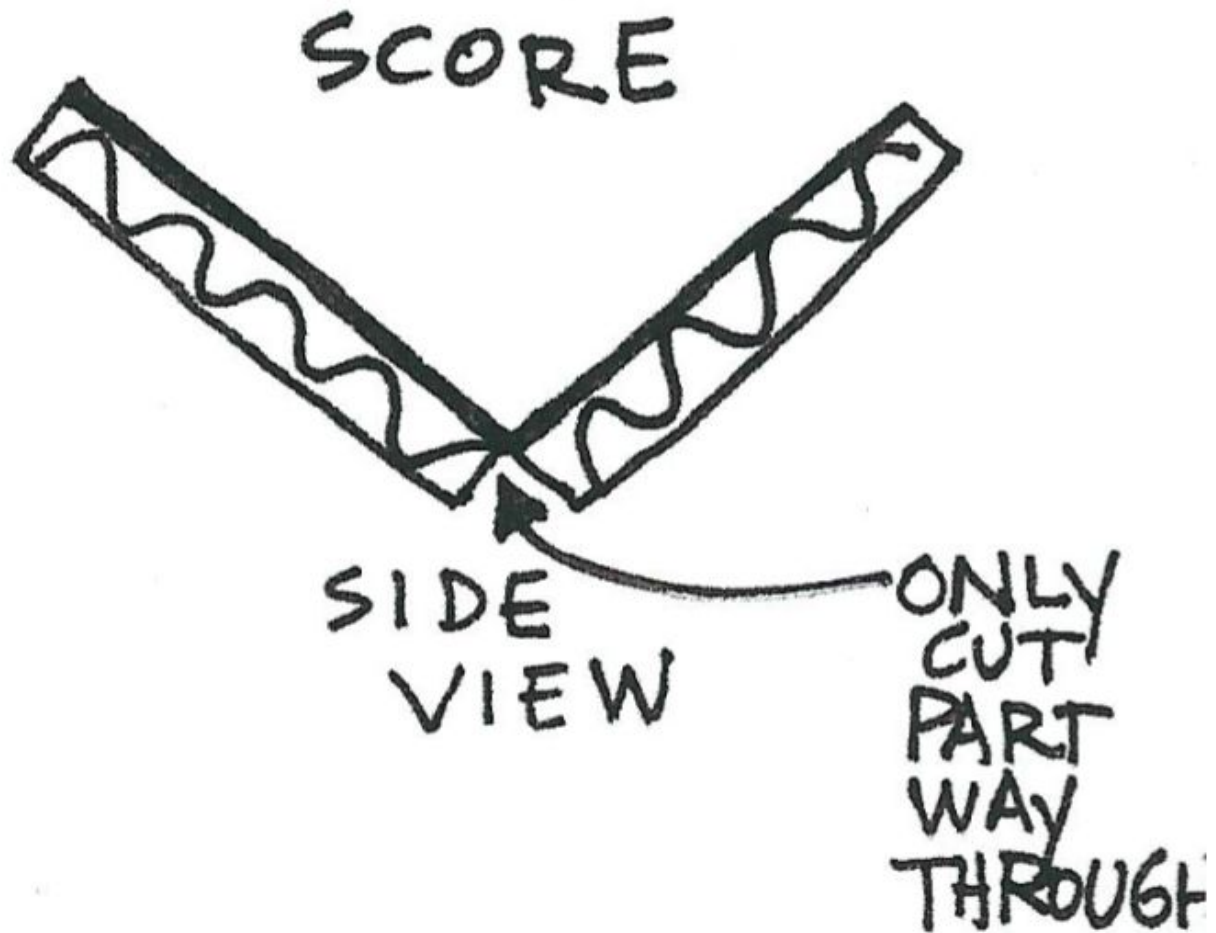
prototype 1

input / reflect

prototype 2

reflect

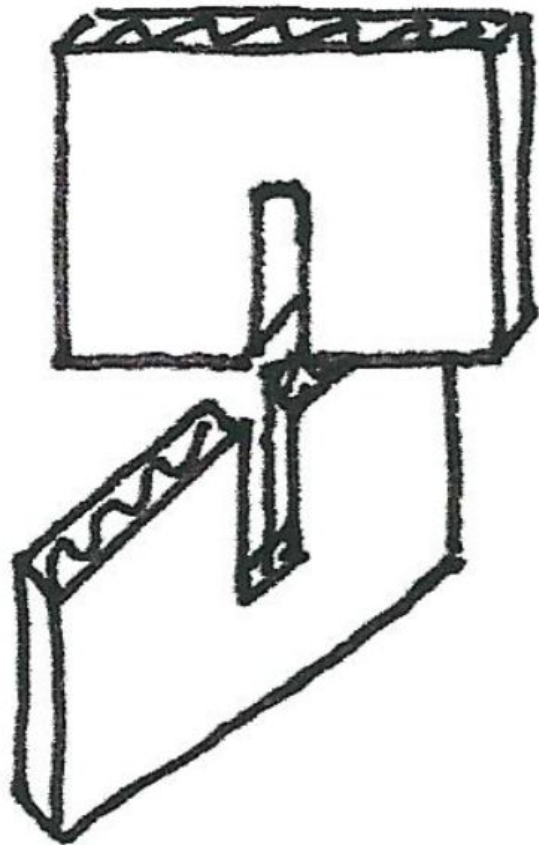




SCORE BEND

SCORE
LINES

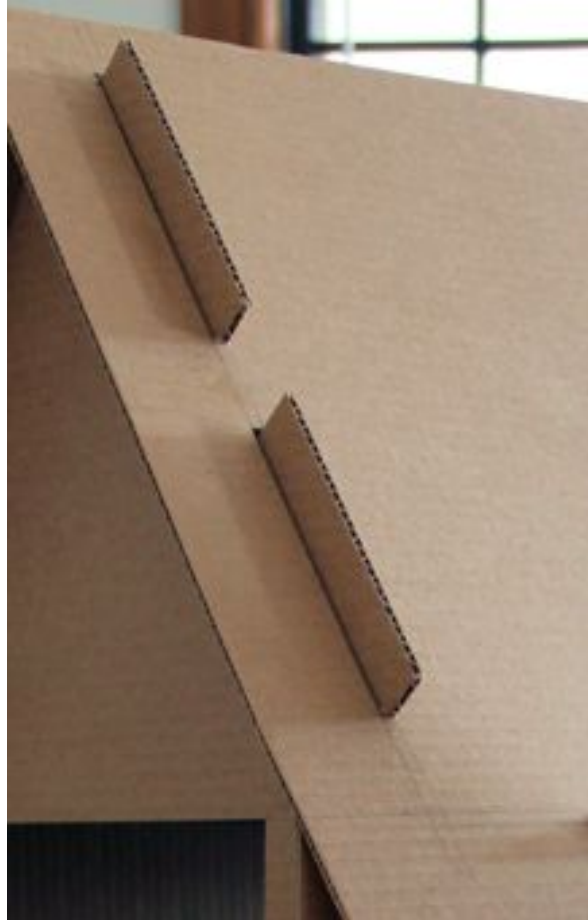




NOTCHES



tabs



reflect and plan

- what worked well about your design/process?
- what will you change about your design/process?
- how can you make your design more beautiful? more functional? more joyful?



prototype 1

input / reflect

prototype 2

reflect



your task

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out of cardboard

requirements

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- it must be at least 18" tall
- it must hold a person who weighs at least 150 pounds



prototype 1

input / reflect

prototype 2

reflect



reflect

how did this feel as a learner?

how did prototyping help your team be successful?

based on your experience, why might we teach/design this way?

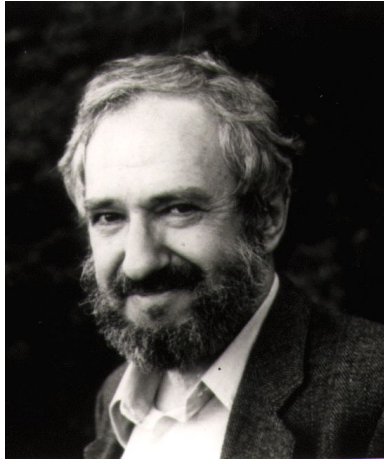
what lessons will you apply to your own design work?



why maker-centered education?

how were personalization strategies (pace, path, people, place, passion) built into the design experience?





"Better learning will not come from finding better ways for the teacher to instruct, but from giving the learner better opportunities to construct."

-Seymour Papert





Maker Empowerment

“A key goal of maker-centered education is to help young people and adults feel empowered to build and shape their worlds. Acquiring this sense of maker empowerment is strongly supported by learning to notice and engage with the designed dimension of one’s physical and conceptual environment — in other words, by having a **sensitivity to design.**”

www.agencybydesign.org



Agency by Design Framework

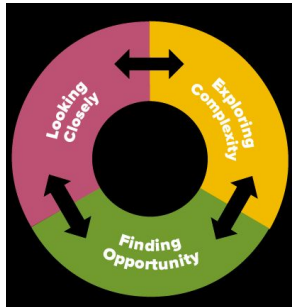
Maker Empowerment (Agency)



Sensitivity to Design



Capacities



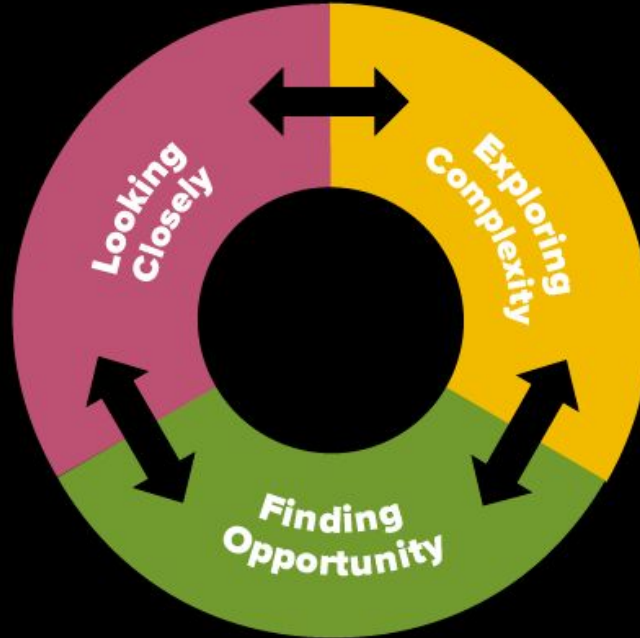
3 Capacities

Looking Closely:

Looking carefully at objects and systems in order to notice their intricacies, nuances, and details. By looking closely, one may begin to see the complexities inherent in objects and systems.

Finding Opportunity:

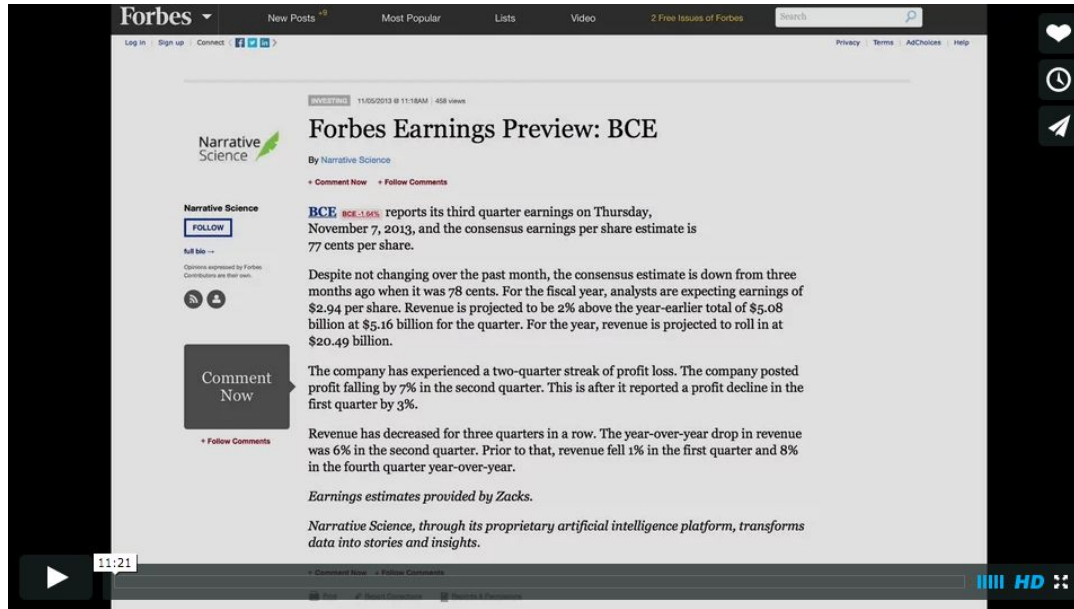
Building on close observations and explorations of complexity to see the potential for building, tinkering, re/designing, or hacking objects and systems.



Exploring Complexity:

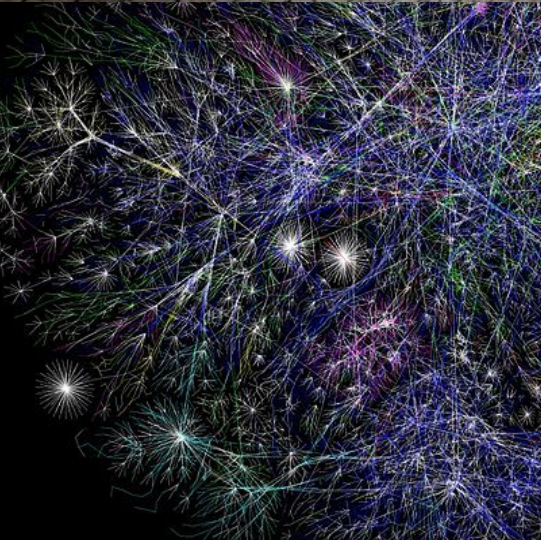
Investigating the interactions between the various parts and people associated with objects and systems, including the range of values, motivations, and priorities held by the individuals who engage with particular objects and systems.

Preparing creative thinkers and generous collaborators for a changing world



<https://vimeo.com/135611275>





```
In[27]:= -1 + x^10^5
```

```
Out[27]:= -1 + x^100000
```

```
In[28]:= Factor[%]
```

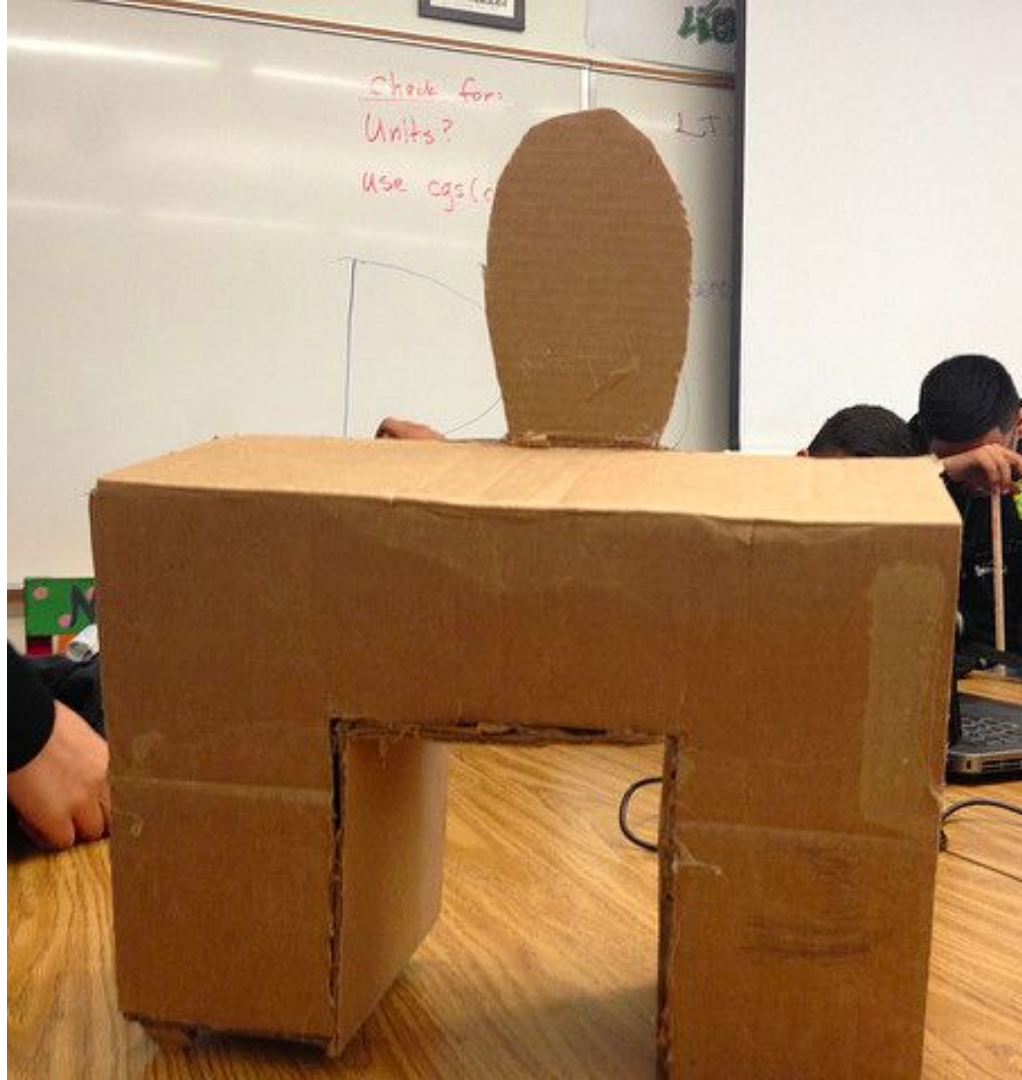
```
Out[28]:= (-1 + x)(1 + x)(1 + x^2)(1 + x^4)(1 - x + x^2 - x^3 + x^4)(1 + x^5 - x^6 + x^7 - x^8 + x^9)(1 - x^2 + x^4 - x^6 + x^8)(1 + x^16)(1 - x^4 + x^8 - x^12 + x^16)(1 - x^8 + x^16 - x^24 + x^32)(1 - x^10 + x^20 - x^30 + x^40)(1 - x^25 + x^50 - x^75 + x^100)(1 + x^25 + x^50 + x^75 + x^100)(1 - x^50 + x^100 - x^150 + x^200)(1 - x^80 + x^160 - x^240 + x^320)(1 - x^125 + x^250 - x^375 + x^500)(1 + x^125 + x^250 + x^375 + x^500)(1 - x^250 + x^500 - x^750 + x^1000)(1 - x^400 + x^800 - x^600 + x^1200)(1 - x^625 + x^1250 - x^1875 + x^2500)(1 + x^625 + x^1250)
```

learning targets

I can explain how prototyping supports successful design.

I can explain how maker-centered education supports personalization.

I can engage positively with others to learn.



sticky
messages



1

fail
fast



Mistakes are
→ expected
→ inspected
→ respected

2

making
supports
personalized
learning



appreciations and acknowledgements



going further, staying connected

slides: bit.ly/23YFP3G

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[@rtorney](#)

LighthouseCreativityLab.org

AgencyByDesign.org

MakerEd.org

