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NEW YORK HALL OF SCIENCE [WWW.NYSCI.ORG](http://WWW.NYSCI.ORG)

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# Math and Making Delight and Identity

Peggy Monahan  
Creative Director of Exhibit Development

So, who am I?

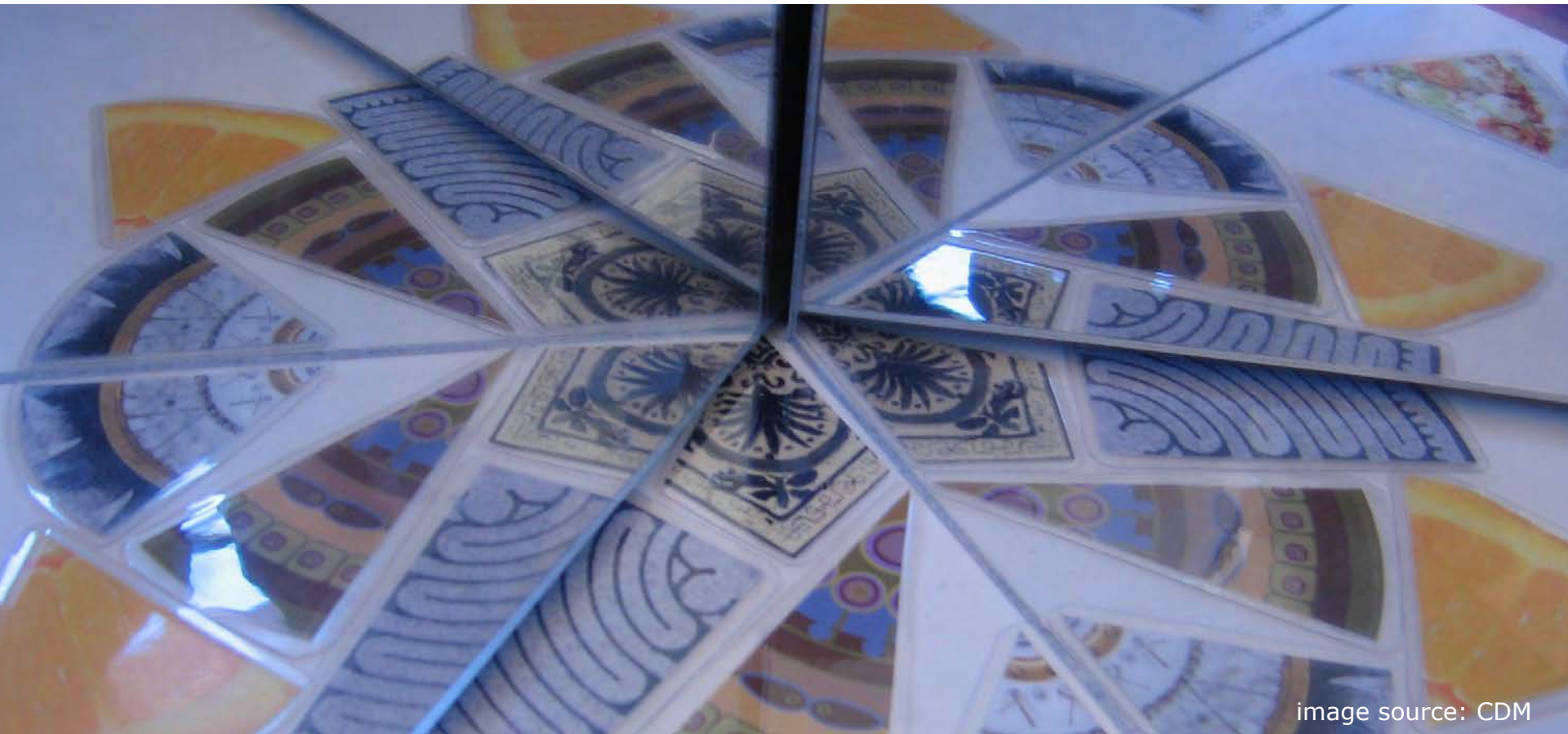


image source: CDM

So, who am I?



image source: Scott Pattison



So, who am I?

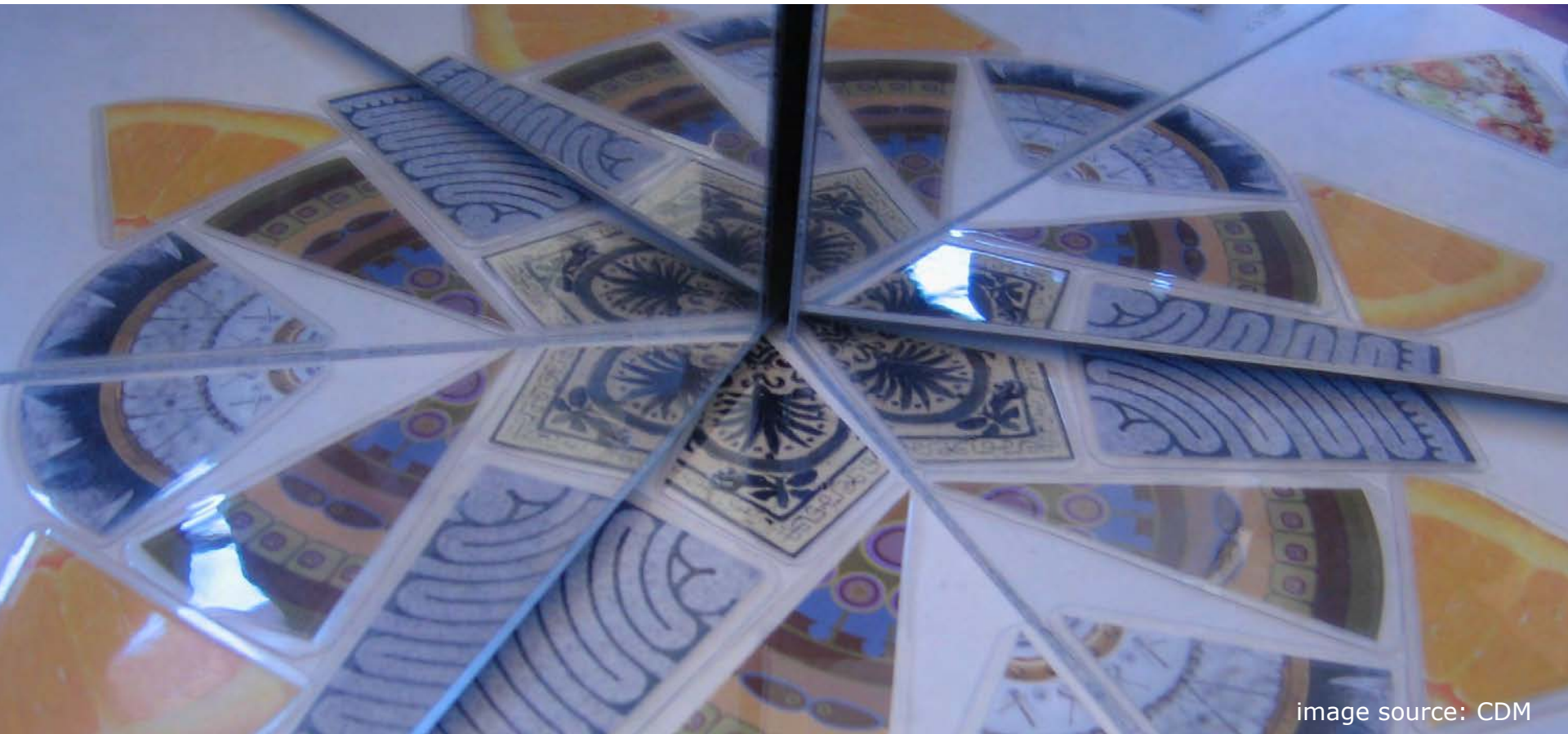
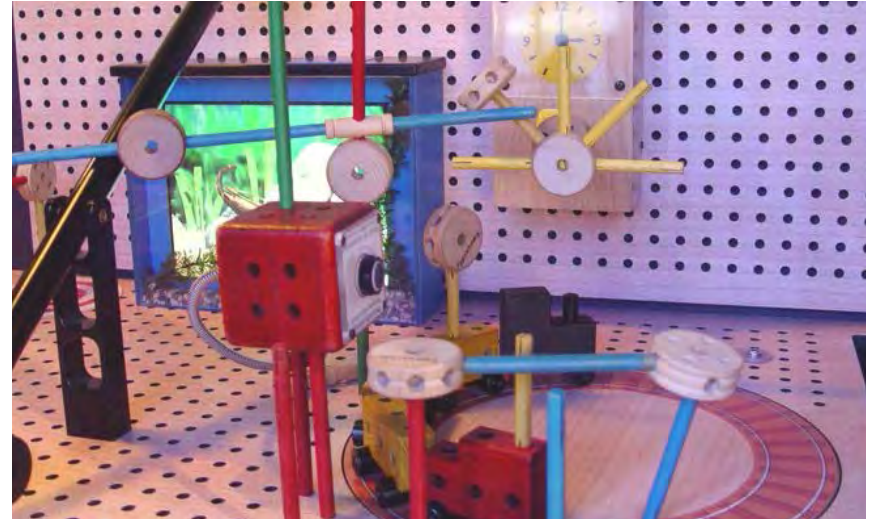


image source: CDM

# Making/tinkering/designing exhibits and programs at many museums









# 3 math exhibitions and 4 math apps



## GEOMETRY PLAYGROUND





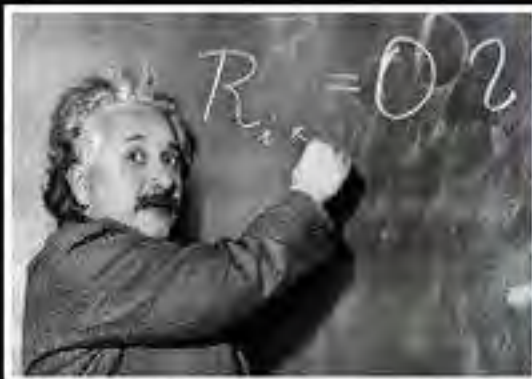


Image source: Exploratorium

Want to compare  
**Math**  
and  
**Making**



# PHYSICIST



**WHAT SOCIETY THINKS I DO**



**WHAT MY MUM THINKS I DO**



**WHAT MY FRIENDS THINK I DO**



**WHAT THE GOVERNMENT  
THINKS I DO**



**WHAT I THINK I DO**



**WHAT I ACTUALLY DO**

quickmeme.com

# Making



What society thinks



What we worry about



What we want

# Math



What society thinks



What we worry about



What we want



# What society thinks Making is

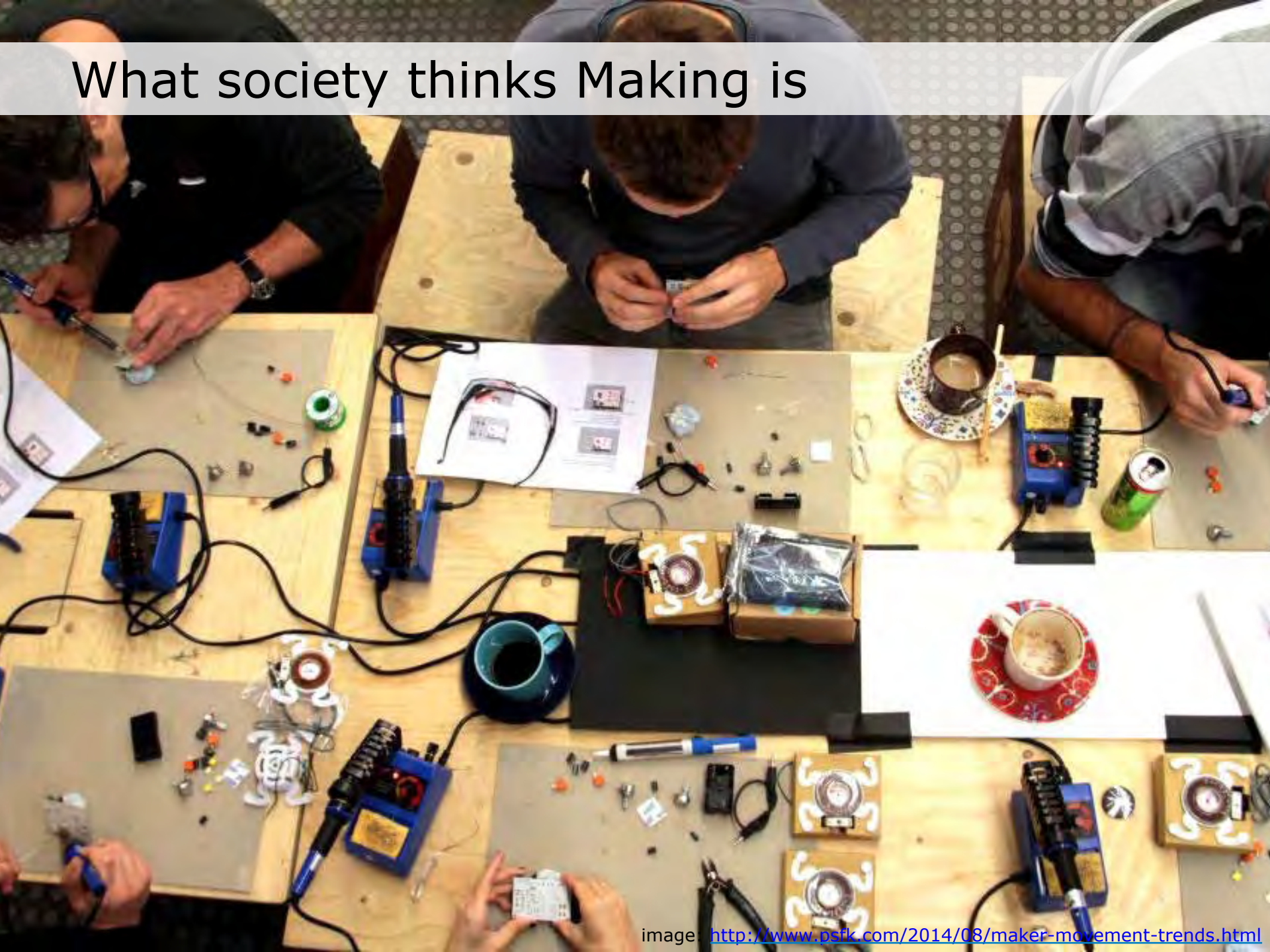






image: <http://sixthirty.pm/how-big-brands-can-learn-from-the-maker-movement/>

(this image was also on the 1st page of results)



# What we worry people think of Making





What we want the effect of Making to be



What society thinks math is





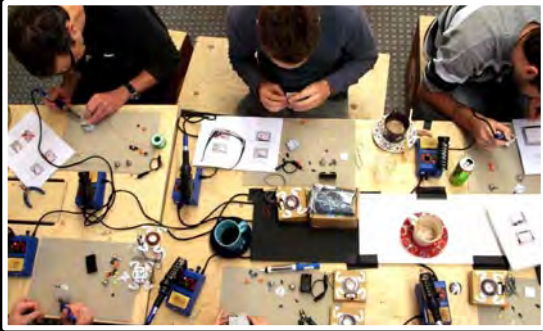
What we worry people think of math



What we want the effect of math to be



# Making



What society thinks

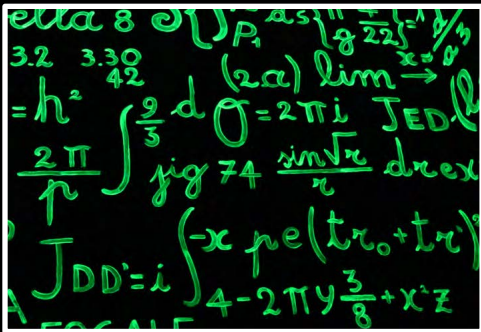


What we worry about



What we want

# Math



What society thinks

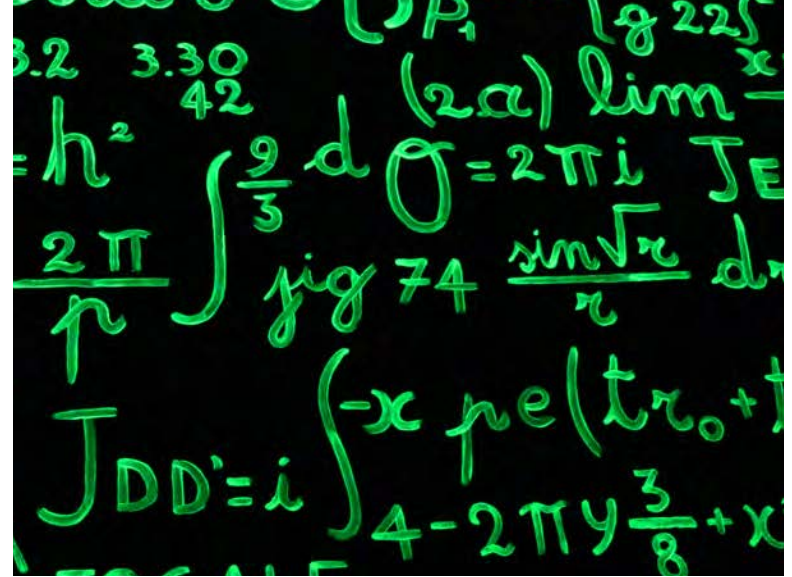
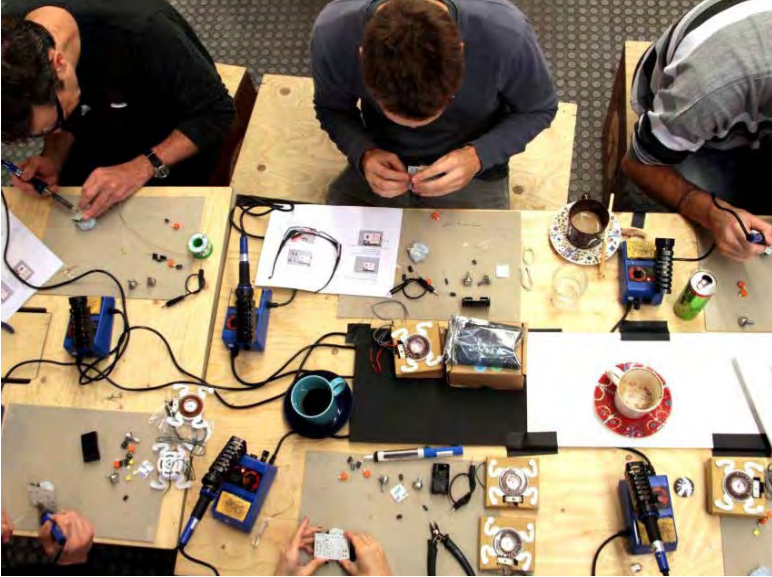


What we worry about



What we want





Making

Math

# Why the mismatch?





We recognize this as a picture of Making...

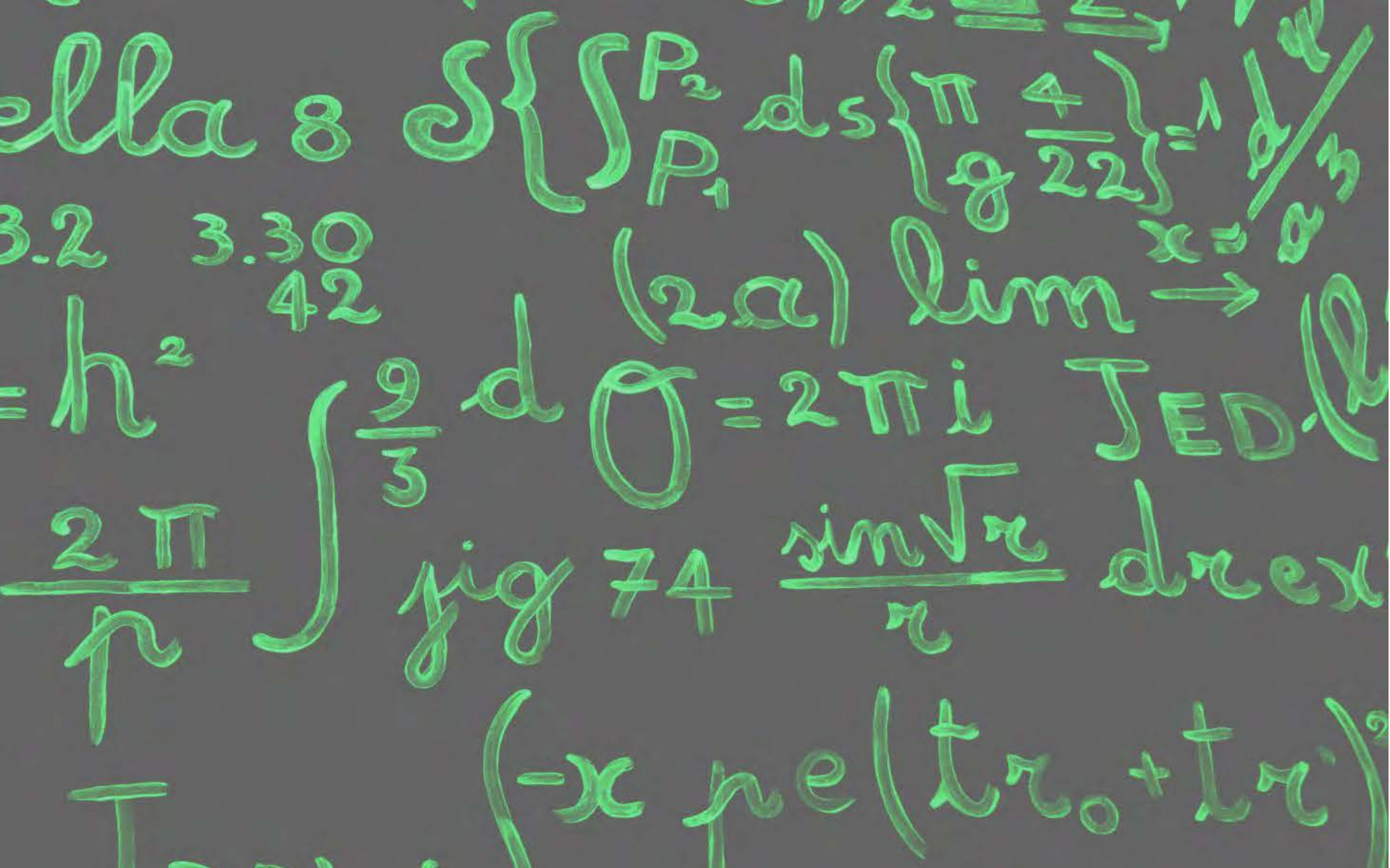
image source: <https://www.flickr.com/photos/nysci/9866731863>





...and that's not far from this kind of awesome





But if THIS is what we think math is...

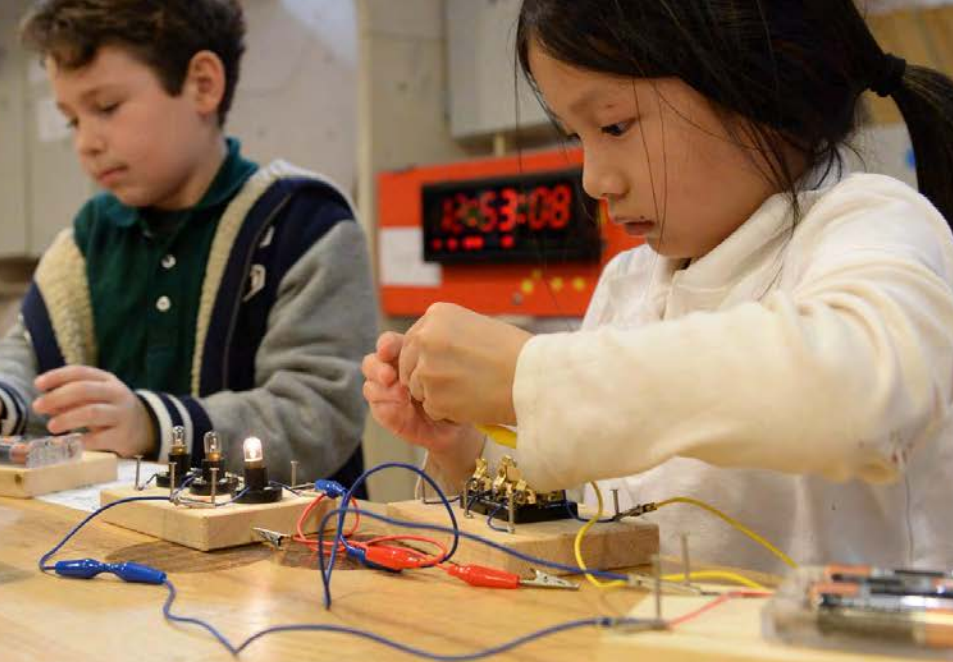


...it doesn't really mesh with this. At all.





...ZZZZ



easy to see the SCIENCE in Making - why not math?





**Hello**  
my name is

**Math**



# How I got to know Math







Mom



Mom





Change the shape, change the volume



# *Calculus*

James Stewart 5e

image source: <http://7prime.com/news/2014/12/19/calculus-textbook-by-james-stewart/>  
Brooks/Cole Publishing Company



HOLT McDOUGAL

# Physics

Serway • Faughn



image source: Houghton Mifflin Harcourt

## Calculus

James Stewart 5e

image source: Brooks/Cole Publishing Company



patterns, relationships, interactions



image source: [https://en.wikipedia.org/wiki/Soap\\_bubble](https://en.wikipedia.org/wiki/Soap_bubble)





Helped me see connections









wanted things to MAKE SENSE to visitors



I could look for patterns and figure things out





Image: NYSCI Flickr site

brought that into tinkering/making experiences



put opportunities to build and create in exhibits



image source: Peggy Monahan





some exhibits were explicitly math-y





here at NYSCI, kids are always making







I think we're here with making





but we're not here  
with math yet

$$\frac{2\pi}{r} \int \frac{9}{3} d\sigma = 2\pi i \text{ JED.}$$





don't want to provoke an immune response







how do we get here?





make sure the math works for everyone





activities that play with proportion

image source: Peggy Monahan



image source: Peggy Monahan





some exhibits were explicitly math-y









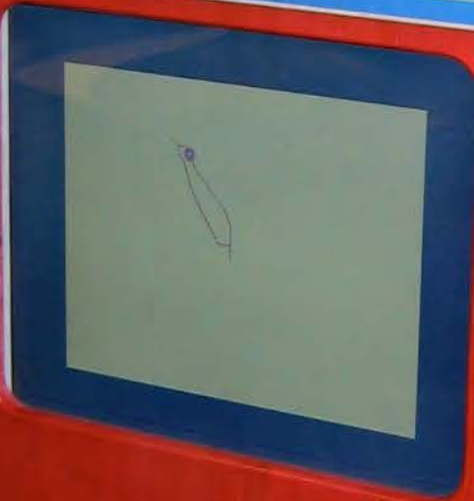




Try to make  
a circle.

Trata de hacer  
un círculo.

Hãy thử vẽ một  
vòng tròn.



Yes, you CAN use math words





find ways to make math explicit





find ways to make math explicit





#guidance  
#encouragement  
#empowerment  
#welovenysci  
#engineers :)











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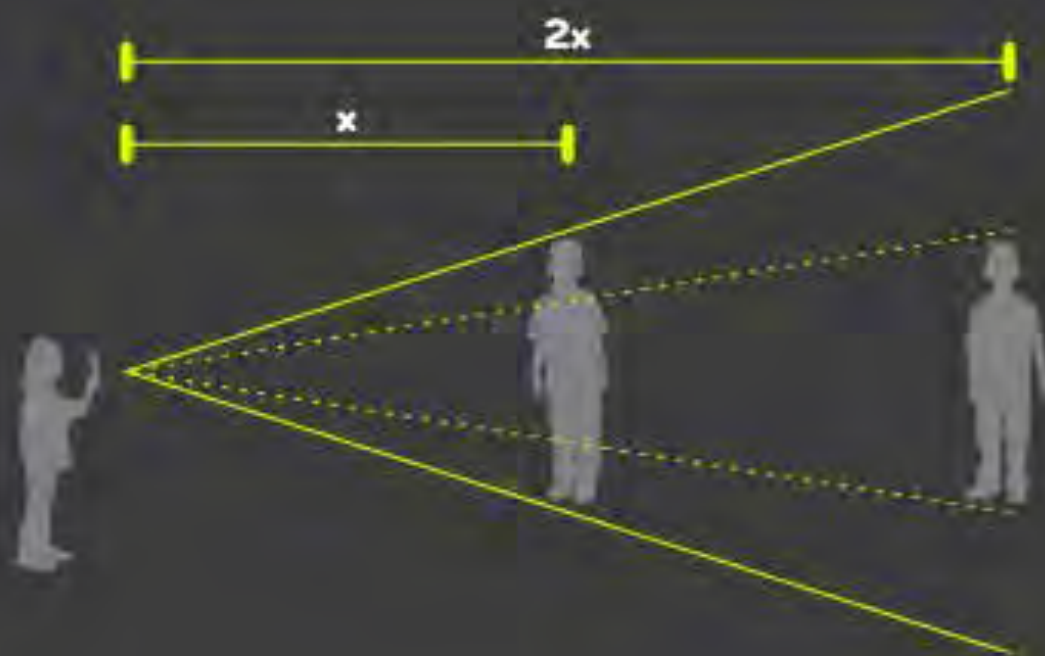
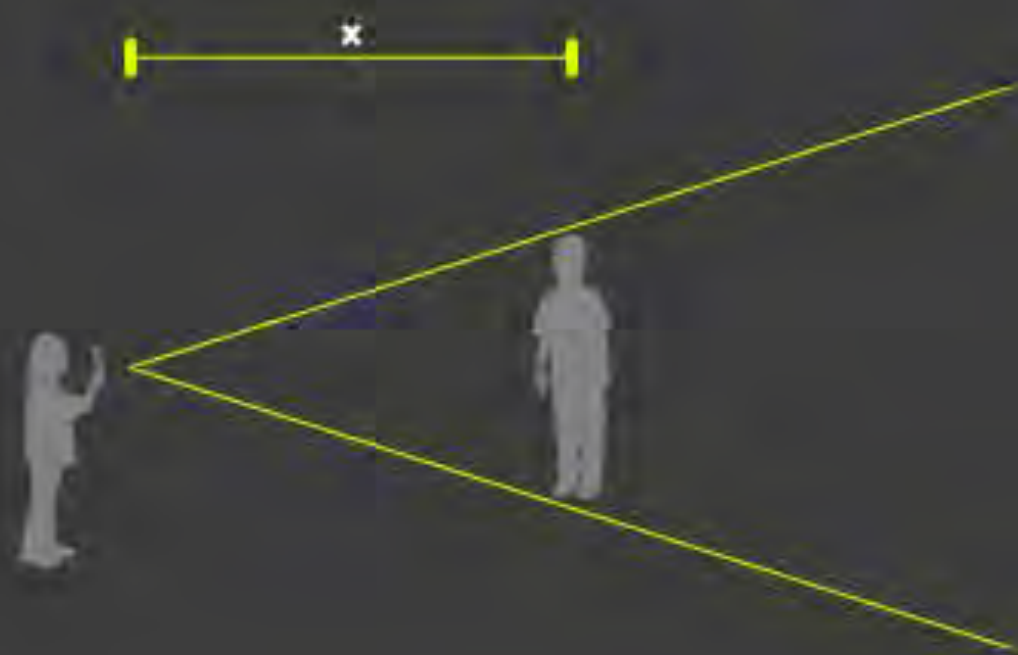


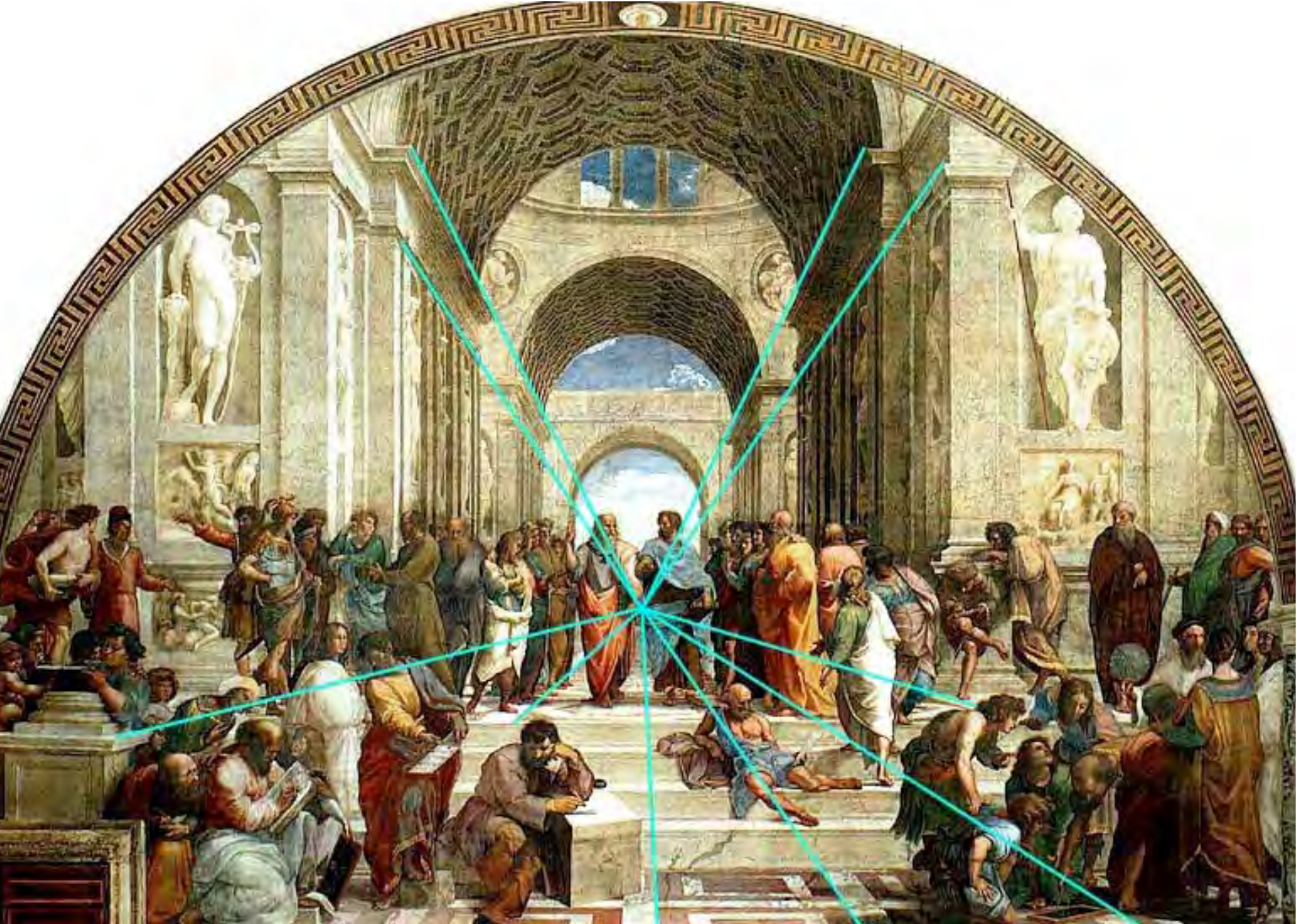












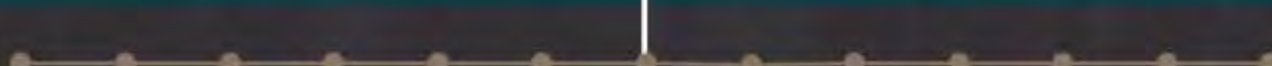
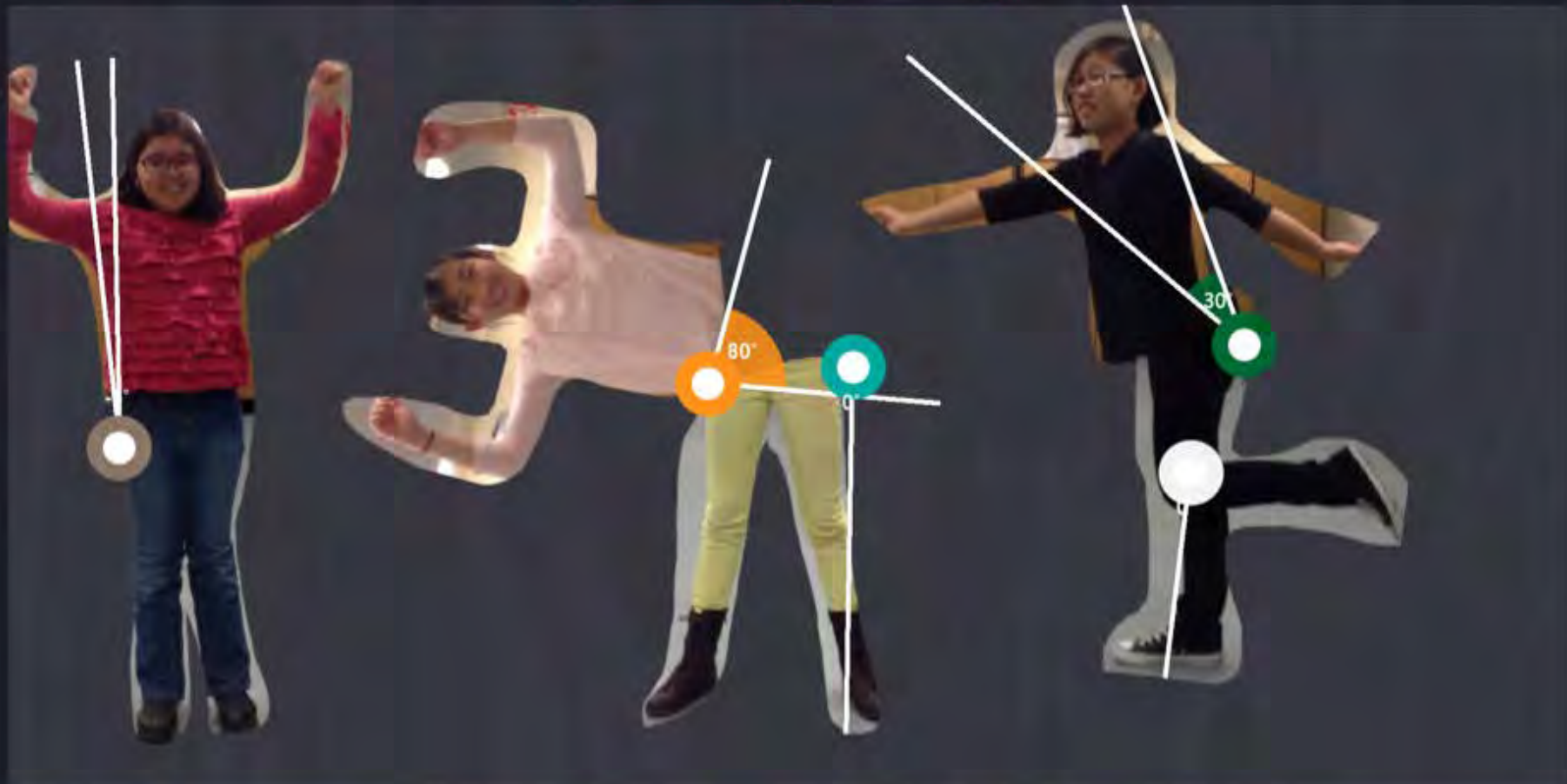




PROJECTS

BUILD

ANIMATE



Exhibits I've done













26:11 / 28:00



# Dizzy Bowl



Dennis Edwards



Subscribe

17K

1,055,250



Add to



Share



More

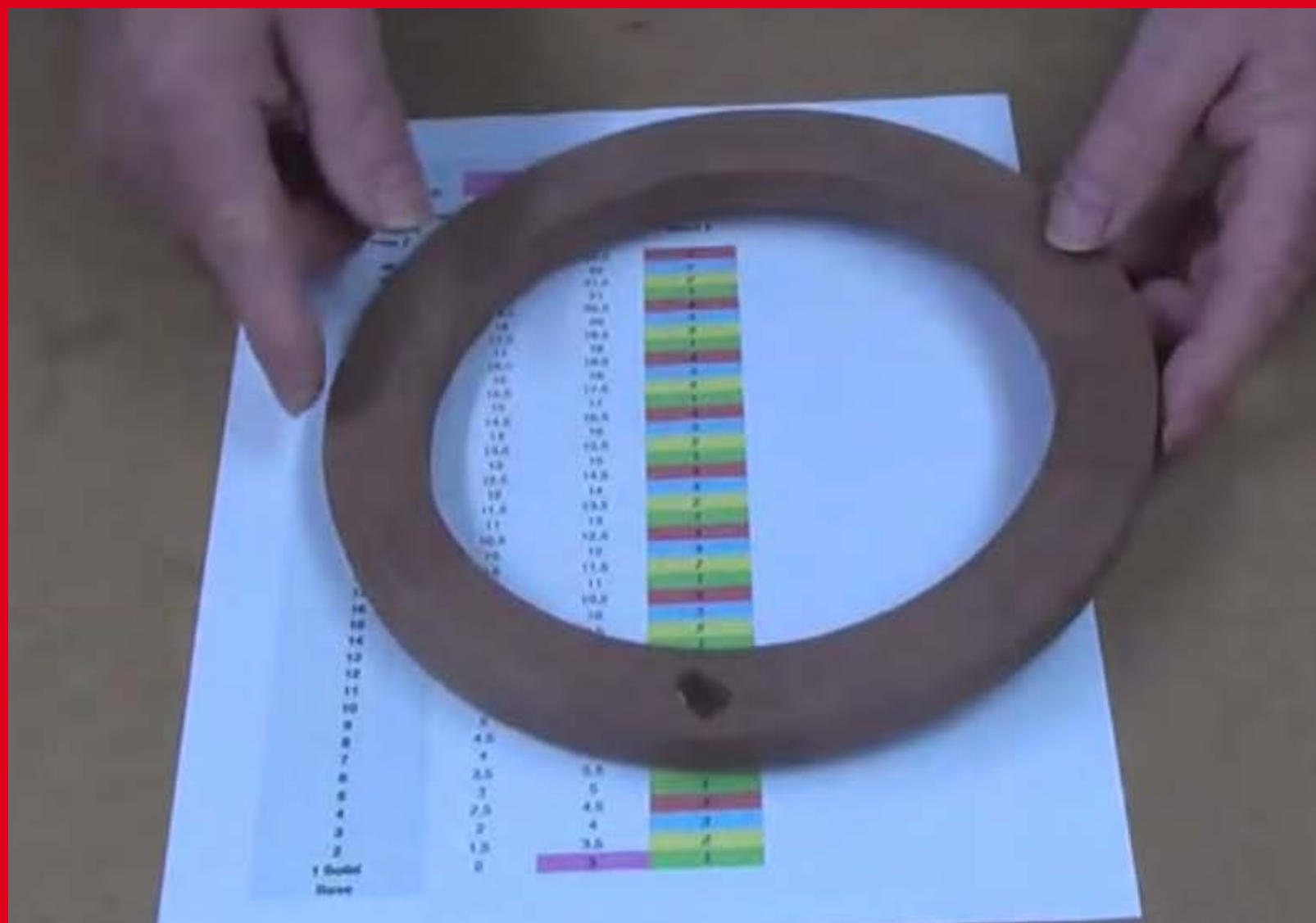


4,610

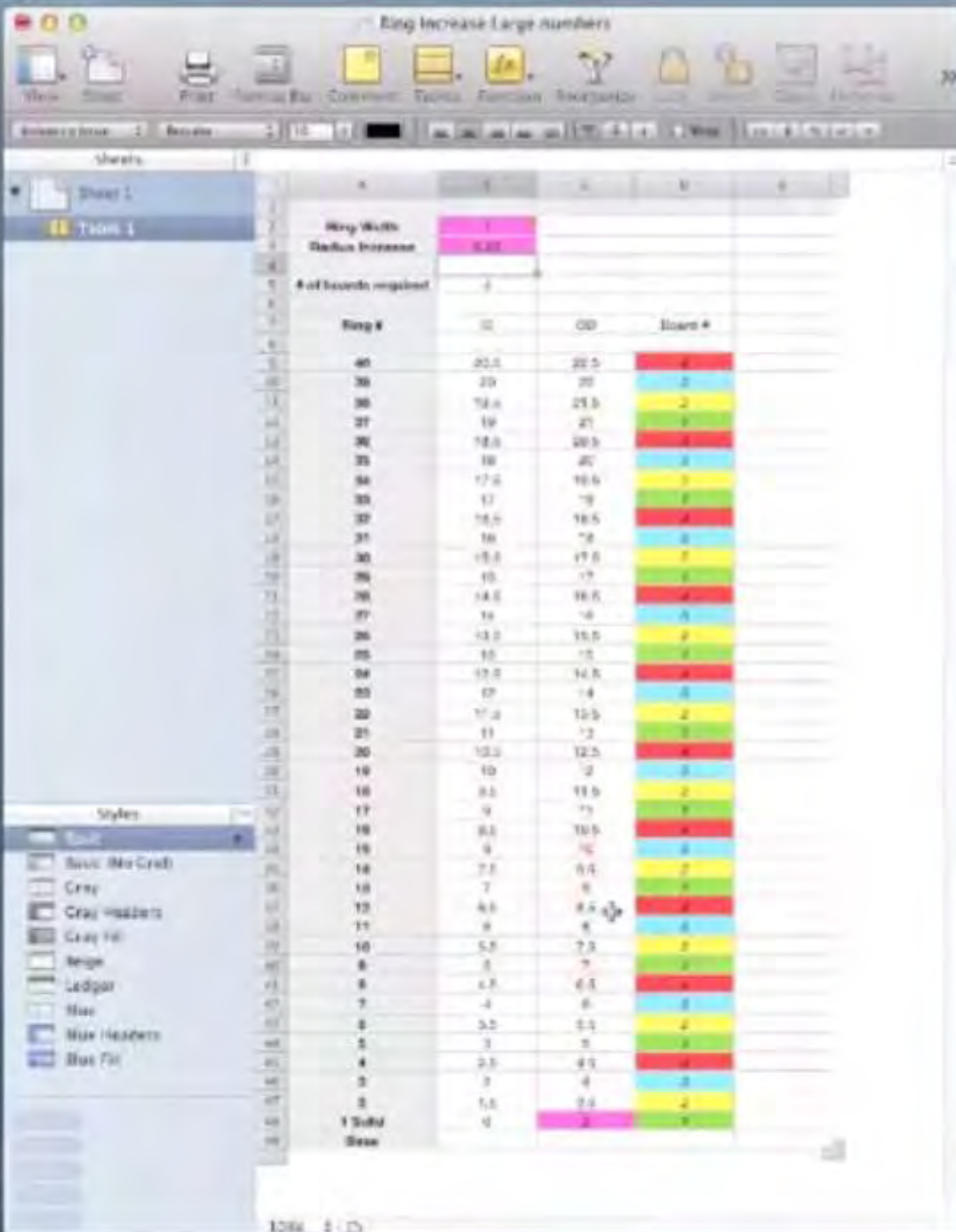


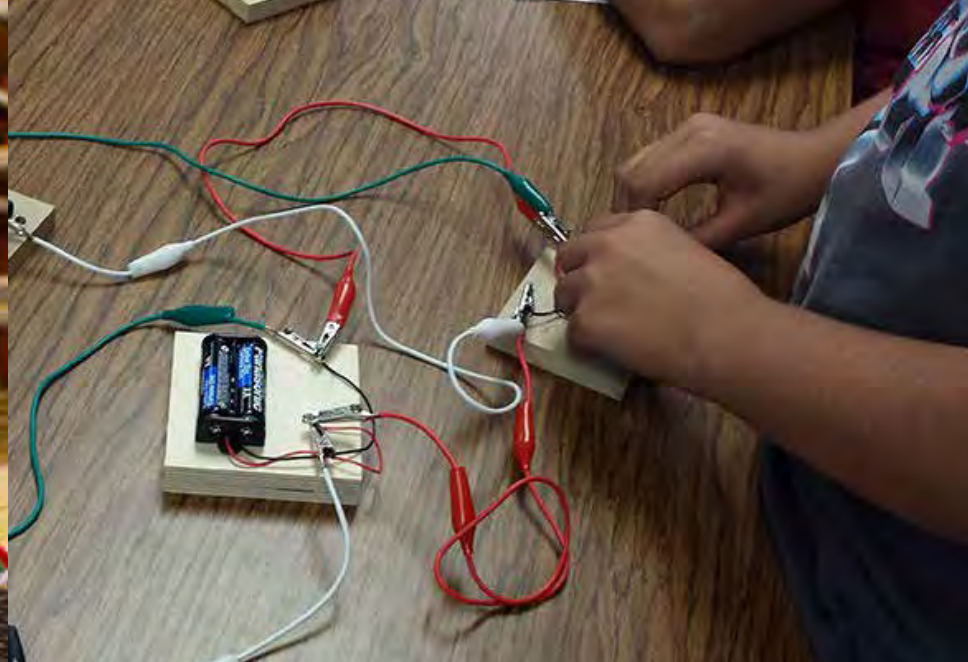
164











easy to see the SCIENCE in Making - why not math?



image source: <http://www.adventuresci.org/>

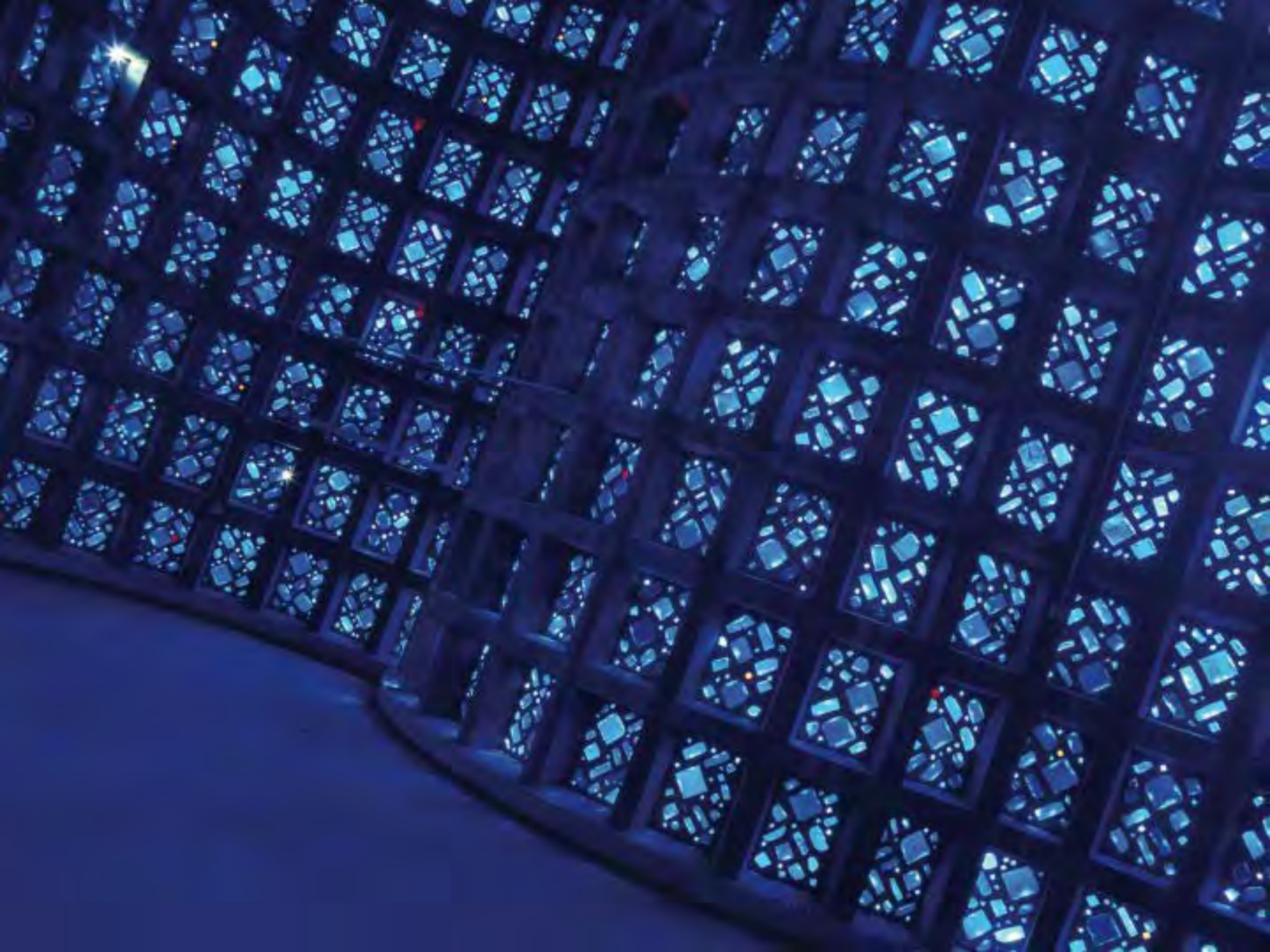






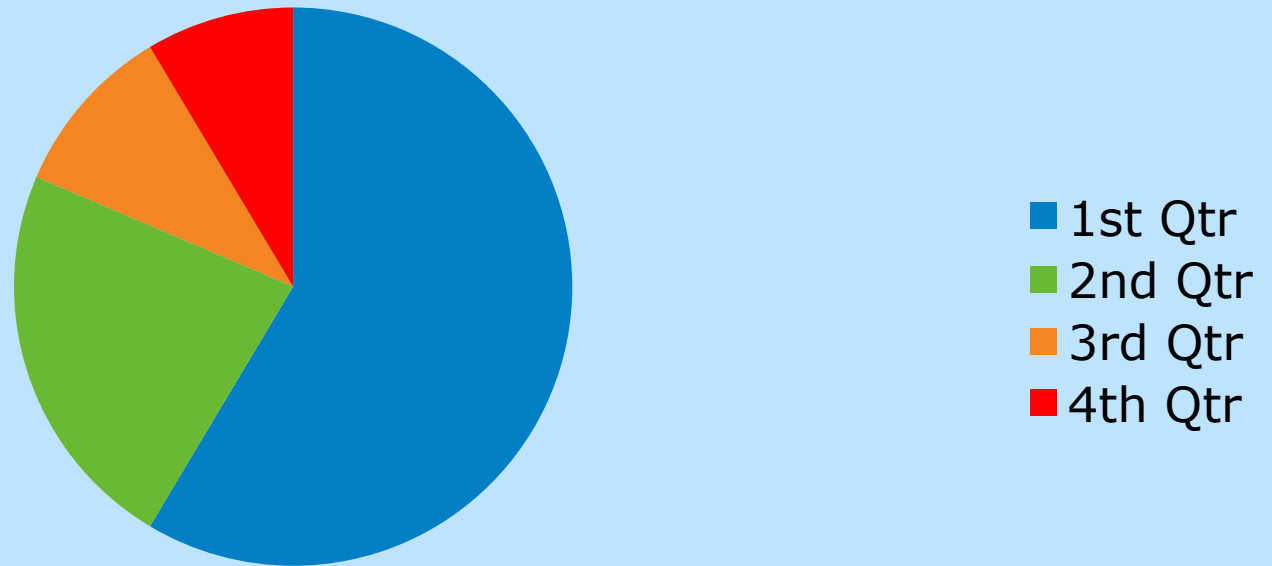








# Title and Content Layout

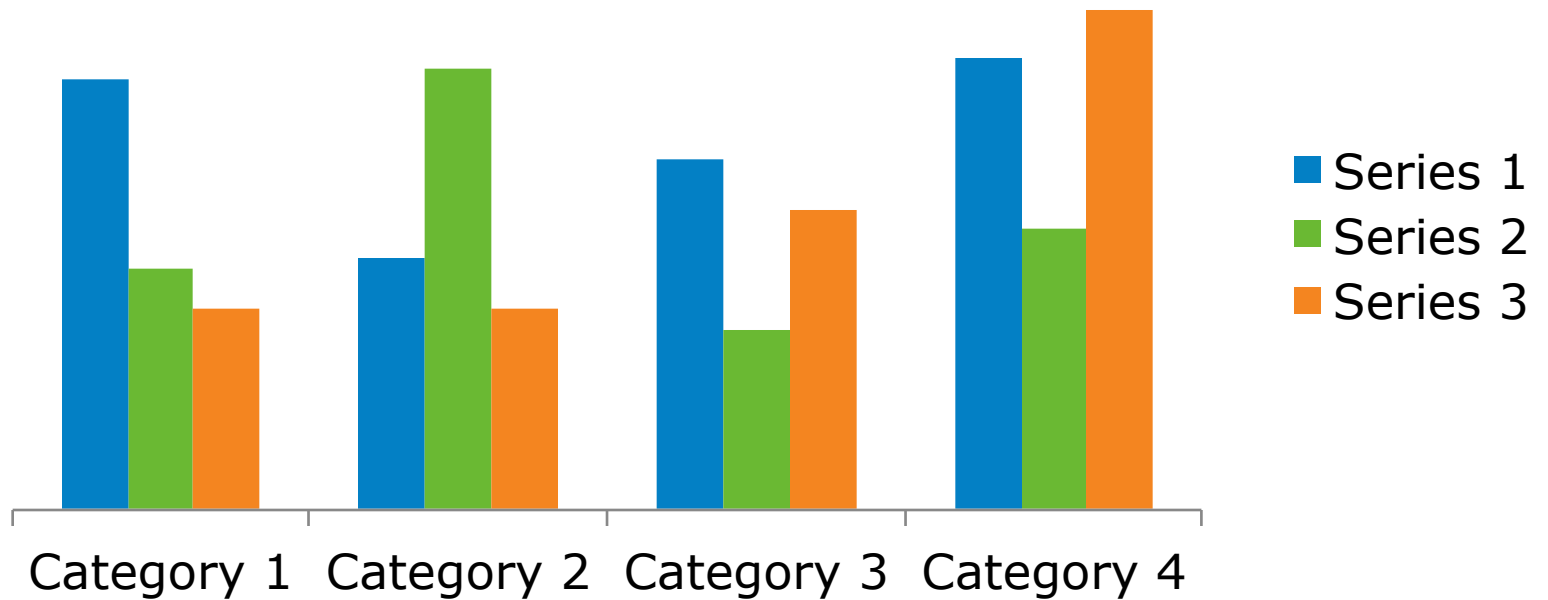


# Section Divider or Picture and Caption





# Title and Chart Layout



# Two Content Layout



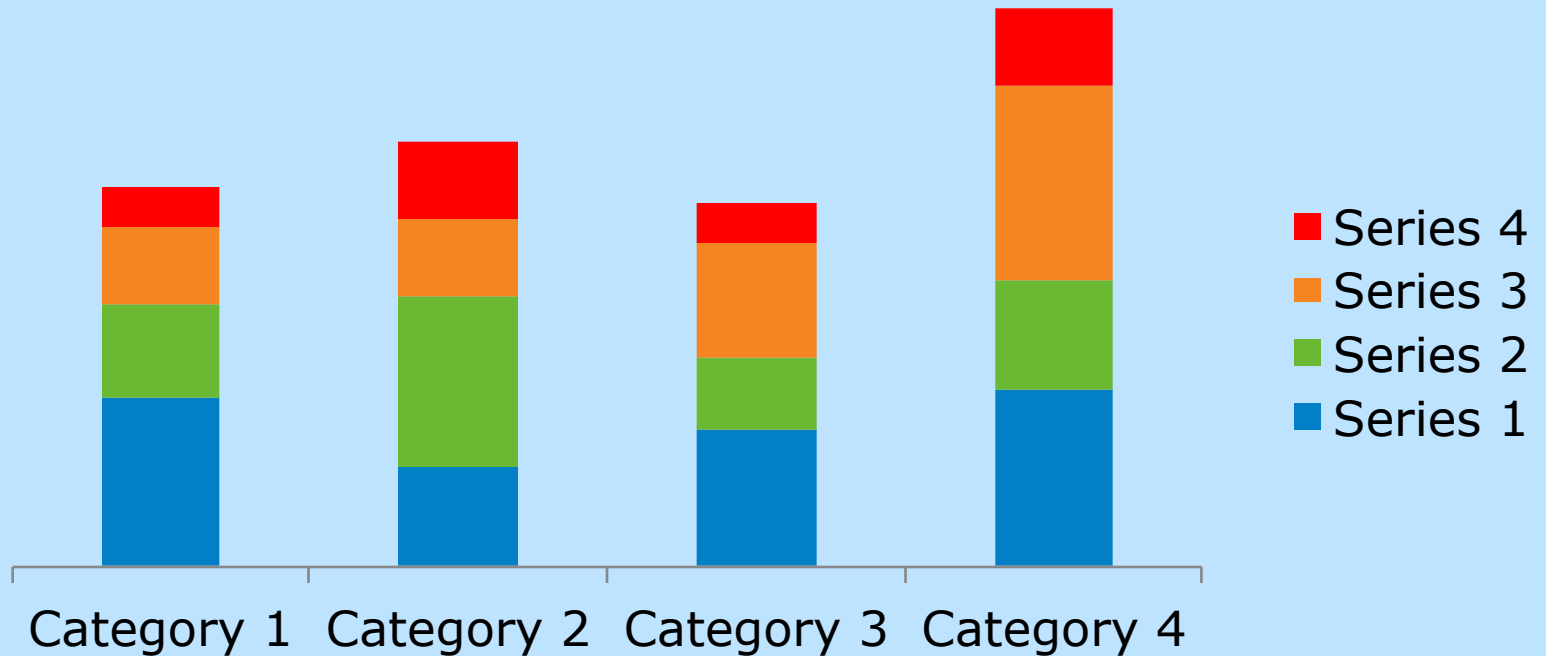
- Adipisicing eiusmod elit sed do. Tempor incididunt ut Labore et dolore. Enim ad minim. Laboris nisi ut.



# One Line Here

Content with Caption Layout

This is area is for footnotes. Three lines here are ideal.





New York Hall of Science



