reMAKING math education: Moving from Abstract Concepts to Hands-On Learning

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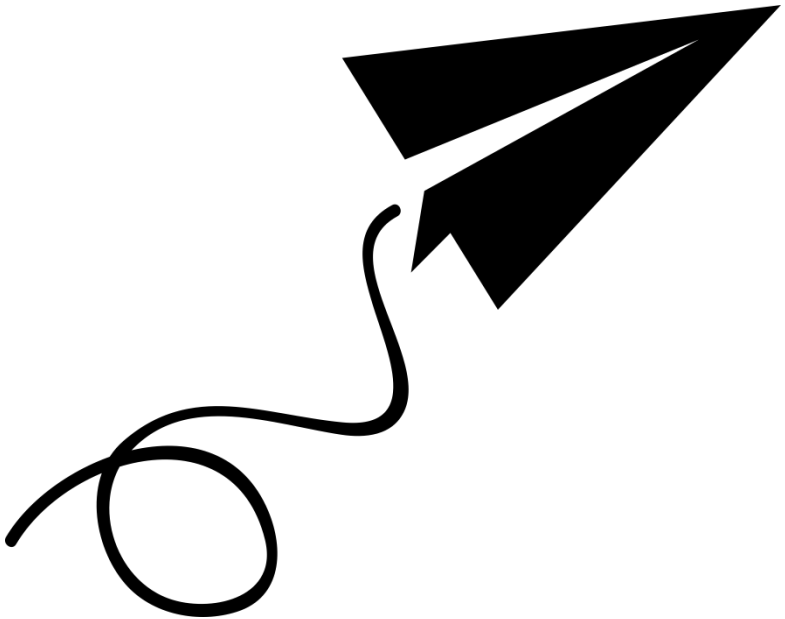
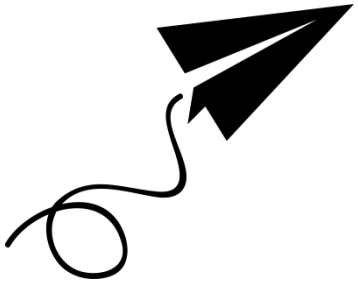
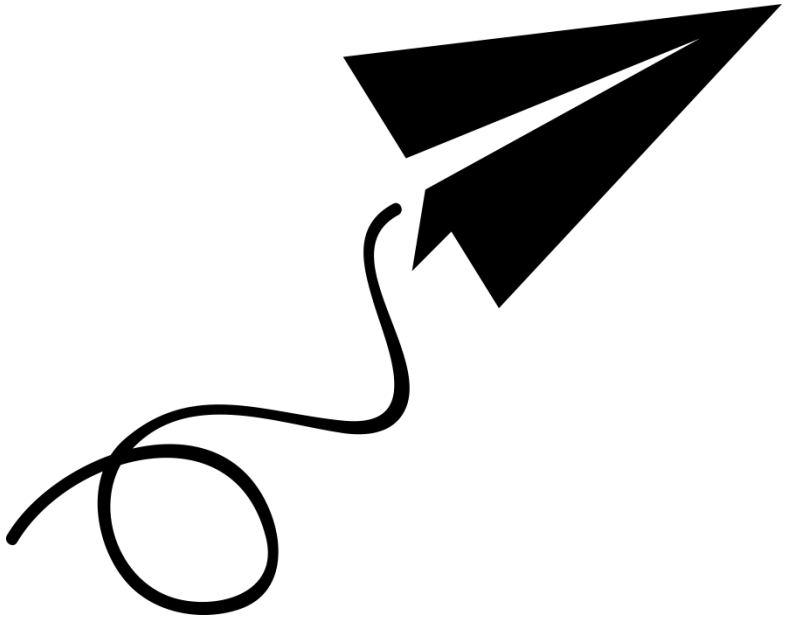


Paper Airplane Challenge

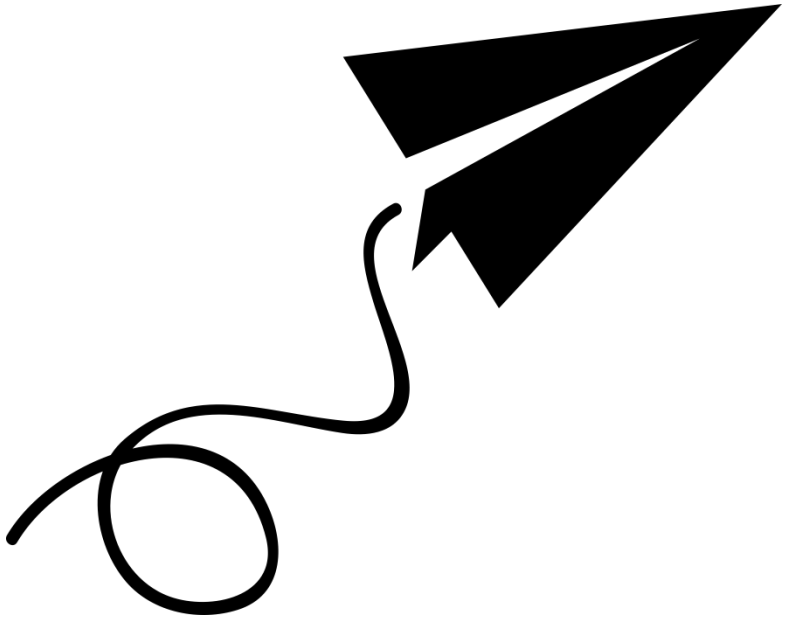


Your Challenge:

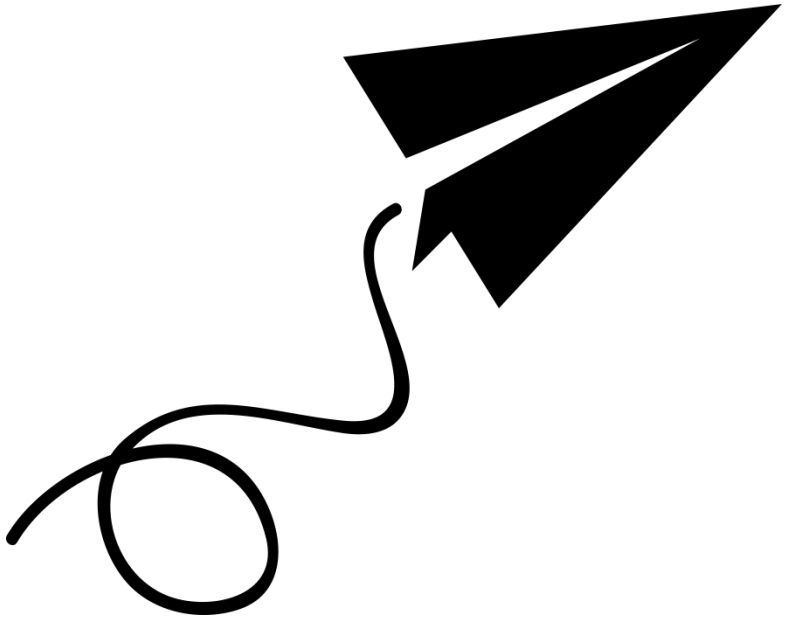
In teams of 3, design & make a paper airplane that will travel the farthest distance in front of the person launching it.



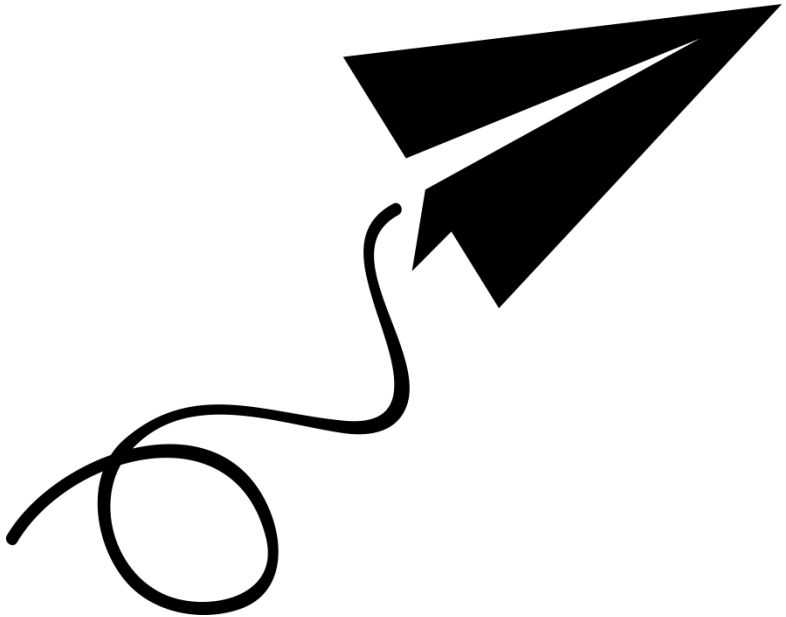
Team Up



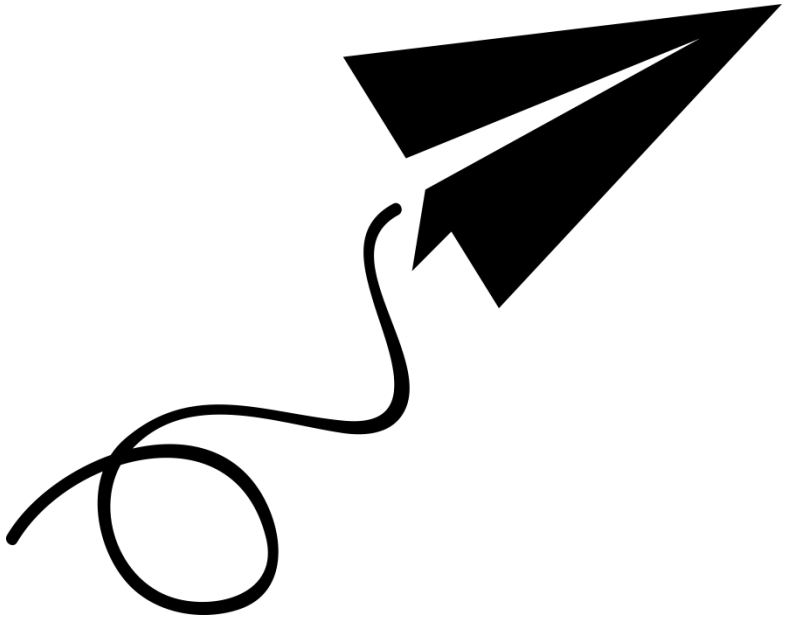
Build & Test



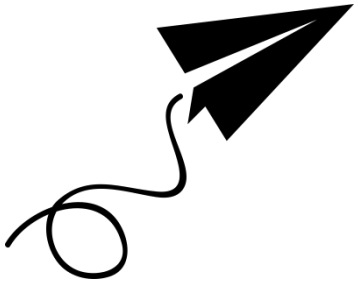
Analyze & Iterate



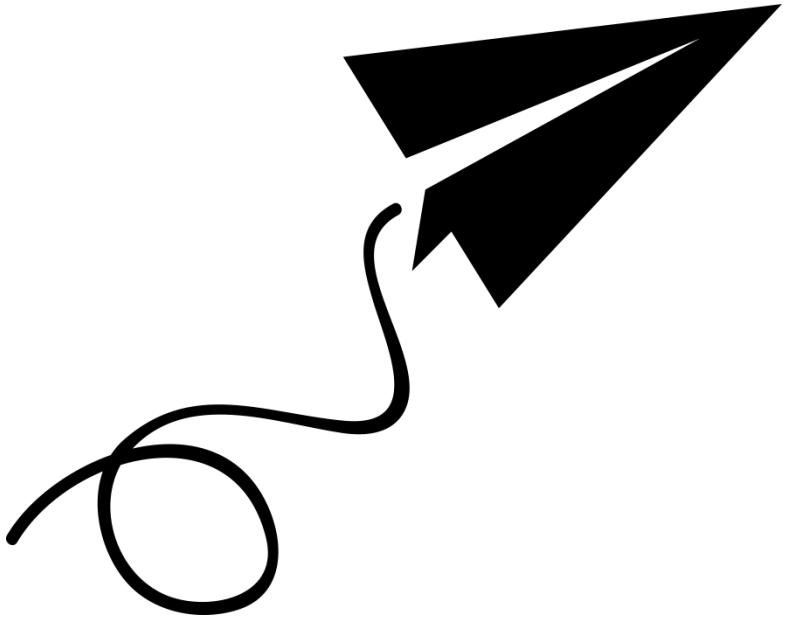
Build & Test
(& Capture Data)



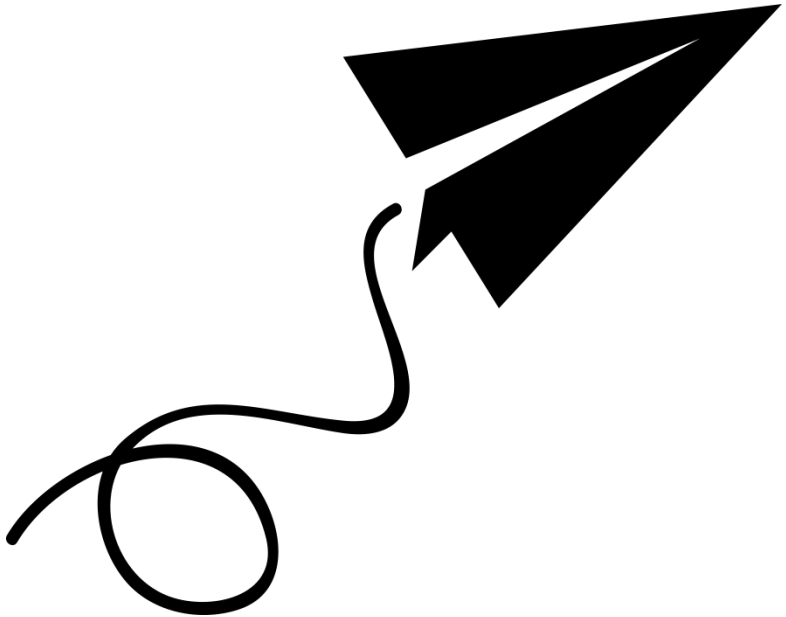
New Challenge!



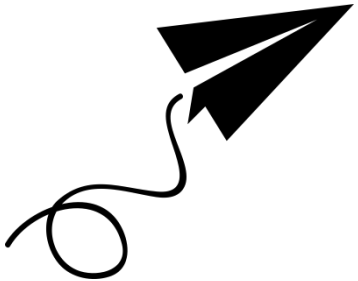
Answer the Question:
Does scaling up your plane translate into proportional increase in distance traveled?



Scale Up Your Plane 3x



Build & Test
(& Capture Data)



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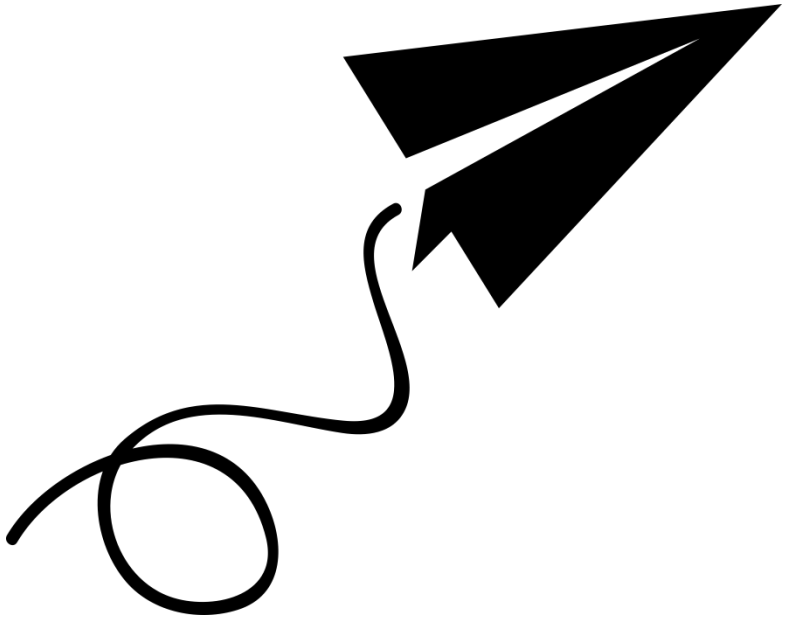
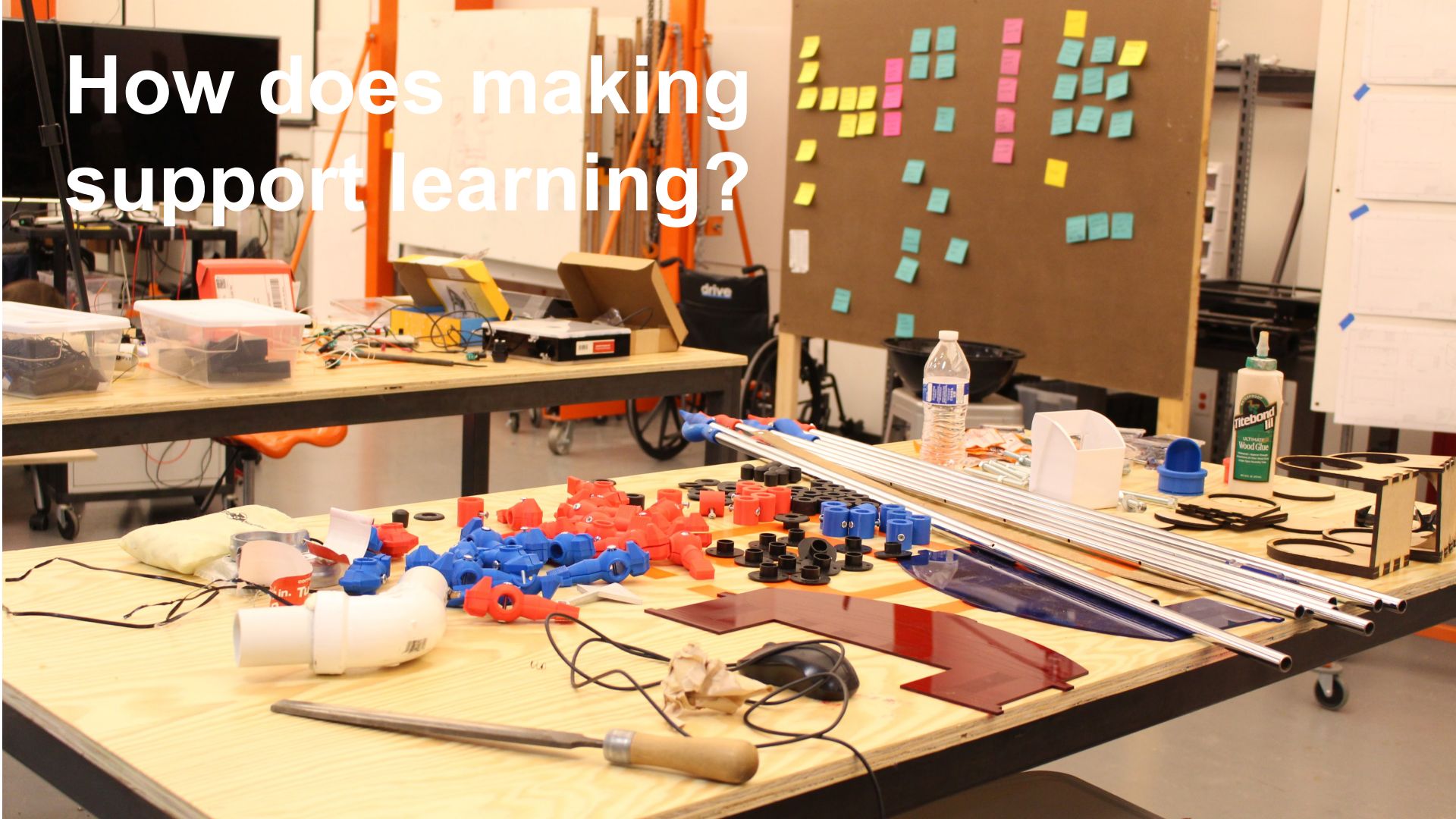
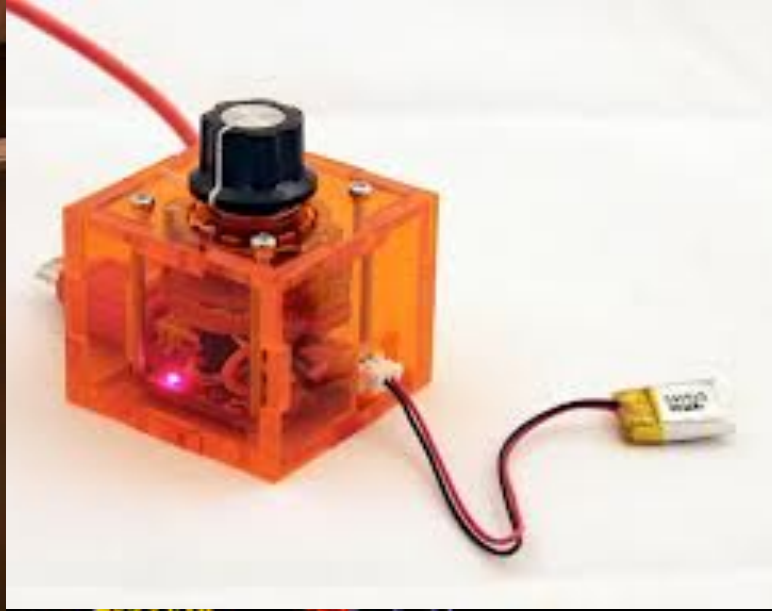
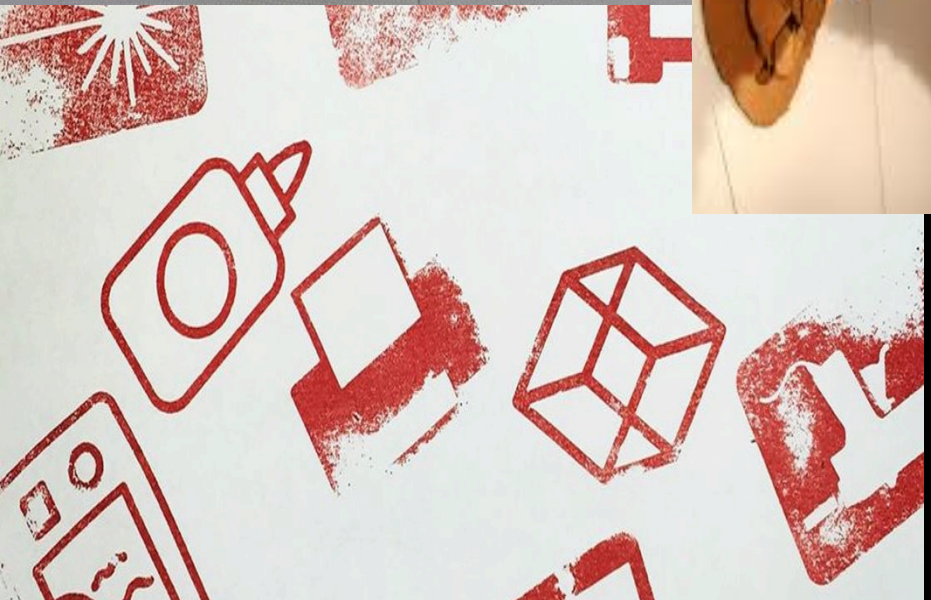


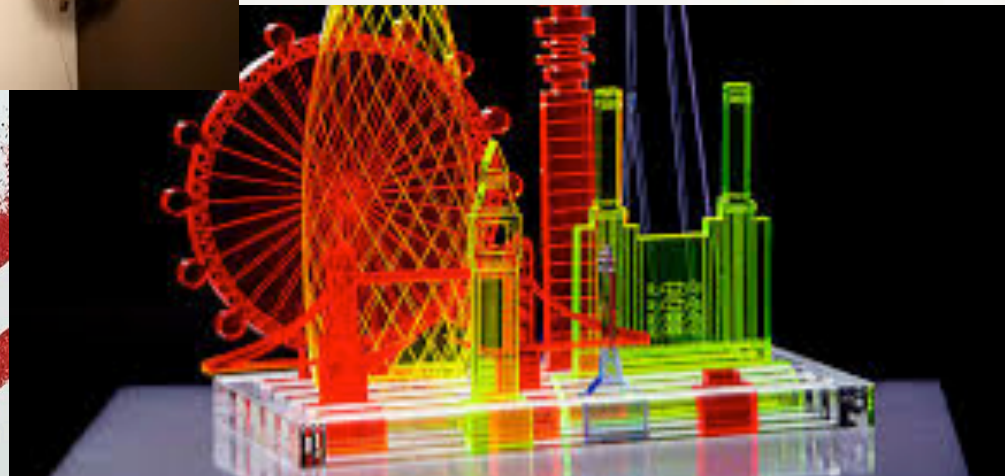
Debrief


How does making support learning?
drive
Titebond III
Wood Glue

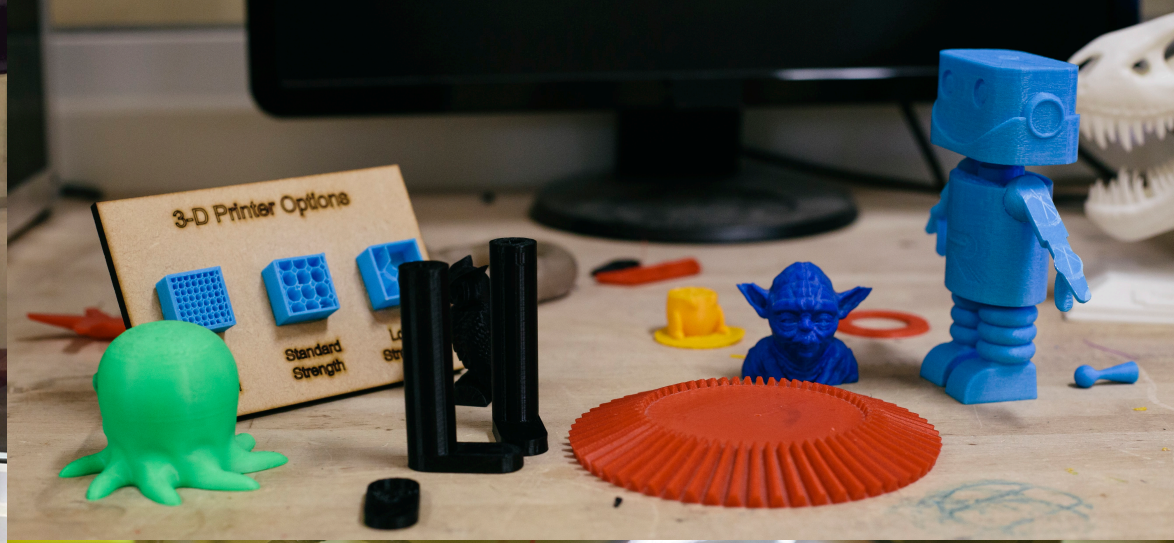

CAUTION
Full Spectrum

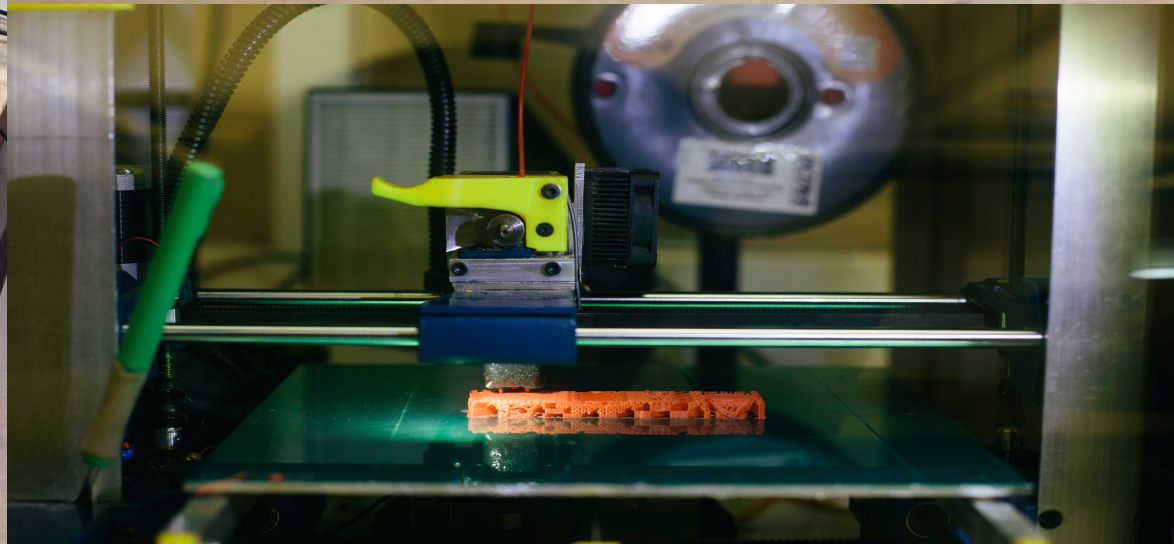







PolyPrinter
229


3-D Printer Options
Standard Strength




, tello world
Put Vinyl Away When Finished


INNOVATION
GYM


JET
START
STOP
JET
JET
OREO
DEWALT
DEWALT


WEN
DEWALT

but also…

hot glue guns
popsicle sticks
googly eyes
yarn
cardboard
clay
tin foil
etc. ...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YOU ARE HERE
STANFORD DESIGN PROGRAM
d.
HASSO PLATTNER
Institute of Design at Stanford
Snap-on
HENGEHOLD TRUCKS
Stanford University


BRUTE


Aumsville
Bacteria
Bots

Why?

When making, students:

When making, students...

… have to face open-ended, ambiguous problems & actively work to solve them

When making, students:

… are intrinsically motivated

When making, students:

… are engaged in & mindful of their learning

When making, students...

...have to persevere or overcome challenges when they are stuck

When making…

… the process of learning, struggling & growing is all to service a larger goal;

the learning is for the making

When making…

… students are often engaged in learning through multiple modalities

When making…

… students explore abstract concepts through the process of creating tangible objects

When making, students…

… have tangible objects to reflect on & get feedback on in order to improve

Perhaps most important to us…

… when students are making things they are building confidence in their ability to creatively tackle any problem

Makers are…

…. empowered to make changes, fix problems & positively influence the world around them

Makers are…

… self-reliant & resilient

Makers have…

… the confidence to tackle tough problems with curiosity & optimism

Makers know…

… how to collaborate with others,
ask for help & learn new skills
in order to solve problems

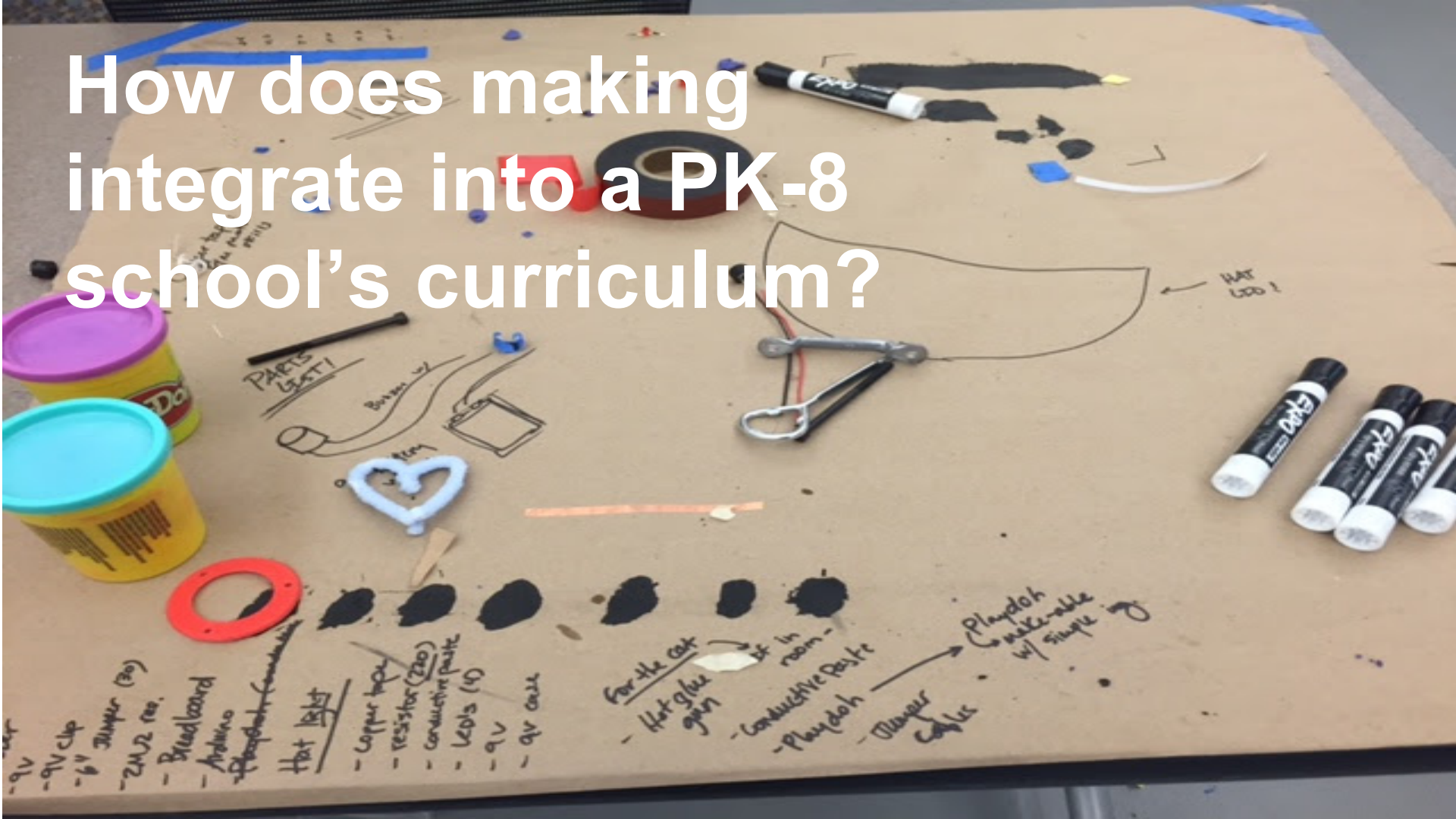
Makers develop …

… an active process of tinkering & problem-solving that supports their own meta-cognitive awareness & growth

Makers develop …

…a growth mindset

How does making integrate into a PK-8 school's curriculum?



Integrating into content

- Procedural knowledge
- Conceptual knowledge
- Problem Solving

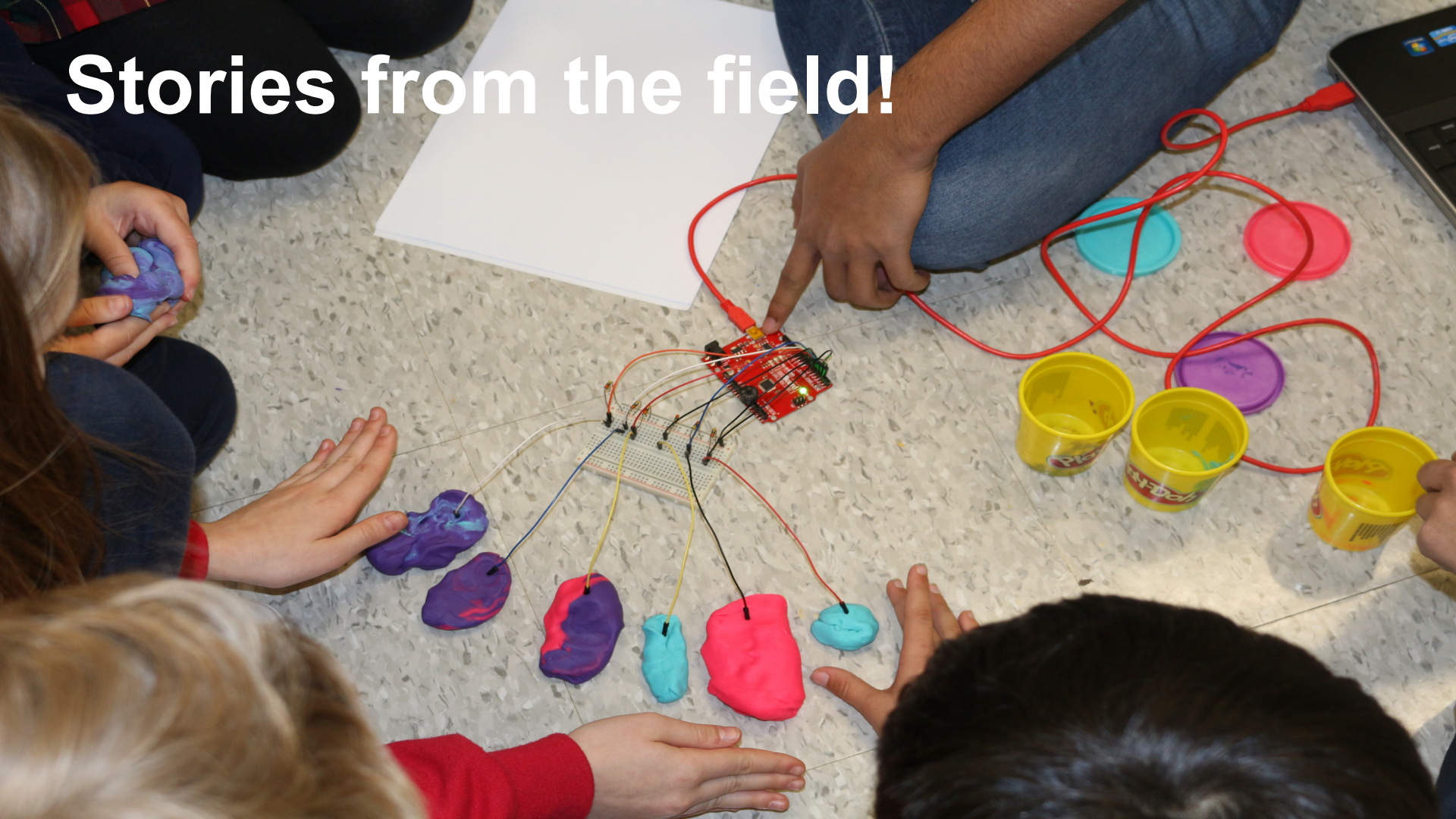
Benefits

- Emotional connections
- Play
- Power

Responsibilities

- Timing of the tell
- Explicit connections to content
- Reflection

Stories from the field!




SES
#CLASSOF2015

Q & A