

The Maker Mindset at *Work*

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The Tech Museum of Innovation



2015 Winner
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- Located in Silicon Valley (San Jose, CA)
- Hands-on technology and science center for people of all ages and backgrounds

Our mission is to
inspire the innovator in everyone.









Investing in
our front-line
educators.

*Bringing them
along for the
adventure!*



Meta moment: Building **empathy** through making so we can design for making!



Permission to prototype





IDEAS SOAR AT TECH STUDIO'S FLIGHT LAB

What, you've never heard of a heart-tailed dragonfly?

Or a winged angel squid? How about a finned, flying squirrel?

Pay a visit to The Tech Studio and you can take a gander at all manner of flying creatures in Just Wing It, a new activity designed by The Tech's Educational Programs team that invites guests to learn through doing.

Just Wing It — a complement to Taking Flight, this year's theme for The Tech Challenge, presented by EMC — allows visitors of all ages to explore biomimicry, an approach to innovation that looks for solutions and strategies inspired by nature.

The activity is simple (and addicting). Grab a fuselage, then select from a wide array of animal parts and pieces. Bat wings. Swallow tails. Flying squid fins. Build your own imaginative flying device, then step up to the launching machine and see how high and far it can soar! Experiment with different parts and constructions to see what works best.

So how does The Tech create experiences like this? With rounds of prototyping, innovation design process methods, and — especially in this case — support from the community.

While prototyping the wings, the team had a vision of whimsical shapes in bright colors. They racked

their brains to find a lightweight but durable material — then glanced over at the plastic pieces of the ITSPHUN design kits used every day in the studio. The team knew they had stumbled on the solution. Happily, ITSPHUN, a local startup, provided invaluable advice on sourcing the material and helped create a fabrication protocol.

Although lightweight, ITSPHUN material was still heavier than the paper prototypes the team had been launching off a consumer paper airplane launcher. They needed something with more oomph. While using an air hose to clear sawdust in the staff fabrication area, the idea hit: What if they could hook up some air power?

Enter Rick Schertle, a San Jose English teacher with a passion for rockets and gliders who owns a company called Air Rocket Works. Schertle is one of the foremost faces of the Bay Area maker scene and has a long history of collaboration with The Tech, so the team approached him about his compressed air launcher. He helped modify his design to create a launcher that is now enjoyed by thousands of "flight engineers" in The Tech Studio!

"I love how The Tech took our launcher and basic idea and exploded it into a hands-on prototyping extravaganza for kids and adults alike," Schertle said.

And we love the collaborative spirit of the maker movement and the innovative nature of Silicon Valley that helped pave the way to this exciting new challenge!



The three-part evolution to Just Wing It!

1

Initial prototype:
Ready, Set Fly
(2013)

Activity: Use scissors, cardboard and tape to build a flying device in a free-form construction activity.

Pros: Guests enjoyed being able to personalize their design.

Cons: Activity took too much time. The "launcher" — a giant pulley system — was more of a push than a launch.

2

First iteration:
Turkeys Take Flight and Flying Fruitcakes
(2013-2014)

Activity: Design a flying machine to transport the holiday turkey or fruitcake into the oven! This new-and-improved Ready, Set, Fly activity involved pre-cut cardboard shapes with attached velcro.

Pros: The process allowed for faster iteration.

Cons: Prep and fabrication time was too long because material wasn't durable.

3

Current iteration:
Just Wing It!
(2015)

Activity: Learn about the properties of flight by creating and testing flying contraptions. From shark fins to glider wings, discover which shapes and forms are most aerodynamic and create lift.

Pros: Pieces made of long-lasting polypropylene. Many different shapes and colors to allow for personalization. Build time is very fast and velcro system allows for quick iterations. New rig has two launch tubes to allow people to test together, inspiring reflection and sharing.

Cons: It's hard to walk away!

What did we learn?

- People like to personalize their flying contraption with interesting shapes.
- Systems that allow for quick building and modification encourage iteration.



Make time for iteration, reflection, and improvement

But did it work?





“My biggest asset as a developer
[for engineering design challenges]
is that I don't know what the hell
I'm doing!”

- Lauren





The mindset has changed our culture



biotinkering lab



REBOOT REALITY

a digital experience lab



Our team
now leads
prototyping
for all new
experiences in
the museum –
*exhibitions
and programs.*





What challenges will the Maker Mindset enable *you* to take on?

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