

# Flingy-Thingy Challenge



## A Terrible Plan

"Ha ha ha!... AH-HEM! I SAID 'HA HA HA'!"

Zoey looked up from her book to see her Uncle Balzer standing over her holding yet another weird and ugly contraption over his head.

She sighed heavily then asked, "Why are you standing on my desk?"

"Oh! You want to know about THIS?!" Balzer retorted, oblivious to what his niece actually said.

"No. I—" was all that Zoey could get out before Balzer launched into yet another evil villain monologue.

"With this device, I'll finally defeat the Inventsons! What is it, you ask?" Balzer stated, despite the fact that Zoey STILL did not ask, "It's a quantum air cannon that shoots bolts of ionized chaos! It's like throwing a hurricane at someone's head! Tomorrow morning, this machine will be rigged to blast young Walt Inventson on sight! It'll scramble his brains like an egg! With his genius mind ruined, the Inventsons will be finished! HA HA HA!!! ... See, *that* was the thing I was 'ha ha ha'ing about earlier."

"Wait, you're using that on my friend, *Walt*?!", Zoey protested.

"Well, the other two Inventson kids are kind of athletic. They would probably dodge the blast then beat me up with the thing. Walt is as uncoordinated as he is smart. If he doesn't get hit by the blast, he'll break his head tripping over his own feet! The only thing that could possibly foil my plan is if some small random object fell in the air intake on top. Though the chances of *that* happening are ummm...."

"Are you trying to think of some kind of 'hurricane' pun right now?" Zoey asked accusingly.

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"Ummmm...The chances are not likely. Dagnabbit!" With that, Balzer left with his machine.

"Uncle Balzer is right about one thing. Walt is amazing, but he's also an amazing klutz!" Zoey thought to herself. "Also, I'll never be able to make him take me to the dance next week if his brain is mush, so I guess I have to stop my crazy uncle. The trick will be making sure no-one knows I did it!"

Zoey put away her book, rolled up her sleeves, and got to work. "The Inventsons aren't the ONLY genius inventors around here! Now the only question is, how do I build a thing to fling a small object into my uncle's machine?"

Help Zoey save Walt Inventson! Create your own "flingy thingy" out of cardboard and test it out!

## What You Need

Cardboard

Scissors

Tape

A sheet of aluminum foil,

A plastic cup

Paper

Pencil

## The Challenge

You're going to make your own "flingy thingy". A flingy thingy is a contraption that flings a ball of aluminum foil into the air. It's like a catapult, except you will be making it out of cardboard. Your goal is to get the ball of foil to land in your plastic cup.

### THE RULES:

- 1.) It must remain on the ground or floor. (No, you can't hold it in your hands to use it!)
- 2.) It must be made mostly of cardboard.

You can use other materials also just as long as your thingy is MOSTLY cardboard.

Here are just a few ideas:

- Rubber bands or pieces of elastic
- Hot-melt glue (Get adult supervision!)
- toothpicks, paper clips and clothespins

- 3.) It must launch a small ball of aluminum foil into the air towards a plastic cup.

### STEP ONE: Inventing

- Think about the materials you have to work with.
- Imagine different ways to launch your item.
- Draw your ideas.

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## STEP TWO: Making

A. Start building! Using your drawings as a guide, build your flingy thingy.

Remember to test things as you build them!

- Make sure pieces fit the way you want.
- Do the parts hold their shape where they need to?
- Do moving parts move the way you want them to?
- Make corrections as you go.

B. Once you have your flingy thingy built, test it out in a safe place.

Make sure there is nothing nearby, especially any people or pets that could be hurt by your device.

How to test your flingy thingy:

- Place your thingy on the floor in an open area.
- Place the aluminum foil ball in the thingy.
- Launch the ball and watch where it lands. (Do this a couple times.)
- Place the plastic cup on the floor around the same place where the foil ball landed.
- See if you can launch the ball into the cup.
- Record each time attempt with either “hit” or “miss”.
- Do this test at least 10 times.

If you have access to a camera, take pictures or video as you go to show the results.

C. Evaluate your flingy thingy.

- Ask yourself the following questions:
  - Did your flingy thingy work the way you wanted?
  - What did you try that did NOT work?
  - What did you try that DID work?
  - What could you do to improve your design?

## OPTIONAL CHALLENGE:

Do you want an additional challenge? If so, go back and build a NEW flingy thingy.

- Use what you've learned to make the new version work better.  
**(You may want to sketch out your planned changes first!)**
- Test the new version.
- Answer these questions:
  1. Which flingy thingy worked better and why?
  2. What would you do differently if you had to build another flingy thingy?

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## STEP THREE: Storytelling

Report your findings. There are two options that we suggest:

**Option A:** Write out the answers to the following questions and send them to your teacher:

1. Did your flingy thingy work the way you expected?
2. Why do you think your flingy thingy worked the way it did?
3. What was the hardest part of this challenge?
4. What would you do differently if you had to do it again?

If you can take pictures of your flingy thingy, send them to your teacher as well.

**Option B:** Record a video. In your video, you should:

- Show the drawings you made from STEP ONE
- Talk about how you built your flingy thingy.
- Answer the following questions:
  1. Did your flingy thingy work the way you expected?
  2. Why do you think your flingy thingy worked the way it did?
  3. What was the hardest part of this challenge?
  4. What would you do differently if you had to do it again?
- Take a video of you using the flingy thingy.

## Lesson Learned

Building a cardboard device that performs a function adds another dimension of difficulty to typical cardboard-building challenges by introducing mechanical reasoning into the challenge. Cardboard performs differently as a dynamic load is put on it during the process of performing a mechanical function. Students use their creativity to come up with a design and critical thinking to observe problems and enact solutions.

The organizational structure of the challenge leads students through the processes of problem identification, solution execution, testing, observing, and revising. These disciplines are applicable to most professional positions regardless of whether they involve engineering or not.

Finally, prototyping with cardboard is a staple skill of professional industrial designers. Used effectively, it's a powerful tool for visualizing a concept early in the design phase with a minimum of resources.