



Science Fair, Farce, and Free-For-All

I started this article on January 21st, the most depressing day of the year [1]. Dr. Cliff Arnall gauged the third Monday of January to be the most depressing day using a formula based on weather, holiday debt, and failed resolutions.

The exception to Arnall’s formula involves engineers with children in kindergarten through eighth grade. The brightly colored notice they receive each year for the school science fair offers a respite from depression. The prospect to tinker with science offsets the depressing effects of weather, debt, and failed resolutions.

Let’s be honest: Most engineers engage in little or no engineering. They entered engineering to design and build but the dirty little secret they don’t tell you in college is that only a small percentage of engineers actually design or build. Most engineers document, configure, test, meet, review, manage, meet, inspect, and meet again, but few design. Those who do design rarely get hands-on building projects and hands-on software is non-existent (note: software builds and keyboard strokes do not count).

When that science fair paper hits home, the pent-up frustration of deprived engineers uncorks like a potato out of a butane fueled polyvinyl chloride pipe – another release activity for hamstrung engineers. Wheels start turning, the engineering paper comes out, and the Home Depot account mounts.

Now, I’m a big fan of parental involvement in school activities, and I also support alleviation of engineering frustration, but I must caution my fellow engineers: Do not overdo it. Here are signs your child may not be getting the expected science project experience:

- The project takes more than 20 minutes to set up.
 - Armed guards are required to protect the project.
 - You ask the janitor for a high voltage outlet.
 - Lloyds of London insures the project.
 - You have to return the derrick crane by 4:00 p.m.
 - Occupational Safety and Health Administration inspection is required.
 - Your child answers all questions with, “Mom!”
- Keep your project simple, involve your child, and, above

all, please leave the volcanoes, Mentos geysers, cake baking instructions, and soda pop-soaked teeth at home.

My daughter, Hannah, was inspired by MythBusters to determine the fastest way to cool a can of soda pop [2]. The results, in the Cool It Pop graph, determined that a cooler full of ice and salt water is your best bet – provided you don’t have a fire extinguisher on hand.

Hannah noticed the refrigerator and freezer seemed very slow to cool. I noticed Hannah left the door open during measures, diminishing the refrigerator’s cooling ability. She

modified her measurement by pulling the can out of the refrigerator, closing the door during measurement, and then returning it. The results were much better as displayed in the Keep the Door Closed graph.

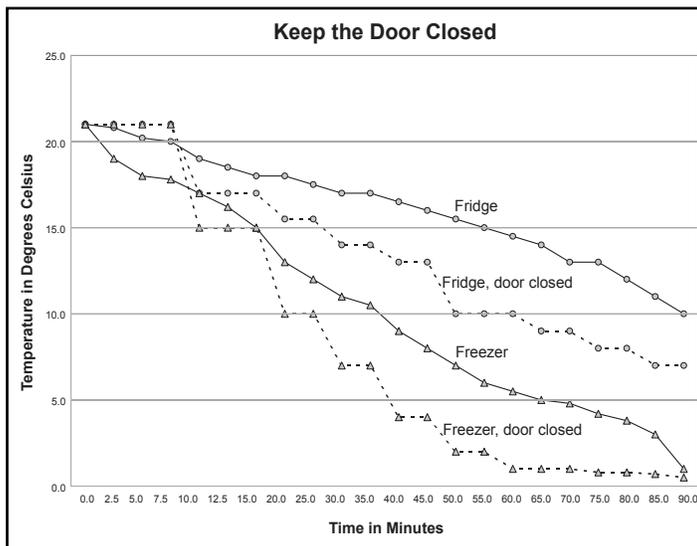
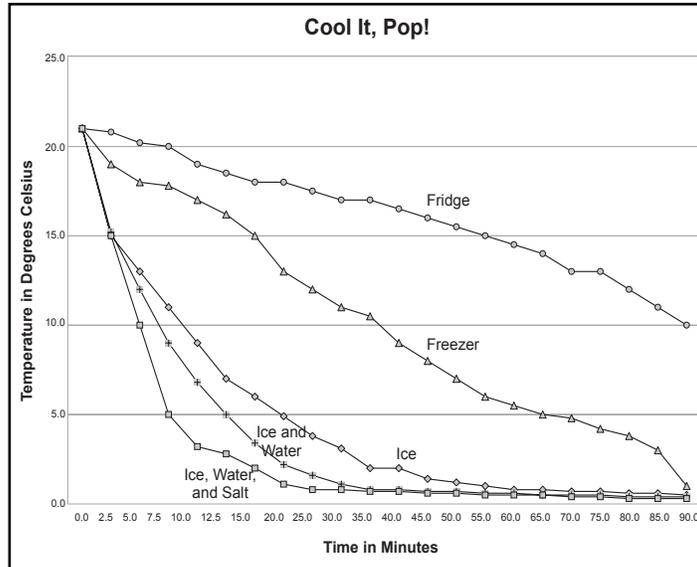
What can the science fair teach us about tracking engineering projects? First and foremost, if you manage engineers, give them at least one task requiring designing, tinkering, or building. This act alone will save both yours and the engineer’s sanity.

Second, resist the temptation to over-measure. If measurements become more important than the project itself, your measures will be sullied. Keep the door closed and let your engineers engineer.

Third, unbiased and precise measures are impossible. Factor that into your analysis, be tolerant on precision, and vigilant on accuracy (see [3] to discern the difference).

Finally, waste not, want not – keep it simple. Not simple minded; simple to implement, simple to measure, simple to use, and simply effective.

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References

1. Tanker, Bill. “The Most Dangerous Day of the Year.” *Time Magazine* Jan. 2008.
2. *Mythbusters*. Discovery Channel <<http://dsc.discovery.com/fansites/mythbusters/mythbusters.html>>.
3. Petersen, Gary A. “Ready, Fire, Aim.” *CROSSTALK* Sept. 2006.