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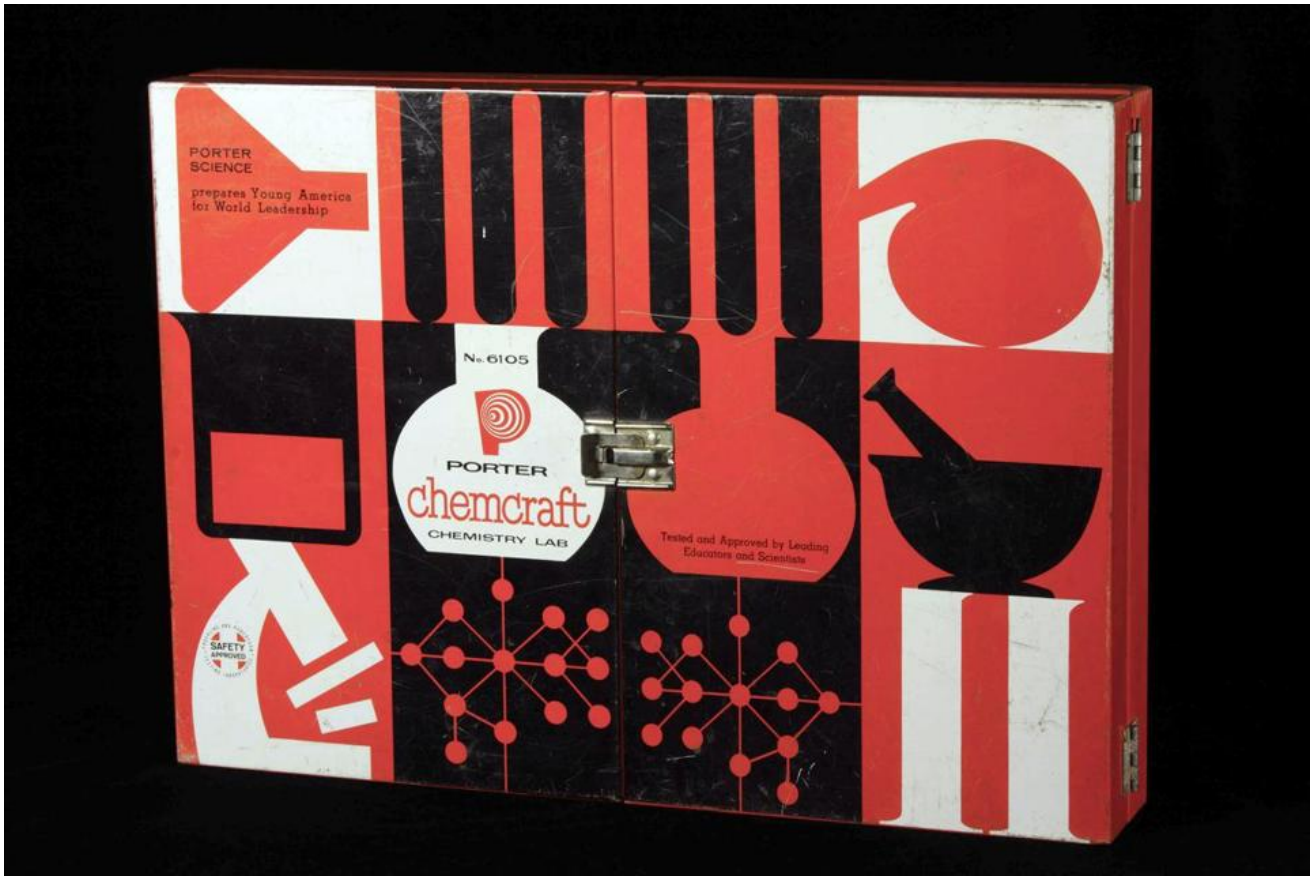
Science toys safer, more fun, but do kids learn?

Some lament loss of trial and error

By Jennifer A. Kingson | NEW YORK TIMES DECEMBER 25, 2012



GREGORY TOBIAS/CHEMICAL HERITAGE FOUNDATION COLLECTIONS VIA THE NEW YORK TIMES

A Chemcraft kit from the mid-1950s.

Ask scientists of a certain age about their childhood memories, and odds are they'll start yarning about the stink bombs and gunpowder they concocted with their chemistry sets. Dangerous? Yes,

but fun.

''Admittedly, I have blown some things up in my time,'' said William L. Whittaker, 64, a robotics professor at Carnegie Mellon University who unearthed his first chemistry set, an A.C. Gilbert, in a junkyard around age 8. By 16, he was dabbling in advanced explosives. ''There's no question that I burned some skin off my face,'' he recalled.

Under today's Christmas trees, girls and boys will unwrap science toys of a very different ilk: slime-making kits and perfume labs, vials of a fluff-making polymer called Insta-Snow, ''no-chem'' chemistry sets (chemical free!), plus a dazzling array of modern telescopes, microscopes, and DIY volcanoes. Nothing will set the curtains on fire.

''Basically, you have to be able to eat everything in the science kit,'' said Jim Becker, president of SmartLab Toys, who recalled learning the names of chemicals from his childhood chemistry set, which contained substances that have long since been banned from toys.

Some scientists lament the passing of the trial-and-error days that inspired so many careers.

''Science kits are a lot less open-ended these days,'' said Kimberly Gerson, a science blogger who lives outside Toronto. ''Everything is packaged. It's either 'yes' or 'no.' If you don't get the right result, you've done it wrong and you're out of chemicals.''

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Others, though, say the new crop of science toys — even with cartoonish packaging and heavy emphasis on neon goo — represent progress. More entertaining, educational, and accessible than earlier products, which relied heavily on a child's inner motivation, these toys may actually help democratize the learning of science and introduce children to scientific methods and concepts at an earlier age.

''I grew up in the 1960s, and a lot of the chemistry sets were kind of boring,'' said William Gurstelle, a science and technology writer. ''You'd go through the book and at the end of the experiment you'd get some light precipitate at the bottom of the beaker. Maybe at most it changes color or something.''

Gurstelle's books, which include ''Backyard Ballistics,'' teach people to make dangerous projectiles, like a potato cannon that uses hair spray as launching fluid. But he had high praise for commercial science kits, which show children (among other things) how to make slime.

''Well, that's a pretty cool thing to have when you're done,'' Gurstelle said. ''You're not going to really learn to be a chemist from a chemistry set when you're in seventh grade; you're just going to be inspired. The point is that new chemistry sets and new toys are just better, because the

manufacturers have figured out how to make them more fun."

Some toy makers, like SmartLab, have used this philosophy to give some classic toys a modern makeover. One of SmartLab's takes on a chemistry set, for instance, is the Extreme Secret Formula Lab, with "squishy-lidded bubble test tubes" and "an abundance of glow-in-the-dark powder." The game of Mousetrap has been reenvisioned as the Weird and Wacky Contraption Lab, which lets children release their inner Rube Goldberg. And the slot car tracks Becker recalls snapping together have been translated into a robot called ReCon 6.0, which children can program to roam around.

"What we do is give kids the opportunity to learn through problem solving," Becker said.

Of course, computer technology has also remade the experience of learning science. Children may be more likely to click on a science app than to play outside.

Critics of the new toys say that's all the more reason to promote playthings that are more suggestive than prescriptive, items that evoke creative thinking. Will the Beautiful Blob Slime Lab release your child's inner chemist?

"I think back to when you had a bucket of Legos dumped in front of you, and you could do what you wanted with them," said Gerson, the science blogger.

Certainly, science toys have evolved. In the 1920s, '30s and '40s, Erector Sets and chemistry sets with real glassware, chemicals, and spirit lamps were "meant to breed a scientific culture in America," said Art Molella, a science historian who directs the Smithsonian's Lemelson Center for the Study of Invention and Innovation.

The atomic era of the 1950s and the launching of Sputnik ushered in science kits that pointed out the possibilities in energy and space, including some with samples of real radioactive ore. For better or worse, Molella said, "there was a lot of hands-on aspects to it, not like our video games today."

Yet the classic science toys have not disappeared. Many old favorites exist in modern forms. The Visible Man and Visible Woman anatomy kits have yielded shelf space to the Squishy Human Body Kit, which has rubbery internal organs and an instruction book that explains what happens when pizza is digested.

"Having kids take those pieces, hold them and put them in there, they get such a deeper understanding of what's going on than they ever could looking at a screen," Becker said.

Another iconic toy, the Ant Farm, introduced in 1956, still exists — including in a high-end version that "projects the shadows of the ants up on your ceiling," said Frank Adler, president of Uncle

Milton, the company that makes it.

And classic chemistry sets, complete with mildly dangerous chemicals, are still available, largely as a boutique product. An 11-year-old company called Thames & Kosmos imports its kits from Germany, selling what are considered to be the only high-end chemistry sets in wide distribution in the United States.

“There’s a lot of people who say the great innovators of the last century all had the opportunity to play with things like chemistry sets, and had the possibility to explore things in a more open-ended way, and that’s what led to their great innovations,” said Ted McGuire, president of Thames & Kosmos. “Now people are worried we don’t have those same opportunities for our young people.”

But even at the goo-making end of the retail spectrum, toy company executives make good arguments for the educational value of their products.

At Be Amazing Toys, top sellers include Insta-Snow, Cool Slime (“Just mix the two liquids together and you’ve got perfect slime every time”) and the Geyser Tube, which is a package of Mentos and a tube to funnel them into a soda bottle. Some kits cost under $5.

“We look at ourselves as, ‘Here’s a great way to introduce your child to the world of science and make it interesting, not boring,’” said Renee Whitney, a vice president at Be Amazing Toys. “Once they’ve had the ‘wow effect,’ we try to explain why it happened.”

Whether a future generation of scientists will look back fondly on their days of dropping candies through the Geyser Tube into Diet Coke remains to be seen. But it does seem that each generation grows up with a science toy that inspires in a particular way.

“I’m 31 years old, and when I was growing up, everyone had this little Fisher-Price doctor set,” said Rosie Cook, a historian at the Chemical Heritage Foundation who is curating an exhibit on chemistry sets. “I honestly think that’s why a lot of people my age wanted to be doctors.”