

THE WALL STREET JOURNAL.

This copy is for your personal, non-commercial use only. To order presentation-ready copies for distribution to your colleagues, clients or customers visit <http://www.djreprints.com>.

<http://www.wsj.com/articles/how-to-raise-a-scientist-in-the-xbox-age-1450137781>

OPINION | COMMENTARY

How to Raise a Scientist in the Xbox Age

Increase kids' boredom so they'll start daydreaming. Also, forget about today's ultrasafe chemistry sets.



PHOTO: GETTY IMAGES/ISTOCKPHOTO

By **ROBERT SCHERRER**

Dec. 14, 2015 7:03 p.m. ET

When I was 12 years old, I nearly blew myself up with my own chemistry set. A blob of sodium silicate had clogged up a test tube, so I heated it over an alcohol lamp, intending to melt it. Instead, the bottom of the test tube exploded, spraying shards of glass all over the basement. Naturally I wasn't wearing safety goggles—I'd never even heard of them. Later, in another mishap, I almost set the basement (and myself) on fire. I tried to duplicate an experiment from my science encyclopedia, which claimed that a rag soaked in alcohol would burn with such a cool flame that the rag itself would not catch fire. Turns out that isn't true.

What did I learn from these experiences? Not everything melts when you heat it. Alcohol can set your pants on fire. And don't do stupid things. (The last of these remains a work in progress.) I've compared notes with colleagues in chemistry and nearly all of them had similar childhood near-death experiences, which they relate with various mixtures of pride and embarrassment. But it's always with a sheepish smile, and all agree that using a chemistry set was a formative experience leading to their scientific careers.

So you can imagine my disappointment when, a decade ago, I set out to buy a chemistry set for my oldest child, only to discover that they had gone the way of the dodo and the cassette tape. Sure, there were pathetic imitations, complete with minute amounts of harmless chemicals. But I could have created a better chemistry set from the liquids in my own refrigerator. What killed the chemistry set? The relentless drive to shield our children from even a whiff of danger.

Yet there is an even more insidious problem now facing young proto-scientists. Arthur C. Clarke once said that "any sufficiently advanced technology is indistinguishable from magic," and many of our household gadgets now lie firmly in the "magic" category. When I was younger, my grandfather, who worked for a moving company, would bring home all sorts of discarded mechanical and electronic gizmos. Armed only with a screwdriver and a hammer (and no goggles), we would dissect these marvels to see what made them work. Try taking apart a modern cellphone or a laptop computer. Assuming you can even figure out how to pry it open, the inside is as mysterious and inscrutable as the outside.

Why does this matter? Because the ability to tinker, to take things apart and understand how they function, is one of the key traits of a scientist. It's no accident that an unusually large number of 20th-century American scientists grew up on farms or ranches, where they had to learn to fix the tractors and planters without outside help. Now most of us don't even change our own oil.

Modern children are also deprived of another key ingredient that has powered many a young person down the road to a career in science: boredom, and lots of it. When I was growing up, summer was devoid of organized activities. We were released into the suburban wilderness at the end of May and left to our own devices until our parents gathered us up for school in the fall. So what did we do during those endless, empty summer days? We daydreamed, explored our neighborhood and invented games. Daydreaming, exploration and invention

happen to be the core of what scientists do. That is largely what I still do for a living.

Yet how can we expect junior scientists to daydream, when they can be playing computer games instead? It isn't that these games are bad, it's that they're far too good. I know this from personal experience: Computer games are crack cocaine for science nerds. Had I been born 30 years later, I would now be lying facedown in a ditch desperately clutching my Xbox. The only thing that saved me was the fact that Pong wasn't that interesting.

So what should you do for your children to encourage an interest in science? Cut back on their computer games. Schedule some unscheduled time. And don't waste your money on cookbook "science kits" from the store. Instead, give your children an old windup alarm clock and a screwdriver, and let them take it apart to see what makes it tick. Just don't forget to make them wear safety goggles.

Mr. Scherrer is the chairman of the department of physics and astronomy at Vanderbilt University.

Copyright 2014 Dow Jones & Company, Inc. All Rights Reserved

This copy is for your personal, non-commercial use only. Distribution and use of this material are governed by our Subscriber Agreement and by copyright law. For non-personal use or to order multiple copies, please contact Dow Jones Reprints at 1-800-843-0008 or visit www.djreprints.com.