



## The Modern Parent: Why Kids Need to Think Like Computers



*There's a big problem in tech, but also an even bigger opportunity for kids.*

BY MARGARET ROCK | APRIL 03, 2013

With a tap and a swipe, your kids just posted photos of your lunch on [Instagram](#) and uploaded videos to [YouTube](#). But does that ease mean they'll have the tech skills to survive in tomorrow's job market? Don't count on it.

Children love smartphones, apps and other fruits of the digital era, but when it comes to becoming the scientists and engineers that create the gadgets, many in the U.S. are woefully unprepared. It's not enough to know your way around a computer: even toddlers can use iPads. They really need to learn to "think like a computer" to survive in the new economy.

What does it mean to "think like a computer"? It means learning to analyze data and see patterns, seeing opportunities to create shortcuts and formulas that translate to better, faster real-life applications. It's not just learning about science and engineering — it's about developing the mindset that looks at data and information and sees possibilities.

STEM — short for science, technology, engineering and mathematics — programs teach kids to think that way, and states are using public and private partnerships to bring them to schools, [according](#) to Chris Roe, CEO of the California STEM Learning Network. But those efforts simply don't cut it. The majority of schools aren't teaching kids to think in

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The Modern Parent guides you through the fast-paced, and often confusing, world of technology to help you raise healthy, happy and well-adjusted children. (Read more...)

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ways that will help them land the high-paying, high-tech jobs of tomorrow.

According to the National Assessment of Educational Progress, in 2011, about two-in-three eighth-graders scored below proficient levels in math. At that rate, there won't be enough of them to fill the surge of tech jobs. In fact, by 2018, there'll be three times as many computer science jobs as qualified applicants, reports USA Today.

That means tomorrow's job hunters will increasingly look in fields like "big data." And by 2015, those sectors will create over four million jobs, so if your kids don't have a major yet, steer them into tech for great opportunities to come.

For example, they could be a big data scientist in the retail market — but they'll need to learn to analyze numbers to detect buying patterns that increase revenue margins. Or they could be an industrial scientist in transportation — but they'll need to use railroad information to figure out efficient transport routes and schedules. That kind of thinking skill, though, requires a different sort of education — and it's not one schools are providing.

### A Different Way of Learning

The best-prepared kids come from schools that use tech tools in a different way. The idea isn't to abandon traditional studies like history and literature, but to approach all subjects with a computing mindset. But if you're serious about developing your kid's computational thinking, you need to start earlier.

In the past, the idea of pursuing computer sciences was abstract, dry and isolating, but that isn't the case anymore. Advocates — from groups like Code.org to projects like CodeED — say computer science should be offered to children in all schools at an earlier age.

One way to give kids a head start is to give them devices: but not just iPads, mini-computers they can actually tinker with — Google and the Raspberry Pi project, for example, are distributing 15,000 of their pocket-sized and transparent computers.

"It's just a little PC," Eben Upton, Raspberry Pi's co-founder, told Deutsche Welle. "It's a credit card-sized PC that runs the Linux operating system and that we bundle with pretty much every operating tool under the sun, with the hope that it'll get into kids' bedrooms and that they'll use it to learn to program."

Upton, a former professor at University of Cambridge, saw the declining rate of Computer Science applicants at the college, so he created the small computer, which costs less than \$40, to help address the problem. The device is housed in a see-through material, so children can see all the bits and parts working. That develops interest in the "how" computers work, rather than the "wow" that interests most.

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
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If your school doesn't use specialized online resources like [EdX](#), [Khan Academy](#) or [CodeHS](#), don't despair. A growing number of public and [private](#) institutions are adding laptops and tablets to classrooms, taking the first critical steps to digital learning.

But schools need to make sure kids use gadgets for more than passively looking up facts and information — they need to actively use them to gather and analyze data in faster and more efficient ways. Instead of using iPads to look up statistics on an election, for example, teachers can use social media to crowdsource the class for data. By learning “digital thinking,” kids are not just using technology to store or access information, but they're learning skills that take raw data and generate useable results.

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## It Starts at Home

Of course, not every school uses a coding academy and technology in the classroom — in fact, for most school boards, technology is an afterthought. And if that's the case, you, as a parent, need to be even more proactive.


Field trips are a good substitute. Ask your school to take the class to workshops like [Computing Connections](#) at the [Raytheon Learning Center](#) in Tewksbury, Mass. The panel — guest speakers from Microsoft, iRobot, Raytheon and Boston's Museum of Science — shows kids futuristic concepts like NASA videos and lets them control robots and tinker with computer models to treat disease in interactive ways.

After-school programs can also spark an interest in STEM fields. Just like workshops, check for activities at your local science center, like [MathAlive](#) in Phoenix, that teach robotics, rocketry and scientific discovery to give kids “hands-on” experience in science and computing.

Kids need help to succeed for tomorrow. Projects like Raspberry Pi and schools that use digital tools create opportunities, but ultimately, parents are the most important factor to sparking an interest in the sciences. And time is of the essence. The tech industry is looking for people who can think like computers, partly because parents don't expose kids to the high-tech fields. [According](#) to the Congressional Research Service, children of immigrants make up one-in-three STEM graduates in 2009.

Legislators from both sides of the political aisle understand the importance of these jobs to our progress, and because of that gap at home, they're considering an [increase](#) in the number of green cards given to foreigners with STEM degrees — up to 55,000 a year. That sobering statistic shows we're not producing enough home-grown, computer-thinking graduates — and that's a big problem in the future, but an even bigger opportunity as well.

Kids are growing up to be great consumers of technology, but to be great makers, they'll need a better understanding of how gadgets work. Our futures may very well depend on it.

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