

The Family CURRENT

Published by Family Learning Organization

Fall 2017

Homeschool Resources for Teaching Technology

By Beth Buck

If you've paid any sort of attention to the landscape of education in the last five years, you know that STEM (Science, Technology, Engineering, Math) subjects are very "in" right now. There's been a huge push to teach children how to code, Lego Robotics teams are all the rage in schools and at home, and then there's the perennial frenzy over whether American kids' math test scores are high enough. Many traditional schools are making a real effort to get kids into the 21st century by issuing laptops, iPads, and other devices.

Obviously the easiest way to teach your 2nd grader electrical engineering, short of enrolling him at MIT at the tender age of six, is to make sure one of his parents is also an electrical engineer. If, for some reason, you have failed to provide your child an engineer parent, do not despair! Whether you're a homeschooling parent or just want to keep your kids from forgetting everything over the summer, tons of easily accessible STEM resources are available.

Coding

Computer programming is everywhere in our lives, even if we don't often recognize it for what it is. Most animated movies these days are someone's calculations just as much as they are art. Think of the scores of apps on your smartphone, or even the technology that allows you to read this article right now. Most people who are adults today never heard much about coding until high school or college, but there are lots of opportunities for children to learn how to code when they are young.

- From MIT, we have [Scratch](#), a free online coding instruction program. By dragging and dropping commands, you can create your own animations, stories, and games. Scratch is set up like an open source community that allows users to share their projects and the source code behind them.
- [Code.org](#) has a game based on the Disney movie Frozen that teaches coding via a series of puzzles to make snowflake designs. Also uses a drag-and-drop interface. Code.org also has a coding game that has an Angry Birds theme.
- [Khan Academy's](#) coding instruction program is less like a game and more like actual instruction. Like Scratch, Khan Academy is also set up like a community. This one would be more effective for older students (as in, not 8-year-olds).

Math

A solid foundation in mathematics is essential for someone wanting to enter the technology field. Lawmakers are forever lamenting America's low math scores. Electrical engineering requires a solid basis in multivariable calculus and differential equations. This is a problem in a society where math is automatically labeled "hard," whether it is or not, and kids who like math are sometimes teased. Kids need to be comfortable with math when they're young if they are to get into it when they're older, and something as basic as a math puzzle book can help. Here are some ways to make math fun (or, at the very least, slightly more interesting):

- Math Facts Games. The curator of the Easy Peasy All-in-one online curriculum has assembled a list of free online math games for practicing basic math facts
- Number Munchers. Kids of my generation probably remember playing endless rounds of Number Munchers during computer class in elementary school. Happily, Number Munchers is now classified as abandonware, which makes it freely available to the public at no cost. You can play it in your internet browser at archive.org, or if you are more technologically inclined, you can download it and play it via a DOS emulator.
- Calculus by and for Young People. Don Cohen was a mathematician who ran a math clinic for children, wherein he introduced topics such as infinite series, fractals, and the Fibonacci sequence. Materials related to this clinic were made free and open to the internet upon his death in 2015. *Calculus by and for Young People* includes a series of videos (via YouTube), a workbook, and a textbook, both pdfs.
- Vi Hart. You may have already run into those "doodling in math class" videos. Those are the work of Vi Hart, who is an expert in explaining interesting calculus concepts with colored sharpies and a spiral notebook. After watching a couple of her videos, you, too, will want nothing more than to go out and count the spirals on pinecones.
- Math Blaster. Another math drill game. It requires registration, but is free. Also available as a mobile app.
- Khan Academy again. While Khan Academy also offers lectures, etc, on a variety of other topics, most of the site is devoted to mathematics. The early math and basic arithmetic section are enjoyable enough that my four-year-old likes to dabble in it from time to time. There is plenty for older students, as well, with courses in algebra, geometry, and calculus. Khan Academy differs from the others because it offers full courses – if you can pass every question and meet the challenges, you can feel confident that you've actually mastered the subject. It uses a self-directed learning approach that lets you choose which topics you'd like to cover, so you can save harder questions for later or skip easier ones.

Engineering

- Hacker YouTube Channels. There are many of these. You'll know them when you see them. There are about a million and one online tutorials about how use a lemon to light things on fire or a vacuum cleaner out of a plastic bottle. Most of these projects only require basic items usually found around the house, in addition to wires and nine volt batteries.
- TeachEngineering.org. This is a teacher's dream. Oodles of free lesson plans for all grades in a variety of subjects related to science.

Non-Internet Resources

Old Textbooks

Yes, old college textbooks. I use them for my elementary school-age kids. If you know where to look, these are easily sourced for cheap, and have lots of pictures. I live in a college town, so our local thrift store is full of textbooks that the university bookstore wouldn't buy back. Last year I found a 1000+ page biology book with the glossy pages and fancy illustrations and it only set me back \$4. If it's good enough for Biology 101, it's good enough for me. In my experience, it's a lot easier as a teacher to dumb down a text than it is to try and give more detail when it's not printed in the book, so it's easy to work a level you and your child are comfortable with. For my first grader, looking at the pictures and reading the captions is more than satisfactory at this point.

Check Your Local University

The university in my town has a lot of programs open to the public that are specifically to encourage children's interest in STEM fields. Our local university had an engineering expo for middle and high school students this last spring. Many local schools brought their students on field trips, but as it was open to the public I went along with my elementary-aged kids and we had a fabulous time. The physics department also hosts a big astronomy day for the community every May, with activities for all ages. The scope of university-sponsored family activities varies considerably from one establishment to another, so you'll just have to ask around or check out the university's website.

Visit Your Local Library

Libraries aren't just for checking out books, any more! Some libraries have summer or after school programs for Lego Robotics or computer programming. The children's nonfiction section is full of possibilities in itself.

This is not anywhere close to an exhaustive list. If you've found something that you find useful for teaching STEM subjects, let us know in the comments!

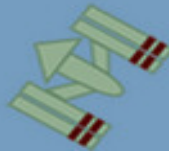
Article source: <http://thesurvivalmom.com/homeschooling-resources-teaching-technology/>



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Teen Tech Project: Building a Computer

By Jeanne Faulconer

This week I visited with a homeschooling family whose son was anxiously awaiting his shipments from **New Egg** and **Tiger Direct** — full of the components he would assemble into his own PC. This brought back fond memories, since two of my three sons undertook this same project during their teen years, and my oldest actually did the same after he graduated. In our case, each son saved his own money for parts and was driven by the desire to have a PC optimized for his specific purposes, rather than sharing the older, slower, family computer.

I can't pretend to have expertise to share about building a computer, and I didn't at the time. However, I was able to make an arrangement with the owner of a computer shop. My middle son — the first to embark on the build-your-own-computer project — would sweep, do errands, and work around the shop in exchange for the owner's advice and guidance.

As it turned out, we hit the jackpot in finding a mentor. He was careful not to give our son easy answers, but sent him to research which parts would be compatible and best for his end use. He asked leading questions to get him on the right track. He was pleasant and supportive, but he didn't do any thinking *for* our son. He then donated time and space in his shop for the actual assembly, leading our son through best practices, including avoiding the dreaded static electricity.

Years later, this son helped younger brother when the build-a-computer bug hit *him*. I was interested to see he employed the same strategy as the computer shop owner, not *telling* his brother what he needed or should buy, but encouraging him to read up on various components and study how they would work together. Then they'd discuss the pros and cons.

The years around our kitchen table have been full of talk about processors and graphics cards and motherboards, and our family computing power has been boosted multiple times by boy-bought, boy-built computers.

As my sons have pointed out, building a computer is not as complex as designing chips, but the projects have certainly been an education. Not only did they learn a lot about computer hardware, but they also had to read deeply to understand specs, and they had to think critically to compare the attributes of various parts. Then they had to put their own money on the line, meaning their decisions were financially important. Thinking back on this teen homeschool technology project, I realize that it demonstrates a lot about homeschooling in our family:

- My homeschooled kids aren't limited by the limits of my knowledge.
- My job, especially with teens, is often to be a facilitator.

- Kids who have a lot of autonomy will often choose cool things to do that are indicators of future direction.
- People will pay *learning* forward and back.
- My kids have often found ways to pay for projects we could not have afforded in the family budget.
- My kids will often successfully complete a project that is bigger than I think they should bite off.

An interest in video games really did turn into an interest in hardware and software which really is turning into a computer science degree and the ability to write good code — and job offers! I'm also gratified to get yet more confirmation that working with my children with an Engaged Homeschooling approach was effective.

When they were younger, I worried a bit about the kids spending so much time playing with Lego bricks, creating tree houses, and building circuits with a kit (over and over and over again). Would they ever gravitate toward something that other people saw as academic?

Today, the first computer builder in our family is long past being a homeschool graduate and has nearly finished his computer science degree at a state university. He's gone over to the software side, but his first experience building a PC was among the homeschool experiences that confirmed his interest in technology.

Learn More...

If authentic engagement represents your homeschool philosophy, read more about how to engage your children in these posts from our contributor Living Education by Oak Meadow covering topics like nature-based learning, creativity, handwriting, homeschooling multiple grades, authentic engagement, and more.

The process has changed a bit. My young friend who was expecting his computer components this week told me about **PCPartPicker.com**, which helps you choose compatible components. I told my computer science major son about it. "Of course," he smiled. "It makes perfect sense to have a site that would do that." He gave me an overview of the magic behind such a website, most of which I did not understand except to say to myself, yeah, he's definitely a software guy now.

Now, years later, I can connect the dots between their play, their curiosity, their autonomy, their evolving interests, their self-motivation, their research skills, their reading, and their pursuits as young adults. That teen tech project, building a computer, turned out to have a much bigger educational payoff than I ever imagined.

Article source: <https://www.thehomeschoolmom.com/teen-homeschool-tech-nology-project/>

Homeschooling with Technology: 4 Reasons to use Tech in Middle School

I often hear moms lament the amount of time their kids spend on 'screen time'. I worry about it too. But, now that TJ is getting older, I am actually learning to embrace some of that screen time. Middle school is a great time to address homeschooling with technology.

Homeschooling with Technology

IPads, laptops, E-readers, and other devices can be very useful for teaching middle school kids to work independently. Instead of lamenting kids and their screen time, let's put those screens to good use. Here are four reasons I'm homeschooling with technology.

THERE ARE SOME GREAT APPS & WEBSITES!

There really are so many great websites and educational apps available. We've used some great ones, some good ones, and we've discovered lots of duds. I do have a few things I consider when I'm thinking about incorporating an app or online tool into our daily school routine. What do I look for?

- technology that encourages independent work
- the 'fun' factor - kids will be happy to work if it's fun for them
- creative teaching or concepts (Dragonbox does a great job of using games to teach algebraic equations)
- subjects that are not my favorite or difficult for me to teach

A few of our favorite apps & websites for middle school:

- Hoffman Academy
- Duolingo
- DragonBox
- CuriosityStream
- Typing.com

and don't forget great resources like Netflix & YouTube! Be choosy and find the things that will fit your family and actually teach valuable skills.

KIDS NEED BASIC COMPUTER SKILLS

It's important to teach basic word processing programs, typing skills, how to use a web browser, and even how to keep a laptop in good condition. In this day and age, these skills are necessary. By incorporating some a few 'screen time' sessions each week in the middle school years you can naturally teach these skills.

OUTSOURCE TO TEACH INDEPENDENCE

Middle school is a great time to outsource a class or two, especially if you are

planning to outsource any high school classes in the future. Kids learn important skills about learning and time management when mom isn't reminding them to do their assignments. Online classes are a great tool for teaching kids to be more independent.

I am planning to have TJ use online classes for upper-level math (and possibly science) so, to prepare for that, I'm having her take one or two classes this year. While not strictly necessary, it's more like a 'trial run' so she'll know what to expect for those future classes, when grades and credits will count.

LOOK TO THE FUTURE

As technology advances, we have to learn to keep up with it. Homeschooling gives our children the opportunity to really dive into technology - they can learn to code, create their own games or apps - the ideas are really endless. Middle school is a great time to encourage this kind of independent learning and creative thinking. Who knows? It could lead to many future employment opportunities. Homeschooling with technology can be a valuable tool.

MOM DOESN'T ALWAYS HAVE TO BE THE TEACHER

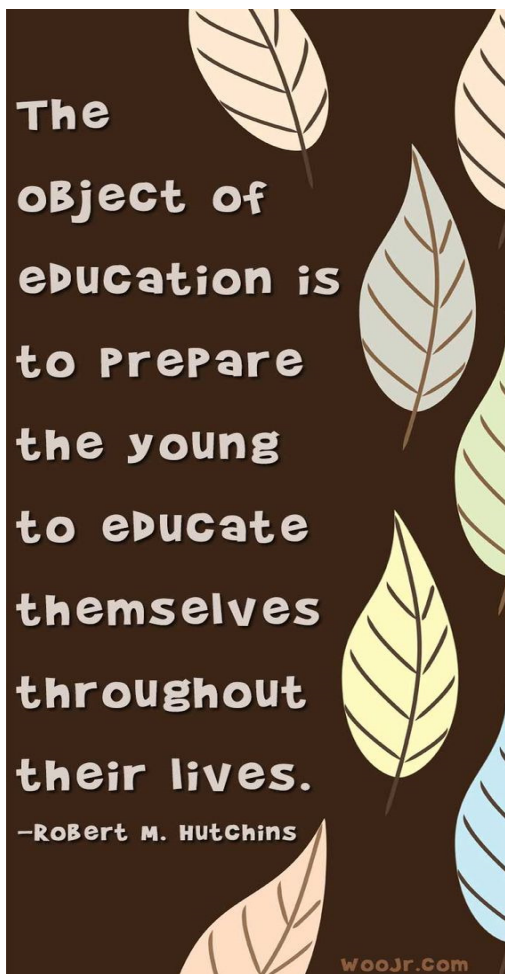
Homeschooling takes a lot of time and effort (years of it, in fact!). It's natural to think that you have to teach every subject and do it all, but that really doesn't have to be the case. By using available tools and technology you can free up your time to study and prepare for those subjects you do plan to tackle in the high school years.

Article source: <http://happyhomeschoolnest.com/blog/homeschooling-with-technology>

Visit

www.familylearning.org

for resources and links to helpful websites, including lesson plans, instructional videos, and curriculum providers!



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Markable CAT (MC) K-3	\$50.00
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TerraNova 1st Edition(T) 1-12	\$30.00
TerraNova/CAT6 2nd Edition (TN) K-12	\$43.00
Practice Tests (PT) 1-3	\$3.00

(S&H to customers included in price)

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GED Prep	\$10.00
Spectrum Test Practice (SPR)	\$13.00

(WA customers must pay sales tax on **test preps ONLY** (not test orders). Tax rates can be found on the WA Dept. of Revenue website: <http://dor.wa.gov>.)

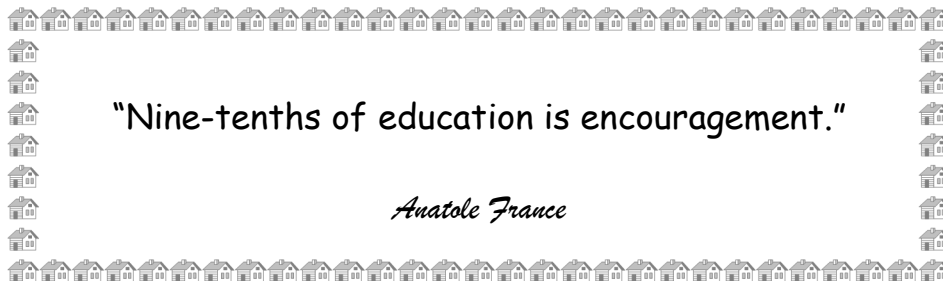
ASSESSMENTS*

Checklist (CSL) K-12	\$30.00
Freestyle (FAF)	\$30.00

(No S&H charge on these items)

*These reports are completed by parents and evaluated by a Washington State certified teacher to document the child's academic progress according to state standards.

If you are unsure of the homeschooling laws in your state, go to www.hslda.org or www.homeedmag.com for specific state information.



KID'S PAGE



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A C O R N H A R V E S T W
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Acorn
Apple
Autumn
Caramel Apple
Carnival
Corn

Fall
Festival
Gourd
Harvest
Hay Ride
Leaves

October
Pumpkin
Scarecrow
Squash
Straw

BOOKS

- Academic Homeschooling: How to Give Your Child an Amazing Education at Home - Tracy Chatters
- Suddenly Homeschooling: A Quick Start Guide to Legally Homeschool in 2 Weeks - Marie-Claire Moreau, Ed.D.
- Learning Styles: A Guide for Teachers and Parents - Barbara K Given
- A Child's Garden: Enchanting Outdoor Spaces for Children and Parents - Molly Dannenmaier

ONLINE RESOURCES

- www.edhelper.com - free downloadable lessons
- www.time4learning.com - economically-priced curriculum
- www.kaboose.com - free lessons and craft projects
- www.mentoringminds.com - books & CDs to purchase
- www.besthomeschooling.org - articles about homeschooling
- www.homeschoolfacts.com - state laws and support groups
- www.schoolexpress.com - free lessons and membership for a fee
- www.lessonplancentral.com - free lessons
- www.sightwords.com - games, activities, curriculum, lesson plans, and teaching tips to prepare children for learning to read
- <http://friendoflearning.com> - over 200 free, online worksheets
- www.communitycollegereview.com - free, detailed profiles of community colleges in the USA

If you have found a particular book or resource to be helpful,
and it is not on this list, please send it to:
martha@familylearning.org.

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