

Technology Programs to Download and Share

It is easy in GEMS to get swept up into science, engineering and math and ignore the technology component of STEM. Luckily there are several wonderful free programs that families and schools can use to encourage children, especially girls, to explore the wonders of computer science and CAD. I highly recommend these.

It may be difficult for you to get access to computers in the school you are using. Computers must be supervised and protected, and many systems do not allow teachers or visitors to download programs that are not purchased by the system. You might want to consider using the wonderful resources from Computer Science Unplugged: <u>https://csunplugged.org/en/</u> to help your girls understand basics.

Here are some programs to share

Scratch from MIT <u>http://scratch.mit.edu/</u>

Scratch was designed at MIT to encourage elementary school students to explore computer programming and to have success and fun in doing so. We use this to design games and stories, and it taps right into the creativity of girls. It is also very well supported and documented, meaning that any question you may have can be answered online. There is also a large educator community available with lessons and tutorials for you as leader to explore.

When I introduce Scratch to girls, I use the example I mentioned in **Developing a Growth Mindset** about being intimidated by the blank screen. But I show them one thing—how to change the cat so she moves around the screen by changing the code on the left, and then I let the girls go. Another thing I do to tear down apprehension is show the examples and tutorials already built into the program and show them how they can adapt them by changing one thing at a time. This strategy usually erases all fear and the girls just jump in. It is amazing what they do with this program.

Code.org <u>Code.org</u>

This wonderful resource is used every year for Hour of Code, a celebration of Computer Science held every December in Computer Science Week. But their resources are available all year round, and they are meant for all ages and all experience levels. They also are rarely blocked in the schools. Explore them on your own first but they are all safe and very fun. Each beginning activity is designed to take about an hour, with a lot of support provided, and the girls get to print out a certificate upon completion of their chosen activity.

HTTPS://GEMS.EDUCATION.PURDUE.EDU



➤ Lego[™] Digital Designer

http://ldd.lego.com/

Although this is a marketing tool for LEGO[®] it is the perfect tool to build spatial skills in young students. Use of this tool has succeeded in getting my GEMS girls to play and build with LEGO[®] when standard approaches did not work. A free download, I close as much of the marketing as I can and encourage the girls to use this in tandem with real LEGO[®] blocks. We practice designing, then building, and then reversing this by building and then designing in LDD.

I built an entire year of Junior Lego League around this tool, having the girls learn to use the program and then build their competition design in LDD before creating it for the showcase. I also adapt this for Blind Building, having the girls do a partner build by having one girl build using LDD and the partner build it in 3-D using LEGO[®] blocks.

As with Scratch, this free download has many examples already built into the program so that reluctant or timid programmers/builders can use the examples and adapt them until they feel comfortable building their own.

Other resources for you:

- ➢ Google SketchUp <u>https://www.sketchup.com/</u> Architectural modeling for kids
- Alice <u>https://www.alice.org/</u> A little more advanced than Scratch, but in 3-D
- Series <u>https://csfirst.withgoogle.com/en/home</u> Learn along with the girls—it's great.

Check the GEMS site for more resources and examples of girls' projects: <u>https://gems.education.purdue.edu</u>



HTTPS://GEMS.EDUCATION.PURDUE.EDU