

# Resources for Final Week for Teachers First Book Club Includes Resources for Programming, Computational Thinking, Interactive Infographics, Favorite NASA Videos, Curated by Beth Dichter (bethdichter@gmail.com)

## Websites for Programming

There are so many great websites for programming, but I think it is important to choose one or two and test them yourself, as well as asking some of your learners to test them and share their feedback. Below are some that I have used with learners. If you would like additional sites let me know.

**CS Unplugged:** <http://csunplugged.org/activities/>

CS Unplugged provides lots activities that do not require a computer, but have the students learn what it means to be a computational thinker. This site does contain unplugged activities that may be used with students in Grades K-3. An unplugged activity is one that does not require the use of a computer. Unplugged activities are also found in Code.org.

If you would like to see an infographic that looks at how to make a peanut butter and jelly sandwich (a great activity to have students 'write the program' to accomplish look in the section on Great Infographics below.

**Code.org:** <https://code.org/>

Code.org provides free online courses for students in grades K through middle school. This site allows you to create a teacher account and you can then set up an account for each student and observe the progress. They continue to expand the number of courses provided and also support Hour of Code. They provide a free one-day workshop for the courses in Grades K – 5. They also offer a free online course. This is one site that is highly recommended.

**The Foos:** <http://thefoos.com/>

This site can be used for all ages. Be aware that there is no text or help on this site. Learners will learn by watching and then coding with visuals. This has been tested by learners in Grades K – 8 with and all learners were enthusiastic. This site uses cookies so learners must use the same computer to get back to their game. Please be aware that this program does take time to load (typically longer the first time it is played). I used this as an alternative program when learners were somewhat overwhelmed (or perhaps frustrated) with Zero Robotics programming with great success last summer. If you are looking for curriculum for the Foos check out this site, <http://www.thefoos.com/hour-of-code/>.

The Foos also provides a one hour version. Go to this website, <http://www.thefoos.com/hourofcode>.

The curriculum for this site is at

[http://www.thefoos.com/hourofcode/curriculum/Teacher Intro to codeSpark Hour of Code.pdf](http://www.thefoos.com/hourofcode/curriculum/Teacher%20Intro%20to%20codeSpark%20Hour%20of%20Code.pdf).

The solution guide for this site is at

<http://www.thefoos.com/hourofcode/curriculum/FoosSolutionsHOC2015.pdf>.

**Scratch** – Scratch can be used by students 8 – 88 (according to their website). This is a student friendly website. I suggest that you have students work through tutorials that are at the website so they get a sense of how to program in this program.

**Scratch:** <https://scratch.mit.edu/>

Scratch was designed at MIT and is available at no cost to students. Students quickly learn how to use this tool and can create stories, games and more. There are materials available on the website. It is suggested that you have parents create the student account and forward the information to you. For tutorials and other information, check out this page: <https://scratch.mit.edu/help/>.

**ScratchEd:** <http://scratched.gse.harvard.edu/>

ScratchEd is designed for teachers and available through Harvard. There are many resources available online at this link, <http://scratched.gse.harvard.edu/resources/new-scratch>, will take you to a page that has resources that include curriculum.

Scratch Jr. is available for free on the iPad and Android. This is designed for students from ages 5 – 7.

**CS- First** (<https://www.cs-first.com/>)

CS First provides access to free materials that provide great scaffolding to teach students how to program, and the program they use is Scratch. They currently have 9 topics: storytelling, fashion & design, art, friends, social media, sports, music & sound, game design, and animation (in beta) as well as a short introductory activity called High Seas Activity.

**Lightbot:** <https://lightbot.com/hocflash.html>

Lightbot was one of the programs available through Hour of Code. This program is free, and has levels that the student must work through. I used this with students from Grade 1 – 7 and the feedback was positive. There is some scaffolding, but as students move up the levels they must understand the previous concepts to be successful. You can also find the solutions to the problems online. Lightbot is free through Hour of Code. Additional products are available through Lightbot but there are costs involved.

**Blockly Games:** <https://blockly-games.appspot.com>

Quoting from the website: “Blockly Games is a series of educational games that teach programming. It is designed for children who have not had prior experience with computer programming. By the end of these games, players are ready to use conventional text-based languages.”

**BotLogic:** <http://botlogic.us/>

BotLogic is a free, online game. You may sign up as an educator, parent or player. I looked at the game for students aged 4 – 8 and the students use arrows to program. The robot may move up, down, right or left. As the student enters each arrow they may also see the programming that is being written.

**Pencil Code:** <https://pencilcode.net/>

PencilCode teaches programming, and for those that know Turtle Logo it may look familiar to you. They provide a section with materials for teachers, and there is a book that you may purchase through Amazon (and perhaps other vendors, but they link to Amazon). The section is COPPA compliant and may be used with younger students. There is an introductory video available at <https://www.youtube.com/watch?v=JJzFD4EdeuY>. Other video tutorials are also available, and they also teach Coffee Script, which is a basic language that may be easier for younger students. This website's home page asks learners if they would like to create art, make music or code an adventure. (First grade and up.)

## Computational Thinking for Educators

Google has created a free online course to help “educators integrate computational thinking into their curriculum.” For more information: <https://computationalthinkingcourse.withgoogle.com/Resources>.

Last summer I was asked to write a unit planning guide on computational thinking for students in Grades K-2 and 3-5. The final product provides access to many resources and I am including many of those resources in the attached documents.

If the concept of computational thinking is new to you, you will also find a list of websites that will provide background material. To get a sense of Computational Thinking you might want to check out this page at ISTE:

[https://www.iste.org/explore/articleDetail?articleid=152&category=Solutions&article=Computational I-thinking-for-all](https://www.iste.org/explore/articleDetail?articleid=152&category=Solutions&article=Computational-thinking-for-all).

The resources here include a short video as well as two Computational Thinking Toolkits (version 1 and 2, both worth checking out). In addition, there is page that provides computational thinking operational definitions as well as a variety of multimedia that may be useful in introducing computational thinking to students (and for a range of grade levels).

In 2011 the National Science Foundation published an article Computational Thinking: A Digital Skill for Everyone. You can find this at <http://csta.acm.org/Curriculum/sub/CurrFiles/LLCTArticle.pdf>. This is also available on the ISTE page but I sometimes find it hard to access.

If you are looking for I Can Statements that address technology this site from Michigan may be helpful. <http://www.saugatuckps.com/District/Department/28-SPS-Information-Technology/2231-i-can.html>. They include statements for Grades K – 8 and high school.

## Great Interactive Infographics

Students like interactive infographics, and I am listing a number of my favorites below. The first is a journey to the edges of our solar system. The 2nd is a journey to the center of the earth. The 3rd is a favorite of mine that looks at why images are important in teaching. The final one is not interactive but it does show programming a how to make a PB&J sandwich.

### How Big is our Solar System?

<http://www.bbc.com/future/ bespoke/20140304-how-big-is-space-interactive/>

This interactive infographic allows learners to begin to see how vast our solar system is...and to learn what has happened at different points in the universe. There is so much information in this that you could have learners create a scavenger hunt. And if you are going to journey to the end of our universe, you might also want to visit to the center of the Earth, through water and land. Luckily BBC has a 2nd interactive infographic called **Journey to the Centre of the Earth** (<http://www.bbc.com/future/ bespoke/story/20150306-journey-to-the-centre-of-earth/index.html>).

### Thirteen Reasons Why Your Brain Craves Infographics?

<http://neomam.com/interactive/13reasons/>

This infographic provides 13 reasons why we should consider using visuals in our classrooms, and provides links to all the material referenced.

### Think Like a Programmer (or How Programmers Make a PB&J)

<http://thecodingentrepreneur.com/think-like-a-programmer/>

One website where I find many great infographics related to education is the ASIDE Blog (Innovation Design in Education). This link (<http://theasideblog.blogspot.com/search/label/interactive%20infographic>) will take you to a page that highlights posts that have interactive infographics. And if you are interested in having students create infographics this is a great site to search for examples from students.

## Favorite Videos from NASA

Please note, I use KeepVid (<http://keepvid.com/>) to download videos from YouTube and place them in a location that my learners can access (because YouTube is blocked for learners). One advantage of this is that you are not dependent on the Internet when you want to view them.

### Five Years of the Sun

<https://www.youtube.com/watch?v=GSVv40M2aks>

This video provides NASA's pick of the best of their videos taken of the sun by the Solar Dynamics Observatory. Take the time to read the information that is included in the description of the video. You can find more at this site, <http://svs.gsfc.nasa.gov/cgi-bin/details.cgi?aid=11742>, which also includes access to the video.

### NASA: A View from the Other Side

<https://www.youtube.com/watch?v=jdkMHkF7BaA>

Learners are interested in seeing the far side of the moon. This video from NASA provides a look at the far side. It is about 2 minutes in length.

### The Secret of the Dark Side of the Moon

<https://www.youtube.com/watch?v=kJkVegBsNyE>

This movie has a more detailed description of the dark side of the moon. It is just over 5 minutes in length.

### What will the Journey to Mars be Like?

<http://visual.ly/what-will-journey-mars-be>

What will space travel be like if you were to go to Mars? This video provides numbers behind the journey to Mars in a format that engaged learners. The video is just over 3.5 minutes long, and most students will have questions that they may want to research after viewing the video.

## A Couple of Multimedia Resources

I found the resources in the book by Boni to be excellent and have a couple of resources to share here.

If you are looking for some excellent exemplars for Blabberize check out this article at **Emerging EdTech**, (<http://www.emergingedtech.com/2014/08/blabberize-in-the-classroom/>).

**PicLits** ([http://www.piclits.com/compose\\_dragdrop.aspx](http://www.piclits.com/compose_dragdrop.aspx)) is another resource that may work well for many students. Learners select an image and may drag and drop words to create a poem (a list of words is provided as are images), and they may also write free style. I am not sure that this website is for use with students under the age of 13.

**PowToon** (<https://www.powtoon.com/edu-home/>) allows students to create animations. PowToon has a cost, but the last few years they have offered free accounts to educators. You will need to check in

periodically to see if they do that again this year. I have used this with middle school students with great success.

I also like to show students is how to make **concept maps**, which are also known as mind maps, and as flow charts. There are four that I would like to share here.

My favorite place to create concept maps is **LucidCharts** (<https://www.lucidchart.com/>). LucidCharts is free to educators. If you are using Google for Education it is available through Google. Otherwise you need to create an account using your school email, and you can then request to be upgraded to the free version. Lucid also has another free program that I have not explored in depth, but that has received positive reviews. It is **LucidPress** ([www.lucidpress.com](http://www.lucidpress.com)) and as the name implies, it provides a wide range of publishing opportunities. Each of these tools allows students to work collaboratively.

**Bubbl.us** (<https://bubbl.us/>) is a great mindmap for younger grades. They are switching over to their newest version on Sept. 1. They allow you to create up to 3 mindmaps that can be saved, but if you want to create more you will have to delete one of the ones you had created.

The third one I have used with learners is **Text2Mindmap** (<https://www.text2mindmap.com/>). This program is also free, and it allows a learner to create an outline and enter it online, and it will change it to a concept map.

The final one is **Slatebox** (<https://slatebox.com/>). This site offers a free account for individuals, but if you would like to have a classroom site it will be free for 30 days and then will cost \$8/month. This site also allows for collaboration, and students may have PIN numbers instead of an email address to register if you have the classroom account. My experience is that this is easier to use than LucidChart, but LucidChart has many more options.

## Teacher Resources

Today there are so many great resources for teachers, and without question the materials provided by TeachersFirst will be of my go to sites this year. Other sites that I find to be helpful include:

**PBS Learning Media** (<http://www.pbslearningmedia.org/>) is wonderful site for teachers AND students. If you know Discovery Ed you will find that PBS is working in a similar direction and has an amazing range of resources that continues to grow.

**CK-12** (<http://www.ck12.org/>) provides resources focused on science and math. They publish online materials that you may modify and share with others. They are a great place for open education resources.

**Open Culture** ([http://www.openculture.com/free\\_k-12\\_educational\\_resources](http://www.openculture.com/free_k-12_educational_resources)) is another resource that has a wide range of materials. It is well worth checking this out when you can find the time.

**Edutopia** (<http://www.edutopia.org/>) is a wonderful resource and their website is easy to search. If you have not had the opportunity to read their work take the time to check it out.

## Digital Citizenship

Many great resources on digital citizenship have been shared with us. There are several that I have not seen mentioned and I would like to share those, as well as one idea I found online and then modified.

Richard Byrne has a blog called **FreeTechForTeachers**. The link below takes you to an article he wrote about his favorite resources for digital citizenship for elementary, middle, and high school students. (<http://www.freetech4teachers.com/2016/06/12-resources-for-teaching-digital.html#.V6q1da08b6g>)

This is another resource that has many great ideas for teachers and he supplies great tutorials for many of the resources he shares.

**Northern Gateway Digital Citizen Resources** includes links with short summaries for each and is at <http://digitalcitizenshipnrgd.blogspot.com/2013/12/planet-nutshell-netsafe-videos.html>.

I have found this a great video for K-2. **Internet Safety for Kids K-3** is at <https://www.youtube.com/watch?v=89eCHtFs0XM>.

I noted at the beginning of this section that I would share a resource that I modified. **EdTech Digest** published a post by Craig Badura called **Digital Survival** (<https://edtechdigest.wordpress.com/2013/10/18/digital-survival/>). In this post he discusses a tool kit he put together with objects that can represent different components of digital citizenship. In the post he shares objects he uses and briefly explain some of the connections. I created a tool box for students in middle school, but I did not tell them what the represented. Each group randomly selected an object (and they were inside the toolbox and held above their head so they could not see what they were selecting. The students were also given a handout on the Nine Elements of Digital Citizenship (resources for this are below). Students were partnered with one other student and had to come up with how the object related to at least three of the nine elements, and share their ideas with the class using their choice of a visual. Each group presented and the class could suggest other ways that object also could reflect various elements of digital citizenship. Each student was asked to find one additional object and write up how this object reflected digital citizenship. The dialogue in class was excellent, and the students came in with a variety of additional objects.

### **Resources for the Nine Elements of Digital Citizenship**

A great visual for the Nine Elements is located at <https://www.fractuslearning.com/2014/09/09/digital-citizenship-poster/>. (A copy of it is pasted on the next page and is available through Creative Commons.)

Mike Ribble has been a key person distributing information about the **Nine Elements of Digital Citizenship**. His website that discusses the elements is at [http://www.digitalcitizenship.net/Nine\\_Elements.html](http://www.digitalcitizenship.net/Nine_Elements.html). The one issue I have with this site is it is not designed for students in elementary school, and may be difficult for those in middle school. On the next page I have included the nine elements that were rewritten by a group of students at my school whom were in Grade 4 and 5. (You may want to go to this site that also lists several additional resources from Mike Ribble - <https://sites.google.com/a/aea11.k12.ia.us/heartland-digital-citizenship/nine-elements>.)

And there are many great infographics that look at the concepts of digital citizenship. Below is one you may be interested in using with students.

**An Ethical Island on Digital Citizenship:** <https://anethicalisland.wordpress.com/2013/04/22/digital-citizenship/>.

This website has a great visual for younger students - <http://lessonsbyandy.com/2012/10/digital-citizenship.html>. More information is available on the website.

And Common Sense Media also has two great visuals, one for students in elementary and one geared more to middle and high school. They also have two excellent game resources for digital citizenship, **Digital Passport** (<https://digitalpassport.org/>) for Grades 3, 4 and 5, and **Digital Compass** (<https://www.digitalcompass.org/>), probably best for grade 7 or 8 (in my opinion).

And another infographic that you may be interested in as a teacher is this new one on **Instructional Methods that are Learner Centered** at <https://anethicalisland.wordpress.com/2016/01/>.



# 9 Elements of Digital Citizenship



**The Nine Themes as written by students at my school:**

Digital Communication – the exchange of ideas and information using digital devices.

Digital Literacy – using technology from a range of sources in a positive and productive way.

Digital Access – the ability to go online with a digital device.

Digital Rights and Responsibilities - everyone has the freedom to go online and to use it wisely, by respecting others.

Digital Commerce – buying and selling of goods online.

Digital Etiquette –a set of rules you follow to show respect and courtesy online.

Digital Law – a set of rules you follow online made by the government.

Digital Health & Wellness – Knowing how to keep your body and mind safe and healthy when on a digital device.

Digital Security – Taking steps to make sure you and your private information is safe.