From STEM to STEAM

STEAM Programming for Teens

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# What is STEM?

Science
Technology
Engineering
Math

Why STEM?

- Current education is very STEM focused

- 21st Century Literacy Skills

21st Century Student Outcomes and Support Systems

Learning and Innovation Skills – 4Cs
Critical thinking • Communication
Collaboration • Creativity

Core Subjects – 3Rs and 21st Century Themes

Life and Career Skills

Information, Media, and Technology Skills

Standards and Assessments

Curriculum and Instruction

Professional Development

Learning Environments

Partnership for 21st Century Skills: Framework for 21st Century Learning

Why STEM?

Benefits for Libraries . . .

- Communicate to our communities that we are relevant

- Communicate to our communities that we are aware of and able to provide best practices

- Demonstrate to our communities that we are proactive

- Demonstrate to our communities that we are engaged

Why STEM?

Benefits for Teens . . .

- Digital Divide or Digital Gap

- Contemporary literacy skills

- Better prepared for success in education, work, etc.

Gaming in the Library

Why?

- **Computer Literacy**
- **Multiplatform Storytelling (Basic Literacy Skills)**
- **21st Century Education**
- **Lateral Thinking, Creativity, Innovation** (STEM Education)
- "Lateral thinking is solving problems through an indirect and creative approach, using reasoning that is not immediately obvious and involving ideas that may not be obtainable by using only traditional step-by-step logic." (Edward de Bono)

   Physical Benefits That Impact Learning and Basic Literacy
- Hand/eye coordination, for example
- **Patron (Customer) Satisfaction and Retention**
- **Supporting General Education**

Challenges: keeping up with popular systems/games, game ratings

Coding @ the Library

Coding Tools:

Code Academy

Scratch

Code.org

Resources:

Article at Librarified

Lego: We Do ($200.00) –

YouTube

Beyond Legos: Coding for Kids

7 Apps for Teaching Coding Skills

Teaching Teens about Digital Literacy Through Coding

Camp for Code: Library program teaches teens basics of programming, robotics

The Basics: Binary Code (YouTube tutorial)
Teach binary code with fun pony bead, fuse bead, Rainbow Loom crafts, for example

Minecraft

Minecraft is a game that was designed to help teach kids coding in a fun, game like environment.

See also, Why Everyone Should Learn to Code:
http://www.slate.com/blogs/future_tense/2013/03/29/codecademy_hacker_school_why_everyone_should_learn_to_code.html

See also these References from YALSA:
http://yalsa.ala.org/blog/2013/04/04/connect-create-collaboratecraft-a-teen-tech-week-post-mortem-minecraft-in-the-library/,
http://www.questia.com/library/1G1-317588244/minecraft-programs-in-the-library-if-you-build-it

STEM Kits

Snapcircuits

Lego We Do

Makey Makey

Raspberry Pi

Not just STEM, **STEAM**

Add the A for ART

Balance of creative thinking, problem solving and self expression added into the science.

Why STEAM?

Combines the benefits of STEM programming with
Creative Outlet + Tech Skills

- Self discovery and expression

- Creative thinking

- Problem solving

- Stimulates imagination

- Develops a sense of craftsmanship

- Multiple disciplines

STEAM Programming With Visual Arts

Digital Photography & Photo Manipulation

Have someone come in and do a digital photography workshop and discuss things like lighting, setting up a shot, etc.

Then, you can have a GIMP workshop. GIMP is a free, online equivalent to Photoshop. You can download it online and a variety of free brushes. It is not easy to use at first, so classes are good.

Picmonkey.com is an online photoediting program.

Instagram – very popular with tweens and teens, visual in nature, quick & easy interface

Top Instagram Tags & Instagrammers

How to Be a Pro on Instagram

Creative Ways to Use Instagram:
- Book Face
- Book Quotes/Covers
- Book Spine Poetry
- Get Caught Reading
- @ My Library
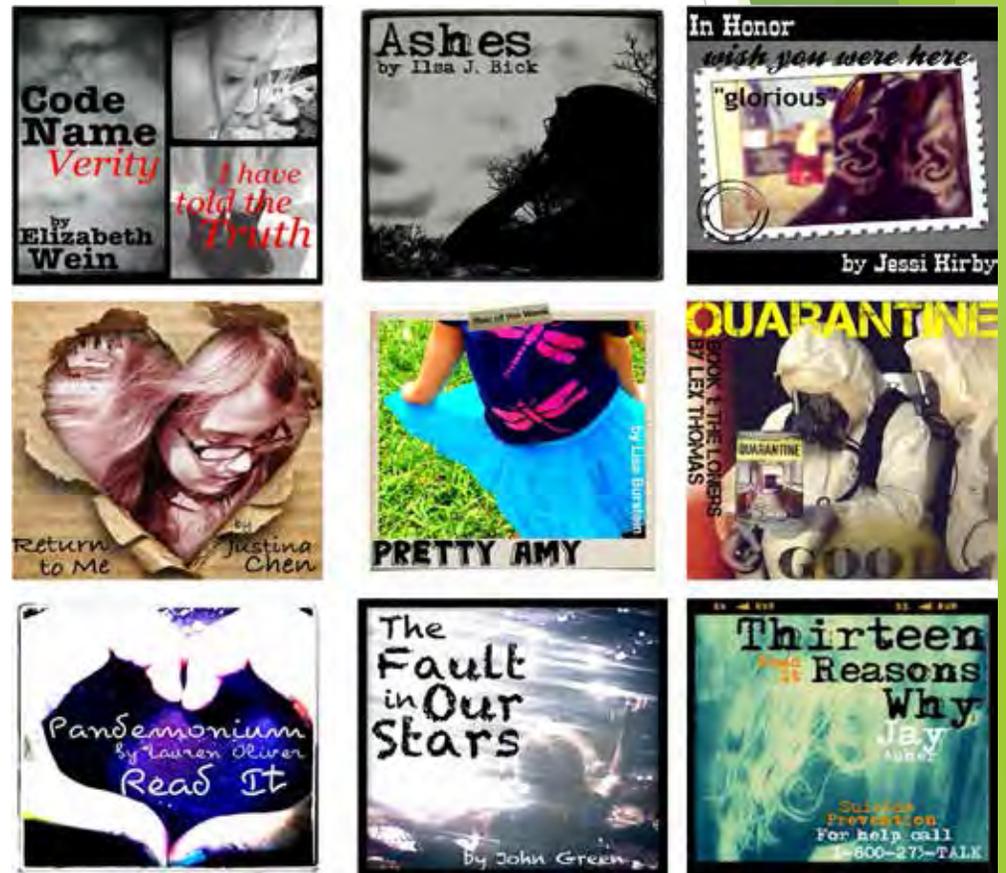
Photo Apps

| Comic Book	Photo Shake	Word Foto	Filter Mania
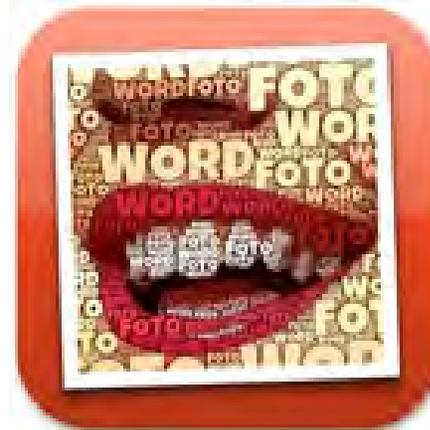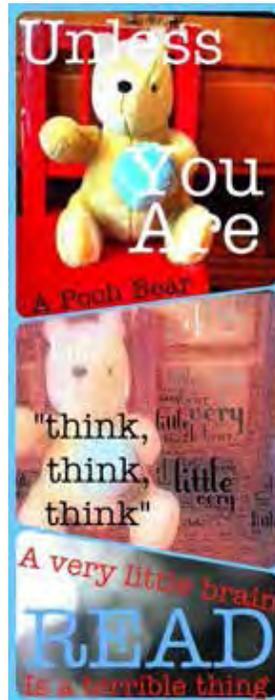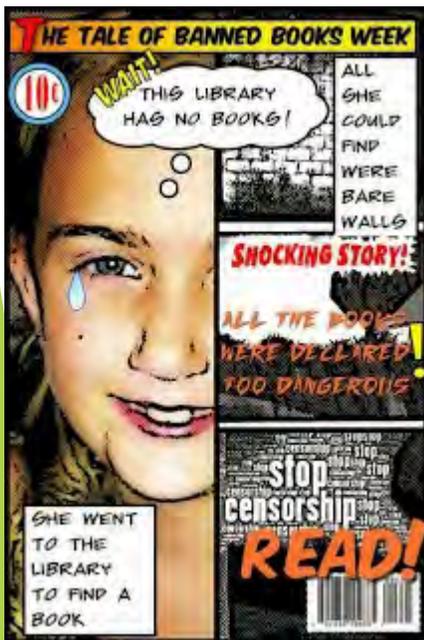
[5 Best Photo Editor Apps](#)

Memes!

5 Word Apps to Enhance Your Photos and Turn Them Into Memes and Quote Art   Word App Review and Breakdown

Basically: An idea that spreads.
See Urban Dictionary
Have Meme contests. See also:
Meme the shirts

the weather outside is frightful
staying in and reading
is so delightful

Books
are food
for your brain

It's a
Readi
Wond

KEEP
CALM
AND
DON'T GIVE
UP

ONE IT
ULD BE
ading
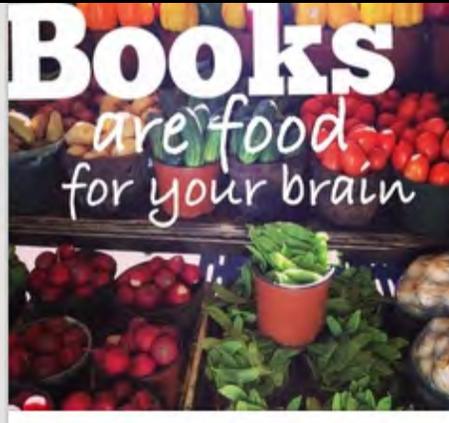
Know Your Meme

Infographics

Infographics is a visual way to represent data. It combines visual arts with computer skills to create the Infographic

Ways to use it with teens:
Nick Felton: Infographic Biographies
Have teens tell their life story, or HS story, or senior year story in infographics
20 Tools for Creating Your Own Infographics
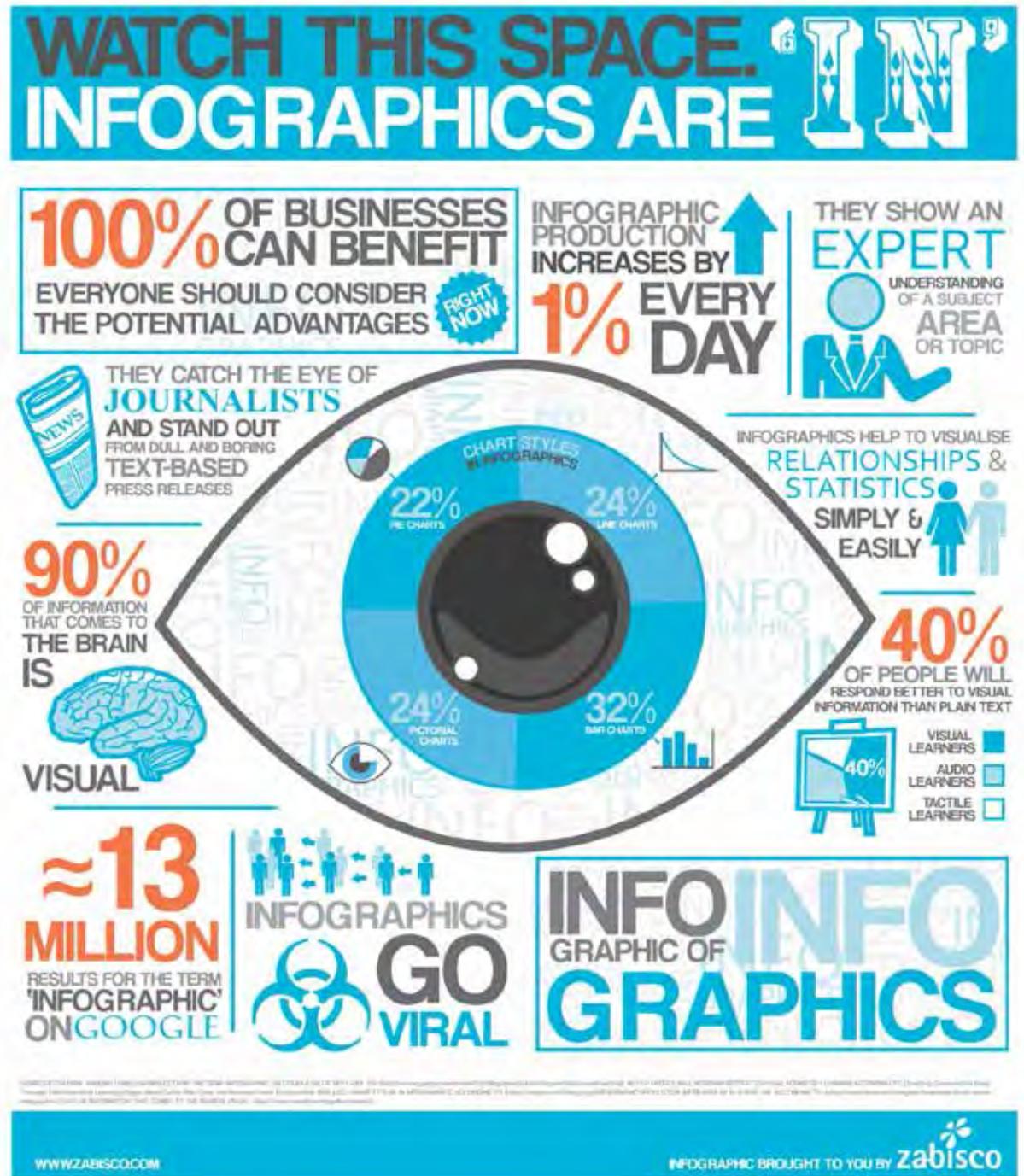
STEAM Programming With Motion Picture Arts
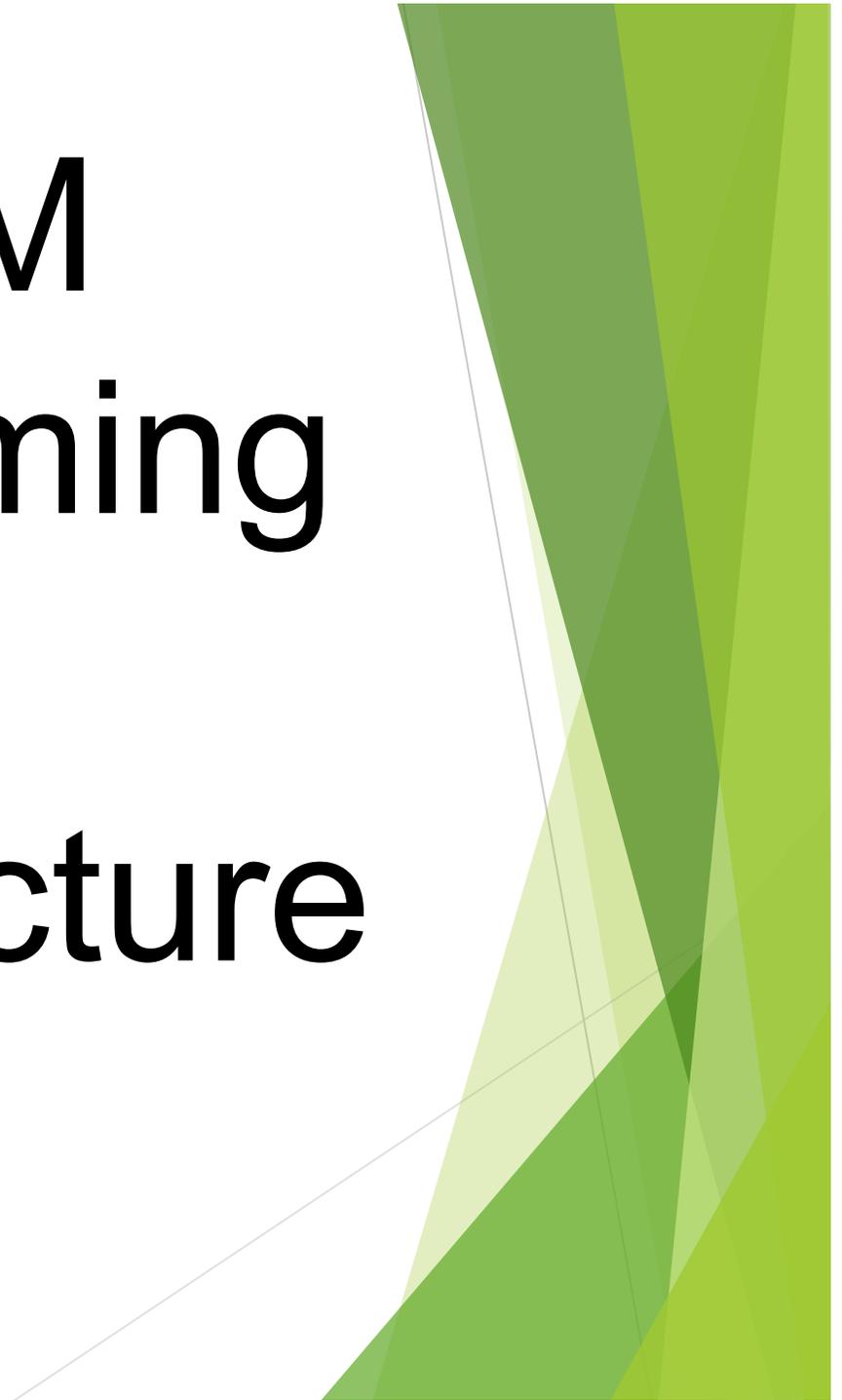
It stands for Graphics Interchange Format. They are those moving picture thingies that you see around the web.

APPS TO MAKE GIFS

GifBoom (app!)
Cinemagram (also an app!)
Gizmodo: How to Make a GIF in 5 Easy Steps
Free Online GIFmaker
Make a GIF
Mashable: Make Reaction GIFs with These 7 Tools
Mashable: How to Make GIFs
8 Free GIF Maker Apps

Vine

6 second videos
Popular with teens
Example: What is Teen Advocacy
6 Second Booktalks
Resources: How to Vine ;
How to Add Special Effects to Vine ;
Ultimate Guide to Vine
; 6 Tips for Making an Awesome Vine Video ;
6 Ways Your Brand Can Use Vine
Examples:
Buzzfeeds 10 People You Should Follow on Vine

YouTube

More popular than FB
Arranged by channels
First online awards show
Resources:
Video App: iMovie
6 Biggest Mistakes Brands Make on YouTube ;
How to YouTube with Success
10 Essential YouTube Tips and Tricks

Teen Film Festival

Teens can create short films using a variety of tools, like iMovie, Movie Maker, Vine, Instagram Video and more.

You can make it a theme: Say, make a video about why the library is important to you. Or do a booktrailer festival. Or you can keep it open ended.

Resources
Want to make a movie? There's an app for that of course. Here's more on iMovie.
Here's some information on making book trailers.
Here's a YouTube clip on making a Short Film
Clipcanvas on How to Make a Short Movie
Top 5 Online Tools to Make a Online for Free
How to Use Windwos Movie Maker

See also:

Lights, Camera, Action: 5 YA Titles about teen filmmakers
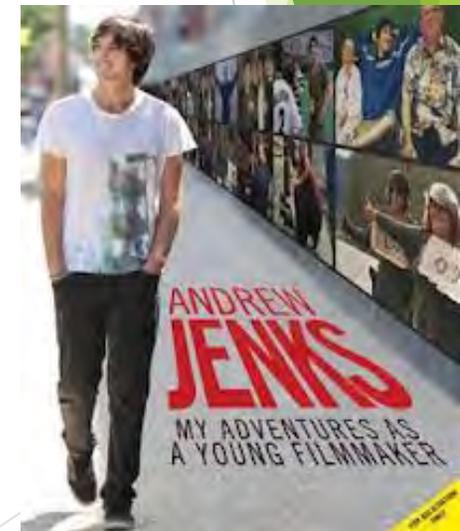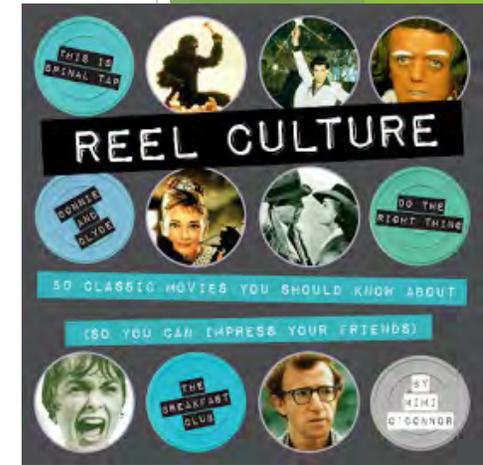
STEAM Programming With Music

Why music?

Music has positive effects on literacy.
There are numerous studies that show this connection:

- http://ecrp.uiuc.edu/v10n1/bolduc.html
- http://www.abcmusicandme.com/documents/impact_of_music_on_literacy.pdf
- http://educationcloset.com/2012/07/17/integrating-music-and-literacy/
- Music and Literacy

There is just something about the teenage years and music.

- Some say there is something about the age 14 and music: http://learning.blogs.nytimes.com/2011/05/25/is-14-a-magic-age-for-forming-cultural-tastes/
- "Fourteen is a sort of magic age for the development of musical tastes. Pubertal growth hormones make everything we're experiencing, including music, seem very important. We're just reaching a point in our cognitive development when we're developing our own tastes. And musical tastes become a badge of identity." – Daniel J. Levitin, a professor of psychology and the director of the Laboratory for Music Perception, Cognition and Expertise at McGill University. (http://blog.clickitticket.com/post/What-Kind-Of-Music-Were-You-Listening-To-At-Age-14.aspx)
- Slate: Musical Nostalgia

The Book Playlist?

Playlist: "a list of recorded songs or pieces of music chosen to be broadcast on a radio show or by a particular radio station." (Dictionary.com)

A playlist is a modern day mixtape!

Book Playlists Can Be Many Things:

The list of songs an author listens to while writing a book that helped set the mood or helps define a character.

The list of songs talked about within the book itself (see The Perks of Being a Wallflower, for example)

The list of songs that comes to the mind of a reader as they read a book or think of the characters.

the READ BEAT

Books About Music And How It Moves You

Lemonade Mouth
by Mark Peter Hughes

Nick & Norah's Infinite Playlist
by Rachel Cohn and David Levithan

Gangsta Rap
by Benjamin Zephaniah

Just Listen & This Lullaby
by Sarah Dessen

Rock Star Superstar
by Blake Nelson

Born to Rock
by Gordon Korman

Pop Princess
by Rachel Cohn
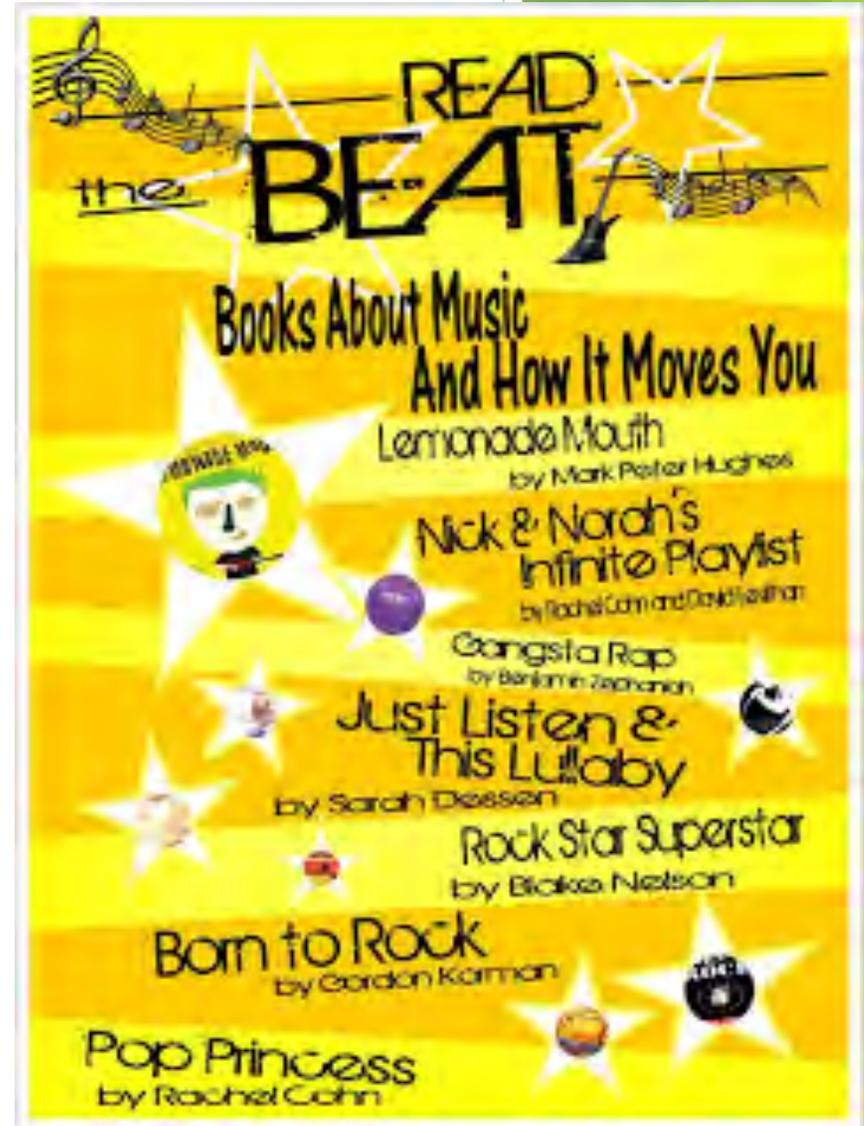
Where can you find Book Playlists?

Many authors will share their book playlists on Tumblr or in Blog Posts
See: Sarah Dessen discussing the playlist for Just Listen

Many readers will create book playlists and share them in the same way.
See: Reading 2.0

Book playlists can be simple – from just a list of song titles – to an actual playlist that embed the audio or video so you can quickly and easily hear the song being mentioned. For example, this Buzzfeed playlist for **The Perks of Being a Wallflower** has the video embedded for easy viewing/listening:

http://www.buzzfeed.com/kaylayandoli/the-perks-of-being-a-wallflower-playlist-you-nee-cqn5)

There are many tools for creating playlists:
Spotify
Mashable: 10 iPhone Apps for Music Lovers
Soundcloud: What are playlists? How do I make them?
www.playlist.com
www.take40.com

Video Killed the Radio Star . . .

Music programming can also be about video

- Teens can create lip sync videos to their favorite songs. How many different versions of *Let it Go* from Frozen have you seen?
- These videos can even be library promotions. You have seen the It's All About the Books take on *All About the Bass*, right? https://www.youtube.com/watch?v=Pduszh4ADTU
- You can do it simple: Use Animoto (which has free, already cleared songs you can use) to create a slide show of teens in the library/at library programs. Share it online or upload it to a screen that repeats behind your circulation desk or in your teen area.
- Or use something like MovieMaker to make "Book Trailers"
- Music copyright info here

Let's Make Beautiful Music Together @ the Library

A number of public libraries have digital media labs and recording studios.
They include:
Arlington Heights Memorial Library: The Studio
Cleveland Public Library
Cuyahoga CPL Recording Studio
Stoke Public Library
And more . . . .

Unconventional

Using technology to take your library's book discussion groups outside the four walls of your library!

Book Discussion Groups

Why Tech?

People can participate from any location

Depending what tech you use, people can participate on their own time

A way of taking your programming outside the building and creating outreach opportunities

You can build an archive of discussions for new people to go back and read

What are the disadvantages?

- Requires an access to technology, so there are economic barriers as well as some other barriers to access

- For some, it will lack the social interaction and intimacy that they are looking for

- While it can increase numbers, it doesn't necessarily get people into the building
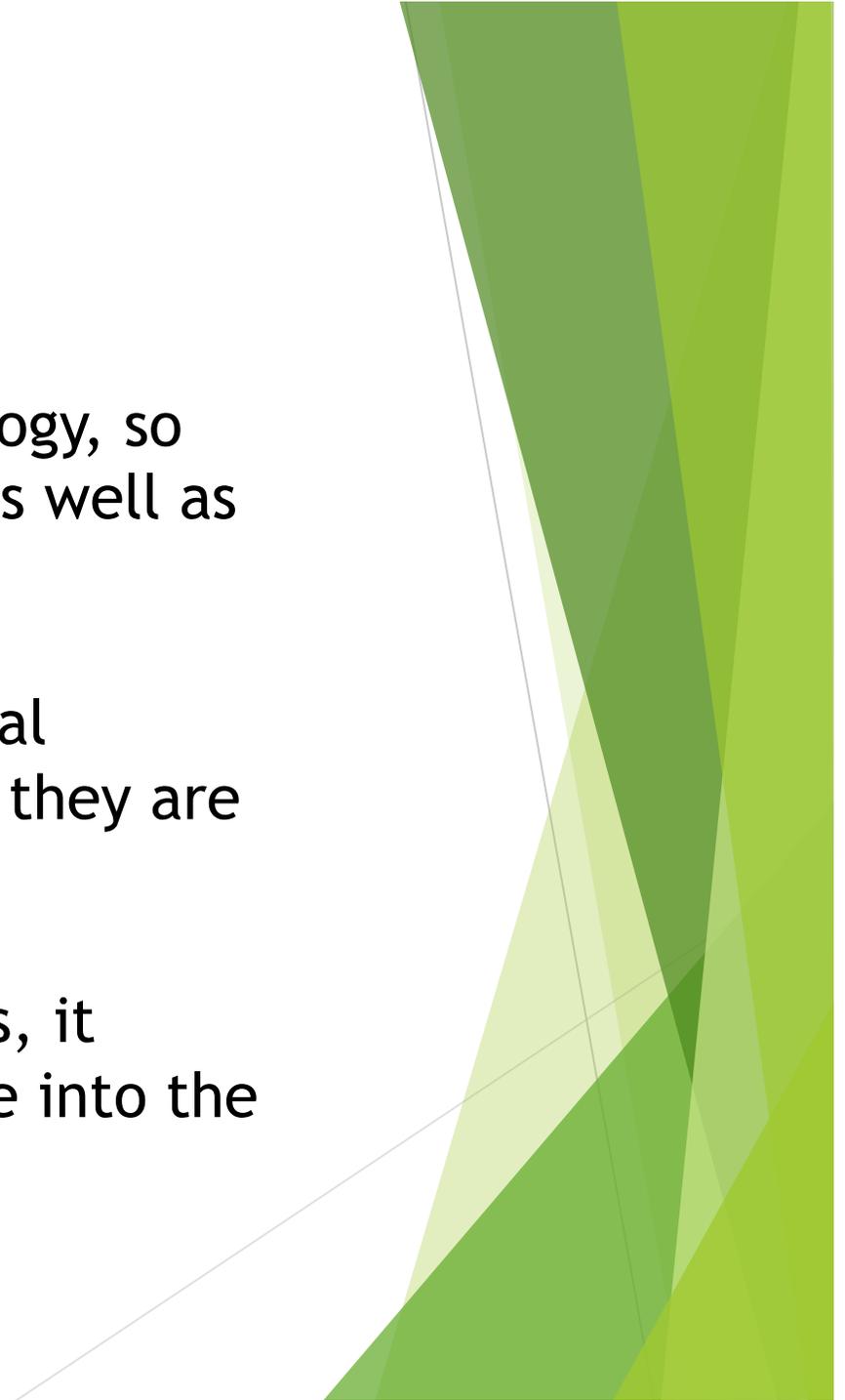
Skype Book Discussion Club

Skype is an online video chat program that you can download for free. Combine this tech with a traditional book discussion group to bring tech into literacy. Many authors will Skype for free (see link below) and love to meet with readers.

You could also do a sort of sister city/pen pal book discussion with another library and meet their teens. For example, have a Divergent discussion in March when the movie is released.

Skype in the Classroom
Authors who Skype (for free!)

Let's Talk Social Media & Book Discussions

Facebook – ongoing changing in policies are causing some users to defect, less popular now, teens are defecting, can now use Hashtags. Groups feature allows for great online book clubs.
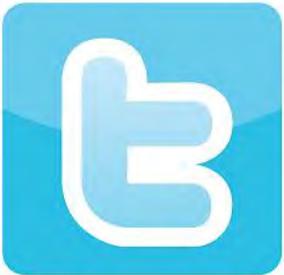
Twitter – very popular, large book/reading community, easy to share, #hashtags rule (see The Beginners Guide to the Hashtag)

Pinterest – results in the most actual purchases and traffic, easily organized, some copyright concerns to be aware of (Mashable: Pinterest Drives More Traffic to Publisher Than Twitter, LinkedIn, Reddit Combined) (20 Ways Libraries are Using Pinterest)

Let's Talk Social Media & Book Discussions

Tumblr – Very popular with teens, allows for a variety of different kinds of posts, has an ask feature, reblogging allows for addition of comments

Google Hangouts – Can be closed or open, similar to Skype, Hangouts can be recorded and shared

Goodreads – Designed as a reading community, great for making lists and sharing reviews, a very tumultuous community at times, now owned by Amazon

Twitter Chats

Put together a schedule, create a hashtag, promote, discuss, archive

Examples:
#yalove
#ewyagc
#svyalit

Tumblr – everyone who works with teens should be using this; easy to use, very visual and easy to organize

Don't Blog, Tumbl
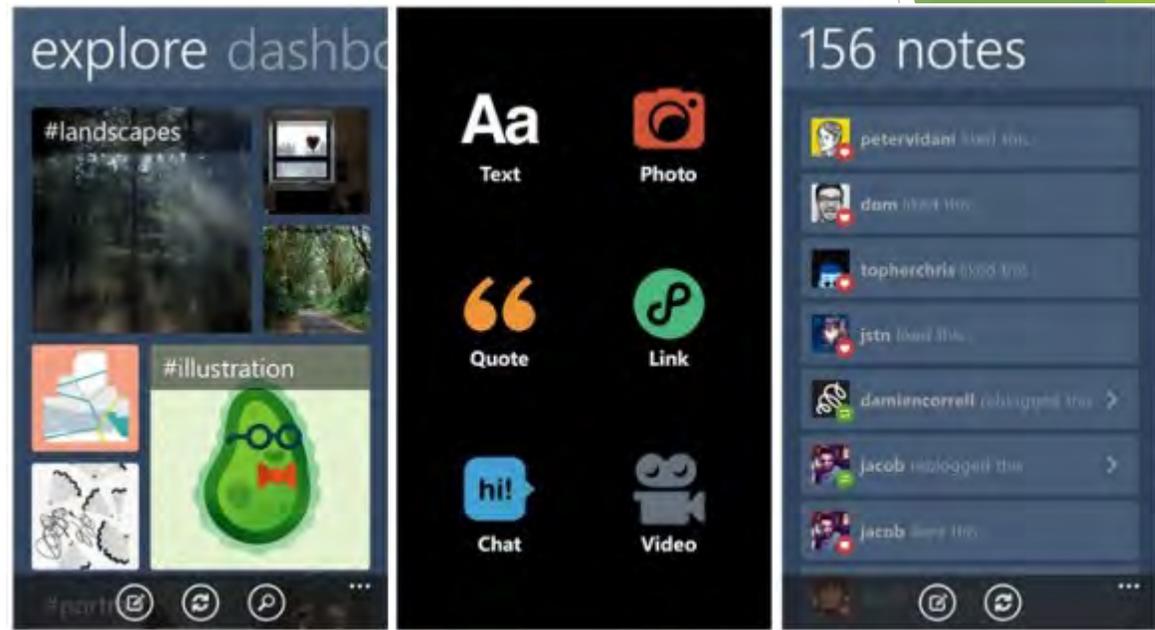
5 Things You Can Do with Tumblr
1. Craft Tutorials: Example, Tardis Costume
2. Booklists: Example, 10 Things I Learned About Surviving the Apocalypse from YA Books
3. New Books: Share the covers & reviews
4. Program Pics
5. Book Quotes

STEM Themed Books

Nick and Tesla has built in projects.
They also have projects on
their website.

Do a reading club with a STEM themed
book and find projects that you can
easily do from the Science Fair books.
STEM Girls Booklist.

Do a Sci Fi book club and have
someone come in and talk about
telescopes and observatories.
#YALIT that takes place in space.

Do a mystery book club and have a
forensic scientist come in and talk
about crime solving procedures.
Or watch How Sherlock Changes the
World on PBS.
CSI Program outline.
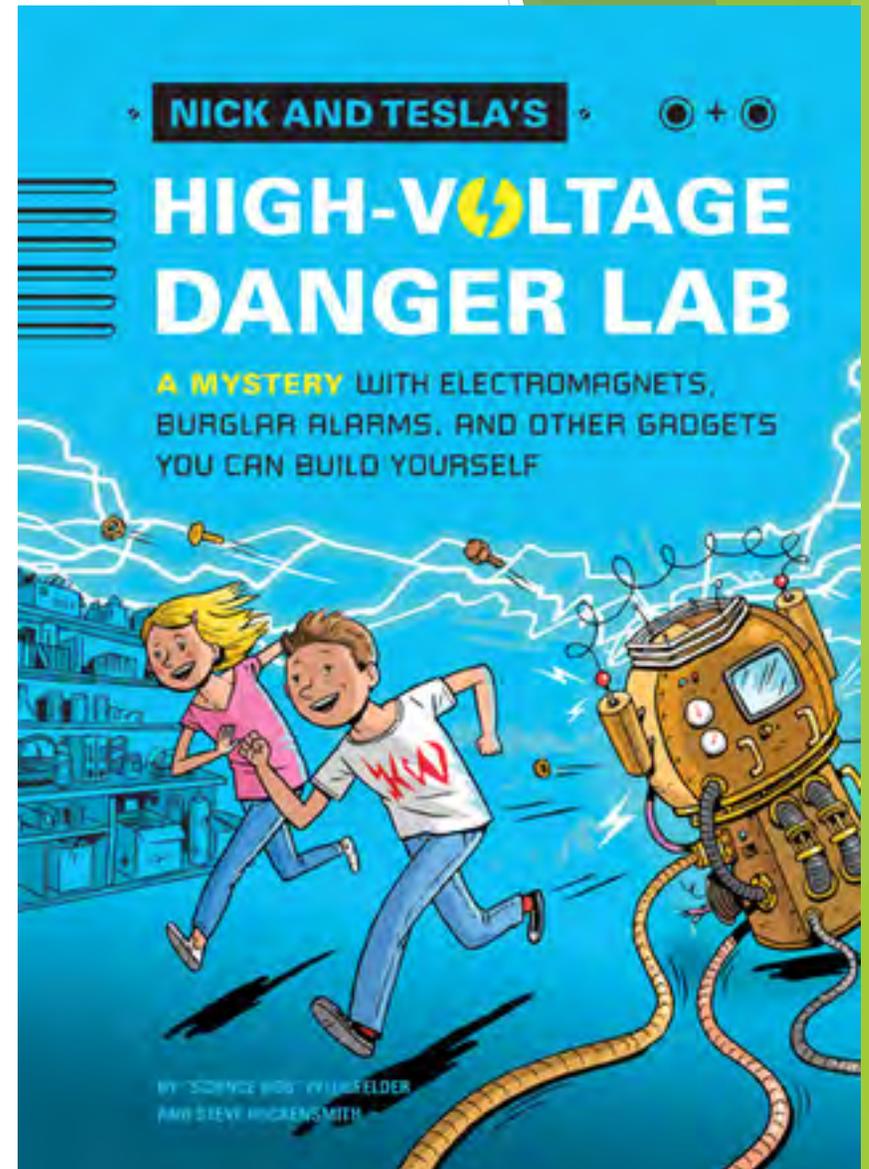
Resources and Further Reading

- Reaching Teens Subversively through Passive Programming: http://www.programminglibrarian.org/library/planning/reaching-teens-passive-programming.html#.UtP2ZLRjs_s (Book Facing)

- 21st century teens & 21st century libraries http://www.districtdispatch.org/2014/01/21st-century-teens-21st-century-library-services-call-action/

- Today's Teens, Tomorrow Techie http://www.bklynpubliclibrary.org/support/volunteer/t4

- Libraries Connect Teens To Technology with Video Games: http://library.austintexas.gov/press-release/library-connects-teens-technology-through-video-games-47499

- Recharge Your Library with Pop Culture and Technology: http://www.amazon.com/Recharge-Library-Programs-Culture-Technology/dp/1610693698

- Teaching Teens about Digital Literacy through Programming: http://www.alsc.ala.org/blog/2012/03/beyond-legos-coding-for-kids/

- http://www.ala.org/news/press-releases/2013/10/diy-your-library-teen-tech-week-materials-national-library-week-among-gems

- Teen Tech Camp http://www.memphislibrary.org/teens/techcamp

- Pew: Teens and Technology http://libraries.pewinternet.org/2013/08/22/our-latest-research-on-teens-and-technology/

- Using Technology to Connect Teens and Public Libraries http://scholarworks.sjsu.edu/slissrj/vol2/iss2/7/

- Retired Teachers Teach Community Art and Science: http://auburnpub.com/lifestyles/it-s-alive-retired-moravia-educators-teach-community-art-and/article_c9a94f03-e932-5b61-ae88-38b3f117411c.html

On TLT: Tech with Nick and Tesla, Teen Tech 12, Check In @ Your Library,

Infopeople

helping libraries think differently