

The Practical Ed Tech Handbook

A REVIEW OF THE BEST ED TECH TOOLS
FOR K-12 TEACHERS.

The Practical Ed Tech Handbook

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Introduction

My view on using technology in the classroom is that it should in some way help teachers create memorable learning experiences for their students. That help can come in the form of streamlining a workflow so that I have more time to focus on the fun aspects of teaching, working with kids. That help can also come in the form of technology that enables students to do things that generations before them could not have done, like producing a video that is seen by thousands of people around the world.

This guide is designed to provide you with an overview of a selection of free web tools, websites, and mobile apps that have utility in nearly every K-12 classroom. In each section you will find more than one tool that can be used to reach the same ends. I like to present more than one option in each category because we all have different levels of access to computers and tablets, different school web filtering policies, and different needs for our students.

Why didn't you include X? I think you should include X? The danger of putting together a guide like this is that for every three tools I include there are probably three or ten others that are like it. The tools that I have included in this guide are ones that I have personally used with students and or in the many professional development workshops that I facilitate every year. I tend to gravitate to the tools that have the simplest user interfaces and those that I think a teacher can feel comfortable using with his or her students in a relatively short amount of time. To that end, throughout this guide you will find links to video tutorials on many of the tools that I've chosen to feature.

Where's all the Google Workspace stuff? I have a YouTube channel in which I've published more than five hundred Google Workspace tutorials. You can see that playlist at <http://bitly.com/gafeplaylist>.

Reusing this guide:

You are welcome to download and print this guide to distribute in your school building. **You may not upload it to your own website/blog or embed it in your own website/blog without permission.** If you would like to use this guide as the basis for a professional development workshop within your school without printing it, please direct people to <http://practicaltech.com/free-handbook/>

I offer in-person and virtual professional development workshops. If you would like to have me come to your school or host virtual trainings, please send me an email at richardbyrne@freetech4teachers.com

About me:

I'm best known for developing the award-winning blog [Free Technology for Teachers](#). I've been invited to speak at events all over North America, Europe, Australia, Southeast Asia, and the

Middle East. Since 2007 my work has focused on sharing free resources that educators can use to enhance their students' learning experiences. I'm currently a high school computer science teacher. In the past I've taught high school social studies and language arts, worked with preservice teachers at multiple universities, and taught continuing education courses for the Midwest Teachers Institute.

I'm a five time winner of the Edublogs Award for Best Resource Sharing Blog. I became a Google Certified Teacher in 2009. I've twice received Merlot Classics awards from the chancellor's office of the California State University. I've been a finalist for ACTEM's (Association of Computer Teachers and Educators in Maine) educator of the year award. And Tech & Learning Magazine named me one of their "people to watch."

In addition to my websites FreeTech4Teachers.com and PracticalEdTech.com I've written for a number of periodicals and been quoted for countless others. My print work includes a monthly column for *School Library Journal*, being contributing author to *What School Leaders Need to Know About Digital Technologies and Social Media*, and contributions to *Teacher Librarian*. With a background in history education it is only fitting that I live with my family in an old house in Maine.



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Communicating with students and parents.

When it comes to communicating with parents nothing can replace a good face-to-face meeting. Face-to-face meetings are not easy to schedule. Not every communication requires the intimacy of a face-to-face meeting. A phone call, a text message, an email, a blog post, or a social media post might be all that you need in order to convey your message. In this section we'll take a look at the best tools for digitally communicating with parents and students. As you read through this section bear in mind that using a combination of the following tools and strategies will provide you with the best opportunity to reach all of your students and their parents.

Text Messaging/ SMS/ Push notifications:

People have a difficult time ignoring text messages and other push notifications that pop-up on their mobile phones. For that reason services that allow you to distribute messages in that manner are great for urgent news and reminders. It is also worth remembering that there are more homes with mobile phone subscriptions than homes with broadband subscriptions in the United States.¹ Therefore, you're statistically more likely to have a parent receive your text message than you are to have them receive an email.

Remind

Remind (<http://remind.com>), formerly known as Remind 101, is a great tool for sending important reminders to students and their parents. Through Remind students and their parents can sign-up to receive text messages on their mobile devices. You send the messages from your computer or mobile device without students or parents seeing your personal cell phone number. Like regular text messages that you might send to friends, you can attach files to messages that you send through Remind. Messages can be sent to individuals or sent to groups that you create in your Remind account.

In addition to text messages Remind offers the option to send audio messages up to fifteen seconds in length. Just like text messages, voice messages can be sent to individuals or to groups.

Stamps is one of the two options that Remind offers for students and parents to use to interact with the messages that you send to them. Students and parents can reply to your Remind messages by selecting one of four stamps to indicate that they have received your message and indicate if they need further clarification about your message.

Chat is the other option that Remind offers to students and parents to communicate with you. Remind Chat allows students and parents to reply with text to a teacher's messages. When I first heard about Remind Chat I was leery of it because I was concerned that students and parents would be messaging teachers at all hours of the day and expecting rapid responses. Remind alleviated that concern when I saw the "office hours" setting in the Remind chat service.

¹ <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

"Office hours" in Remind Chat allows teachers to specify when they will allow chat messages to be sent and received. Teachers can also pause or stop chat exchanges at any time.

Seesaw Messages

Seesaw.me is best known as a digital portfolio service (more about that later in this guide). Seesaw includes an option for sending messages to students and parents. Messages can be sent to individuals or to groups. There is an option for parents to reply, but you can disable that option if you're worried about getting too many responses. A video overview of Seesaw's messaging option is provided at <https://youtu.be/yynfnKOSFg0>

ClassTag

ClassTag (<http://classtag.com>) lets you send email, push, and SMS/text announcements to parents. That's nothing unique. What is unique is that ClassTag will track whether or not those messages are opened and read by parents. If they're not opened and read, ClassTag will provide you with an option to print a flyer to send home. That flyer contains the same information as the electronic announcement.

Through the ClassTag marketplace teachers can get classroom supplies and other products as rewards for having a high level of engagement with parents through the ClassTag system.

A video overview of ClassTag can be watched at <https://youtu.be/QWKUUOtdwsl>

Pros & Cons of Using Text Messages to Communicate With Students & Parents

Pros of using text messages for announcements:

1. Immediate broadcast of messages to large groups of students and parents. Some of these services will schedule broadcasting of messages too.
2. People have a very hard time resisting opening text messages immediately whereas email is easy to ignore for hours or days. Don't believe me, the next time you receive a text message try to ignore it for one hour.
3. Even households that don't have laptops, desktops, or home wireless are likely to at least one person that has a mobile phone to receive text message alerts. The Cellular Telephone Industries Association claims wireless penetration in the U.S. is 104% (<http://bitly.com/1frOfha>).
4. You can attach files to your messages to enhance and or explain the larger context of your message.

Cons of using text messages for announcements:

1. You have to get parents and students to opt-in to receive messages.
2. While great for short announcements like, "school is cancelled due to snow" or "remember your field trip permission slip" text messages are not great for announcements that require explanations.
3. Depending upon the service you choose, you may find yourself receiving a lot of replies that should be handled on the phone call or in-person conversation.
4. Despite the CTIA statistic above, some students and parents won't have reliable access to a mobile device that receives text messages. This is particularly true in communities in which pay-as-you go mobile plans are prevalent.

Email Management Tips

Like most people, I have a love-hate relationship with my email inbox. As soon as it gets close to empty, it fills up again. I'm sure you can relate.

The current (August 2021) version of Gmail for consumer and education accounts is packed with helpful, time-saving features including canned responses, message snoozing, and follow-up reminders. An overview of all of those features is available in video form at <https://youtu.be/v6j4XxLGIN4>

Canned Responses AKA Message Templates is my favorite feature of the current Gmail user interface. Canned Responses lets you create and store messages to use and re-use whenever you're crafting a new email or replying to a message in your inbox. This is a tremendous time-saver at the beginning of a school year or semester when you find yourself repeatedly answering the same type of questions from students and or their parents.

Smart Reply is my second favorite feature of the current Gmail user interface. Smart Reply creates suggestions for replies to send to the messages in your inbox. This can be a real time-saver when your inbox is full of emails that only require a short response. I've been using Smart Reply since it came out and it has proven to be helpful for sending short replies to messages.

Nudging is another feature of the current Gmail UI that I like a lot. Nudging prompts you to reply to emails that you haven't responded to. Nudging also prompts you to follow-up on messages that you sent but didn't receive a reply to.

Gmail offers a confidential mode that you can use to make messages self-destruct at a specified time. That same feature lets you prevent recipients of your messages from forwarding them or printing them.

In addition to the new Gmail features there are some other tools that I have used for a few years to help me manage my email workflow.

Magical Text Expansion (<http://bitly.com/1fsd3Wk>) is a convenient Chrome extension for writing long messages quickly. The extension enables me to create keyboard shortcuts for words and phrases that I frequently use in emails and in other online forms. This extension will work with Gmail as well as other email services. The trick to using this extension is that you must make your shortcuts things that you don't normally type or else the extension will start to fill in any form that it can. For example, don't use "syllabus" as a shortcut code unless you want the extension to work anytime and anywhere you type syllabus. Instead use something like "sy21" as your shortcut code.

Loom (<http://useloom.com>) is a Chrome extension that you can use to record screencast videos from your inbox. Making a quick screencast video is a great alternative to trying to write step-by-step directions to answer a request for tech help. Watch this video (<https://youtu.be/5oK2rriyTI4>) to learn how to use Loom in Gmail.

Mote (<http://mote.com>) is a Chrome extension that launched in early 2021 and has become very popular in just eight months. With Mote installed in Chrome you can record voice messages right from the message composition window in Gmail. Your voice messages can be up to thirty seconds long, but you can record and send multiple messages in the same email. A video demonstration of how Mote works can be seen at https://youtu.be/_WBgmeB1adg

Those who use Outlook as they're primary email service can also create response templates. A short overview of how to do that can be watched at <https://youtu.be/OCtv4t3TNnl> and written directions are available at <https://bitly.com/3CF1JCp>

Creating classroom blogs and websites.

A classroom blog can serve as an online hub for all information about your classroom. You can use a blog to publish updates about your class, to distribute assignments, to post handouts, and share study guides and other reference materials. Of course, a blog is the ideal place to have students write reflections on things they've learned and for you to do the same.

Blogger is my preferred platform for building classroom blogs. It's free to use all of its features, it integrates into Google Apps for Education accounts, and it takes less than five minutes to create a blog through Blogger. A 90 page guide to using Blogger in school can be downloaded at <http://bitly.com/ftblogger15>. Within that guide you will find a glossary of blogging terminology, step-by-step directions for creating a blog, directions on adding third party content to your blog, and directions for using Blogger's mobile apps.

Edublogs (<http://edublogs.org>) is a popular alternative to Blogger. The biggest selling point of Edublogs is that it lets you manage your students' accounts. That can be a huge benefit to you as you won't need to spend classroom time on having your students create accounts and or reset their passwords. Edublogs is also designed entirely with students and teachers in mind which means you have many privacy and moderation controls that are not present in services like Blogger and WordPress.com. A chart comparing educational blogging services is available in [this Google Document](#) and is included below.

Regardless of the blogging platform that you choose to use, the secret to getting people to read your blog consistently is to update it consistently. That doesn't mean that you need to update it every day, but it does mean that you should update it on a regular schedule. A good, manageable schedule is a Sunday night/ Monday morning update about the week ahead and a Friday update about the week that was just completed.

	Blogger Blogger.com	WordPress.com	Edublogs.org	WordPress.org	SeeSaw seesaw.me
Technical knowledge required?	No	No	No	Yes, but many easy-to-follow tutorials are available.	No.
Manage students' accounts?	Yes, but only in Google Workspace for Education domains.	No	Yes.	Yes, but you are responsible for managing all aspects of the account.	Yes.
TOS states "13 or over?"	Yes. Exception for Google Workspace for Education.	Yes.	No	No, you manage all aspects of accounts.	No.
Offers native iPad and Android Apps?	No	Yes.	Yes. Through the WordPress app.	Yes.	Yes.
Supports embedding media from 3rd parties?	Yes.	Limited.	Yes.	Yes.	Limited.
Displays advertising?	No.	Yes. Ads can be removed for a fee.	No.	No.	No.
Custom domain mapping (use your own domain).	Yes. \$10-20/year	Yes. \$13-\$26/year	Yes - for a fee.	Yes, it's your only option.	No.
Theme / layout customizations	Limited	Limited	100+ for free.	Unlimited.	Limited.

Pros & Cons of Using Blogs for Classroom/ School Announcements

Pros of using blog posts as school announcements:

1. It is easy to have multiple people maintain the blog. The burden of keeping parents informed about school news doesn't rest with just one person.
2. An archive of announcements is automatically created and easy to find.
3. You can include as much media as you like (or your hosting allows) in a blog post. It is easy to include video of a great school event. Or include an audio announcement that is accessible to struggling readers.
4. You can write announcements in advance and schedule them for distribution at later times.
5. You can easily call attention to and direct people to previous announcement and or to reference pages containing things like school calendars and handouts.

Cons of using blog posts as school announcements:

1. Parents must remember to check your blog or you convince them to subscribe to it.
2. If you have commenting enabled you will need to moderate comments.
3. If you don't have comments enabled parents will have to open a separate email client or call to ask questions about the information in the blog post.
4. If your blog's URL is complicated, people will have a hard time remembering it correctly. For example, parents and students in my district complained about remembering the structure of sad17.k12.me.us when looking for some of my colleagues' blogs. My blog was simply mrbyrneteaches.com (I spent \$10 per year for hosting that domain through Blogger and wrote off the cost on my tax filing).

5. If you choose to self-host your blog you will have to spend time maintaining the back-end for software updates and security.

A couple of considerations that are neither pros or cons.

1. Blog posts can easily be converted into and sent as email messages through services like FeedBlitz, FeedBurner, and Convert Kit (my preferred service) to name a few. Parents who prefer email can receive the posts through those services. Parents who prefer to subscribe to a blog via RSS can use services like Feedly and Flipboard to follow the blog. Edublogs blogs and any blogs running on WordPress also have a free option for delivering blog posts as emails.
2. Nearly every blogging platform will let you create static pages for content like calendars, policies, and handouts.

Blogging Activities You Can Do With Your Students

Whether your students are just learning how to type or they're aspiring journalists, there are lots of ways to use blogging as a classroom activity. Edublogs offers a nice directory of active classroom blogs. Take a look through that directory at theedublogger.com/check-out-these-class-blogs/ to find some good examples of how teachers are using blogs in all grade levels from Kindergarten through twelfth grade.

Before jumping into the activities that you could possibly do with your students, let's review some ground rules that you should establish with your students for publishing online. These ground rules can apply to any activity that involves online publishing, not just blog publishing.

1. Everything you publish on the classroom blog will be held to the same standard as things you do and say in the classroom.
2. Try to use your best spelling and grammar. (Side note, I try to refrain from correcting things like spelling and grammar on a public forum).
3. Keep comments polite and productive.
4. Refrain from publishing sensitive personal information.
5. Check with classmates before writing about them or posting pictures of them.

Check with your school's IT department as they may already have a set of guidelines for publishing blog posts and or use of students' images on public-facing forums like blogs or videos. If that is the case, review the guidelines to make sure you are in compliance with them and talk to your IT administration if you think there needs to be an exception or alteration made. It is also important to clearly communicate to students' parents why your students will be blogging. In that communication to parents explain how you'll be using students' work as well as how you will protect students' privacy.

Blogging Activities for K-2

One of the best ways to use blogging with students of this age is to have students write a sentence or two about a picture. You could start the process by uploading a picture then having students write one comment about what they see or what they think about the picture. One of my favorite examples of this activity came from Jennifer Lefebvre who had her P1 (grade 1) students write about their class mascot which was a stuffed animal. Her students wrote about what the mascot did and what they did with the mascot.

In the fall of 2018 I worked with a second grade class that invited parents to participate in a modified blogging activity. The blog was established through Seesaw. Parents used the video recording function in Seesaw to record themselves reading books. Those recordings were then posted on the classroom blog for students to watch.

Blogging Activities for 3-5

I don't think you'll find a better example of using blogging with students of this age group than Linda Yollis' Classroom Blog (<http://yollisclassblog.blogspot.com/>). The blog has the tagline, "Third graders learning and sharing together." On the blog you'll find lots of examples of students blogging including "Family Blogging Month." During Family Blogging Month Mrs. Yollis invites parents, siblings, grandparents, aunts, and uncles to comment on the blog. The blog post announcing Family Blogging Month even includes a video from students about how to write quality blog comments.

It is at this age that many students are introduced to reading news and current events. A site like DOGO News is a good place to find age-appropriate articles for students to read. You can post links to these stories on your classroom blog then have students respond to the stories with comments of their own. Depending upon your students, you may need to include some discussion prompts with the articles that you post for your students to read.

Blogging Activities for 6-8

This is a great time to start letting students have a larger role in communicating information about their schools. Creating a student council blog is one way that you can give students that increased communication responsibility. Let them post daily or weekly announcements in text or video form. Have them write about the decisions that were made in the student council and how the decisions were made.

A blogging activity that I did with eleventh grade students that could easily be modified for middle school students is blogging as historical characters. Students in my U.S. History class wrote a series of blog posts in which they attempted to use the voices of delegates to the Continental Congress and the Constitutional Convention. After writing their blog posts they then had to respond in character to classmates' blog posts.

Blogging Activities for 9-12

By the time students reach high school they are capable of managing and maintaining their own blogs. In doing that students are creating portfolios of their thoughts and their work. You could have students create their own blogs that will serve as portfolios of their work done in your classroom or for the work they've done in all of their classes. What's important in doing this is that students should be writing more than just a simple "I did X." They should write about the process and what they learned through the process.

In 2019-20 my computer science students used Google Sites to write updates about the projects they were working on. This process forced them to stop and look at what they had done and what they still needed to do. Having them blog about their projects in progress also gave me the opportunity to see where I needed to interject into their project processes.

When I taught a current events course for eleventh and twelfth grade students I made them all editors on a group blog created with Blogger. Every week each student was responsible for posting a news article or video of interest to them along with their own commentary about their chosen article or video. All students were also responsible for commenting on their classmates' posts.

One more example of using blogs with high school students comes from my former colleague (now retired) Pam who used blogging as a publishing outlet for students in her high school journalism class. Obviously, anyone visiting the blog could read the students' stories. But Pam was able to give her students' work a bigger audience by getting a local newspaper to link to some of the stories. Those links provided students' with a far bigger audience than any printed school newspaper could have.

A Glossary of Blogging Terminology.

After years of leading workshops on blogging I have found that many people benefit from having a glossary of terms that they can refer to. Likewise, if you're blogging with your students it is helpful if there is a common understanding of the terminology used in your blogging activities. This is a glossary of terms that I created a couple of years ago for participants in my workshops.

Theme: WordPress and many other blogging platforms use "themes" to describe the look of a blog. The theme can include the color scheme and the layout of elements on the blog. Changing the theme does not change the content of your blog posts.

Template: Blogger and some other blogging platforms use the term "template" to describe the look of a blog. The template can include the color scheme and the layout of elements on the blog. Changing your template does not change the content of your blog posts.

Tag: Tags are applied to WordPress (Wordpress.com, Kidblog, Edublogs) blog posts to identify the key ideas or purpose of a post. Tags make it easier for people to search and find older posts on your blog. For example, if you write a post about your Revolutionary War lesson, tag it with

“revolution” or “revolutionary war” so that at the end of the school year when you have 150 posts on your blog your students can quickly click on the “revolution” tag and jump to the post that has that label. It’s a lot easier to locate older posts by tag than it is to click through archives by date.

Label: Labels are applied to Blogger blog posts to identify the key ideas or purpose of a post. For example, if you write a blog post about your Revolutionary War lesson plan, label it with “revolution” or “revolutionary war” so that at the end of the school year when you have 150 posts on your blog your students can quickly click on the “revolution” label and jump to the posts that have that label. It’s a lot easier to locate older posts by label than it is to click through archives by date.

Tag Cloud and Label Cloud: Tag and Label clouds can be added to your blog’s homepage to make it easy for visitors to see the tags or labels that you use, click on one of them, and jump to a list of all of the posts that have that particular label.

Categories: In WordPress-powered blogs you can use categories for broad descriptions of posts in addition to using tags. For example, on iPadApps4School.com I used the categories “pre-K,” “elementary school,” “middle school,” and “high school.” I assign each post to a category and use tags for describing the academic topic of the post. This way if someone visits my blog looking for math apps appropriate for elementary school, he or she can click on the “math” tag then click on the “elementary school” category to find all of my posts meeting that search criteria.

Embed: To display a video, slideshow, audio recording, Google Calendar, Google Map, game, and many other multimedia elements in a blog post you will use an embed code provided by a service hosting that media. Embedding media into a blog post does not make you the owner of it and as long as you follow the guidelines set forth by the hosting service you are not violating copyright by embedding something you didn’t create. For example, when you find a video on YouTube that you want your students to watch you can embed it into a blog post and ask students to comment on the blog post. If the owner of that video decides to take it offline the video will no longer play through your blog post.

Embed Codes: An embed code is a piece of code, often HTML, that media hosting services like YouTube provide so that you can easily display the media that they host in your own blog posts. On some services an embed code will be clearly labeled as such next to the media you’re viewing. On other services the embed code will be one of the options that appears when you click on the “share” option. YouTube, for example, currently requires you to open the “share” menu before you see the embed code option.

Widget: A widget is a small application that you can include in the posts and or pages of your blog. A widget could be a game, a display of Tweets, a display of RSS feeds, a tag cloud, a calendar, or any other application that offers an embed code.

Gadget: Gadget is the term that Blogger uses for a widget. A gadget and a widget do the same things.

Plug-in: A plug-in (sometimes plugin) is a small application that you can add to the software that powers your blog. Unlike widgets and gadgets plug-ins operate in the background and visitors to your blog will not see them working. A plug-in can add functions to your blog such as suggesting related posts to your visitors or detecting the type of device a visitor is using to view your blog then automatically displaying the mobile or desktop version of your blog's layout.

Post: "Post" can refer to an entry on your blog as in "a blog post." "Post" can also be used as a verb as in "I am going to post a new entry on my blog."

Page: A page on a blog is different than a post because a page is designed for static content. Pages are good for posting information that you want visitors to your blog to be able to quickly access. For example, my classroom blog had pages for curriculum outlines and review guides.

Permalink: Each blog post is assigned its own separate URL this is known as a permalink (permanent link). This URL is the one that you would share if you wanted someone to directly access a post rather than going to your blog's homepage then searching for the post.

Hosted Blog: A hosted blog is one whose software is maintained by a company for its users. Services like Blogger and WordPress.com are examples of services on which you can create hosted blogs. The advantage of using a hosted service is that you don't have to worry about installing software, software updates, server maintenance, or bandwidth capacity. The disadvantage of using a hosted service is that you don't have access to the servers hosting your blog, the service may limit some customization options (WordPress.com in particular does this), and if the service closes you will be looking for a new place to blog.

Self-hosted Blog: A self-hosted blog is one for which you own the blogging software, you install it on a server or shared server, and you are responsible for all technical maintenance and updates. The advantage of having a self-hosted blog is that you can customize it to your heart's content, you have access to the server(s) hosting your blog, and you can move your content from one hosting service to another if you choose. The disadvantage of a self-hosted blog is that you do have to feel somewhat comfortable installing the software on a server. Fortunately, most hosting companies have good tutorials on installing popular blogging software. Another disadvantage of self-hosting is that you are responsible for performing all updates and other maintenance tasks. This can be time consuming for new bloggers. Finally, to have a self-hosted blog you will have to buy a domain and pay a monthly or annual hosting fee for your blog. I pay roughly \$200 annually to MediaTemple.com for hosting and I have eight domains on my plan. If you decide to go the self-hosted route, Media Temple is my recommendation for a hosting service. They offer excellent 24/7 customer service and I've never experienced any downtime since I started using them in April of 2012.

Google Search Strategies

I'm often asked for recommendations on how to help students use Google more effectively in their research efforts. Whether you teach elementary school, middle school, high school, or college students these tips can be used by your students.

1. Not every question needs to be Googled.

- One of the bad habits that I see many students fall into when it comes to research is simply entering into Google the first thing that comes to mind. While this strategy can work, it often leads to a lot of time wasted on searches for information that students already have. Before embarking on a research project ask students to make a list of the things they already know about the topic they plan to research. Have them look in their notes to see if they already have information on the topic.

2. Search within a search result.

- One of the worst offenses students commit while conducting web searches is only glancing at the webpages they open from the search results page. Or worse yet, only reading the brief snippet that appears below the links in a search results page. The reason for this behavior that students often give is “it takes too long to read the whole page.” To remedy this teach your students to use “Control F” (Windows) or “Command F” (Mac) when they open a webpage from the search results page. Control F or Command F allows you to search within any webpage for any letter, word, or phrase. This also works for searching within PDFs and other documents that students may download during a web search.

3. Think like someone else.

- When formulating search phrases it can be helpful to think about the words that someone else might use to describe your topic, question, or problem. Try using those terms instead of your own. Learn more about this strategy in the short video available here <https://www.youtube.com/watch?v=F9dBn3aK4rw&feature=youtu.be>

4. Open the advanced search menu.

- The advanced search menu is often overlooked by students. It is found by opening the advanced menu that appears under the “tools” menu on the search results page. In that menu you will find tools for refining search results by file type, domain, language, and more. Here's a demo of how to refine search results according to date https://www.youtube.com/watch?v=bWSUJ-L_m8o

5. Search by domain.

- Limit search results to specific top-level domains or to a specific website. For example, if I wanted my search results to be limited to links from [.edu](http://www.edu) sites, I would enter “.edu” in the domain limitation box.

6. Search by file type.

- Search by file type allows you to find results according to file format. Combine searching by file type **.ppt** or **.pdf** with searching by domain **.edu** or **.k12.me.us** to find PowerPoints or PDFs produced by students and teachers. (replace the **.me** in **.k12.me.us** with your state's two letter abbreviation to find slides and PDFs produced in your state).

7. Try Google Scholar.

- Google Scholar to find academic, peer-reviewed articles on your topic. Often these are articles that you would not find in typical Google search. Google Scholar is also useful for finding court rulings and patent filings. A video overview of Google Scholar is available at <https://youtu.be/-T3ZQbDw4GE>

8. Set Google alerts and Google Scholar alerts.

- Go to <https://www.google.com/alerts> to create alerts for specific search terms. When new information related to your topic is available, it will be emailed to you. Google Scholar also has an alerts function. Watch the video at <https://youtu.be/o3U30CSUnMI> to learn how to create Google Scholar alerts.

9. Search Google Books & Newspapers

- Google Books (<https://books.google.com/>) indexes millions of books and periodicals that you can search within. Many books and periodicals are available to read online for free. The Google News Newspaper Archive (<https://news.google.com/newspapers>) has digitized hundreds of old newspapers that you can search through.

10. Remember that Google isn't the only search engine.

- Most schools and local libraries have access to databases that are not indexed by Google and or are not accessible without the subscription fee that your school or library pays. Ask the librarian for assistance in accessing those databases. Additionally, you'll find that other commercial search engines like Bing and DuckDuckGo may uncover resources that you overlooked when just relying on Google. Wolfram Alpha is a great search tool for students who need help locating statistics, solutions to math problems, or brief fact sheets like those demonstrated in the video at <https://youtu.be/fmhj86g8jll>

Creating Search Practice Activities for Students

After reviewing the ten basic search tips outlined above, give your students some activities to practice using those tips. Google's Search Education site offers good lesson plans that are freely available to use as written or to modify for your students. You can find those lesson plans at <https://google.com/insidesearch/searcheducation/lessons.html#lessons>

I like to create my own search challenges for students. The process that I use is heavily influenced by following the work of Daniel Russell. He is a "Senior Research Scientist for Search Quality and User Happiness" at Google. What that means for you, me, and our students is that he spends a lot of time studying how people search and using that information to help people conduct better searches. Both his book, [*The Joy of Search*](#), and his blog, Search ReSearch (<http://searchresearch1.blogspot.com/>), offer many explanations of detailed search methods.

Here's the process that I use to create my own image-based search challenges for students.

1. Select an interesting picture that you can build a little story around. Incorporate into that story some clues that students can use to answer the questions that you will ask students to answer about the image.
2. Create a few questions based on the image. I like to arrange the questions in an order such that the correct answer to the first one provides clues toward answering the subsequent questions.
3. Take a test run of answering your own questions to detect any possible confusion or pain points for students.

Here's a sample image-based search challenge that I developed and frequently use.

1. The story: The picture below is one that I took while walking through a historic neighborhood in Maine. I was told that the house was once owned by a Vice President of the United States but I couldn't find any signs around the house that confirmed that rumor. With the use of a couple of Google search tools I was able to confirm that it was, in fact, owned by a former Vice President. Furthermore, it's now the site of a historical

collection that contains the last Duesenberg produced.



2. Questions:

- a. Which former Vice President owned this house?
 - i. How did you find that?
- b. What is the address of the house?
- c. Will the sunset be on the front or back of the house?
 - i. What Google tools did you use to find that answer?
- d. Who owns the last Duesenberg?

Here's the outline of the possible steps students might take to get the answers to the search challenge questions.

1. Find a list of all former Vice Presidents of the United States. (Wikipedia provides an accurate list). Work through the list to find the Vice Presidents who either resided in Maine and or owned property in Maine.
 - a. Alternatively, conduct a search along the lines of "vice presidents owning property in Maine."
 - i. Through both methods students may come up with answers that include George H.W. Bush, George W. Bush, Hannibal Hamlin, and Nelson Rockefeller.
 - ii. After creating the list of possible owners of the home, students turn to Google Images to search for pictures of the properties of respective VPs.
 - b. Another method that students can use to get to the answer to the first question is to take a copy of the picture presented to them and upload it to Google Images. This will create a list of possible matches for the original picture. (Note, by the time you read this students might come across one of my blog posts describing this search challenge).
2. Through one of the methods outlined above students should determine that the house was owned by Hannibal Hamlin. It is at this point that some students will mistakenly think that the home in Bangor, Maine when it is actually in Paris, Maine (sometimes listed as South Paris or Paris Hill). From here students can turn to Google Maps or Google Earth to find the address for the home. The use of Google Maps or Google Earth will let students see the orientation of the house to determine if the sun will set on the front or back of the house.
3. Now that students know where the house is (Paris, Maine) and who owned it (Hannibal Hamlin) students can add Duesenberg to a search for Paris Maine or Hannibal Hamlin House in a manner like this "Paris Maine Duesenberg." Those search results will lead to many articles about the car collection of Bob Bahre, the current owner of the home and car collection.

Have Students Create the Search Challenge

Creating a search challenge in which you give students the questions to answer is one approach to having students practice their search skills. Another approach is to have students ask the questions that they want to know the answers to. To that end I keep a Google Slides presentation that contains some interesting pictures intended to get students to ask questions that they'll answer by using a variety of search strategies.

The pictures below are ones that I've used for many years to prompt students to ask questions that they then have to search to find the answers to.





Some of the questions that students often ask about these pictures include:

- How big is it?
- What is it used for?
- Can I drive it?
- How big is the wheel?
- What's the gas mileage?

All of these questions can be answered once students determine where the truck is located (fairly obvious if they look at the second picture). Once the location is determined students can use Google Maps or Earth to view the truck in Street View and see its make and model. With the make and model information is obtained the answers to the other questions should fall into place.

A search challenge to encourage the use of historical archives.

A fun and effective way to encourage students to use academic databases and digital archives is to have them solve search challenges that are based upon items found in the digital archive or academic database of your choosing. Included below is an example of a search challenge that I created for students studying local history in Maine.

The Prompt: Everyone knows that Hannibal Hamlin (Abraham Lincoln's first Vice President) lived on Paris Hill in Maine. What you might not know is that Paris Hill was the home of another person who participated in a notable first.

Your challenge has three parts:

- Identify the significance of the airplane pictured below.
- What is the connection between the airplane and Paris Hill?
- Find out what kind of car was driven by the person who represents the connection between the airplane and Paris Hill.

Hints:

- Make or find a list of all of the people who flew on this airplane.
- Utilize resources on the Maine Memory Network website (<http://mainememory.net>) to attempt to identify the type of car driven by the person who represents the connection between the airplane and Paris Hill.



2

Finding the Answers to the Search Challenge

If you'd like to use my search challenge with your students, you're more than welcome to do so. But you'll probably want to know the answers and the process used to find the answers before

² Image source: Public Domain image hosted on Wikipedia.
https://commons.wikimedia.org/wiki/File:StateLibQld_1_139254_Landing_the_aircraft,_Southern_Cross_in_Brisbane,_Queensland,_ca._1928.jpg

giving the challenge to your students. There are a few ways to arrive at the answers. What I've outlined below is the most direct way to get to the answers.

Step 1: Identify the airplane and its historical significance.

The image itself gives us a big hint. Do a quick Google search for “southern cross airplane” and the top result will be a Wikipedia page about the airplane. It’s important to include “airplane” in the search because searching Google for just “southern cross” will put a music video of the Crosby, Stills, and Nash song *Southern Cross* at the top of the results. Further down the search results page for “southern cross” you’ll find links to articles about the constellation of the same name, links to an energy company, and links to a Brazilian award for chivalry. In fact, you won’t see any reference to an airplane in the first ten pages of Google search results when searching “southern cross.” Furthermore, “southern cross airplane” isn’t even a term that Google suggests when you enter “southern cross.”

As mentioned above, the top Google search result for “southern cross airplane” is the Wikipedia page about the airplane ([https://en.wikipedia.org/wiki/Southern_Cross_\(aircraft\)](https://en.wikipedia.org/wiki/Southern_Cross_(aircraft))). Read through that page and you’ll learn that it was the first aircraft to be flown from the United States to Australia.

Step 2: Identify who flew on the airplane.

Also on that same Wikipedia page you’ll learn that the four members of the flight crew were Charles Kingsford Smith, Charles Ulm, Harry Lyon, and James Warner.

Once you’ve identified who the members of the flight crew were, the next step is to figure out which one had a connection to Maine. To do this, open the Wikipedia page for each member of the flight crew then use keyboard commands of CTRL+F (Windows computers) or COMMAND+F (Mac computers) to search each page for the word “Maine.” Only the pages for Charles Kingsford Smith and Harry Lyon include a match for “Maine” and the match on Smith’s page is only found in the context of the word “remained.” Lyon’s page includes “Maine” as part of a link to the Maine Memory Network’s website which is mentioned in the hints for this challenge.

Step 3: Find the reference to Paris Hill.

If you follow the link to the Maine Memory Network from the Wikipedia page about Harry Lyon, you’ll find a fairly long article about Lyon and his life including that his parents bought a house on Paris Hill and Lyon later lived there.

Alternatively, you could have followed the hint about using the Maine Memory Network’s website then headed there to do a search within the site for references to Harry Lyon.

Step 4: Find the reference to a car.

At the very bottom of this Maine Memory Network page (https://www.mainememory.net/sitebuilder/site/272/page/531/display?use_mmn=1) about Harry Lyon you'll see a picture of Lyon sitting in a car in his driveway in 1927.

Step 5: Identify the car.

This is the hardest part of the whole challenge. To do this you'll want to enlarge the picture found on the Maine Memory Network's article about Lyon. Fortunately, they provide a zoomable version of the image (<https://www.mainememory.net/artifact/25464?popup=1>). By zooming in on the image you can look at some important details including the shape of the front door on the car, the shape of the front of the car (in particular, the grille of the car) and a little badge on the front of the car.

At this point the process becomes a little bit of guesswork followed by a process of comparison and elimination. There are some points to consider before guessing at what kind of car is in the picture. Here's a list of those points to consider:

- First, the picture was taken in 1927, a year before the flight of the Southern Cross.
- From reading about him, we know that Lyon was not a man of exceptional wealth, but probably middle to upper-middle class.
- Based on Lyon's financial standing as well as looking at the details of the car we can probably remove luxury brands from our guesswork.
- When we zoom-in on the car we can see that it has some imperfections as the result of driving and or post-manufacturing modification. Notable, there are what appears to be two wooden bench seats behind the driver's seat. The back half of the body appears to be wooden as well.

Now that we've considered the points above we can start guessing at the manufacturer of the car and the production year. Noting that cars didn't significantly change from one model year to the next at this time, if they did at all, we're guessing the year according to decade or half-decade is a viable approach to this challenge. At this point, turning to Google Image search is our next step. A search for "1920s cars" or "1910s cars" is a starting place. However, those results generally feature examples of luxury cars of the time. We're looking for cars that could have been owned by middle to upper-middle class people of the time. At this point in the process it's helpful to have a list of American car manufacturers of the 1910s and 1920s. Again, we may turn to Wikipedia for such a list or to any number of antique car websites for such a list.

Based on the lists of American car manufacturers and what we know about Lyon, Ford is the most common guess as it was the most popular brand in the United States at the time and is still in the forefront of Americans' minds today when they think of automobile manufacturers. Some adults will still think of Studebaker as an American car manufacturer. Dodge is also a common guess as it satisfies both the price and popularity

components of our quest. So now it's a matter of comparing pictures of cars produced by those manufacturers during the 1910s and early 1920s.

Use Google Images to find images of Ford, Studebaker, and Dodge cars produced in those decades. Compare the pictures closely to those of the picture of Lyon sitting in his car and you'll start to notice that the shape of the door in his car doesn't match those of Ford and Studebaker (they're not as rounded at the bottom). The front of Lyon's vehicle is also more rounded than that of the Fords and Studebakers made at the same time. A final detail is on the hood of the car when we look at the radiator caps of the vehicles. In all three cases, the Dodge examples are consistent with what we see in the picture of Lyon in his car. The final answer is a Dodge Touring produced around 1919 (give or take a year) that was modified in the back.

Disclosure: I spent at least ten hours comparing images of cars to the one of Lyon sitting in his car. To verify my information about the car I enlisted the help of one the top antique car preservationists in the country, Jeff Orwig. Jeff is a friend of mine and the curator of Bob Bahre's exquisite car collection housed on Paris Hill in Paris, Maine. You can read more about the collection here (<https://www.themainemonitor.org/for-bob-bahre-collecting-classic-cars-never-got-old/>).

Digital Citizenship

Whether our students are in Kindergarten or high school before we send them out on the web, we should be teaching them digital citizenship.

Common Sense Education (often referred to as Common Sense Media) offers an extensive set of free lesson plans for teaching digital citizenship to all K-12 students. The lesson plans are listed by grade level on Common Sense Education's Digital Citizenship Curriculum homepage (<https://www.commonsense.org/education/digital-citizenship/curriculum>) As is to be expected Common Sense Education's series of lesson plans include videos and instruction about privacy and what to share or not share online. What I like about Common Sense Education's curriculum is that beginning with Kindergarten and running through twelfth grade there are lesson plans under the heading of "media balance & well being." Those lessons get beyond the nuts and bolts of digital citizenship by making students think about how their media choices and media use affect them and others.

Planet Nutshell's Net Safe series (<https://planetnutshell.com/netsafe/>) contains eighteen episodes covering topics like protecting personal information, responsible posting of pictures, and mobile location privacy. The videos are labeled with grade levels. Below each grade level label you will find a summary of the key points of each video.

Elementary School Resources

Ruff Ruffman: Humble Media Genius (<http://pbskids.org/fetch/ruff/>) is a PBS Kids online series of videos and online quizzes designed to help elementary school students understand the importance of things like online privacy, safe texting behaviors, and managing screen time. The series also includes a section on how to conduct internet searches and how to tell the difference between what is an advertisement on a webpage and what is useful information. (<https://pbskids.org/fetch/ruff/find-what-you-want/>).

Be Internet Awesome (<https://beinternetawesome.withgoogle.com>) is Google's Internet safety curriculum. The Be Internet Awesome site features a game called Interland. The game is set in a virtual world that students navigate by correctly answering questions about Internet safety. The graphics of the game are great and there are some elements in which students navigate, but there is also a heavy reliance on multiple choice questions in the game. The Interland game can be distributed through Google Classroom. G Suite administrators can push the game to the taskbar on managed Chromebooks. There is a 98 page PDF containing lesson plans on each concept in the Be Internet Awesome curriculum that teachers can download for free. The curriculum is based on five concepts: *Share with care, Don't fall for fake, Secure your secrets, It's cool to be kind, When in doubt, talk it out.*

Middle School / High School Resources

Google's Applied Digital Skills website includes a whole section of lesson plans for teaching digital citizenship skills. You'll find that section at <https://bitly.com/37HgZ3j> or by simply going to <https://applieddigitalskills.withgoogle.com/c/en/curriculum.html> then scrolling down the page to select the digital citizenship category. There is an activity from that category that is great for starting the school year on the right foot. That activity is called Identifying Cyberbullying and you can find the directions at <https://bitly.com/2VTcno3>. In the activity students collaboratively create a Google Document outlining the traits of cyberbullying and steps to take to combat cyberbullying.

Microsoft's Educator Center offers a short, free course on digital citizenship. The course, available at <https://bitly.com/3lVoY5k>, is designed to be completed by teachers who will then utilize the resources included in the course to develop their own digital citizenship lessons. Some of the resources included in the course include printable infographics, PowerPoint presentations, and handouts on topics like digital footprints and information literacy.

Everfi offers a series of six free online activities designed to help middle school students develop good digital citizenship habits. These activities are best described as interactive cartoons that teach students skills like balancing screen time with offline time, online account security habits, recognizing the permanence of online publishing, and evaluating the credibility of information found online. All six activities are part of the free course that Everfi offers at <https://everfi.com/courses/k-12/digital-literacy-wellness-safety/>

Factitious (<http://factitious-pandemic.augamestudio.com/#/>) is a game for testing your skills at identifying fake and misleading news stories. The game was developed by the American University Game Lab and the American University's School of Communication. To play Factitious simply go to the site and select quick start. You'll then see an article appear on the screen. Read through the article, click the source listed at the bottom, and then select either the green check mark or red X to indicate whether or not you think the article is a real news story. After you make your selection you'll get instant feedback and an explanation of how you can tell if the article was a real or fake news story.

Checkology (<https://get.checkology.org/>) is a service that is designed to help students develop those skills. Checkology's free version offers four interactive modules for students to complete. Each of the modules is composed of between twenty and forty-seven instructional video clips and interactive comprehension checks. The four modules are titled Info Zones, Democracy's Watchdog, Practicing Quality Journalism, and Misinformation. As you might expect, the contents of the modules get progressively more difficult as each section is completed.

Bad News (<https://getbadnews.com>) is a website that offers simulations that show visitors how misinformation is spread through social media. Bad News is available in two versions. The regular version is intended for those who are high school age or older. Bad News Junior is appropriate for middle school and older elementary school students. The difference between the

two versions is found in the news topics that are used in the simulations. In both versions of Bad News players work through a simulation in which they attempt to build a Twitter following by spreading misleading news stories. (I must emphasize that there are no real Tweets sent and you don't have to even have a Twitter account to play Bad News). Through the simulation players learn how headlines, memes, and Tweets are designed to manipulate people and prompt reactions from them. The simulation also shows players how Twitter bots are used. There are six distinct sections of Bad News. At the end of each section players are awarded a badge signifying that they have learned about the manipulation techniques associated with trolling, impersonation, discrediting, polarizing, emotional manipulation, and conspiracy theories.

Creating and Protecting Strong Passwords

One of the best ways to protect your online identity is to create strong passwords containing unique characters. Creating a strong password is the first step in securing your online accounts. Google offers good advice in this video https://www.youtube.com/watch?v=0RCsHJfHL_4

Sometimes it's difficult to think of new strong passwords. When you're having a mental block thinking up a new password try using Wolfram Alpha to come up with a new password. To do this simply go to WolframAlpha.com then type in "password." Then a random eight character password will be shown to you.

Whenever it is offered as an option, it is a good idea to use two-step or two-factor authentication on the online services you use. Google, Dropbox, Box, and many other cloud services offer this option. Two-step authentication means that just entering one password isn't enough to log into a service. Learn about Google's two-step authentication in this video <https://youtu.be/zMabEyrPRg> and read about it in detail at <http://bitly.com/ftgtwostep>

Common Craft offers some excellent videos on crafting strong passwords (<https://www.commoncraft.com/video-secure-passwords-explained-common-craft>), understanding why creating a strong password isn't enough to stay safe online (<https://www.commoncraft.com/video/account-security>), and how to protect your mobile phone from hacking (<https://www.commoncraft.com/video/mobile-safety-security>).

Seven styles of classroom video projects

The process of creating and publishing videos can be a great way to get students excited about researching, storytelling, and sharing their work with an audience. For teachers who have never facilitated video creation projects in their classrooms, choosing the right style of video and the right tools can be a bit confusing at first. To help bring clarity to the styles and tools, I have a rather simple outline that I use in my video creation workshops.

Project style #1 - One-take videos:

These are videos that are shot using the camera built into a mobile phone or tablet. You might also use the camera in a laptop for these types of videos. The purpose of a one-take video is to quickly record a short observation, to record a short message, or to capture an important moment like students making observations during a science lab. Generally, these videos should be less than sixty seconds.

One-take videos can be uploaded just as they are to YouTube, Vimeo, Instagram (depending on the length of the video), your classroom blog, Google Drive, Dropbox, or any number of online hosting services. If you use the YouTube or Instagram mobile app (available for Android and iOS) you might trim the beginning or end of the video to remove dead space in it or apply a color filter to it, but that will be the extent of the editing that is done before the video is shared.

There is not a company that has done more to popularize one-take videos in classroom settings than Flipgrid (<http://flipgrid.com>). The basic idea behind Flipgrid is that it enables you to post a video prompt and then have your students respond through video by using the webcams in their laptops or through the cameras on their smartphones or tablets. All responses are collected and displayed in a grid format. You can choose to respond to your students' videos in video form or in text form. You can also allow students to respond to their classmates' videos. Watch this video (<https://youtu.be/p1f992gNBec>) for an overview of how to get started using Flipgrid. A playlist of more than a dozen Flipgrid tutorials is available at <https://www.youtube.com/c/RichardByrne/search?query=flipgrid>

Project Style #2 - Audio slideshows

These are videos that are built upon a series of still images combined with a soundtrack of either music or spoken words. Summarizing the highlights of an event, summarizing the key points in a story, and summarizing the results of a research project are all common purposes for creating audio slideshows. You will also find this style of video used to give step-by-step directions for a process. This style of video is typically less than three minutes long.

Canva (<http://canva.com>) is a graphic design tool that I've used for years to create graphics for blog posts and social media posts. In the last year I've started to use it more and more for developing presentations and creating short videos. Canva offers a library of music that you can easily incorporate into your presentations. Those presentations can then be exported as video

files to play wherever you like. Watch the short video found at <https://youtu.be/HguHXjS1tNA> to learn how to create an audio slideshow video in Canva. You can also use Canva to record yourself talking while presenting your slides. A demonstration of that simple process is available at <https://youtu.be/v5dnLGyXib4>

Narakeet (<https://www.narakeet.com/>) is a service that lets you upload slides and have them converted into a video that is automatically narrated for you. You can choose from about twenty voiceover options, adjust the speed of the voiceover, and choose to have captions automatically added into your video. To use Narakeet you must have your slides in PPTX format. Fortunately, all of the popular slideshow creation tools including Canva and Google Slides let you export your presentations as PPTX files. When you upload your PPTX file to Narakeet your speaker notes are used as the basis for the narration that is created for your video. When your video is completed you can download it as an MP4 file that can be used anywhere that you typically share videos. Video demonstrations of how to use Narakeet with PowerPoint, Google Slides, and Keynote can be seen at <https://bitly.com/3yMDzDw>

Animoto (<http://animoto.com>) was the first tool to popularize creating this style of video. Animoto can be used in a web browser on your laptop or Chromebook. Android and iOS apps are also available from Animoto. To create an audio slideshow through Animoto you simply need to upload ten to fifteen pictures then choose the soundtrack that you want to hear as the images are displayed. Within Animoto there is an extensive gallery of free music that you can use if you don't have music of your own to upload. Animoto does allow you to add some limited text to your slideshow video. A variety of frame and transition themes are offered by Animoto. Some of those themes are free and others are only available to subscribers to Animoto's premium service.

The shortcoming of Animoto's audio slideshow creator is that you have very limited control over the timing of transitions in your video. So if you want to narrate the slideshow rather than just play music you will have to try another tool. On an iPad Shadow Puppet Edu and ShowMe are good apps to use to create audio slideshows. WeVideo is a good browser-based as well as Android option. (Explain Everything is also a good Android and iPad option, but it is not free). For desktop creation of audio slideshows iMovie and Windows Movie Maker are good choices.

Shadow Puppet Edu (<http://bit.ly/shdwft>) is a free iPad app that you can use to create audio slideshow videos. The app offers an integrated search tool for finding pictures from the Library of Congress, to search for images from NASA, and to find Creative Commons licensed images from Flickr. You can also import pictures and videos from the camera roll on your iPad. After selecting a set of images students can arrange them into any sequence by simply dragging and dropping them into order. Then to create a story press the record button and talk while flipping through your images.

Typito (<http://typito.com>) is a good tool for creating simple videos. Typito is designed for making audio slideshows like those you might have made in the old YouTube photo slideshow tool. To

get started on Typito you upload a picture or a video clip and then add a title for your project. After the initial file is uploaded you can upload more images and video clips. You can control how long each item is displayed in your video. Typito provides many options for placement of text over your images and videos as well as the style of the text that you use in your video. Finally, you can upload your own audio or use some of the music provided in the Typito library. Finished Typito videos can be downloaded to your computer, uploaded directly to your YouTube account, or shared via social media.

Project Style #3 - Whiteboard/ Screencast Instructional Video

This style of video is what you will find on places like Khan Academy. This style is used for explaining and demonstrating how to solve problems, how to use a piece of software, providing a walk-through of a timeline or flowchart, or to simply narrate a set of slides. This style of video is often made by teachers for the purpose of instruction to students. There is value in flipping that model to have students create instructional videos through which they model their knowledge of a process or topic.

Flipgrid includes a feature that lets teachers and students create whiteboard videos. This feature can be used in conjunction with all of the other features of Flipgrid's recording tools including stickers, emojis, and trimming the beginning and end of videos. As a teacher you can record and post a whiteboard video for your students and have them reply with whiteboard videos of their own. A demonstration of how to use the whiteboard feature in Flipgrid is available in this video <https://youtu.be/MYSKTW5qgy8>

Clarisketch (<http://clarisketch.com>) is a free Android app that has great potential for classroom use. The app allows you to take a picture or pull one from your device's camera roll and then add your voice to it. While you are talking about your picture you can draw on it to highlight sections of it. Completed projects are shared as links to the video file hosted on Clarisketch. You can share the link to your Clarisketch video and have it play on nearly any device that has a web browser. Clarisketch is also available as a Chrome app (<http://bitly.com/clarisketch>).

To record your screen on a MacBook you can simply open QuickTime Player then choose "New Screen Recording" from the File drop-down menu.

There are lots of tools for creating screencast videos on a Windows computer.

Screencast-O-Matic (<http://screencast-o-matic.com>) is the tool that I use on a regular basis for creating screencasts on both my Windows laptops and on my MacBook. You can launch it from your web browser and use it for free. It will let you capture your webcam while simultaneously capturing your screen. Screencast-O-Matic also offers a premium option for \$18/year. The premium option includes longer recording time, removal of watermark, editing tools for cutting and trimming videos, background music options, and tools for making green screen videos.

Loom (<http://bit.ly/2x3FyXV>) is a free screencasting tool that works on Chromebooks, Macs, and Windows computers. Loom is a Chrome extension. With Loom installed you can record your

desktop, an individual tab, and or your webcam. That means that you could use Loom to just record a webcam video on a Chromebook. Of course, that also means that you can use Loom to record your webcam while also recording your desktop.

CaptureCast (<http://bitly.com/1R3YJyJ>) lets you record your webcam while recording your screen. You can choose to record your screen, your screen and your webcam, or just your screen or just your webcam. CaptureCast gives you three options for recording definition. So if you're on a slower network you can choose a lower resolution recording to save processing time. CaptureCast lets you save a recording locally or send it to YouTube or Vimeo.

Screencastify (<http://bitly.com/1R3YSIM>) is a popular choice for creating screencasts on Chromebooks as well as on Windows and Mac computers. The free version limits recordings to five minutes and puts a watermark on the recording. There are two features of Screencastify that are worth noting. First, you can draw on your screen while talking and recording. That feature is great for making short math instructional videos. Second, you can have your Screencastify recordings automatically saved in Google Drive and directly post them on Google Classroom.

Project Style #4 - Animated Videos

Creating animated videos is a great way for students to bring a story to life. They can create animations for stories they've created or for stories they've read.

ChatterPix Kids (<https://bitly.com/2Xuf9Bj>) is one of my favorite digital storytelling apps for elementary school students. It is a free app that students can use to create talking pictures. To use the app students simply open it on their iPads or Android devices and then take a picture. Once they've taken a picture students draw a mouth on their pictures. With the mouth in place students then record themselves talking for up to thirty seconds. The recording is then added to the picture and saved as a video on the students' iPads or Android devices. Demonstrations of how to use the iOS and Android versions of ChatterPix Kids can be seen at <https://bitly.com/3CO9rKo>

Wick Editor (<https://www.wickeditor.com/>) is a free tool for creating animations in your web browser. Wick Editor doesn't require you to register or sign into any kind of account in order to use it. Simply head to the website and click "launch web editor" to get started. The editor itself doesn't have a lot of text or menus to tell you what exactly the features are or where they're found. You kind of have to just click and try things. That said, the tutorial video (<https://youtu.be/pAsrXT8Klrl>) found on the Wick Editor homepage will show you everything you need to get started. Some of the highlights of Wick Editor include an onion-skinning feature that lets you work on one frame of your animation while viewing the previous frame, a wide variety of drawing tools, and options for uploading and or recording audio to include in your animated video.

PowToon (<http://powtoon.com>) is similar to Animaker. It has been a popular platform for creating animated videos for many years. In PowToon students create animated videos on a scene-by-scene basis through a series of slides. Students can choose background scenes, characters, and scene objects from a huge media gallery. After configuring the scenes of their stories, students can record voiceovers or play music in the background.

Toontastic 3D (<https://toontastic.withgoogle.com/>) was released about five years ago and while it's still good, it is getting a little dated. The app is available for Android and iOS. To make a video on Toontastic 3D students first select the type of story that they want to create. Their options are "short story" (a three part story), "classic" (a five part story), or "science report." Once they have selected a story type they will be prompted to craft each part of their stories in order. A short description of what each part of the story should do is included before students start each section. Students can pick from a variety of story setting templates or they can create their own within Toontastic 3D. Once they have established a background setting students then select cartoon characters to use in their stories. Students can choose from a wide array of customizable cartoon characters or they can create their own from scratch. Once characters are placed into the story scenes students can begin recording themselves talking while moving the characters around in each scene. Students can swap characters between scenes, change the appearance of characters between scenes, and move characters from one scene to the next. To use Toontastic 3D students do not need to have accounts or log into any service. Their completed videos can be saved directly onto the devices that they use to create their videos. Watch a video tutorial at <https://youtu.be/QEcbO8Z3yiA>

Simpleshow Video Maker (<https://videomaker.simpleshow.com/>) is a good tool for creating Common Craft style explanatory videos. The best aspect of Simpleshow Video Maker is the emphasis that the developers have placed on storyline planning and development. One of the best things about Simpleshow Video Maker is that students have to write a script on Simpleshow Video Maker before they can begin to use the video editing tools. Watch a demo video at <https://www.youtube.com/watch?v=MTfZ1SN-LiY>

Scratch (<http://scratch.mit.edu>) allows students to program animations, games, and videos through a visual interface. Students create their programs by dragging together blocks that represent movements and functions on their screens. The blocks snap together to help students see how the "if, then" logic of programming works.

Slides+Transitions+Screencasting = Animated Video. Google Slides, PowerPoint, and Keynote all have transition and animation tools that students can use to animate movements of clipart. Have students create a set of slides that utilize the animation tools. Then have them record the animations while they narrate and record the presentation with a screencasting tool like Screencastify or Screencast-o-Matic. That process is demonstrated in this video <https://youtu.be/7GMZJXMnRjE>

Project Style #5 - Stopmotion & Time-lapse Videos

Creating stopmotion videos is a good way for students to see how a story develops frame-by-frame. Think about the process of making a claymation film. That process requires students to plan each part of a story by positioning the clay figures for each scene. I have had students use this process with paper cutouts instead of clay. The videos on CommonCraft.com provided my inspiration for having students create stopmotion videos featuring paper cutouts in place of clay.

Time-lapse videos offer a fantastic way for students to record and then see how a lengthy process occurs. Capturing the process of osmosis provides a good opportunity to use time-lapse videography. Take that standard osmosis demonstration of placing a raisin in a beaker of water and capture it with a timelapse video tool. When you're finished capturing the process you will have a short video that will show students the stages of the raisin swelling.

Lapse It (<http://www.lapseit.com/index.html>) is a mobile app (available for iOS and Android) that makes it easy to create short time lapse videos. The app comes in two versions, free and pro. The free version is adequate for most uses, but the pro version offers additional editing effects and a much higher output resolution. To create a time lapse video with Lapse It just open the app, select "new capture," and set the timer for the frequency with which you want images captured. You can set the frequency by milliseconds, seconds, or minutes. Lapse It provides options for setting the focus, white balance, color saturation, and flash for the camera on your phone or tablet. Once you've captured all of your imagery for your time lapse video you can use Lapse It to set the number of frames per second in your playback. Lapse It also provides tools for trimming your video and adding music to your video. When you're happy with your final product you can share it to YouTube or render it in MOV, MP4, or FLV.

Cloud Stop Motion (<https://cloudstopmotion.com/>) is a browser-based tool for creating short stop motion videos. You can try Cloud Stop Motion without creating an account. That said, I'd recommend creating a free account because without one your video has to be so short that you really can't get a sense for how all of the tools work. Once you've created your account you should enable your webcam so that you can use it to capture pictures of objects that you place in front of it. Taking a series of pictures is as simple as clicking the camera icon in the video editor. Your pictures are automatically added to the editor in the sequence in which you took them. You can also connect an external camera to capture and import images into your project. After adding images to your project you can upload sounds, record sounds, or select sounds from the gallery provided by Cloud Stop Motion. You can also add text and title screens to your project. When all of the media for your project is in place you can preview your video by hitting the play button. If you don't like any element of the video, you can go back and edit it out. Adjusting the frames per second is a simple edit that you can make in the Cloud Stop Motion editor. A demo of Cloud Stop Motion is available at <https://youtu.be/Gx4quJdvFSI>

OSnap (<http://bit.ly/ftosnap>) is an iPad app (available in a free version and a paid version) that you can use to create stop motion and timelapse videos. The app is quite easy to use. To create

a video with the OSnap app you simply need to start a project and take a series of still pictures using your iPad's camera. Then adjust the number of frames per second to edit your video. If you want to, you can add a soundtrack to your video by selecting audio files that are stored on your iPad. You can go back and edit your videos by removing images and from the project at any time. Completed projects can be stored on your iPad, uploaded to YouTube, or shared via email.

Stop Motion Animator (<http://bit.ly/2vX5GP6>) is a free Chrome app for creating stop motion videos. The app is free and easy to use. It does not even require students to create accounts in order to use it. To create a stop motion video with Stop Motion Animator, launch the app and grant it access to your Chromebook's webcam. Then you capture a series of pictures with your webcam and play them back at various speeds in a stop motion style. You can add audio to your video in Stop Motion Animator. Your completed video must be downloaded to your Chromebook as a .webm file which you will have to upload to either YouTube or Google Drive to playback outside of Stop Motion Animator.

Project Style #6 - The Documentary/ Feature Film

These are the longest video projects in a classroom. Students will create videos of five minutes or more to tell a fiction or nonfiction story. While any of the previously mentioned project styles could be stretched to five minutes, generally they're better kept to shorter lengths. The typical project over five minutes is going to be a documentary style, news report, or telling of a long fiction story with live action. For Mac users, iMovie is the go-to tool for these projects. Windows users will lean toward Windows Movie Maker. On a Chromebook, WeVideo is your best option for editing documentary/ feature film projects.

Adobe Spark (<http://spark.adobe.com>) offers a great option for creating a video that falls somewhere between the categories of audio slideshow and feature film. Adobe Spark lets students create videos based on images that they upload or select from its integrated search option. At the end of 2016 Adobe Spark introduced the option to use video clips within each frame of a video. Students can also draw and type on slides in Adobe Spark. The best part of Adobe Spark is that students can record their own narration directly over each frame of their videos. To record narration students simply hold down the microphone icon in the editor and start talking. The video available at https://youtu.be/BD81ew_UvGU provides an in-depth overview of how to use Adobe Spark.

Headliner (<http://headliner.app>) is a free online video editor that was designed for the purpose of making videos for use on social media, but the editor could be used for making videos for any purpose. To get started using Headliner you do need to create a free account on the site. Once you've created an account you can begin making videos from scratch or by following one of the simple templates in Headliner. Using the blank template is probably the best way to get to know the features built into the Headliner editor. A video overview of how to use Headliner is available at <https://www.youtube.com/watch?v=yPLgdPggqjM>

Type Studio (<https://typestudio.co/>) is a video editing tool that was released in early 2021. When I used it for the first time I actually said aloud, "Whoa! That's Awesome!" What made me say that was using the editor to clip a section of video. With typical video editing tools you have to drag and select a section to delete it or enter time stamps of a section to delete it. In Type Studio I simply selected a few words from the transcript of my video and hit the delete key on my keyboard to remove a section of my video. Type Studio creates a transcript for you when you upload your video into their editor. Depending on the length of the video this can be just a few minutes or can be quite a bit longer than that. Once the transcript is created it appears in your Type Studio editor alongside your original video. Then to cut a section of your video all you have to do is select the words or sentences you want to remove and Type Studio will remove the corresponding section of the video itself. A short video demonstration of Type Studio is available at https://youtu.be/oJ-c2H_lpvw

WeVideo (<http://wevideo.com>) offers the most features of any of the tools featured in this section. It is an online video creation tool that I have written about many times over the last few years. WeVideo offers templates that new users can follow to create their first videos. Advanced WeVideo users can skip the templates, use the full editor, and apply themes to their videos by choosing them from the themes menu in the editor. In the video editor you can upload your own media clips or use stock media clips to produce your video. WeVideo's Google Drive app allows you to save all of your video projects in your Google Drive account. WeVideo also offers an Android app and an iPhone app that students can use to capture images and video footage to add to their projects.

Project Style #7 - Green Screen Videos

Turn on your favorite local news television station and you're going to find green screen video in action. The most common use is during the weather forecast when the meteorologist appears to be pointing at a map. Creating green screen videos used to be difficult. Today, just about anyone can do it on any modern computer.

Through the use of green screen editing students can virtually appear in front of almost any landmark, appear on stage in front of an audience, or any just about any other place that they have a picture or video of. Creating green screen videos is a fun way for students to share what they've learned through research about a place or event. Making green screen videos is also a great way for kids to make their own weather forecast and newscast videos.

When it comes to making green screen videos in classrooms there are really only two tools that I recommend today. Those are iMovie and WeVideo. If your students have access to Macs or iPads, go with iMovie. Otherwise, WeVideo is a great choice for making green screen videos on Chromebooks and Windows computers. This video will show you how to make a green screen video with iMovie <https://www.youtube.com/watch?v=4mJij3WCN1c> and this video will show you

how to make a green screen video with WeVideo
https://www.youtube.com/watch?v=kjLx61V14_0

Materials and Tips for Making Green Screen Videos

- Your live action needs to be recorded in front of a green screen. You can purchase screens specifically made for this purpose or do what I do and head down to your local Walmart and purchase a queen size green bed sheet.
 - If you do choose the green bed sheet option, make sure you stretch the sheet tightly enough to remove any wrinkles.
- When it comes to lighting, the goal is to remove any shadows and cast an even light on the person in the video and on the screen itself. Again, you can buy lighting kits made specifically for this purpose or use a couple of cheap clamp-on lights from your local hardware store.
- Whenever possible try to have students use images and video clips that are in the public domain as the background for their videos. Pixabay and Pexels offer large collections of public domain videos and pictures.

Planning Your Video Project - Simple Guide for Students

In a separate document or on a separate piece of paper, please outline your project by following the template provided below. (If you're viewing this in Google Docs, you can make a copy and fill in the requested information below each section description).

Purpose:

Use no more than five sentences to describe the purpose of your video. Should people learn something from your video? If so, please state what they should learn from watching your video. Will your video prove that you understand a process or concept? If so, please name that process or concept.

Video production tool:

Please name the website, iPad app, Android app, or desktop software that you are going to use. Briefly explain your choice. If you're not sure which one to pick, please see me.

Outline your video:

Identify the introduction, central point, and conclusion to your video.

If you are going to add narration to your video, write a short script that you can read while recording.

Media elements:

What type of media will be included in your video? Examples: pictures, drawings, music, spoken words, live action, animation. Please remember to use media that you own, is in the public domain, or has a Creative Commons license. Please cite the source of any Creative Commons media that you use.

Share your video:

You may share your video with me by sending me a link to it, sharing it through Google Drive, or by submitting it through the Google Form link on the class blog.

Video Production Rubric - Planning & Organization

	25 points	20 points	15 points	10 points
Use of Resources and Citations	All sources (images, videos, sounds) properly cited using citations.	All but one source credited using citations.	Two sources not cited	Three or more sources not cited.
Planning of story.	A complete storyboard with images and footnotes was created.	A storyboard was created but lacked images or footnotes	An outline but not a storyboard was created.	An incomplete outline was created.
Organization of video presentation	The video has a clearly identified purpose/message. Graphics and messages are presented in a logical order.	The video's purpose/message is identifiable. Graphics and media presented in logical order.	The video's purpose/message is not easily identified and or graphics and messages are not in a logical order.	The video lacks an identifiable purpose or message.
Content knowledge	The video conveys a students' complete and thorough understanding of the subject.	The video conveys a nearly complete understanding of the subject.	The video conveys an incomplete understanding of the subject.	The video conveys very little understanding of the subject.

Creating & Distributing Flipped Video Lessons

Year after year EDpuzzle (<http://edpuzzle.com>) remains at the top of my list of recommended tools for creating flipped video lessons. It is a neat tool that allows you to add your voice and text questions to educational videos. On EDpuzzle you can search for educational videos and or upload your own videos to use as the basis of your lesson. In your EDpuzzle lessons you can make it a requirement for students to answer a question before moving forward in the video. EDpuzzle has an online classroom component that you can use to assign videos to students and track their progress through your video lessons. EDpuzzle's Chrome extension (<http://bitly.com/edpzext>) enables you to save YouTube videos directly to your EDpuzzle account. This means that instead of having to search within EDpuzzle for videos you can simply browse YouTube like you normally do then just click the EDpuzzle extension to save the video. Once a video is saved you build your questions around it. Learn how to use EDpuzzle by watching the video at <http://bitly.com/edpzle>

Vialogues (<http://vialogues.com>) is a free service that allows you to build online discussions around videos hosted online and videos that you have saved on your computer. Registered users can upload videos to Vialogues or use YouTube videos as the centerpieces of their conversations. After you have selected a video from YouTube or uploaded a video of your own, you can post poll questions and add comments that are tied to points in the video. Your Vialogue can be made public or private. Public Vialogues can be embedded into your blog or website. Learn how to use Vialogues in the video available at <http://bitly.com/1EER4Cj>

Blendspace (<http://blendspace.com>) makes it easy for teachers to organize and share educational materials in a visually pleasing format. On Blendspace you can arrange videos, links, images, and files around any topic of your choosing. Blendspace has built-in search tools so that you do not have to leave your Blendspace account in order to locate resources. When you share a set of Blendspace materials with your students they can give you feedback to show that they understand the materials or they can ask questions about the materials. You can also see if your students actually looked at all of the materials that you have shared with them. Using Blendspace can be a good way to create and deliver flipped lessons.

ClassHook (<https://www.classhook.com/>) is a service that helps you locate video clips to use in your classroom. ClassHook's best feature is being able to search for video clips according to subject and topic. Most of the video clips that you'll find on ClassHook come from well-known television shows and movies. ClassHook has two features that are helpful in creating lessons based on video clips. Pause Prompts are time-stamped questions that you add to video clips in ClassHook. When you're showing a video to your class, the questions you've written as Pause Prompts will automatically pop-up at the timestamp you've specified. The video will stop and the question will appear full-screen in its place. You can then have a discussion with your students about the prompt.

Live Discussions builds upon Pause Prompts by incorporating an online response element for your students. When a Pause Prompt is reached you can have your students respond online as well as by speaking in class. Live Discussions generates a link and QR code for students to follow to land on a response page where they can answer the questions in the Pause Prompts. You'll be able to see their responses in your ClassHook teacher account.

Audio Recording & Publishing

Synth (<http://gosynth.com>) is a free service that was designed for classroom use. It had some significant updates in 2021. Originally, Synth limited recordings to 256 seconds. Now you can record for up to 30 minutes. As before you can post your recordings for students to listen to and respond to with recordings of their own. Likewise, students can create a recording, post it, and get responses from you and their classmates. A video overview of Synth is available here <https://youtu.be/WW6-UNOwNuk>

Anchor (<http://anchor.fm>) is a simple and free platform for recording, editing, and distributing podcasts. Recording on Anchor can be as simple as just holding down the record button on your phone or on your laptop and then releasing it when you're done talking. Anchor lets you upload external audio files to include in your podcast. Finally, if you want to distribute your podcast to Apple Podcasts (iTunes), Google Podcasts, Spotify (Anchor's parent company) or any other large podcast networks, Anchor simplifies that process for you. Watch the video at https://www.youtube.com/watch?v=8NfKlCP_Yxg&t=5s to learn how to publish a podcast through Anchor.

Soundtrap (<http://soundtrap.com>) is a fantastic tool for creating music online. The cool thing about Soundtrap is that students can use virtual instruments to create music or they can record themselves playing music on an instrument and then use that recording in conjunction with the virtual instruments in the Soundtrap environment. What makes Soundtrap stand-out from the crowd is its collaboration options. Click the "collaborate" tab in the Soundtrap editor to invite others to create music with you. Soundtrap will work in the Chrome web browser on a laptop, iPad, Chromebook, and Android tablet. In my workshops I often describe Soundtrap as Google Docs for music.

I've been using Vocaroo (<http://vocaroo.com/>) for more than a decade. It's incredibly simple to use. Just head to the site, click the record button, and start talking. When you're finished recording, hit the stop button. You can listen to your recording before downloading it as an MP3. If you don't like your recording you can create a new one by just refreshing the Vocaroo.com homepage and starting again.

Online-Voice-Recorder.com offers the same simplicity of Vocaroo plus a couple of features that I've always wished Vocaroo had. One of those features is the ability to pause a recording in progress and resume it when I want to. The other feature is the option to trim the dead air at the beginning and end of a recording.

Twisted Wave (<https://twistedwave.com/online>) offers many more features than either of the tools mentioned above. But at its most basic level you can still just head to the site, launch the recorder, start talking, and then export your recording as an MP3 all without creating an account on the site. TwistedWave's audio editing tools include options for fade-in, fade-out, looping, sound normalization, and pitch adjustments. The editor also includes the typical track clipping

tools that you would expect to see in an audio editing tool. For those who are looking for a way to save audio directly into Google Drive, Twisted Wave offers that capability.

Twisted Wave, Vocaroo, and Online-Voice-Recorder.com are demonstrated in the short video available at <https://youtu.be/gEXgQ55vNIE>

Backchannels & Formative Assessment

Backchannels, polling services, and quiz tools provide good ways to hear from all of the students in a classroom. These kinds of tools allow shy students to ask questions and share comments. For your more outspoken students who want to comment on everything, a feedback mechanism provides a good outlet for them too.

For nearly a decade Today'sMeet was my go-to tool for creating an online backchannel chat for my students to use. It shut down in the middle of 2018. A few months later Yo Teach! (<https://yoteachapp.com/>) was developed by The Hong Kong Polytechnic University's Pedagogic and Active Mobile Learning Solutions project as an alternative to Today'sMeet. Here's a video overview of how it works <https://www.youtube.com/watch?v=EpDksD0NTSE>

Kahoot (<http://getkahoot.com>) is a service for delivering online quizzes and surveys to your students. On Kahoot you create a quiz or survey that your students respond to through any device that has a web browser. Your Kahoot questions can include pictures and videos. As the teacher you can control the pace of the Kahoot quiz or survey by imposing a time limit for each question. As students answer questions they are awarded points for correct answers and the timeliness of their answers. A scoreboard is displayed on the teacher's screen. Students do not need to have a Kahoot account in order to participate in your activities. To participate they simply have to visit Kahoot.it then enter the PIN code that you give to them to join the activity. Kahoot games can be played in your classroom or you can assign them to be played at home as "challenge" activities. A set of Kahoot tutorials is available at <https://www.youtube.com/user/rbyrnetech/search?query=kahoot>

Socrative (<http://socrative.com>) is the standard to which I compare all new student response systems. Socrative uses cell phones and or laptops (user's choice) for gathering feedback from students. You can post as many questions as you like in a variety of formats. One of the more fun question formats is the "space race" format in which students can work individually or in teams to answer questions as quickly as possible.

Triventy (<http://triventy.com>) is a free online quiz game platform that is similar in concept to platforms like Kahoot and Socrative. Triventy differentiates itself from the crowd by allowing you to accept question suggestions from students. Teachers can invite students to add questions to their games. Typically, this is done as a homework assignment before running the game in class. This creates a comprehensive learning experience in which students are both 'players' and 'tutors' who share their knowledge with you and their classmates. One of the neat features of Triventy for students is that they can ask for a hint or to have an answer choice eliminated. Students can also see an explanation of the answer to each question. Learn more about Triventy in the video available at <https://youtu.be/F1Cp8JPTYA>

Formative (<http://goformative.com>) provides you with a place to create online classrooms. Your students join your classroom by entering the assigned class code after registering on the Formative website. Once your classroom is established you can begin distributing assignments to students. Assignments can be as simple as one question exit tickets like "what did you learn today?" to complex quizzes that use a combination of multiple choice, short answer, and true/false questions. You can assign point values to questions or leave them as ungraded questions. You can also enable or disable instant feedback for students. When you give an assignment to students through Formative you can watch their responses in realtime. The best feature of Formative is the option to create "show your work" questions. "Show your work" questions enables students to draw responses and or upload pictures as responses to your questions. When you use this question type students will see a blank canvas directly below the question. On that canvas they can draw and or type responses.

On Backchannel Chat (<http://backchannelchat.com/>) you can create a free backchannel room (AKA chat room) in which you can post comments and questions for your students to respond to. Your students can respond in realtime. Students can ask you and their classmates questions within the confines of your Backchannel Chat room. Learn more about Backchannel Chat in the video at <https://youtu.be/3NEjplsQzRQ>

GoSoapBox (<https://www.gosoapbox.com/>) allows you to have your audience respond to questions through their laptops, tablets, and phones. Polls and Discussion in GoSoapBox are the meat and potatoes of the service. The Polls tool allows you to survey your audience by having them select an answer choice in response to a question. The Discussions tool allows you to have audience members reply to open-ended questions. One of the simplest yet effective survey options in GoSoapBox is a tool called a Confusion Meter. The Confusion Meter allows members of your audience to simply say, "yes, I get it" or "no, I don't get it." The Confusion Meter, like all of the GoSoapBox survey tools, can accept anonymous feedback. You can use the Social Q&A tool in GoSoapBox to have students submit their questions to you. Students can see each other's question submissions and vote them up if they want to.

Quizalize (<http://quizalize.com>) is a quiz game platform that will remind you of Kahoot. Like Kahoot, students play your quiz games on their laptops or tablets by going to the Quizalize website then entering their names and a class code. Students are awarded points for correctly answering questions quickly. Students are given feedback instantly on every quiz question that they answer. A total score is presented to students at the end of every quiz. Students receive immediate feedback and can track their own progress on a game when they play it multiple times. You can learn how to use Quizalize by watching the video at <https://youtu.be/W4eKfe-fNYs>

Padlet

Padlet (<http://padlet.com>) is a great tool that I frequently use in my workshops for the purposes of gathering feedback from attendees and having attendees share digital creations they made during a workshop. One of the reasons that I like it so much is that it is easy to use. I also like it because it can be used for a bunch of purposes. A playlist of Padlet tutorials can be found at <http://bitly.com/ftpadlet>

Padlet as a simple blogging platform:

Padlet walls can be arranged in free-form, grid, or stream layouts. Creating a Padlet page in the stream format could be a good way to create a simple, collaborative blog for students. You could create the page, select "stream" format, and make the page accessible for students to write short posts on. Their posts could include images and videos. If you want to, you can password protect your Padlet pages and moderate messages before they appear on your Padlet page.

Padlet for group research and discussion:

A few years ago I showed my special education students a short (18 minutes) video about cultural changes that took place in the US during the 1920's. After the video we discussed what they saw. Then I had students search online for other examples of cultural change in the 1920's. When they found examples they put them onto a Wallwisher wall that I projected onto a wall in my classroom. The wall started with just text being added to the wall and quickly progressed to YouTube videos being added to the wall. Once every student had added a video to the wall we stopped, watched the videos, and discussed them.

Padlet as a showcase of your students' work:

If your students are creating digital portfolios, creating slideshows, or producing videos you could use Padlet to display all of your students' best work on one page. Create the wall, call it something like "my best work this year," and have your students post links to their works.

Plickers

Plickers (<http://plickers.com>) is the ideal polling/ informal assessment tool for classrooms in which not every student has a computer or tablet to use. Plickers uses your iPad or Android tablet in conjunction with a series of QR codes to create a student response system. Students are given a set of QR codes on large index cards. The codes are assigned to students. Each code card can be turned in four orientations. Each orientation provides a different answer. You can ask questions verbally or project them on a screen for students to see. When you're ready to collect data, use the Plickers mobile app to scan the cards held up by your students. Plickers will show you a bar graph of responses. Responses can also be saved in your online Plickers account.

For the 2020-21 school year Plickers has introduced an elearning mode. The elearning mode assigns to each student his/her own unique link that they can use to respond to any prompt that you share in your Plickers classroom. The nice thing about the elearning mode is that it can be

combined with the classic version of Plickers. In other words, you can have some students participating by using Plicker cards in your classroom while at the same time some students are participating by using their elearning links on their computers at home.

Three ideas for using Plickers in your classroom:

1. Quickly taking the pulse of the class. Ask your students, "do you get this?" (or a similar question) and have them hold up their cards to indicate yes or no. You can do this with a saved class or a demo class in the app.
2. Hosting a review game. Create a series of questions in your saved Plickers classroom. To conduct the review, have students hold up their cards to respond to each question. Every student gets to respond at the same time and you get to see how each student responded. This is an advantage over many review games in which only the first student to respond has his or her voice heard.
3. Take attendance. In a saved Plickers class each student has a card or URL assigned to him or her. At the start of class just have them hold up their cards to check-in.

Creating Digital Portfolios

Over the course of the school year our students create some fantastic digital products. Building a digital portfolio is a great way for students to look back at everything they've done and organize their works into a cohesive package. The following six tools are good for creating digital portfolios.

Seesaw (<http://web.seesaw.me/>) is a free service designed for creating digital portfolios on iPads, Android tablets, and Chromebooks. Students can add artifacts to their portfolios by taking pictures of their work (in the case of a worksheet or other physical item), by writing about what they've learned, or by shooting a short video to record something they have learned. Students can add voice comments to their pictures to clarify what their pictures document. To get started with Seesaw, create a free classroom account. Students join the classroom by scanning a QR code (you will have to print it or project it) that grants them access to your Seesaw classroom. As the teacher you can see and sort all of your students' Seesaw submissions. Seesaw allows parents to create accounts through which they can see the work of their children. As a teacher you can send notifications to parents when their children make a new Seesaw submission. Visit <http://bitly.com/ftseesaw> to watch a series of tutorials about Seesaw.

Student Stories is ClassDojo's (<https://www.classdojo.com/studentstories/>) digital portfolio tool that allows students to submit work to be displayed in what is called a ClassDojo Class Story. You moderate your students' submissions before anyone can see them. Student Stories includes options for video uploads, image annotation, audio recording, video capture, and text notes. Student Stories is available in iOS and Android apps as well as for use in your web browser.

FreshGrade (<http://freshgrade.com>) is a digital portfolio service that is popular in some schools that I have worked with in the past. The service allows teachers and students to create portfolios containing video and audio files, pictures, and text files. Teachers using FreshGrade can create and manage accounts for their students. From their dashboards teachers can assign tasks to students and see the work that students complete. A nice end-of-the-year aspect of FreshGrade is the option to create a slideshow of highlights of a student's portfolio. That slideshow can be shared directly to parents.

Book Creator (<http://bookcreator.com>) is an excellent tool for creating multimedia ebooks. It's available to use as a mobile app and in the Chrome web browser. Students can use Book Creator to create an ebook that shows examples of their best videos, their best written work, and images of their work. For 2021-22 Book Creator offers a new digital portfolio template for students. That template can be found at <https://bitly.com/3jRMdul>. A video overview of Book Creator for Chrome can be seen at <https://youtu.be/wlfooQcV75Y>

Google Sites can be a good option for making digital portfolios in middle school and high school settings in which Google Workspace is already being used. For example, my computer science students maintain individual Google Sites on which they write about and post pictures of their projects. Some students are including unedited video clips as well. In my ninth grade classes I had them all organize their sites in the same format with pages for every month of the school year. I'm letting my sophomores (most of them), juniors, and seniors organize their sites a little more loosely because they have bigger, but less frequent projects than my freshmen have to complete. Here's an overview of how to create a website with Google Sites <https://youtu.be/EPzJzAScdKQ>

Spaces (<https://spacesedu.com/>) is a digital portfolio tool that launched in early 2021. It offers some unique features that teachers and students will like. Not the least of these features is a group portfolio function that is best described as providing asynchronous breakout rooms. Spaces offers three ways for you and your students to share materials and interact with each other. These three ways are referred to as "Class Spaces," "Individual Spaces," and "Group Spaces." The class spaces and individual spaces are exactly what you'd expect, a place to share with the class and a place to save private work. The group spaces can be described as "asynchronous breakout rooms." You can assign students to specific group Spaces to share with each other and with you. Group Spaces could be used for simply sharing finished group projects. The better use of group Spaces is as a place where students can share their work in progress and get feedback from each other as well as from their teacher. Video demonstrations of how to use Spaces can be seen at <https://bitly.com/2Xr24Zp>

Augmented Reality & Virtual Reality

Augmented reality (AR) and virtual reality (VR) are hot topics in education right now. But before you jump into using these technologies in your classroom it is important to understand the differences between them.

Augmented reality content is typically displayed on your mobile phone to show you digital content over a physical world. Pokemon Go was a mainstream example of augmented reality. Augmented reality heavily relies on location to display images, text, video, and animation.

Virtual reality content is typically displayed on a mobile phone placed inside a virtual reality headset/ viewer. That viewer can be as simple as a Google Cardboard viewer that you can get for about \$10 on Amazon or you can spend much more for fancier viewers. The digital content that you see in VR is not dependent on your current physical location.

Augmented Reality Apps to Try

Plum's Creaturizer (<http://pbskids.org/apps/plums-creaturizer.html>) from PBS Kids is a free iOS and Android app that lets students create fun cartoon creatures then place them into outdoor settings through the use of augmented reality. The purpose of the app is to have students learn and show how the characteristics of an animal help it thrive in its environment. You can see an overview of Plum's Creaturizer in the video at <https://www.youtube.com/watch?v=2GPXOq2YuEk>

Spacecraft 3D (<https://itunes.apple.com/gb/app/spacecraft-3d/id541089908?mt=8>) is a free iPad app produced by NASA's Jet Propulsion Laboratory. Spacecraft 3D uses augmented reality technology to bring NASA spacecraft to life on your iPad. To get started using the app you first need to print out the spacecraft target codes. Then your students can scan those target codes with their iPads. The spacecraft then becomes a 3D model that your students can explore.

NASA offers another AR app about spacecraft. It's called Spacecraft AR. Spacecraft AR (<https://apps.apple.com/us/app/spacecraft-ar/id1452909829#?platform=ipad>) is a free iPad and Android app offered by NASA's Jet Propulsion Laboratory. The app enables students to learn about various NASA spacecraft including the Curiosity rover, Voyager, Mars Exploration Rover, and a handful of other spacecraft. Spacecraft AR includes information about each spacecraft's development and use. With Spacecraft AR installed and open on their iPads or phones, students can select a spacecraft or mission then point their iPads or phones at a flat floor or wall to see the spacecraft appear. Once the spacecraft appears on screen students can move to see other angles of the spacecraft and move the spacecraft. Students can also pinch and zoom to change the size of spacecraft they're looking at. The Android version is available at https://play.google.com/store/apps/details?id=gov.nasa.jpl.spacecraftAR&hl=en_US

The Walking With Dinosaurs app

(<https://itunes.apple.com/gb/app/walking-dinosaurs-photo-adventure/id692778428?mt=8>) uses a bit of augmented reality to take students on a virtual walk with dinosaurs. To use the apps you have to print out the "targets" that when scanned reveal a dinosaur's story. The apps also allow your students to include pictures of themselves in settings with the dinosaurs that they learn about through the app.

Quiver (<http://www.quivervision.com/apps/quiver-education/>) is a service that is part augmented reality and part coloring books. Quiver offers coloring pages (some content is educational, some is not educational) that students can color and then scan with the corresponding Quiver mobile app. When the pages are scanned with the app, the drawings become animated on students' phones or tablets.

WWF Free Rivers (<https://itunes.apple.com/us/app/wwf-free-rivers/id1349935575?mt=8>) is a free augmented reality app produced by the World Wildlife Foundation. The app uses augmented reality to present a story about rivers. WWF Free Rivers tells students stories about the implications of changes in weather patterns, damming rivers, and pollution on river ecosystems. Students interact with these stories by moving their iPads and or by pinching and zooming on elements in the stories. Unlike some other AR apps the animations within WWF Free Rivers can be experienced by students from a variety of angles. A great example of this is found early in the app when students can see what a dam does to a river. During that experience students can see the dam from above, from below, and from the sides.

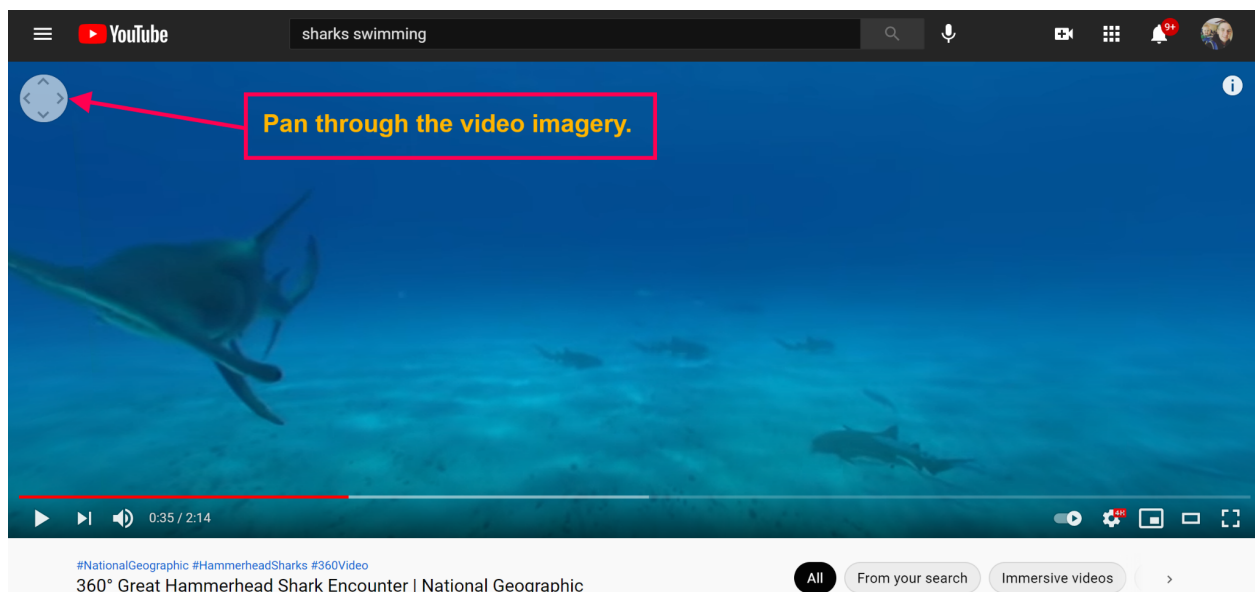
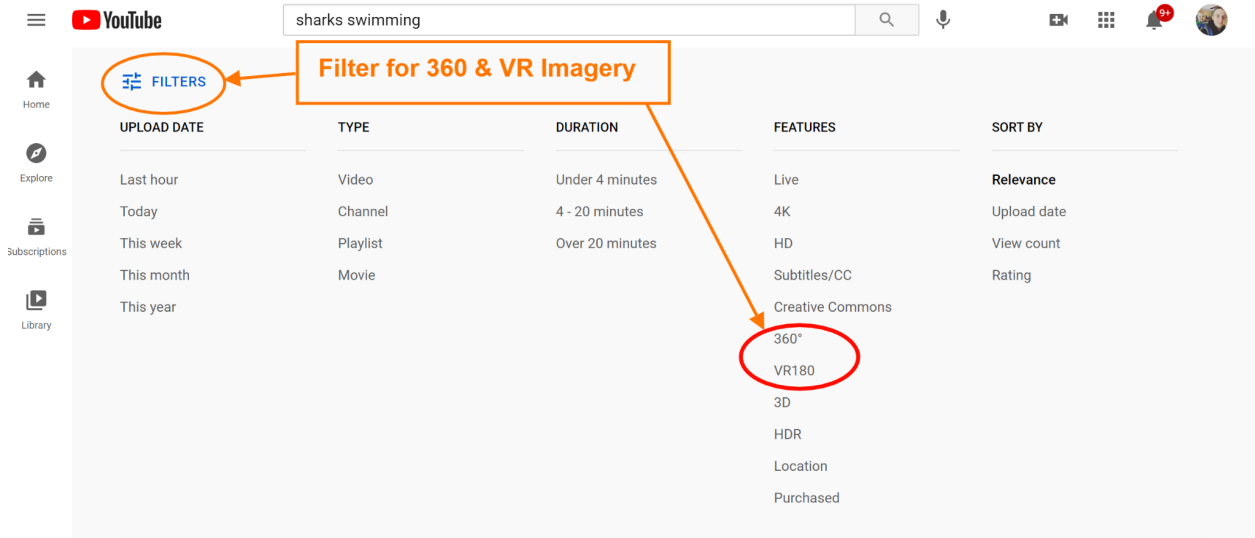
Merge Cube (<https://mergevr.com/cube>) offers augmented reality experiences through the use of a physical object, the Merge Cube, and free apps that interact with the cube. The is essentially a six-sided QR code. Interactive digital content is displayed on students' phones or tablets when they scan a side of the cube with one of the Merge Cube apps. Turning the cube changes the content that is displayed on the phone or tablet. To use Merge Cube augmented reality experiences you will need to purchase a Merge Cube. They're typically \$14.99 from your favorite online retailers. Once you have the cube you can use it with as many compatible apps as you like. A few popular apps to try include 3D Museum Viewer, Galactic Explorer, and AR Medical.

Virtual Reality Apps to Try

Unfortunately, after years of promotion, Google decided to shutter Google Expeditions on June 30, 2021. That left a big hole in the VR for education landscape. The alternative to Expeditions that Google is pushing today is the Google Arts & Culture App (<https://artsandculture.google.com/>). The Google Arts & Culture app includes many of the experiences that are present in Google Expeditions. The one thing that you can't do is guide students on tours. Google has introduced a new teacher center for Google Arts & Culture. In the video at <https://www.youtube.com/watch?v=zRO0oW3B-s8> I provide an overview of how to use

the Google Arts & Culture teacher center. The video includes directions for sharing specific portions of an Arts & Culture experience with your students.

YouTube's VR imagery is another alternative to Google Expeditions for teachers who are looking for video to use in a VR context. In YouTube you can filter your search results according to video features. One of the feature filters you can pick is VR180. Another filter you can pick is 360 degree video imagery. I used both of those filters this morning when I was searching for VR imagery of sharks swimming. In the screenshots below you can see where to find the search filters and how to pan through VR videos on YouTube.



Sites in VR (<http://sitesinvr.com/>) is a free app that features immersive imagery of notable landmarks around the world. The imagery can be viewed in VR headsets or without them. Unfortunately, there is not any audio accompanying the views in Sites in VR.

VR Math (<https://vrmath.co/>) is a virtual reality app that, as the name implies, is designed for use in mathematics lessons. Specifically, the app is intended to help students gain a better understanding of geometry concepts. When students open the app they have to choose between “I want to learn” and “I want to understand.” The “I want to understand” mode opens a library of exercises that students complete in virtual reality. Some of the exercise categories that students will find include calculating volume, sum of angles, and counting vertices. Within each of those categories students will find exercises to complete within the VR environment. VR Math can be used with or without a virtual reality headset. As with most VR apps that have a non-headset option, the app experience is much better with a headset than without one.

Google’s VR Tour Creator was also shuttered at the end of June, 2021. There are some tools that have emerged to fill the void created by the closure of Tour Creator. One of those is Story Spheres (<https://storyspheres.com/>). It is a neat tool for adding audio recordings to 360 imagery. Story Spheres lets you upload short audio recordings in which you describe to viewers what they’re seeing, the history of what they’re seeing, and the significance of what’s in the scene they’re seeing. It’s possible to upload multiple audio recordings. When you’re done you can share your Story Spheres story in a blog post, on social media, or any other place that you typically post a link. Take a look at this Story Spheres story about Uluru (<https://storyspheres.com/uluru/>) to get a better sense of what can be done with Story Spheres. A video demonstration of how to make a Story Spheres story can be seen at <https://youtu.be/1McJdXQdcTw>

CoSpaces Edu (<https://cospaces.io/edu/>) is a tool that you and your students can use to create virtual worlds. As a teacher you can create a classroom that your students join so that you can see their work. Students can design virtual worlds using a variety of pre-made artwork. After designing scenes in their virtual worlds students can animate the characters by using a block programming interface to make characters walk, talk, and interact.

Intro to Programming and Makerspaces

For some of us of a certain age, Logo was our introduction to computers and programming 30+ years ago. Logo is still accessible today. Dr. Gary Stager has repeatedly said that it is still the best way to introduce students to programming (<http://stager.tv/blog/?p=4056>). Logo is the basis for many other sites and apps that teachers can use to help students learn to program. Here are some of the best options for teaching and learning programming.

When the conversation amongst educators turns to programming, [Scratch](https://scratch.mit.edu/) (<https://scratch.mit.edu/>) is often the first resource that is mentioned. Scratch allows students to program animations, games, and videos through a visual interface. Students create their programs by dragging together blocks that represent movements and functions on their screens. The blocks snap together to help students see how the "if, then" logic of programming works. Watch the video at <https://vimeo.com/65583694> to learn more about Scratch. And check out the ScratchEd team's curriculum for teaching with Scratch http://scratched.gse.harvard.edu/sites/default/files/sneak_peek_creative_computing_curriculum_guide_v3.pdf

Scratch Jr. is based on the aforementioned online Scratch program. Scratch Jr for iPad (<https://itunes.apple.com/us/app/scratchjr/id895485086>) and for Android (<https://play.google.com/store/apps/details?id=org.scratchjr.android>) uses the same drag and drop programming principles used in Scratch. On Scratch Jr students can program multimedia stories and games. To program a story or game on Scratch Jr. students select background settings for each frame of the story. Then in each frame students select the actions that they want their characters to take. Students snap programming pieces together to make characters move and talk in their stories and games.

Snap! (<http://byob.berkeley.edu/>) is a drag-and-drop programming interface designed to help students learn to program. Snap! uses a visual interface that works in your browser on your laptop as well as on your iPad. To design a program in Snap! drag commands into a sequence in the scripts panel. The commands are represented by labeled jigsaw puzzle pieces that snap together to create a program. You can try to run your program at any time to see how it will be executed. After previewing your program you can go back and add or delete pieces as you see fit. Snap! may remind some people of Scratch. That is because the Snap! developers call their program "an extended re-implementation of Scratch." The potential benefit of Snap! over Scratch is that teachers who have a mix of iPads, Android tablets, and laptops in their classrooms can have all of their students use the same programming interface.

The MIT App Inventor (<http://appinventor.mit.edu/explore/>) allows students to create and publish their own Android applications. The MIT App Inventor works in your web browser (Chrome is recommended). The only download that is required for App Inventor 2 is the optional emulator. The emulator allows people who don't have Android devices to test their apps on their desktops. If you have an Android device then the emulator is not required and you don't need to worry

about installing it. MIT provides excellent support documentation and curriculum for classroom use for new users of App Inventor. A detailed tutorial on how to make an Android app with the MIT App Inventor can be watched at https://youtu.be/9_2J0ZHk8TE

Thunkable (<https://thinkable.com>) is a free platform for designing, testing, and publishing your own Android apps and iOS apps. Through Thunkable you can create your apps even if you don't know how to write code. That is possible because Thunkable uses a drag-and-drop design framework. That framework, based on the MIT App Inventor, shows you jigsaw-like pieces that have commands labeled on them. Your job is to put the pieces together to make your apps work. Thunkable offers detailed written tutorials and video tutorials.

Daisy the Dinosaur (<https://itunes.apple.com/us/app/daisy-the-dinosaur/id490514278?mt=8>) is a free iPad app designed to introduce young students to some programming basics. The app asks students to create commands for Daisy the Dinosaur to carry out. There is a free play mode in which students can make Daisy do whatever they want. But to get started you might want to have students work through the beginner challenges mode. Daisy the Dinosaur asks students to enter commands in the correct sequence in order to make Daisy complete tasks correctly. Daisy the Dinosaur could be used with students as young as Kindergarten age.

Hacking STEM is a Microsoft website that offers about two dozen hands-on science and engineering lessons. The activities are a mix of things that students can probably do on their own and some that probably can't be done without the supervision of a teacher or parent with working knowledge of the concept(s) being taught. For example, the mini solar house project that I'm having my ninth grade students do can be done safely without my direct supervision (I'm removing the glue gun component and having them use tape). But the "party lights" activity on the same page is not something they'll be able to do on their own. Find Hacking STEM at (<https://www.microsoft.com/en-us/education/education-workshop/activity-library.aspx>)

Exploratorium's Science Snacks website (<https://www.exploratorium.edu/snacks>) has dozens and dozens of hands-on science and engineering projects for students of all ages. There is a subsection of the site called Family-Friendly Snacks that offers activities specifically designed for parents to do at home with their kids. The vast majority of the projects can be done with common household items. And in response to the COVID-19 outbreak Exploratorium has a selection of activities and videos about viruses.

Tinkercad (<http://tinkercad.com>) is an online program that students can use to create designs for 3D printable objects. It can also be used to design simple circuits and Arduino projects. Students can safely design and test circuits and Arduino projects completely online through the use of Tinkercad's online simulator. As a teacher you can create a free classroom account in which you can see your students' work.

CodePen (<https://codepen.io/>) is a code editing environment in which students can see how HTML, CSS, and JavaScript work together to form web applications. As you can see in the

screenshot that I've included below, the screen is divided into four parts. There's a column for HTML, a column for CSS, and a column for JavaScript. Below that there is a preview panel that displays what the application looks like and how it functions. The best aspect of CodePen is that it is a real-time editor. That means you can change any aspect of the HTML, CSS, or JS and immediately see the effects of those changes in the preview panel. This is a great way to see what happens when a variable is changed in an application. If the change didn't work as anticipated, a quick "CTRL+Z" on your keyboard reverts it back to the previous state. The same is true when you edit an aspect of the HTML or CSS.



Blackbird (<https://www.blackbirdcode.com/>) is a platform that launched in early 2021 to help teachers teach programming to middle school and high school students. Blackbird positions itself as a platform that fills the gap between using a blocks-based service like Scratch and writing code in an IDE. Blackbird doesn't use blocks or even offer any blocks. Instead, Blackbird provides a series of interactive lessons in which students write JavaScript. Blackbird lessons are arranged in progressive units. From the first lesson students are building a game they can customize to their heart's content. When they've finished all of the lessons students can move onto a "workshop" where they can work on independent projects that you can observe from your teacher dashboard in Blackbird.

Google Earth - It's More Than Just Social Studies

Google Earth is available to use in your web browser, as desktop software, as an iOS app, and as an Android app. All versions can be found at google.com/earth. The web version will work in your web browser on a Chromebook, Windows, or Mac laptop. The desktop version has more features than the web and mobile versions, but those versions are starting to catch-up. The desktop version is only available on Windows, Mac, and Linux computers. Here are ten ways for students to use Google Earth in your classroom.

I do offer a complete, self-paced course on how to use Google Earth. That course is available at <https://practicaledtech.com/on-demand-pd/>

1. Take a tour of new and interesting places.

This is the most basic activity that you can do in Google Earth. The web and mobile versions of Google Earth have pre-made tours called "Voyages" that your students can view. Stops on the voyages include notes about the notable landmarks in the tour. The desktop version of Google Earth also has pre-made tours. You can also find tours made by others and use them in Google Earth. Watch this video (https://youtu.be/gFeeZ2b6_cl) to learn how to do that.

2. Play *Where in the World is Carmen Sandiego* and other geography games.

In March of 2019 Google added a version of the classic computer game, *Where in the World is Carmen Sandiego?* to Google Earth. The game can be played in the web version of Google Earth as well as the iOS and Android versions. *Where in the World is Carmen Sandiego?* isn't the only game or quiz you'll find in Google Earth. You can find them all by opening the Voyages tab in Google Earth. A video of how to find the games and quizzes is available here:

<https://youtu.be/5INfgWQCLVo>

3. Take and or Create Literature Tours

Google Lit Trips (<http://googlelittrips.org/>) is dedicated to helping teachers use Google Earth tours in literature lessons. In a literature trip students explore the places that are significant in a story and or the places that are significant in an author's life. The desktop version of Google Earth has built-in tools for creating tours of landmarks around the world (watch this video: <https://youtu.be/Y9R2bV9NHbw> to learn how). The web version of Google Earth doesn't have the same tour recording tools, but you can import placemarks(<https://youtu.be/LrlwYsuUyMo>) and then use a screencasting tool to create a tour.

4. Global scavenger hunts.

Create a scavenger hunt for students to complete by using clues and finding the answers "hidden" throughout the globe. This can be a fun way for students to test their knowledge of physical and human geography.

5. View a Timelapse of Coastline Changes.

Thanks to historical imagery available through the Google Earth Engine you can view historical satellite imagery in Google Earth. This allows viewers to see how things like coastlines have changed over time. You can piggyback on that visual to prompt students to investigate what makes a coastline change.

6. Map and Compare Datasets.

Mapping datasets can be a good way for students to create visualizations of species diversity and distribution or to see economic data as it relates to geography. It is possible to take a dataset that is in a CSV or Google Sheet and have that data appear in Google Earth. To do this you will first make a map in Google's My Maps tool (a tutorial is available here: <https://youtu.be/R2X0oRiMtWE>) and then export a KML from My Maps to import into Google Earth. A tutorial for completing that process in the desktop version of Google Earth is available here: <https://youtu.be/fjvID2iKtX8> A tutorial for completing that process in the web version of Google Earth is available here: <https://youtu.be/LrlwYsuUyMo>

7. Layer Images Over Maps.

The desktop version of Google Earth lets you layer images over a view of the world. Adjust your zoom level to cover more or less of the map with your image. Adjust the image's opacity to let the map faintly show through the image. This is a great way to show students a comparison of a historical map with a contemporary map. Try using this method to show how coastlines and waterways have changed over time.

8. Measure Distances for Math Lessons.

Google Earth includes tools for measuring distances in a variety of units. Students can use the measuring tool to complete activities designed to help them understand distance, scale, and units of measurement. Tom Barrett's Maths Maps page (<http://edte.ch/blog/maths-maps/>) is a good place to find lessons that incorporate measurement. A tutorial on measuring in Google Earth is available here: <https://youtu.be/ysMo6cZQtHk>

9. Explore the Moon or Mars.

The desktop version of Google Earth includes a moon view and a Mars view. Select the moon view or the Mars view then click on some of the placemarks in the NASA layer. Your students could even create a narrated tour of the moon or Mars by following these direction: <https://youtu.be/FsIZohEUrIE>

10. Use Google Earth as an Alternative to PowerPoint.

The next time you're thinking about having students give a presentation on a place that they've studied in your geography lesson, have them create a Google Earth tour instead. They can use their custom placemarks shown in full size as an alternative to using slides.

Tools to Improve the Accessibility of Documents, Slides, Videos, and Websites

We all have different needs and preferences when it comes to consuming the media in our lives. Our students are the same. Some need websites read aloud, some need different color schemes or fonts, and others need captions enabled on videos. Those are just a few of the things that can be done to improve the accessibility of documents, slides, videos, and websites used in our classrooms.

Improving the accessibility of documents, slides, videos, and websites used to be a lot more difficult than it is today. Here are some tools that you and your students can use to improve the accessibility of media used in your classroom.

Improve the Accessibility of Websites

Microsoft Edge

- If you have access to Microsoft Edge (the default for Windows computers) then should familiarize yourself with Microsoft's Immersive Reader tool. Immersive Reader in Microsoft Edge can be used to have pages read aloud, to alter the font size and spacing, and to alter the color scheme of articles read on websites.
- Microsoft Edge is also available to use on Android and iOS phones and tablets. A read-aloud function is available in the iOS and Android versions of Microsoft Edge.
- Mac users aren't left out of using Microsoft Edge and Immersive Reader. Microsoft Edge is to install on Mac OS. It contains the Immersive Reader functions that are available in the Windows version of Edge. You can find the Mac OS version of Edge right at <https://www.microsoft.com/en-us/edge>

Safari

- Safari has a "reader view" option that you can find to the left of the URL in the address bar. The reader view menu appears as four horizontal lines. Click the menu to enter the reader view. The reader view will let users change the font style and size as well as the overall page color scheme.
- Safari's reader view is in addition to all of the other accessibility options that are built into the Mac operating system. A comprehensive list of Mac accessibility options is available at <https://www.apple.com/accessibility/mac/>

Chrome

- The Chrome web browser can be customized to each user's preferences regarding font size, font style, and spacing. Those setting choices can be made by typing <chrome://settings/fonts> into the address bar in Chrome. The choices will apply as the default wherever you go in with Chrome.
- You can zoom-in or zoom-out on individual pages in Chrome by simply holding the control key then tapping the "+" key on a Windows or Chromebook keyboard or by holding the command key then tapping the "+" key on a Mac keyboard.
- There are Chrome extensions that offer read-aloud capabilities. Read & Write for Chrome is one of the most popular ones for use in school settings. Other accessibility extensions can be found at <https://chrome.google.com/webstore/category/ext/22-accessibility>

Firefox

- The Firefox users can customize default font sizes, spacing, and colors. These options are available by opening the options menu listed under the "Tools" drop-down menu in Firefox. Alternatively, the options menu can be accessed by typing "about:preferences" (without quotation marks) into the address bar in Firefox.
- Other accessibility options for Firefox include using a keyboard to navigate webpages, zooming to enlarge pages, and installing screen reader add-ons. You can enable keyboard navigation from the options menu under general settings. To zoom in to enlarge pages simply hold down the ctrl key then press the "+" key. To reverse that process hold ctrl and press the "-" key. A couple of screen reader add-ons for Firefox can be found at <http://bit.ly/accsettings> and complete list of Firefox accessibility settings is available at <https://mzl.la/2DSxHhy>

Improve the Accessibility of Your Slideshows

- **Automatic Subtitles for Your Live Presentations**

Both PowerPoint and Google Slides offer automatic subtitling tools that you can use when presenting to an audience.

In Google Slides the subtitles appear at the bottom of your screen when you are in full-screen presentation mode. You can enable subtitles by entering presentation mode then hovering your cursor over the lower-left corner of your slides to make the subtitles option appear. This short video (<https://youtu.be/cuH8n0UqpJU>) provides a demonstration of how to enable subtitles in Google Slides.

PowerPoint gives you the choice of having subtitles appear at the top or bottom of the screen when you are using the full-screen presentation mode. The process of enabling subtitles is slightly different depending upon whether you're using the web browser version or desktop version of PowerPoint. In both versions the subtitles options are found by choosing the "slideshow" menu. This video (<https://www.youtube.com/watch?v=DrLRJlbNIRc>) demonstrates subtitles in the browser version of PowerPoint and this video (<https://youtu.be/lvXO47uaPpc>) demonstrates subtitles in the desktop version of PowerPoint.

- **Add Alt Text to Your Slides**

Alt text, short for alternative text, is text that you can add to images and videos to describe what they are and or what they contain. Adding alt text can make your slideshows accessible to people who use screen readers. The alt text describes what is in a picture, chart, or video that is included in a slide. PowerPoint, Keynote, and Google Slides all provide options for adding alt text to your presentations.

To add alt text to images or videos in Google Slides simply right-click on the image or slide to which you need to add alt text. The menu that appears when you right-click on the image or video will include an alt text option where you can then write a title and description for the image or video. This (<https://youtu.be/Z5RnzMfj9Qk>) video provides a demonstration of how to add alt text to Google Slides.

You can add alt text to PowerPoint slides by right-clicking on an image in your slides. One of the options that appears when you right-click on an image in PowerPoint is "edit alt text." Select that option then write your description of the image.

Keynote users can add alt text to images by selecting an image on a slide which then opens a panel on the right-hand side of the slide. In that panel select the image tab then add your alt text in the description box that appears at the bottom of the screen.

Improve YouTube Video Accessibility

YouTube can be a great source of educational videos to either display in your classroom or have students watch on their own. Fortunately, YouTube offers some easy ways to improve the accessibility of the videos that you use in your instruction.

- **Enable and Customize Captions Display**

You can enable captions on any YouTube video by clicking on the little "CC" icon in the lower-right corner of any video that you're viewing. This will turn on the automatically generated captions for any spoken words in the video you're viewing.

The default size, style, and color of the automatic captions on a YouTube video may not work for every viewer. If that's the case for you or your students, you can adjust how the

captions are displayed. To adjust the captions display click on the small “gear” icon in the lower-right corner of the video that you’re viewing. Once you click that icon you’ll be able to select “subtitles/CC.” Within that menu there is an “options” menu that you can click on to select the size, style, and color of the captions display. This video (<https://youtu.be/p0NgXg7A5U8>) will walk you through the process of customizing the display of the captions on YouTube videos.

- **Edit the Captions on Your Videos**

If you’re making original videos for your students to watch, when you upload those videos to YouTube they will be automatically captioned. However, the automatic captions are not always accurate. For example, my last name is always captioned as “Bern” instead of it’s proper spelling of Byrne. You can edit the automatic captions. I’ve outlined the caption editing process in this video (<https://youtu.be/4eCdC47AKJM>).

- **Create a Transcript of any YouTube Video**

YouTube offers automatic transcription of videos. You can find an automatically generated transcript by opening the “more menu” (it looks like three stacked dots) next to the “share” button when you are watching a video. This short video (https://youtu.be/t_Kl0LtCTBg) demonstrates how to use the automatic transcription option on YouTube.

Improve Document Accessibility

- **Google Documents**

Google Documents has some built-in accessibility options that you should know how to enable. There are also some third-party Google Docs add-ons that can help you improve the accessibility of your documents.

In Google Documents there is a built-in voice typing capability. To find the voice typing tool simply open the “Tools” drop-down menu then select “Voice typing.” A microphone icon will appear in the left margin of your document. Click it to activate your microphone then start speaking and your words will appear on the page. You will have to speak directions like “question mark” to add punctuation and “new line” to start writing on a new line.

In the same “Tools” drop-down menu that contains the voice typing tool you will find the general accessibility settings menu. It is there that you can enable support for screen readers and screen magnifiers.

On the topic of screen readers, when you insert an image into a Google Document you can right-click on it to bring up the option to add alt text. Alt text is text that you add to an image to describe what is in the image. Screen readers will read the alt text.

Grackle is a Google Docs and Slides add-on that will check your documents and slides for accessibility compliance. When you run Grackle's accessibility checker it will identify places where your slide doesn't meet accessibility standards. It makes suggestions for improvement on the areas in which your document, slide, or sheet doesn't meet accessibility standards. Some of the suggestions can be implemented with just a click from the Grackle Add-on menu while others are changes that you will have to make yourself.

You can watch a demonstration of all of the Google Docs accessibility options mentioned above right here <https://youtu.be/w90cW9sh3zs>

- **Word Documents**

When it comes to accessibility options, Microsoft Word is far ahead of Google Documents. Not only does Word come with many built-in accessibility options, Word also contains extensive help documentation that can be accessed without exiting the document that you are working on.

Speech-to-text is built into the current versions of Word. To use speech-to-text simply open a new document then on the "Home" ribbon select "Dictation." Dictation is available for a variety of languages in Word.

Text-to-speech or read-aloud capabilities are available in Word through the power of Microsoft's Immersive Reader. Immersive Reader will read documents aloud. Additionally, Immersive Reader can be used to alter the spacing of a document, to highlight words and syllables while the document is read aloud, and to highlight parts of speech as a document is read aloud. Immersive Reader can be found in the "View" menu in Word.

Microsoft Word has a built-in accessibility checker. You can find the accessibility checker under the "Review" menu in Word. Simply click "Check Accessibility" and Word will run an accessibility check then give you feedback on areas for improving the accessibility of your document. That feedback will appear in the right margin of your document. Below the suggestions for improvement you will see a link to "read more about making documents accessible." Click that link will open help documentation and suggestions that you can read in while simultaneously implementing them into your current document.

Microsoft offers a good video overview of Word's accessibility checker. That video is available at <http://bitly.com/2Mwxs07>

More About Immersive Reader

As mentioned in the sections about the Edge web browser and Word, Microsoft's Immersive Reader is a fantastic accessibility tool. Not only can it be used as a read-aloud tool, it can also be used to alter the font size, font spacing, and page color schemes of pages that students view. And Immersive Reader includes a picture dictionary tool for students to use. Microsoft's official guide to Immersive Reader can be found at <http://bitly.com/33Qt3Lx>

Immersive Reader is available in most of the Microsoft products in use in schools today including OneNote, Word, Forms, Teams, Office Lens, Flipgrid, and Outlook. Additionally, Immersive Reader has been incorporated into more than a dozen popular third-party programs including Thinglink, Wakelet, and Nearpod. The full list of third-party services that have incorporated Immersive Reader can be found at <http://bitly.com/immr3rd>

Ten Time-saving Ways to Use Technology

One of the ways to take control of our time is to use technology to automate or at least streamline some of the things that we all have to do. Here are ten time-saving ways to use technology in your practice.

Use Smart Replies

If you use Gmail or any G Suite-based email account, enable the Smart Replies function. Smart Replies will predict what you want to write in response to an email in your inbox. Using Smart Replies saves me ten to twenty seconds per reply. Taking an average of fifteen seconds per email for twenty messages in a day and you've gained five minutes. Watch this video (<https://youtu.be/zZ2Po57uCnY>) to learn how to enable Smart Replies in your inbox.

Use Canned Responses

This is similar to using Smart Replies but instead of letting Google guess what you're going to write, you actually create replies that you save for reuse at any time. This video (<https://youtu.be/qpjZpAP0uAY>) will show you how to use Canned Responses in Gmail.

If you're an Outlook user, you can create canned responses to use to answer frequently asked questions in your email. Here's (<https://youtu.be/OCTv4t3TNnI>) a good video overview of how to create and use canned responses in Outlook.

Give Quizzes in Google Forms or Microsoft Forms

If you have to give multiple choice or similar quizzes, use Google Forms or Microsoft Forms. Both will let you create a quiz that your students can take online and have grades automatically calculated for you. An overview of creating a quiz in Microsoft Forms can be watched here (<https://youtu.be/yVKEBdcocgw>). A series of Google Forms tutorials can be seen in [this playlist](http://bitly.com/360clWb) (<http://bitly.com/360clWb>).

Use a Quiz Scanner App

If giving quizzes online isn't practical in your classroom, use a quiz scanner app to quickly grade paper-based quizzes. Quick Key by Validated Learning (<https://validatedlearning.co/>) and Gradecam (<https://gradecam.com>) offer free apps for scanning quizzes to tally quickly tally results.

Create Email Filters

Not every email needs an immediate response. Not every email needs to be stored in your primary inbox where it clutters and distracts from the task at hand. Create email filters to organize and prioritize the messages landing in your inbox. This video (https://youtu.be/hJ87mqCW_H4) and this video (<https://youtu.be/PXC3UVoYdUA>) will show you how to create filters in Gmail and other G Suite-based email accounts. Outlook users, this video (<https://youtu.be/78z5Spx7eIA>) is a good place for you to start to learn about using filters and folders.

Schedule Your Social Media Posts

If you use social media to post updates for school or your class, you can save time by using a tool like Hootsuite (<https://hootsuite.com>) to schedule a series of updates at once. Instead of going to all of the social media sites that you update individually, you can do it in bulk from your Hootsuite dashboard.

Schedule Blog Posts

Whether you have a personal blog or a professional blog, use the scheduling tool so that you can write when you have time but update on a consistent schedule. If you use WordPress, Blogger, or Edublogs watch this video (<https://youtu.be/-0HrdJMnFL4>) to learn how to schedule blog posts.

Enable Reminders in Your Calendar or Task Manager

I find that if I use Google Calendar and or Google Keep to schedule reminders for myself I'm less likely to end up scrambling at the end of the day to get something done in a rush that I could have done more efficiently earlier in the day. Here's a short overview (<http://bitly.com/2ERyFeg>) of how to create task lists in Outlook. Here's a video (https://youtu.be/0S_3-HdPoAg) featuring ten Google Keep functions.

Use Scheduling in Your LMS of Choice

Every popular LMS contains a scheduling tool that you can use to write up a list of assignments and have them distributed on a schedule over the course of a week or month.

Block Yourself from Social Media Sites

Those times when we check Facebook for "just a minute" are never just a minute and they quickly suck time out of our days without adding much, if any, value to them. Use a Chrome extension like ReCall Study Time or Stay Focusd (intentionally misspelled) to limit the amount of time that you allow yourself to spend on social media sites.

Practice Saying No

This one doesn't involve technology at all unless you happen to set a reminder on your phone to "practice saying no." This might be the hardest time-saver to implement, but you have to practice protecting your time and avoiding commitment creep. There's simply not enough time in the day to say yes to every request to help with this or help with that. I'm not suggesting shirking your real responsibilities, but before adding another commitment to your list, ask yourself if you really have the time to do it without compromising time for the things that are truly important to you.

Remote Instruction Tools and Strategies

For many of us the choice of Zoom, Google Meet, or Microsoft Teams will be made for us by our school district's IT department. All three of these tools include some helpful features for teachers and students. Here's a breakdown of the features you should know how to use in Zoom, Google Meet, and Microsoft Teams.

Five Zoom Features You Need to Know

- **Virtual Backgrounds:** This is an option available to Mac, Windows, and some Chromebook users. This option allows you to place any picture of your choosing in place of the background that is in your default webcam view. It's possible to use the virtual background as a means for making a green screen video. Here's a video on how to make a green screen video with Zoom <https://youtu.be/lvl6EY616hI>
- **Whiteboards:** Zoom has an integrated whiteboard that you can use at any time during a meeting. You'll find the whiteboard function in the screensharing menu during your Zoom call. This video shows you how to use the whiteboard in Zoom <https://youtu.be/jTf24kk82BY>
- **Breakout Rooms:** During a Zoom call you can divide participants into groups for small group discussion then bring them back into one large group. In order to use breakout rooms in Zoom you must have the breakout room function enabled in your account settings. For a detailed overview of how to use Zoom's breakout rooms function, watch this recorded webinar hosted by Rushton Hurley from Next Vista for Learning <https://youtu.be/zg0pPbWhttE>
- **Waiting Rooms:** Enable the waiting room function in your Zoom account settings to prevent students from joining your Zoom meeting before you get there. Waiting rooms also allows you to make sure that no one joins your meeting without your approval. Watch this video to see how to enable the waiting room function <https://youtu.be/c9AcOd2tBC4>
- **Recording:** If you plan to record your Zoom meetings, enable recording by default in your account settings. Doing this will ensure that you never forget to hit the record button at the start of your meeting.

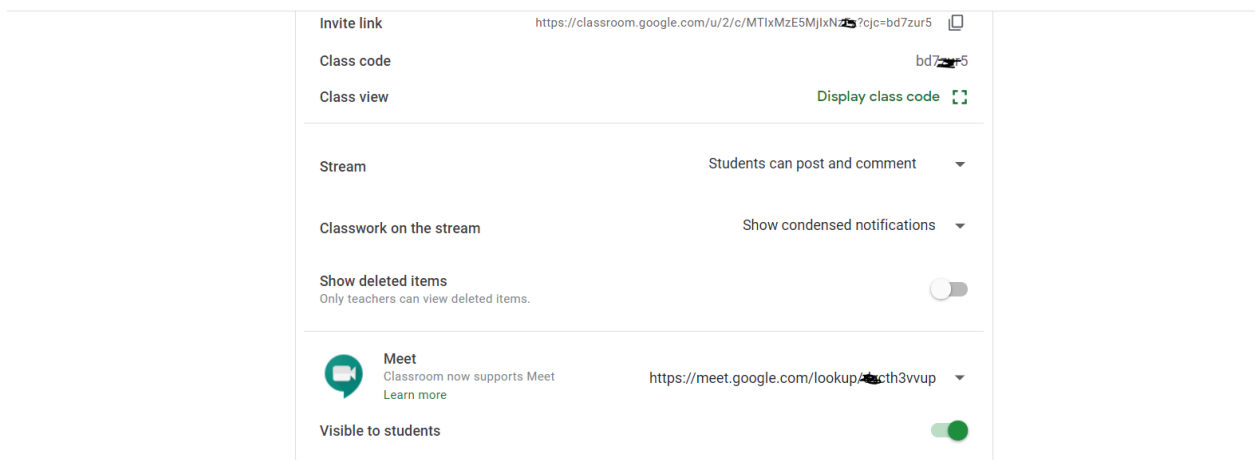
Five Features of Google Meet You Need to Know

- **Meeting Nicknames:** This feature allows you to choose a nickname for your meeting in

place of using the default code that Google assigns to it. An obvious benefit of using a meeting nickname is that it's easier to spell, remember, and share than a default meeting code. Another benefit is that you can give out the nickname to your students but they can't join the meeting until you start it at meetings.google.com Learn more about meeting nicknames and all features of Google Meet in this recorded webinar <https://bitly.com/311ZYOQ>

- **Captions:** You and or your students can turn on captions at any point during a Google Meet session. Simply click the captions button and all spoken words will appear below the camera view in the meeting.
- **Classroom Link:** Within the class settings for every Google Classroom there is an option to enable a permanent Google Meet link. That link can be re-used for all meetings held for that class. You can choose to display that link to your students or keep it hidden. Either way, the link is always the same for meetings directly associated with that Classroom.

Class settings



- **Calendar Integration:** In addition to using the Google Classroom integration and going directly to meet.google.com there is a third option for scheduling meetings. When you create an event in a Google Calendar that you own or have edit access on, you can have Google Calendar create a Google Meet link for you.
- **Recording:** Your G Suite for Education domain administrator has to enable the recording option for you. After September 30, 2020 the native recording feature will only be available to G Suite for Education Enterprise Edition users. In other words, after September 30th it will only be available to those who have the paid version of G Suite. A possible work-around for this is to record your calls with a desktop recording tool like Screencast-o-matic or Camtasia.

Five Features of Microsoft Teams You Need to Know

- **Whiteboards:** To use the whiteboard in Microsoft Teams meetings simply open the screen sharing menu then choose “whiteboard.” You can turn the whiteboard on or off at any time during your meeting.
- **Grid View:** An option to see all of your students in a grid display in a Microsoft Teams call was released in July of 2020. As of this writing (August, 2020) it is available for some, but not all users. Additionally, it only works in the desktop version of Teams. Here’s a short video demo of how it works <https://youtu.be/ZIJUTNd8LXc>
- **Custom and Blurred Backgrounds:** This is another feature only available in the desktop version of Teams. With this feature enabled you can insert a custom image to use as your background or simply blur your background. Find this function in the ellipsis menu next to the screen sharing and recording options in a meeting.
- **Attendance Reports:** This is a relatively new feature that must be enabled by your IT administrator before you can use it. Once enabled, you can download a record of who attended your meeting. Mike Tholfson, Microsoft EDU project manager, offers this video tutorial on how to use attendance reports in Microsoft Teams <https://youtu.be/OBJ3hQx0-GE>
- **Recording:** To record a meeting in Microsoft Teams your IT administrator has to enable that function. Once it is enabled you’ll see a small recording icon within the ellipsis (more actions) menu during your meeting. It’s important to note that the recording will not capture shared notes or a whiteboard. Learn more about recording here: <https://bitly.com/346EphZ>

Five Tips for Live Online Instruction

- **Elevate your camera and plug in a mic:** Besides the obvious, “no one wants to look up your nose” reason, elevating your webcam makes it easier for students to see your eyes during a live meeting. And you should keep your webcam on because students want to see you and make a connection with you and not just your voice whenever it is possible.

If you have one, use an external microphone for your live classes in Zoom, Google Meet, or Microsoft Teams. Using an external microphone, especially one with a USB connection will improve the quality of your audio. Even pairing bluetooth earbuds to your computer can improve the audio quality of your online meeting.

- **Share an outline:** Just like you would put a daily agenda on the board in your physical classroom, share an agenda with your students at the start of each online class meeting. It gives students a sense of what to expect during the class and how the meeting will

last. Don't forget to give kids a break during the meeting if you're going to have them on for more than twenty or thirty minutes.

- **Assign roles:** Kids want something to do during a class meeting besides just listening to you drone on. Consider assigning roles like meeting secretary, fact-checker, or even co-moderator in your online meetings.
- **Silence is okay:** It's natural to want to fill every moment of an online class meeting with your voice or your students' voices. You don't have to do that. You can give students a task to work on during the meeting then just leave your webcam on and the call going to support them if they have questions while working on the task. Zoom's breakout rooms function can be useful for this kind of meeting structure.
- **Announce recordings:** If you plan to record a meeting, let your students and their parents know at the outset of the class.

A "Quiz" Activity Ideal for Breakout Rooms

My top tip for keeping kids on task in breakout rooms is to keep the activities short and sweet. To that end, I recommend trying an activity known as a "Three Color Quiz." This activity can be done in breakout rooms in Zoom, Google Meet, and Microsoft Teams.

A Three Color Quiz doesn't have to be a graded quiz activity. In fact, it's hardly a quiz at all, but that's the name that was given to it in [this paper published by the University of Nebraska Digital Commons](#) (link opens a PDF) which is where I learned about it a couple of years ago.

I started using a modified Three Color Quiz with my students as an in-classroom assignment last year then transitioned to using it as an in-Zoom assignment this year (you could also do it in Google Meet or Microsoft Teams). Here's how I run the Three Color Quiz in Zoom.

Step One: First Color

I give students a question or prompt and have them spend two minutes writing responses on their own in a Google Doc or Word Doc. This should be done in one font color.

Step Two: Second Color

After writing on their own for a few minutes, put students into breakout rooms to talk to a classmate or two for two minutes to get their ideas in response to the original question. While talking they should also be adding to their original answers. What gets added to the original response should be written in a second font color different from the first.

Step Three: Third Color

Bring the group back together then send them into new breakout rooms where they again talk to classmates for two minutes. This time they can also consult web resources and their notes as they talk. Again, while talking they should be writing and adding to their original answers. The writing in this step is done in a third font color.

The Three Color Quiz in breakout rooms accomplishes a few things for me.

- First, it gets students who might not otherwise talk to each other a chance to talk.
- Second, when they turn in their documents I can see how much help a student needs from classmates or the Internet based on the use of color (by the way, I don't grade the documents).
- Third, by only making the breakout sessions a couple of minutes students don't have time to get off-task for too long if at all before I bring the group back together.

DIY Online Games & Skills Activities

Making online educational games used to be the domain of those with specialized coding and programming skills. Today, there are free tools that anyone can use to create their own educational games for students. Likewise, there are now some excellent free tools for creating online skills practice and knowledge recall activities to share with your students.

Educandy (<http://educandy.com/>) is a neat service for creating simple vocabulary games and multiple choice trivia games. A convenient aspect of the service is that once you've created a list of vocabulary words it will automatically be applied to multiple game formats for you. In other words, write one word list and you'll get three games that your students can play. Your students can play the games without needing to create an account on the Educandy site. Watch the short video at https://youtu.be/yEXpoYXV_tY to learn how you can create your own educational games with Educandy.

Flippity (<http://flippity.net>) is a free service that provides nearly two dozen Google Sheets templates that can be used to create a variety of online games including spelling games, vocabulary games, problem-solving games, and trivia games. The board game template is one of the most popular templates that Flippity provides. That template can be used to create an online board game that is similar in nature to Candy Land or Shoots & Ladders. Watch the video at <https://youtu.be/Hq1cdfoa4Hk> to learn how to create an online board game with Flippity's free board game template.

ClassTools.net (created and hosted by a teacher named Russel Tarr) has long been one of my favorite places to find free educational games and templates for creating educational games. On ClassTools you'll find templates for creating map-based games, word sorting games, matching games, and many more common game formats. Use the search function on ClassTools to find the game template that is best for you and your students. You can see a video demonstration of ClassTools at <https://youtu.be/b-SbGn4-g5c>

TinyTap (<http://tinytap.it/>) is a free iPad app and Android app that enables you to create educational games for your students to play on their iPads or Android tablets. Through TinyTap you can create games in which students identify objects and respond by typing, tapping, or speaking. You can create games in which students complete sentences or even complete a diagram by dragging and dropping puzzle pieces.

TeacherMade (<http://teachermade.com/>) is a service on which you can upload a PDF then add to it fillable text boxes, lines for matching activities, multiple choice questions, and interactive hotspots to highlight specific points in the PDF. You can also use TeacherMade to add audio to an uploaded PDF. Depending upon the type of questions that you select, TeacherMade will automatically score assignments for you. Canva offers nearly two thousand worksheet templates (<https://www.canva.com/worksheets/templates/>) for teachers to copy and modify. All of the templates can be downloaded as PDFs. You can combine the use of Canva and

TeacherMade to create online activities for your students to complete. Depending upon the TeacherMade settings that you choose, your students can get immediate feedback. The process of combining TeacherMade and Canva is demonstrated in the video at <https://youtu.be/s234wMpcyqI>

Google's Jamboard became wildly popular during the 2020-21 school year and that popularity doesn't seem to be wavering as we head into the 2021-22 school year. Part of the reason for that popularity is the flexibility of Jamboard. Besides using it to create simple whiteboard sketches, it can also be used to create templates for activities like magnetic poetry and map identification. The process for using Jamboard to create mapping activities can be seen at <https://youtu.be/8bPZvOizbEk> and the process for making magnetic poetry activities can be seen at <https://youtu.be/mdG5vC-A0A0>. Both processes can be modified to create almost any kind of template that you want to distribute to your students. The process of distributing Jamboard templates is outlined in the video at <https://youtu.be/xxNkQnkAyiQ>

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