# TPT *WebSights* column draft for April 2020:

*WebSights* features announcements and reviews of select sites of interest to learners and teachers of introductory physics. This column is available as a web page at [PhysicsEd.BuffaloState.Edu/pubs/WebSights/](http://PhysicsEd.BuffaloState.Edu/pubs/WebSights/).

If you have successfully used a physics website that you feel is appropriate for *WebSights*, please email me the URL and describe how you use it to teach or learn physics. [macisadl@buffalostate.edu](mailto:macisadl@buffalostate.edu).

**Flipgrid.com – An easy to use free classroom student video site (website and smartphone app)**

<[Flipgrid.com](http://Flipgrid.com) >

<tinyurl.com/WS-flipgridPM>

Flipgrid is a free (for educational use; registration is required) platform for students to make video responses to instructor queries. Teachers create “grids” (basically an online class group) and post “topics” to the “grid.” Each “topic” is a prompt soliciting a student video response. There’s a searchable “disco library” of “topics” written by teachers. The library includes a few (though not many) examples from HS and college intro physics. Eg. Valerie Conti’s “Projectile Motion” shows how Flipgrid could be used for formative assessment -- students view a YouTube video (Dunking Devils Trampoline) and read a short article from [physicsclassroom.com](http://physicsclassroom.com), and then make a video response to four questions. Students can add text, subtitles and drawings to their videos in the smartphone (both Apple and Android) app.

So far, I’ve only posted a single “topic”- a 0:30 “introduce yourself to the class in a short video” topic to help me learn my student names. Students seemed to find the platform easy to use with their smartphones - two students incorporated both text and drawing in their video, though neither had used Flipgrid before.

*Suggested and submitted by Dr. David Abbott of Buffalo State Physics*

**New NAS publications on K-12 Engineering Education; Teacher Professional Development**

**K-12 Teachers of Engineering in U.S. Lack Needed Preparation and Support from Education:**

**[Building Capacity for Teaching Engineering in K-12 Education](https://www.nap.edu/read/25612) (2020)**

<tinyurl.com/WS-NASk12engg>

A new National Academies report discusses preparation of K-12 teachers for promoting learning of engineering, with ten specific recommendations. Includes a section on recruiting underrepresented populations into engineering and the teaching of engineering. The report is particularly useful to policy and grant planning.

[**Changing Expectations for the K-12 Teacher Workforce**](https://www.nap.edu/read/25603)**:   
Policies, Preservice Education, Professional Development, and the Workplace**

<[www.nap.edu/catalog/25603/](http://www.nap.edu/catalog/25603/)>

A policy report on how teacher education and professional development needs to change to address the expectations raised by changing learning standards and rapidly diversifying student populations, particularly STEM students.

**Adapting simple mechanics numeric computer modeling to epidemics like COVID-19 / CoronaVirus**

<[rhettallain\_gmail\_com.trinket.io/](https://rhettallain_gmail_com.trinket.io/)>

<tinyurl.com/WS-epidemic1>

<tinyurl.com/WS-epidemic2>

<[www.ncbi.nlm.nih.gov/pmc/articles/PMC2717691/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2717691/)>

[<cdc.gov/coronavirus/2019-ncov/index.html](https://www.cdc.gov/coronavirus/2019-ncov/index.html)>

For many years now, introductory mechanics instructional practice has included having students develop simple mechanics models, usually starting with kinematics. Students use a spreadsheet or simple computer program to establish initial (t0 = 0) position, velocity and acceleration of an object, then use the kinematics equations to calculate a change in position and velocity a short time interval later (t1 = t0 + ∆ t), add in the changes (x1 = x0 + ∆ x, etc) and repeat the process. Usually results are graphed and shown in a table and interpreted, then friction, time varying and velocity dependent forces added in, time step interval shortened and so forth to explore model limits, further develop the model etc. This modeling mechanics approach is richly established, well documented and shown in some computer workshop at most every AAPT national meeting.

However, these same skills can be applied to epidemics – like the currently developing COVID-19 / CoronaVirus situation, or many other contagions --- model parameters exist for outbreaks of measles, SARS, MERS, Ebola, Swine Flu, 1918 Spanish Influenza etc. The simplest common model is known as SIR (for Susceptible, Infected and Recovering people –the variables replacing x and v) and is built with typical timesteps of 1 day, and you can plug in recovery time for your select contagion. You can then explore the effect of modifying a transmission coefficient while running your model over a theoretical numeric population of 1 million people etc. YouTube videos demonstrate the basic model relationship equations, and as well as running your own models over your hapless theoretical population, you can also analytically explore the effects of reducing the susceptible population (through vaccination), or slowing the transmission via changing behaviors – like hygiene, quarantine and related policies. Those circumstances leading to self-extinguishing contagions -- where the contagion can’t take hold in the population due to unlikely (low) transmission and fast recovery, or how herd immunity works (and when it fails) can be explored. The SIR model excludes births and deaths, though can readily be extended for such.

Who thought freshman kinematics computer modeling methods could lead to understanding why mandatory paid sick leave for service workers makes sense? Powerful insight emerges from reflecting on simple models.

**Jeremy Fielding teaches practical motors (and more)**

<tinyurl.com/WS-FieldingVidz>

Mr. Fielding’s YouTube channel dedicated to making, tinkering, inventing and teaching explores the recycling of old appliances – specializing in washing machine motors. His practical maker video series explore how motors work, how to recover them, wire and control and measure their output, and the things you can make with motors. Watching his tinkering and his budget construction of homebrew shop equipment accompanied by gentle insightful discourse reminds me of a “Mr. Rodgers” like figure for the maker community.

**Franklin: Electric Fields and potentials in 3D for Mac**

<<http://highcliffsoftware.com/>>

I just wanted to share a recent (re-)discovery for the macOS users out there.   For many years I used a piece of software called “Franklin” for classroom demos and the like.  It did a wonderful job of visualizing electric potentials and fields in 3D, and is highly configurable.  Like many pieces of educational science software (Atom in a Box, anyone?), I was sad to leave it behind when I moved all my machines to Catalina.  But I just recently discovered that the developer has released a 64-bit version of Franklin that runs fine on Catalina. I encourage the macOS users in the crowd to download and play with it.  It’s gorgeous.   It absolutely DOES require you to read the manual though … it takes a little getting used to.  Have fun!

*Reported by David Craig <http://www.panix.com/~dac/>*