Annotated Resource List

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Grades 7/8 Science

Introduction:

Initially when exploring resources I attempted to look for new and novel data sets to provide to middle school students; generally when implementing data sets and pieces of data with middle school (outside of data students have created themselves from in-class experiments) I have had a difficult time. Often I have had to create all data for students, which is time consuming, or have had to scaffold information significantly to make it accessible and quickly accessed. My overall goal was to find data that would fit these criteria. I was pleasantly surprised at what I was able to uncover, as I haven't been successful overall. While my results below will naturally have some scaffolding that will have to occur, I anticipate it being less than what I have typically had to do with data.

1.

Title of the resource	Greenhouse Gas Equivalency Calculator
Web Link	https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
Course and topic	7th Grade Science
3-5 sentence description of the resource	The Greenhouse Gas calculator will take provided information regarding gas emissions and translate that into viewable and comparative data. Energy amounts can also be utilized (i.e. gallons of gasoline, KWH, etc.) Also supplied within the data is mitigation procedures to remove carbon dioxide pollution from the atmosphere, and what it would necessarily take.
3-5 sentences describing how it can be used in a lesson	I would utilize this within a seventh grade lesson regarding climate change, carbon dioxide, and general pollution. With enough scaffolding students of most levels can generate information regarding how driving a car, bus, etc. can cause cascading effects on environments. Students initially will generate data regarding their regular use of transportation, or will specifically look at how their electricity use generates pollution. This eventually can be spiraled into reducing individual carbon footprints.

Modifications needed to use this resource in teaching	Examples will need to be provided and decent scaffolding for students to utilize this. I foresee needing to provide examples for how to access this. For best use students would take data and place it within a different table for later reference / comparative graphs.
Other information	

2.

Title of the resource	Sea Level Rise Viewer
Web Link	https://coast.noaa.gov/digitalcoast/tools/slr.html
Course and topic	7th Grade Science
3-5 sentence description of the resource	This resource delivers qualitative and quantitative data regarding rising sea levels around the country. Focus can be given to specific areas depending upon individual interest. Students can activate an image viewer for specific pictures of how sea level rise would affect a chosen area or students can view numerical data for how many days flooding occurs in a given area, and how a specific sea rise could affect these variables.
3-5 sentences describing how it can be used in a lesson	I can easily see how the image aspect of this resource can be used for middle school students. Given the various images taken on the website, students could raise and lower the sea level and see how it specifically changes an area. A nice aspect is that a chosen place could be highlighted, namely various spots in New Jersey. A deeper dive into this would allow students to be given specific scenarios for changing variables and how this would affect their chosen area.
Modifications needed to use this resource in teaching	The image aspect would require only situational context; additional use in quantitative data would require significant scaffolding and previous exploration by the teacher. There is so much information it would require a decent amount of modifications for multi level learners.
Other information	

3.

Title of the resource	NJ Harmful Algal Bloom Sampling

Web Link	https://njdep.maps.arcgis.com/apps/dashboards/49190166531d4e5a811c9a91e4a41677
Course and topic	7th / 8th Grade Science
3-5 sentence description of the resource	This website shows specific data regarding harmful algal blooms in NJ. By reviewing the specific measured sites (some measured as recently as 9/25) students are able to see firsthand images of what harmful algal blooms look like, and connect them to the repercussions that can later occur.
3-5 sentences describing how it can be used in a lesson	Students are provided with visual and numerical data for each site. Visual data shows how algal blooms change the color and aesthetic appearance of a body of water. The numerical data leans specifically into amount of toxins present in the water, as well as amount of specific HAB's present.
Modifications needed to use this resource in teaching	Students would need to be introduced to specific information
Other information	

4.

Title of the resource	NJ Water Data Use
Web Link	https://waterdata.usgs.gov/nj/nwis/water_use/
Course and topic	8th Grade Science
3-5 sentence description of the resource	This data provides a breakdown of specific water usage by counties in New Jersey. Individuals can utilize county water usage by its intended meaning (waste, domestic, commercial, etc.) Data tables can be pre-generated to assist with this, or it can be given out as raw data for analysis.
3-5 sentences describing how it can be used in a lesson	This information can naturally be used to track water usage throughout NJ and compare counties depending upon chosen variables. I would foresee this data being most useful in a school unit (I do several with 8th grade) on data analysis and how to break down information into usable blocks. Simple data entry, transcription, and the generation of graphs would be applicable here.

Modifications needed to use this resource in teaching	This would need to be largely teacher led with constant check ins to be useful. Ultimately students can take away information from this, but it would require a great deal of scaffolding to be used.
Other information	

5.

Title of the resource	NSTMF Gravity Laboratory
Web Link	https://lab.nationalmedals.org/gravity.php
Course and topic	7th / 8th Grade Science
3-5 sentence description of the resource	This is computer simulation that loosely reviews gravitational fields of celestial bodies in regards to increase/decrease of mass. By holding a button the body of a planet increases in mass. The larger the mass the higher the gravitational field. If force is added (clicking and dragging) an orbit can be created utilizing multiple celestial bodies.
3-5 sentences describing how it can be used in a lesson	I envision this simulation as an initial phenomenon. By students interacting with the simulation the effects of mass and gravity become readily apparent. Increasing the challenge with orbits of different celestial bodies adds the variable of orbiting into the simulation.
Modifications needed to use this resource in teaching	Minor scaffolding would be needed; a caveat with this simulation is that it is not overly complicated. Inversely it means it is simple. Beyond this activity there isn't much more here.
Other information	

6.

Title of the resource	NJ Water Withdrawal
Web Link	https://experience.arcgis.com/experience/ 9da78182503e467989c280bfdf741d3a
Course and topic	8th Grade Science
3-5 sentence description of the	This GIS map shows total withdrawals of water depending upon township and municipality. As students navigate the

resource	map they are able to compare data points between townships and specific water use. Unlike the earlier simulation explained in this assignment this is more visual based and easier to understand in broad strokes.
3-5 sentences describing how it can be used in a lesson	I anticipate 8th graders using this resource to view data sets and analyze water usage amongst different communities. If students compare these data points to proximity to alternative energy sources this could be a useful resource. It would require significant exploration.
Modifications needed to use this resource in teaching	Heavy scaffolding would be needed, as this is a large volume of data.
Other information	