Earth Science and Space Science Links / Apps from Wisconsin Earth Science Teachers Association (WESTA)

Updated Dec 30, 2024 12:00 PM

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APPS, Games, News, and more

Other science teachers websites that have many links and resources:

Latest science News and scientific research (search engines)
Students can select a science article, write a personal reaction to this article, and share this latest research with the rest of their class - other students are expected to ask questions of the article to continue group discussion of the latest science discoveries:
Articles can be found at .http://www.sciencedaily.com/ OR https://www.sciencenews.org/

EARTH SCIENCE AND GEOLOGY LINKS

Earth Science sites with multiple links

Earth science for kids - geography for kids shows links and resources for elementary students that includes: earth energy, earth structure, atmosphere, hydrosphere, biosphere, climates and BGC cycles http://www.geography4kids.com/index.html

Phenomenon NGSS resources for all grade levels

The Phenomenon Master List for all grade levels and subjects - excellent list of phenomenon that can be used to introduce topics and begin storylines for students: This was developed by the Wonders of Science: https://docs.google.com/document/d/1vyOQBzVugeDj13lMHZDN4QNOg5DQpm_E9h28yTJ2M-g/edit#

Phenomena for NGSS - here is a compilation of phenomena that can be used to introduce topics for your classes and student engagement: https://www.ngssphenomena.com/

Phenomena for Next Generation Science Standards: This brief **resource about phenomena** was developed for educators, and describes how phenomena can be used in NGSS classrooms to drive teaching and learning.https://www.nextgenscience.org/resources/phenomena

Early Elementary (K-2)

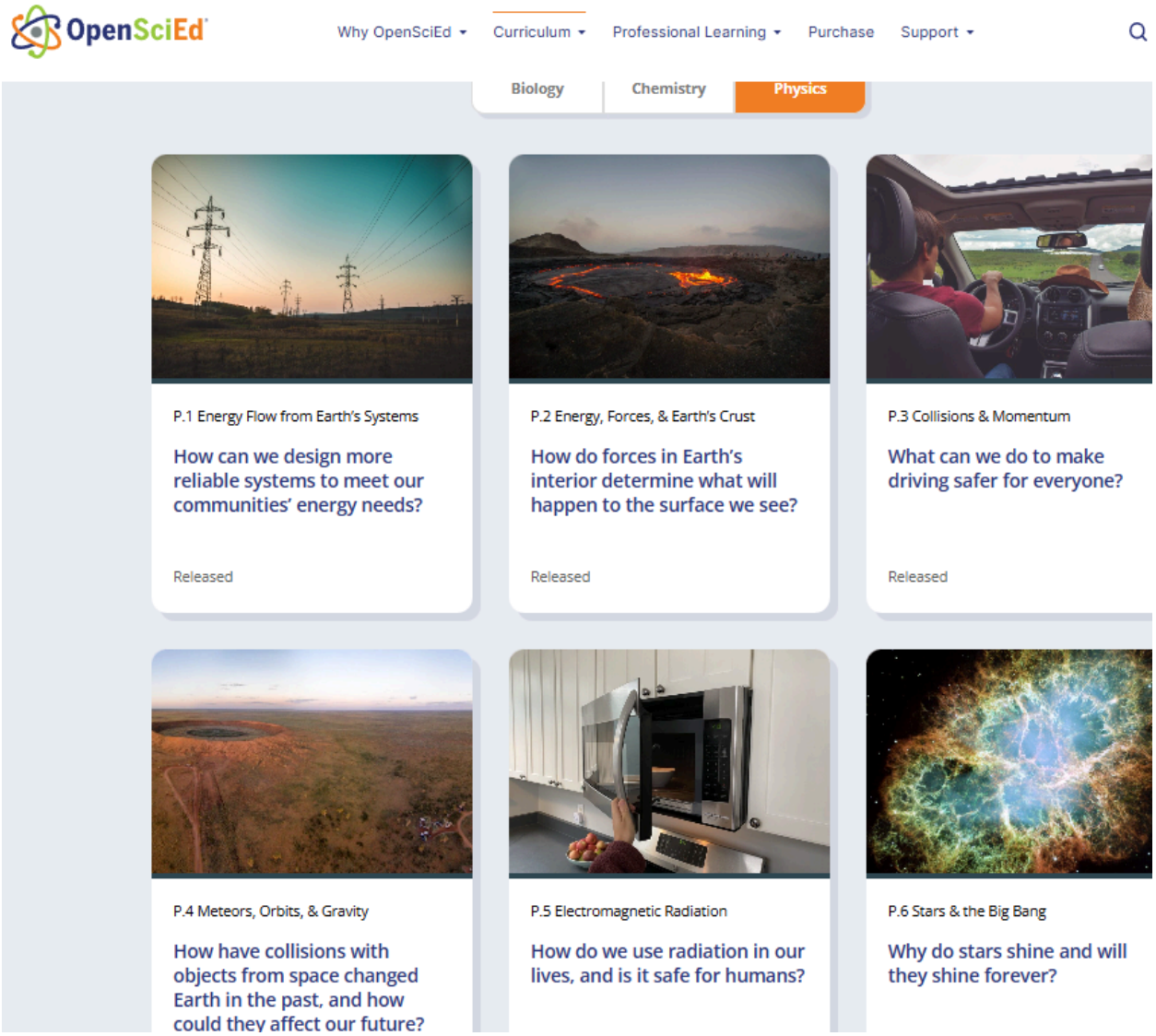
Pebblego.com is a subscription we purchase at the elementary that covers various science topics including Earth, Physical, Life, Social Studies, Animals, Dinosaurs, and Biographies. We pay to include science and it's an excellent source of information. The students love it!
(shared by Katie Hanson, 1st grade Seymour Rock Ledge Primary School, Seymour, WI)

NGSS Storylines in Earth Science

This is a list of the current NGSS Storylines Curriculum offerings that are available OR known of at the present time - **please add to this list**.

New Visions Science Curriculum from New York state. This curriculum set is under development and a couple storylines are currently available.
https://curriculum.newvisions.org/science

Open SCI ED - Physics curriculum has units aligned to Earth and Space science make account to get started and many free resources available - full lesson plans - support and training if needed



NGSS Earth Science Storylines - this is a facebook group that is designed to help others develop their own Earth Science storylines.
https://www.facebook.com/groups/NGSSESStorylines

NGSS for Middle and High School Science Teachers: This group is for teachers dedicated to improving their instruction utilizing the NGSS - understanding what it means to teach with an “NGSS-style,” identifying and sharing aligned resources and approaches, and supporting others who are also making this transition. This group is for teachers who take responsibility for their classroom - from student learning to behavior - and want to grow as educators through professional development, collaboration, and connection. This is a group setup by iExplore Science. https://www.facebook.com/groups/IESteachers

Illinois NGSS Storylines working group on facebook: Originally NGSS storylines for Biology, but they are working on creating storylines for Middle School science, Earth Science, and Chemistry. https://www.facebook.com/groups/ngssbiology

Remote Teaching and Learning

Remote Teaching and Learning for all grade levels and subjects from NVPS: This site is designed to provide educators with access to digital curriculum resources, models for teaching with technology, and support for using educational technology.
https://remote.newvisions.org/

History of planet Earth

Article about how old the planet is by the rocks on our planet.
http://www.extremescience.com/earth.htm

Earth and the Environmental Resources from HHMI (Howard Hughes Medical Institute) includes animations, interactives, clips of lecture lessons, short films, scientists at work, EarthViewer, etc. This links and activities highlight the deep connection between life, the environment and the ever changing Earth.
http://www.hhmi.org/biointeractive/earth-and-environment

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Groundwater

Groundwater Foundation - What is Groundwater? Great background information on wells, drinking water, resources for teachers, aquifers, threats to drinking water, etc http://www.groundwater.org/get-informed/basics/groundwater.html

Wisconsin Well Water Quality Viewer: Private Well Data for Wisconsin From UW-Stevens Point Center for Watershed Science and Education: https://www.uwsp.edu/cnr-ap/watershed/Pages/WellWaterViewer.aspx

Wisconsin Historic Well Construction Reports (1930 to 1989) from the Wisconsin Geological and Natural History Survey http://geodata.wgnhs.uwex.edu/well-viewer/

Wisconsin DNR website that covers all aspects of Groundwater and drinking water resources in Wisconsin - Wells, threats to drinking water. http://dnr.wi.gov/topic/Groundwater/

EPA Drinking Water Contaminants: Standards and Regulations - lists the primary and secondary standards, sources of potential contamination, etc for substances that could be found in drinking water across US https://www.epa.gov/dwstandardsregulations

EPA secondary standards for drinking water - https://www.epa.gov/dwstandardsregulations/secondary-drinking-water-standards-guidance-nuisance-chemicals

WI DNR Drinking Water & Groundwater Quality Health Standards/Advisory Levels and Table II - Drinking Water & Groundwater Quality Public Welfare/Secondary Standards and their associated health risk levels http://dnr.wi.gov/topic/drinkingwater/documents/haltable.pdf

Arsenic found in Wisconsin Drinking water - article from State newspapers highlighting student research http://wisconsinwatch.org/2016/01/despite-state-efforts-arsenic-continues-to-poison-many-private-wells-in-wisconsin/

Failure at the Faucet - Wisconsin drinking water issues as reported by Wisconsin Center for Investigative Journalism http://wisconsinwatch.org/series/faucetfail/

USGS (United States Geological Survey) Groundwater data for Wisconsin current conditions, historical observations, daily data, statistics,and field measurements across Wisconsin https://waterdata.usgs.gov/wi/nwis/gw

Central Wisconsin Groundwater Center at UW-Stevens Point Center for Watershed Science and Education helping citizens and governments manage the groundwater in Wisconsin wisely, through education, public information, applied research, and technical assistance https://www.uwsp.edu/cnr-ap/watershed/Pages/GWHome.aspx

Threats to Groundwater - resource information of Wisconsin's Buried Treasure obvious and hidden sources of contamination
http://dnr.wi.gov/wnrmag/html/supps/2006/apr06/threats.htm

Potential dangers of groundwater, how to protect it, interesting facts and date involving the groundwater throughout Wisconsin.https://www.dhs.wisconsin.gov/water/index.htm

Outagamie and Winnebago county Minimum casing requirements for private drinking wells (to reduce risk of naturally occurring arsenic deposits found in and near St. Peter's Sandstone formation :
http://dnr.wi.gov/topic/groundwater/arsenic/casingRequirements.html

This is a game I post on my website for kids to play when learning about water use / water cycle.
https://www3.epa.gov/safewater/kids/flash/flash_qagame.html
(Shared by Laurie Upp, Seymour Rock Ledge Elementary)

Love Canal disaster: Toxic waste in the neighborhood; retro report, from the New York Times video clip
https://www.nytimes.com/video/us/100000002566509/love-canal-a-legacy-of-doubt.html

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Geology of Earth

The United States Geologic Survey provides science, products and real-time data and near-real time data on current conditions and earth observations found at https://www.usgs.gov/

Earth Viewer Interactive from HHMI Biointeractive - allows student to view plate locations at any time in Earth's History including Atmospheric content, Biodiversity, length of day, Temperature, and solar luminosity. There are student labs available for download, videos, to allow for interactive manipulation of Earth data through time. Use on google chrome or firefox. (Thank you to Margaret Guderyon for the link:) https://www.hhmi.org/biointeractive/earthviewer

Geologic time travel activity (From Cheryl Esslinger - Thank you:) For the following I do a geologic time machine travel, where students have stops at different periods, they draw organisms from a hat (3 different) and have to find the period, era, epoch for each species and a time travel log that shows what is happening during that particular period. I use the following two sites to have them find their information:

1. Geologic Time Scale from University of California Museum of Paleontology (Thank you to Cheryl Esslinger for the link) http://www.ucmp.berkeley.edu/help/timeform.php
2. Research of each species can be found at this site: http://www.ucmp.berkeley.edu/science/research.php

Geology and Earth Science Information - Excellent overall resource for all areas of Geology http://geology.com/

Mass Extinctions video (from Cheryl Esslinger - thank you:) When we talk about mass extinctions, I stop and show the full movie "Racing Extinction" and have students take notes to use later.....which I have them create a presentation to a different time period to warn the species of what is coming, what they could do to save themselves etc. Click the "film" link on top to watch video or click on "education" and scroll down for interactive lessons and activities. https://racingextinction.com/

Geology of Wisconsin-

Wisconsin Geological and Natural History and Survey and Digital Collection that includes: Bulletins, Maps, Lake Superior notebooks, F.T. Thwaites papers, Exposed rock, Glacial Landforms, Mines, Parks and Natural Areas, People and Transportation. https://uwdc.library.wisc.edu/collections/econatres/wgnhs/

Glacial Geology field notes of Wisconsin's Ice Age National Scientific Reserve from National Park service https://www.nature.nps.gov/geology/parks/icag/

Map of Wisconsin and explanation of all the glacial advancements and recessions. Effects of the Wisconsin Glacier on different areas of the state. http://www.geology.wisc.edu/~davem/abstracts/06-1.pdf

Geology education materials, rock sets, posters, etc available from Wisconsin Geological and Natural History Survey. 3D map of Wisconsin shows excellent topography overview for glacial landforms. https://wgnhs.uwex.edu/education-resources/educational-material/

Henry S. Reuss Ice Age Center Kettle Moraine Northern Unit near Dundee, WI - Exceptional glacial geology landforms for students to visit and experience first hand. Kames, Drumlins, Kettles, Eskers, inter lobal moraines, etc. Field trips available. My high school students love this annual field trip and enjoy the Parnell Tower at the end of the day highlighted with an amazing visit to the Spruce Lake Bog which was named a Wisconsin State Natural Area in 1968 and a National Natural Landmark in 1973. https://dnr.wi.gov/topic/parks/name/kmn/naturecenter.html

MOONSTONE resources

Minerals and Mineral Identification

Mineral Education Coalition - site designed to assist K-12 educators and students with mineral resources, mining, education resources, and outreach.
https://mineralseducationcoalition.org/

Minerals - Earth Science for Kids from Ducksters Education site - (Elementary) Easy to read information on Minerals' types, properties, characteristics, interesting facts. Ducksters Education is a large site with many other links and topics for Elementary students. https://www.ducksters.com/science/earth_science/minerals.php

Mineral Identification steps - High School - How to identify an unknown sample using simple tests - Hardness, streak, luster, color, etc includes videos and other resources - from cK12 Education
https://www.ck12.org/earth-science/Mineral-Identification/lesson/Mineral-Identification-HS-ES/

Mineral Identification Chart - very complete list - downloadable chart first developed from Art Crossman (Mansfield University) from Geology.com
https://geology.com/minerals/mineral-identification.shtml

Moh's Hardness Scale for Mineral ID - High School / upper middle school. How to determine the hardness of a mineral steps, hints, and a large list of the hardness for many minerals from Geology.com.
https://geology.com/minerals/mohs-hardness-scale.shtml

USGS National Minerals Information Center including economic Information with maps and images https://minerals.usgs.gov/minerals/

Mineralogical Society of America - research papers, publications, links, images
http://www.minsocam.org/

Images of Minerals - listed in alphabetical order- from Shinichi Kato's Mineral Fossil Meteorite Collection page http://www.asahi-net.or.jp/~ug7s-ktu/se_mine.htm

Craters of the Diamonds state park in Arkansas where you can dig your own diamonds http://www.craterofdiamondsstatepark.com/

Minerals in WI

Minerals in Wisconsin - you can search where to look for various minerals in WI with images and location information from Wisconsin Geological and Natural History Survey in Madison. Content of this database was prepared by Dr. William S. Cordua, University of Wisconsin–River Falls.
https://wgnhs.uwex.edu/wisconsin-geology/minerals-wisconsin/

Mines, pits and quarries in WI - current and potential mines - from DNR website http://dnr.wi.gov/topic/mines/

Back 40 mining project website - Aquilla resources
http://www.aquilaresources.com/projects/back-forty-project/

History of mining in Wisconsin http://www.miningartifacts.org/Wisconsin-Mines.html

Iron mining in Wisconsin https://wgnhs.uwex.edu/wisconsin-geology/iron-mining/

Diamonds in Wisconsin http://geo.msu.edu/extra/geogmich/kimberlites.html

History of Lead mining in Wisconsin
http://www.wisconsinhistory.org/turningpoints/tp-026/?action=more_essay

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Rocks and Rock Cycle

Rocks and Rock Cycle from Ducksters Education (Elementary classrooms) - https://www.ducksters.com/science/rocks.php

Rock Cycle Interactives for elementary and middle school.
http://www.learner.org/interactives/rockcycle/

Interactive Rock Cycle animation from Classzone.com - lab activity for middle school earth science.
http://www.classzone.com/books/earth_science/terc/content/investigations/es0602/es0602page02.cfm

Rock Cycle visualization and animation links - Exploring Earth compiled by Mark Francek at Central Michigan University.
https://serc.carleton.edu/NAGTWorkshops/petrology/visualizations/rock_cycle.html

Rock Cycle information and images
http://geoscience.wisc.edu/~chuck/Classes/Mtn_and_Plates/rock_cycle.html

Rocks - information and images of various types of igneous, metamorphic, and sedimentary rocks. https://geology.com/rocks/

Life Story of a ROCK - animated cartoon integrating history (*age of Earth) and the rock cycle - Story Life of a Rock Animated

Meteorite Identification

Meteorite links from Wisconsin Geological and Natural History Survey - including Rock Elm Structure of Western Wisconsin.

Introductory guide to Meteorite Identification - types, simple tests to determine the type of meteorite from Geology.com
https://geology.com/meteorites/meteorite-identification.shtml

To determine if your unknown sample is a Meteorite - simple tests, hints, videos
http://meteorite-identification.com/streak.html

Do you think you have found a meteorite? Meteorite ID Guide from University of New Mexico. Compares meteorites with meteor-wrongs.
http://meteorite.unm.edu/meteorites/meteorite-museum/how-id-meteorite/

Earth Impact Database of the confirmed impact structures across the world - detailed information and map location of each - including 2 impact structures in **Wisconsin.** http://www.passc.net/EarthImpactDatabase/index.html

Terrestrial Impact Craters including photo gallery and descriptions of famous meteor craters http://solarviews.com/eng/tercrate.htm

Meteorite images organized by type of meteorite - from Kato's Collection of minerals, fossils and meteorites. http://www.asahi-net.or.jp/~ug7s-ktu/se_othe.htm

Glacial Geology-

Information about how Niagara Falls and the lakes around it was formed by the Wisconsin Glacier.
https://www.niagarafallsinfo.com/niagara-falls-history/niagara-falls-geology/niagara-geological-areas/the-wisconsin-glacier-niagara/

Glacial history in WI - information of glacial advancement and animal species alive during glaciation. Also includes a time lapse video of past 31,000 years showing ice sheet location and resulting glacial landforms. Download publication showing map images of Laurentide glacial advances across the state. Other links for glacial geology in WI found on the Wisconsin Geological and Natural History Survey site.
https://wgnhs.uwex.edu/wisconsin-geology/ice-age/

Ice Age Trail in Wisconsin - Landscape and Geology from the Ice Age Trail Alliance which promotes the creation, support and protection of the Ice Age Trail.
https://www.iceagetrail.org/ice-age-trail/ice-age-trail-landscape-geology/

Glaciation of Wisconsin PDF downloadable and printable images of glacial landforms across Wisconsin. Shows names of recessional moraines, landforms, time scale, etc from UW-Extension office. http://www.geology.wisc.edu/~davem/abstracts/06-1.pdf

US Geological Survey Bulletin: Late Wisconsinan Glacial History of Northeastern Wisconsin and Western Upper Michigan by Warren L. Peterson, 1986. PDF of entire report with images of glacial advancements and landforms.
https://pubs.usgs.gov/bul/1652/report.pdf

Rivers and Wind erosion-

Erosion resources, video clip, and educator materials from National Geographic
https://www.nationalgeographic.org/encyclopedia/erosion/

Erosion information about various types of erosion from Encyclopedia Britannica
https://www.britannica.com/science/erosion-geology

Erosion for Kids for elementary students at
http://www.geography4kids.com/files/land_erosion.html

River processes of transporting sediment and erosion including videos of processes in action.
http://www.alevelgeography.com/the-long-profile-changing-processes-types-of-erosion-transportation-and-deposition/

The different types of erosion and the process it takes to erode natural material. Examples of the different landforms that were formed from the effect of erosion.
http://peter-mulroy.squarespace.com/wind-erosion/

National Flood Insurance program - information on risks of floods, maps, and database on floods in the past https://www.fema.gov/national-flood-insurance-program

Meteorology (Weather and Climate)-

Jetstream (an Online school for Weather) from the National Weather Service -
This site is designed to help educators, emergency planners, and anyone interested in learning more about the weather. Excellent lessons for use in the classroom with students. Shared my Justin Frey, Fort Atkinson HS - Thank you!
https://www.weather.gov/jetstream/

Database archive for National Hurricane Center http://www.nhc.noaa.gov/data/

Hurricanes demo on bubbles?!? Interactive and hands on portion from PBS
https://www.pbslearningmedia.org/resource/vortices-hurricanes-experiment-physicsgirl-1014/how-to-make-a-hurricane-on-a-bubble-physics-girl/

Tornado History Project - database for past Tornadoes across US
http://www.tornadohistoryproject.com/

Storm prediction center from NOAA and NWS - current and past Data base, maps, etc for future, current, and past storms across US http://www.spc.noaa.gov/

Tornado database from NWS for each region, county, etc
http://www.midsouthtornadoes.msstate.edu/

NOAA National Severe Storms Laboratory in Norman, OK - Severe Weather research, Tornadoes, Flooding, Lightning, Hail, Wind Damage, and Winter Weather research. There is also an educator's link with resources for all levels from weather coloring books and activities for early elementary to research links for middle and high school.
http://www.nssl.noaa.gov/

Tropical cyclones database and real time monitoring of Pacific cyclones from Earth Observation Research Center and Japan Aerospace Exploration Agency
http://sharaku.eorc.jaxa.jp/TYP_DB/index_e.shtml

Digital Typhoon images and information database and real time monitoring
http://www.digital-typhoon.org/

El Nino and La Nina Years and Intensity from 1950 - present
http://ggweather.com/enso/oni.htm

Ice in and Ice out data Madison, WI Lakes Ice Data Summary from 1852 - present
http://www.aos.wisc.edu/~sco/lakes/msnicesum.html

Great Lakes NOAA MODIS CoastWatch Maps and images of cloud cover over each of the Great Lakes for past 2-3 weeks.
https://coastwatch.glerl.noaa.gov/modis/region_map.html

Ten Hottest Years globally on record article and graph from Climate Central
http://www.climatecentral.org/gallery/graphics/the-10-hottest-global-years-on-record

2016 Warmest year on record from NY Times article https://www.nytimes.com/interactive/2017/01/18/science/earth/2016-hottest-year-on-record.html?_r=1

What is the difference between Weather and Climate from NASA and links for weather and climate https://www.nasa.gov/mission_pages/noaa-n/climate/climate_weather.html

Weather and Climate resources from NASA for grades K-8 at https://pmm.nasa.gov/education/weather-climate

Climate and Weather resources and links at bottom of page http://www.climateandweather.net/

Climate Education modules for grades K-12 from North Carolina State University at https://climate.ncsu.edu/edu/home

Climate and Weather video clip from National Geographic (also has many other videos from National Geographic http://video.nationalgeographic.com/video/climate-weather-sci

Climate change indicators of Weather and Climate from EPA https://www.epa.gov/climate-indicators/weather-climate

Maps and Data showing current and history of Climate in US from National Atmospheric Space Administration https://www.climate.gov/maps-data

NOAA SciJinks - It is all about the Weather! Complete website from NOAA geared toward upper elementary, middle school, and high school students and teachers with a ton of activities, lessons, and information on a variety of Weather topics. https://scijinks.gov/menu/topics/

State of the Climate - NOAA Climate Monitoring Data - This site gives both National and Global data for Climate including: National Summary Information, National Climate Reports, Drought, Wildfires, Hurricanes / Tropical Storms, Tornadoes, Regional Analysis, Upper Air, Global Snow and Ice (including glaciers and polar ice caps), Global Hazards and El Nino data. https://www.ncdc.noaa.gov/sotc/

My NASA Data - This site has phenomenon data activities that are grade banded for 6-8 or 9-12. Featured Activities include: Hurricanes as Heat Engines, Hurricane Katrina - a

problem based learning module, Tropical Cyclone counts (compare data displays), Hurricane Sandy to Scale, Tropical Atlantic - Aerosols and Clouds, An Earth System view of Earthrise, and many more! NGSS aligned phenomenon based activities utilizing real world data. https://mynasadata.larc.nasa.gov/atmosphere/lesson-plans

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Global Climate Change

Games and Trivia about climate change. https://climatekids.nasa.gov/menu/play/

Ice Core Data - National Centers for Environmental Information from NOAA: The World Data Center (WDC) for Paleoclimatology maintains archives of ice core data from polar and low-latitude mountain glaciers and ice caps throughout the world. Proxy climate indicators include oxygen isotopes, methane concentrations, dust content, as well as many other parameters.
https://www.ncdc.noaa.gov/data-access/paleoclimatology-data/datasets/ice-core

Arctic Sea Ice News and Analysis - Database and images of ice cover over time (also Antarctic information) http://nsidc.org/arcticseaicenews/

Glacier Database -and GLIMS glacier viewer for entire Earth from the National Snow and Ice Data Center http://glims.colorado.edu/glacierdata/

GLIMS: Global Land Ice Measurements from Space: Monitoring the World's Changing Glaciers http://www.glims.org/

World Glacier Monitoring service has been compiling and disseminating standardized data on glacier fluctuations at http://wgms.ch/

Climate change indicators of Weather and Climate from EPA
https://www.epa.gov/climate-indicators/weather-climate

Natural Hazards

Interactive simulation game to rebuild and protect against natural hazards from the United Nations Disaster Risk Reduction.

http://www.stopdisastersgame.org/

Volcanoes-

Volcano facts and types of volcanoes http://www.livescience.com/27295-volcanoes.html

Volcanoes of the World resource from Volcano discovery
https://www.volcanodiscovery.com/volcanoes.html

Map of active, extinct, and dormant volcanoes. Also danger zones of suspicious volcanic activity. Interesting facts about volcanoes as well as all the volcanoes found around the world. http://volcano.si.edu/

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Earthquakes-

https://www.iris.edu/hq/retm Every major Earthquake is followed up by emails with slides, questions, maps and data ready for your class to investigate **Use these links to sign up for notifications** What Are Teachable Moments? View All Teachable Moments Questions for independent student exploration and then watch email for IRIS - Tammy Bravo - for a lesson ready.

USGS Earthquakes hazards program site - real time Data, significant earthquakes, map of latest earthquakes, paleoseismology, information, Earthquake early warning system, Earthquakes for kids https://earthquake.usgs.gov/index.php

Earthquake map of current real-time earthquakes
https://earthquake.usgs.gov/earthquakes/map/

Overview of Earthquakes - Facts and information on why/how they occur
http://www.nationalgeographic.com/environment/natural-disasters/earthquakes/

Seismic world map showing Earthquakes in last day to 5 years ago - zoomable map to every continent and ocean region in World from USGS data

http://ds.iris.edu/seismon/

World's largest recorded Earthquake ever information from Geology.com
http://geology.com/records/largest-earthquake/

Interaction maps of real time earthquakes and quivers. The biggest earthquakes in history as well as the damage done by those earthquakes. Identifies the ring of fire and major hot spots.
http://www.australiangeographic.com.au/topics/science-environment/2011/03/earthquakes-the-10-biggest-in-history/

Search significant earthquakes from each calendar year and search Earthquake database for earthquakes in specific geographic area, size, or time - USGS
https://earthquake.usgs.gov/earthquakes/search/

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Plate Tectonics-

Plate tectonics - Earth Science for Kids from Ducksters Education - easy to read resource for elementary students and classrooms
https://www.ducksters.com/science/earth_science/plate_tectonics.php

Plate Tectonics animation from HHMI (Howard Hughes Medical Institute) along with other geology, paleobiology, Earth processes, human impacts, climate, and Earth History http://www.hhmi.org/biointeractive/plate-tectonics

Explains where tectonic plates are and what they are.
http://www.livescience.com/37706-what-is-plate-tectonics.html

Plate Tectonic reference information from National Geographic
http://www.nationalgeographic.com/science/earth/the-dynamic-earth/plate-tectonics/

Plate Tectonic interactives from Dynamic Earth for upper elementary / middle school students that also includes interactive links for Earth structure, plates and boundaries, Slip, Slide and collide, and a link for students to test their skills at
https://www.learner.org/interactives/dynamicearth/drift.html

Plate tectonic, hot spot, and tectonic plates reference from Encyclopedia Brittanica

https://www.britannica.com/science/plate-tectonics

DIfferent types of boundaries found at the meeting place of tectonic plates. Interactive map of Pangea and the world millions of years ago. The principles of plate tectonics and last but not least some interesting facts about the sea floor spreading.http://geology.com/plate-tectonics/

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Paleontology and Fossils

Fossils in WI - Information, images, formation, and where to search for common fossil types that are found across Wisconsin (public outcrop locations that contain fossils) - from Wisconsin Geological and Natural History Survey.
https://wgnhs.uwex.edu/wisconsin-geology/fossils-of-wisconsin/

Background information on Paleontology from National Geographic.
https://www.nationalgeographic.org/encyclopedia/paleontology/

Information about paleontology dig sites around the country and also about the significance of paleontology in our science field today.
https://www.nps.gov/subjects/fossils/significance.htm

Fossils found in US National Parks and corresponding geologic formations and ages from the National Park Service https://www.nps.gov/subjects/fossils/fossil-parks.htm

Fossil photo identification for Ordovician and Non-ordovician fossils from Dry Dredgers
http://drydredgers.org/thumb_index.htm

Shark Teeth fossil guide from
http://www.elasmo-research.org/education/evolution/guide_f.htm

Index fossils from USGS https://pubs.usgs.gov/gip/geotime/fossils.html

Ammonite fossil ID at http://www.fossilidentification.org/ammonites.html

Fossil Image Gallery (images of fossils by Geologic Time) and Museum and Rare fossil images http://www.fossilmuseum.net/FossilGalleries.htm

Fossil images organized by type of fossil from Kato's collection of minerals, fossils, and meteorites. http://www.asahi-net.or.jp/~ug7s-ktu/se_foss.htm

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Natural Resources-

Introduction to Natural Resources for upper Elementary and Middle School - contains many links
http://www.eschooltoday.com/natural-resources/what-is-a-natural-resource.html

Toxic Release Inventory from EPA - database of toxic chemicals released into air or water by industry or communities. TRI is a resource for learning about toxic chemical releases and pollution prevention activities reported by industrial and federal facilities. TRI data support informed decision-making by communities, government agencies, companies, and others.https://www.epa.gov/toxics-release-inventory-tri-program

Resource page for North America from National Geographic
https://www.nationalgeographic.org/encyclopedia/north-america-resources/

Focus on Plant Lite - http://www.biocourseware.com/iphone/plantlite/

What is a Natural Resource and how we can utilize them. Finding different ways to preserve our natural resources and what would our world be today if there weren't any natural resources left. (Biocourseware has multiple apps - http://www.biocourseware.com/

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Biogeology-

What Biogeology is and the similarities of different ecological progressions that help aid in the knowledge of biogeology.
https://www.britannica.com/science/ecological-succession

Human Impact on Earth

Describes how we impact Earth and how we can fix it.https://www.factmonster.com/dk/encyclopedia/earth/human-impact

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SPACE SCIENCE / ASTRONOMY LINKS

General Astronomy information

Astronomy Magazine website with the latest research and discoveries of space http://www.astronomy.com/

Sky and Telescope Magazine website with the latest research and discoveries of space http://www.skyandtelescope.com/

The latest information of research in Astronomy https://www.universetoday.com

Cosmos for Kids - space and universe information and links for elementary students covering the following topics: Universe, Galaxies, Stars, Systems, Solar System, Solar System details, Exploration http://www.cosmos4kids.com/

Earth from Space

Light pollution map of Earth - excellent current and past maps that show where light pollution is occurring and where best viewing for looking at the night time sky. (Thank you David P. for the site!)
https://www.lightpollutionmap.info/#zoom=3&lat=5260729&lon=-8325970&layers=B0FFFFTFFFF

Interactives on various Astronomy topics

Astronomy Simulations and Animations to assist in Astronomy educators on many topics - developed by the Astronomy Department of University of Nebraska at Lincoln - Many different Laboratory activities are also here found that coincide with the simulations and animations - developed for use in Introductory Astronomy classes - very complete list of animations, simulations, and interactives: http://astro.unl.edu/animationsLinks.html

Online Labs for Introductory Astronomy (NAAP Labs) using simulations and interactives from Astronomy Department at University of Nebraska Lincoln. Labs include student guides and are found at http://astro.unl.edu/naap/ include the following titles (each are a link): Will not work on google chrome, but will work in firefox or windows. Solar System Models , Basic Coordinates and Seasons , The Rotating Sky , Motions of the Sun , Planetary Orbit Simulator , Lunar Phase Simulator , Blackbody Curves & UBV Filters , Hydrogen Energy Levels , Hertzsprung-Russell Diagram , Eclipsing Binary Stars , Atmospheric Retention , Extrasolar Planets , Variable Star Photometry , Cosmic Distance Ladder , Habitable Zones

Eclipse Interactive for solar and lunar eclipses at http://highered.mheducation.com/olcweb/cgi/pluginpop.cgi?it=swf::640::480::/sites/dl/free/0072991816x/220730/eclipse_interactive.swf::Eclipse%20Interactive

How Venus would appear in Ptolemaic Model simulation at (use on fire**fox or windows - will not** work on Chrome) http://astro.unl.edu/classaction/animations/renaissance/ptolemaic.html

Ptolemaic View of Mars simulation at (use on firefox or windows - will **not work on Chrome)http://astro.unl.edu/classaction/animations/renaissance/marsorbit.html**

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History of Astronomy-

History and definition of Astronomy. http://www.space.com/16014-astronomy.html

How Venus would appear in Ptolemaic System simulation (us**e on firefox or windows - will** not work on Chrome)
http://astro.unl.edu/classaction/animations/renaissance/ptolemaic.html

Ptolemaic view of Mars simulation (use on firefox or windows - **will not work on** Chrome)http://astro.unl.edu/classaction/animations/renaissance/marsorbit.html

Universe and Stars-

An article about the predicted count of stars and galaxies in space.
http://www.esa.int/Our_Activities/Space_Science/Herschel/How_many_stars_are_there_in_the_Universe/

50 Brightest stars in the sky http://astropixels.com/stars/brightstars.html

300 Brightest stars list in apparent magnitude
http://www.atlasoftheuniverse.com/stars.html

List of the 300 most luminous stars (absolute magnitude)
https://en.wikipedia.org/wiki/List_of_most_luminous_stars

List of the nearest bright stars in Apparent Magnitude from Earth
https://en.wikipedia.org/wiki/List_of_nearest_bright_stars

HR (Hertzsprung-Russell) Diagram interactive simulator with student guide (use on firefox or windows - will not work on Chrome) http://astro.unl.edu/naap/hr/animations/hr.html

HR Diagram background information at
http://www.atnf.csiro.au/outreach/education/senior/astrophysics/stellarevolution_hrintro.html

Jewels of the Night Activity (HR Diagram) and lab sheets
https://www.noao.edu/education/jewels/home.html

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Life cycle of stars

Takes you through the stages of a star's life https://www.telescope.org/login.php

Life Cycle of stars online activity designed for Students in grades 9-12 analyze characteristics that indicate human life cycles, and then apply these observational principles to various NASA pictures of stars to synthesize patterns of stellar life cycles.
http://btc.montana.edu/ceres/html/LifeCycle/stars1.html#activity1

Life Cycle of Stars activity (along with many other science topics) at
http://aspire.cosmic-ray.org/index.html

How stars form

Describes the general idea of what happens when a star forms.
http://lasp.colorado.edu/education/outerplanets/solsys_star.php#why

Stellar Evolution using NASA images from Chandra X-Ray telescope
http://chandra.harvard.edu/resources/flash/stellar_evolution.html

Stars information and links from NASA that address star formation, main sequence stars, and how stars end their life cycle depending on their mass (white dwarfs, neutron stars, and black holes at
https://science.nasa.gov/astrophysics/focus-areas/how-do-stars-form-and-evolve

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Galaxies

What is a galaxy, which galaxy do we live in, and some recent discoveries involving the never ending space.
https://science.nasa.gov/astrophysics/focus-areas/what-are-galaxies

Using Cepheid Variable Stars to determine distances to distant galaxies and other labs -
http://astrosociety.org/edu/publications/tnl/32/starscience3.html

Students will view NASA images of Galaxies to identify each type of galaxy.
http://btc.montana.edu/ceres/html/galaxy/gal1.html

Solar system and planets-

Retrograde motion simulator for Mars (use Firefox or Windows to run this interactive simulation) http://astro.unl.edu/classaction/animations/renaissance/retrograde.html

How Venus would appear in Ptolemaic Model simulation at (use Firefox or Windows to run this interactive simulation)http://astro.unl.edu/classaction/animations/renaissance/ptolemaic.html

Ptolemaic View of Mars simulation at (use Firefox or Windows to run this interactive simulation)http://astro.unl.edu/classaction/animations/renaissance/marsorbit.html

Eccentricity of planetary orbits simulator (use Firefox or Windows to run this interactive simulation)http://astro.unl.edu/classaction/animations/renaissance/ellipsedemo.html

How much would you weigh on a different planet? Calculator
http://btc.montana.edu/ceres/html/Weight/weight1.htm

Planets (and links to dwarf planets) of our solar system. Reference information and also includes the difference between planets, dwarf plane**ts and small solar system bodies (SSSBs).**http://www.theplanetstoday.com/the_planets.html

3D Solar System - http://project-metis.com/SolarSystem/

Mars Map 3D - http://mars3dmap.com/

Moon Map - http://moon3dmap.com/

100,000 Stars http://stars.chromeexperiments.com/

Planetarium -Description of all the planets found in our solar system.
https://neave.com/planetarium/

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Sun, Earth and moon system-

-Video of Sun Earth and Moon, system.
http://study.com/academy/lesson/interactions-in-the-sun-earth-moon-system.html

Lunar Phases activity at http://aspire.cosmic-ray.org/index.html

Solar storms, Auroras, Coronal Mass Ejections

News and information about the Sun-Earth Environment that includes Sun spot activity, solar storms, and Forecasts for Aurora Borealis http://www.spaceweather.com/

Daily forecast of Aurora Borealis for Northern Hemisphere (Alaska and North America) http://www.gi.alaska.edu/AuroraForecast

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Electromagnetic Spectrum

How Earth's atmosphere protects Earth from certain wavelengths yet allows other wavelengths through.
https://www.windows2universe.org/?page=/earth/Atmosphere/layers_activity_print.html

Solar Energy in the Earth's atmophere at
https://www.windows2universe.org/?page=/earth/Atmosphere/earth_atmosph_radiation_budget.html

Analyzing spectrum lab overview
http://www.chemistryland.com/CHM107Lab/Exp7/Spectroscope/Spectroscope.html

Tour of the Electromagnetic Spectrum from NASA video 23 minutes
https://www.youtube.com/watch?v=HPcAWNIVI-8

Eclipses (lunar and solar)

2017 solar eclipse across United States that occurred on August 21, 2017.
http://www.eclipse2017.org/xavier_redirect.htm

Mr Eclipse information on solar and lunar eclipses
http://www.mreclipse.com/MrEclipse.html

Eclipse Interactive for solar and lunar eclipses at
http://highered.mheducation.com/olcweb/cgi/pluginpop.cgi?it=swf::640::480::/sites/dl/free/0072991816x/220730/eclipse_interactive.swf::Eclipse%20Interactive

Solar and Lunar eclipse Calendar until 2029 and link to all of ther animations and interactives from NAAP Labs for Introductory Astronomy (use Firefox or Windows to run this interactive simulation)
http://astro.unl.edu/classaction/animations/lunarcycles/eclipsetable.html

Exosolar Planetary systems

Exoplanet interactive simulator and student lab guide (use Firefox or Windows to run this interactive simulation)
http://astro.unl.edu/naap/habitablezones/animations/stellarHabitableZone.html

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Black hole

Makes you find black holes with a telescope shows how black holes are created. Takes you on a journey in a spaceship to find a black hole. (use Firefox or Windows to run this interactive simulation)
http://hubblesite.org/explore_astronomy/black_holes/modules.html

Satellite tracking information

Live real-time satellite tracking information and data on nearly every earth-based satellite from most countries around the world http://www.n2yo.com/

NASA missions-

Slide show of future NASA missions and their purpose.
https://www.jpl.nasa.gov/missions/keck-interferometer/

Interactive tour of the International Space Station (ISS)
http://fios.verizon.com/beacon/iss/

Video visit to the ISS with astronaut host tour 2016 - 28 minutes long
https://www.youtube.com/watch?v=SGP6Y0Pnhe4

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Telescopes-

Kids website that goes through the history of telescopes.
http://www.kidsastronomy.com/telescopesD.htm

Chandra X-Ray telescope home page that has recent discoveries, images, research
http://chandra.harvard.edu/

Telescope Buying Guide - what to look for when buying a telescope
http://www.telescope.com/Articles/Current-Articles/Telescopes/Telescope-Buyers-Guide/pc/9/c/192/sc/194/p/99897.uts?gclid=CM6x3aeekrICFacWMgodnE8A6Q

List of Telescope manufacturers and their websites and contact information
http://www.skyandtelescope.com/astronomy-equipment/telescopes/

Light Pollution activity http://astrosociety.org/edu/publications/tnl/44/lightpoll4.html#4

Planetary Motion (Kepler's Laws)-

Kepler Law lab of planetary motion from NMSU
http://astronomy.nmsu.edu/agso/keplerslaws.pdf

Kepler laws of Planetary motion
http://peter-mulroy.squarespace.com/keplers-laws-of-planetary-motion/

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Planetarium - constellations - simulations of the sky

Sky Map google App link for download onto your device
https://play.google.com/store/apps/details?id=com.google.android.stardroid&hl=en

StarDome program from Astronomy Magazine allows users to look at the sky at any time and from any location on Earth, to see what stars and planets are visible during any time of the night. The scale, orientation, and many other parameters can be changed at will. http://www.astronomy.com/observing/stardome

In the Sky Planetarium is an online planetarium which can be changed to any location on the Earth to show stars, planets, objects in the sky that evening. https://in-the-sky.org/skymap.php?year=2016&month=8&day=28&country=240&reg1=3626&reg2=34594&town=17631

The Sky Live Online Planetarium can be changed to any location on the Earth to show stars, planets, constellations and objects in the sky https://theskylive.com/planetarium?obj=&aobj%5B%5D=sun&aobj%5B%5D=moon&aobj%5B%5D=mercury&aobj%5B%5D=venus&aobj%5B%5D=mars&aobj%5B%5D=jupiter&aobj%5B%5D=saturn&aobj%5B%5D=uranus&aobj%5B%5D=neptune&aobj%5B%5D=pluto&h=20&m=00&date=2016-08-28#ra|11.4909041198

Your Sky interactive Planetarium will give a view of any location on the Earth for any date to show stars, planets, constellations and objects. https://www.fourmilab.ch/cgi-bin/Yourhorizon?lat=44.5131&ns=North&lon=88.014&ew=West&fov=45.000&azimuth=45.000&date=1&utc=2016%2D08%2D28+19%3A50%3A49&jd=2457629%2E11862&azideg=0%B0+%28N%29&coords=on&moonp=on&deep=on&deepm=3%2E0&consto=on&constn=on&constb=

Sky and Telescope Observing and “this week at a glance” to show highlights of night sky for locations across US http://www.skyandtelescope.com/observing/

Constellations review - learn and review 17 of the Northern Hemisphere constellations https://www.quia.com/jg/319760.html

Constellations flash card review http://www.flashcardmachine.com/print/?limit_flagged=include&topic_id=1841166&mode=cut&cpp=3&size=4x6

Constellations review from images http://www.astronomyquiz.info/constellations-picture-quiz.html

Native American Starlore of the sky
http://www.wwu.edu/depts/skywise/legends.html#Coyote,%20Wolves

Sky chart Planisphere activity - students create their own star chart they can make and use to study the sky on any evening https://in-the-sky.org/planisphere/index.php

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APPS, Games, News, and more

NASA New Earth-Now APP - Experience our planet's vital signs in 3D on your phone https://www.nasa.gov/topics/earth/features/earth20120319.html (thank you Margaret Guderyon for this great app)

Discovery Education Chrome APP - http://www.discoveryeducation.com/chrome/
OER Commons (Open Education Resources) https://www.oercommons.org/
Exploros – Digital Resources - http://exchange.exploros.com/marketplace.html
Spheros Lighting Lab - https://edu.sphero.com/ (not just computer science, but connecting STEAM – Science, Technology, Engineering, Arts, Math)
Desmos Graphing Calculator - https://www.desmos.com/calculator
Instagrok - http://www.instagrok.com/
Kami – mark up digital documents - https://web.kamihq.com/web/viewer.html
Ck-12 (California K-12) – curriculum - https://www.ck12.org/
Science Bits (content/lessons) – https://www.science-bits.com
Top Science News – http://earthnewspapers.com/Science-News-Feeds
PBS Kids – Science - http://pbskids.org/games/science/
Kids.gov - https://kids.usa.gov/teens/play-games/science/index.shtml
Resource website with even more ideas sorted by topic- http://interactivesites.weebly.com/science.html

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Other science teachers websites that have many links and resources:

Earth Science in Middle School, New York City Public School District,
http://peter-mulroy.squarespace.com/
High School Astronomy, Seymour High School in Seymour, WI (Dennis Rohr)
http://www.seymour.k12.wi.us/faculty/drohr/astronomy.cfm
High School Geology, Seymour High School in Seymour, WI (Dennis Rohr)
http://www.seymour.k12.wi.us/faculty/drohr/geology.cfm

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Please contact Dennis Rohr, Seymour HS, drohr@seymour.k12.wi.us for any changes, updates, or new links that you find that should be added to this list. Make everyday your bonus day!!