

[Technology Resources for Teaching Science](#)

url: <http://edtechteacher.org/index.php/teaching-technology/tswt>

Why Use Technology in the Classroom?

Technology, when used appropriately, can help make science classroom a site of active learning and critical thinking, furthering student inquiry and connections with the materials. Teachers can use technology to enable students to explore fundamental curriculum issues and answer core questions. Students can use the Internet, electronic databases, applets and other online sources to gather information. They can use spreadsheets, virtual labs, and other programs to store, organize, and analyze information. Students can also integrate multimedia desktop publishing, web publishing, video and audio editing, as well as graphics programs to create and present information in innovative and engaging ways.

There are scores of educators and researchers deeply concerned with how our schools, largely the product of 19th century industrial society, are going to prepare students for the 21st century. Researchers like Howard Gardner (2006), Tony Wagner (2008), Henry Jenkins (2007), Frank Levy and Richard Murnane (2004), and others have produced a lists of the skills and competencies for our students in the future. While the lists and frameworks are diverse, they all tend to recognize a few major competencies: creativity, critical thinking, cross-cultural communication and collaboration, and digital age literacy. To develop these skills, we need classrooms where students are working in teams and using technology to build creative, meaningful content that reflects their understanding and learning. In these environments, teachers act often as facilitators and mentors rather than always fonts of authoritative knowledge. These classrooms are dramatically different from the ones where our most current teachers grew up, apprenticed, and taught. As a result, helping teachers effectively use new technology to support innovative, student-centered, inquiry-based learning will involve leveraging these emerging technologies.

General Science Resources

[iTunesU](#)

More than 600 universities distribute lectures, slideshows, PDFs, films, exhibit tours and audiobooks are available through the iTunesU Store. The Science section contains multimedia content on topics including agriculture, astronomy, biology, chemistry, physics, ecology and geography.

[PBS.org](#)

PBS provides a great source of information and activities on a myriad of topics. This online compilation offers an assortment of lessons and activities for educators and students alike. The Media Infusion Blog in particular showcases strategies and resources to help teachers create engaging learning experiences using multimedia. Other science sites from PBS include:

- **PBS Science & Nature:** <http://www.pbs.org/science/>
- **PBS Nova:** <http://www.pbs.org/wgbh/nova/>

- **PBS Teachers:** <http://www.pbs.org/teachers/>
- **PBS Teachers Media Infusion Blog:** <http://www.pbs.org/teachers/blogs/>

[MIT Blossoms](#)

Initially seeded by MIT faculty members, this website has since partnered with educators in Jordan and Pakistan to create a large, free repository of video modules for high school math and science classes.

[5 TED Talks on Science](#)

Five "mind-blowing" presentations on the world of science.

[Wolfram Alpha](#)

Much like Wikipedia, Wolfram Alpha, in essence, is never really complete. It is a computational search engine (unlike general "textual" search engines like Google) that provides mathematical, logical, and factual responses to search items. Wolfram is particularly helpful in mathematics and science research for understanding terms, rules, laws, and statistical analysis.

[Refseek](#)

Much like Google, Refseek is an extensive search engine, but strips out non-scientific and non-academic results for more educationally applicable resources. Search "flowers" in Refseek vs. Google to see the difference.

[SCRATCH at MIT](#)

Scratch is a website created by MIT to provide a simple programming language for younger students to utilize and create their own websites, animations, and story-telling. Visit the main Scratch community site, where people can share and browse Scratch projects created by their fellow community members. You can also get help from the Scratch forums, and find out about upcoming Scratch events.

[Science Netlinks](#)

Science Netlinks provides resources for K-12 science educators and standards-based online experiences for students. Check out the Lessons page for helpful and engaging internet lesson plans for all different sciences.

[PhET Simulations](#)

The PhET Interactive Simulations project at the University of Colorado provides a free website of research-based simulations that are designed to support student learning through active engagement. It features simulations such as Energy Skate Park, Salts and Solubility, Gas Properties, Density, Circuit Construction Kit, and Build an Atom.

[BrainPop – Science](#)

A very creative and engaging animated website for students between middle and early high school level.

BrainPop provides a wide variety of curriculum-based content in an accessible and fun format, and is a highly recommended and extensive resource for teachers and students.

[Molecular Workbench](#)

Molecular Workbench features visual, interactive, critical-thinking simulations and course modules provided by the Concord Consortium. By clicking on the “Showcase” link, one has access to hundreds of problem animations and example simulations from a variety of textbooks and academic websites in the subjects of physics, chemistry, biology, biotechnology, and nanotechnology.

[Natural and Cultural History Activities and Lesson Plans](#)

The “teaching resources” section of the Interactive Earth website lists a variety of online natural and cultural history lesson plans and activities for teachers to use in web-based classrooms. Many of these lesson plans come with interactive games for students to engage in as well.

[Science Daily](#)

Science Daily is a well-established news website for the latest information on scientific research and resources for all levels of interest. It includes popular articles, videos, images, book recommendations, and more. Topics include health & medicine, the mind & brain, plants & animals, earth & its climate, space & time, matter & energy, computers & math, and fossils & ruins. A good example of a featured news story is the “[Little Shop of Physics](#).”

[Turning the Pages](#)

The British Library’s online gallery provides access to engaging, interactive virtual tours of classic books. The library includes science-related works such as Elizabeth Blackwell’s Botanical illustrations, Vesalius’s stunning 16th Century anatomy history, and scientific sketches by Leonardo Da Vinci. Many of these works represent perfect examples of classic scientific journals and illustrations of the past.

[Kinetic City](#)

Kinetic City is an online collection of interactive Science Experiments, Games and Projects for late elementary/early middle school grade level. Although the games in general are very rudimentary in nature, after completion, be sure students click on the “Learn More” feature that goes into a succinct yet informative explanation of the topics summarized in the activities.

[Skool Math & STEM](#)

Skool is an online learning and teaching technology tool dedicated to student development through middle and high school age levels. By providing interactive science and math activities, students can not only explore material currently being covered in their classrooms but can expand on their learning for the future as well. The Teachers section includes skill development, a technology literacy review, using ICT in mathematics, and issues in building schools and curricula. Main subjects include Maths, Biology, Chemistry, and Physics, as well as Exam A and B prep (for students in the U.K.).

[MyExperiment](#)

MyExperiment makes it easy to share digital items, workflows, and other objects associated with your scientific research with colleagues and communities. Although it requires registration, for more advanced students, this website provides a great opportunity to see what research is currently being done on topics of interest.

[Science Alive! wiki](#)

Although most wikis in science education seem to be created by teachers for teachers, *Science Alive!* was created by two middle school students for the benefit of other students. For each experiment they undergo, students write an introduction to the experiment, an overview of previous knowledge about the topic, discuss thoughts and questions from themselves and others, and talk about what they have learned in the experiment.

[Science and Technology of World War II](#)

This highly impressive online exhibit of science and technology of WWII contains an animated timeline, activities (such as sending encrypted messages), expert audio responses to science and technology questions, lesson plans, quizzes, introductory essays, a virtual field trip, and more. Explore not only the applications of science and mathematics during WWII, but also discuss the real-world ethical and moral implications of their uses.

[Michigan 4-H Children's Garden Tour](#)

Although this virtual tour is aimed towards younger students (elementary ages), the interactive landscape of this Garden Tour also provides teachers with mini lesson plans and activities involving a variety of maps and videos.

[TED: Science](#)

TED (Technology, Entertainment, Design) is a nonprofit organization dedicated to *Ideas Worth Spreading*, often hosting conventions, talks, and speaker series aimed to promote new ideas in areas of Technology, Entertainment, Design, Business, Global Issues, and Science. On the bottom left of the homepage, under "Show Talks Related To," click on "Science" to see the latest in science presentations and discussions.

[Twenty Four Seven Science!](#)

This kid site from the Lawrence Hall of Science provides projects, activities, and games for young science students. The *Citizen Science Activities* provide interactive ways for students to experiment, design, and discover about the world around them. An Educator's Page is in the works as well.

Physics & Mathematics

[Physics Central](#)

The American Physical Society presents this student-oriented hub of information on physics – how it works, why it's important, and how we can apply it to current events. By providing examples of physics in action,

famous people in physics, pictures, podcasts, a writer's gallery, and an "ask & experiment" feature, Physics Central creates an in-depth interactive community that is fun and accessible to students. In particular, Physics in Pictures features exciting illustrations of nature's physical beauty as well as humankind's ingenuity. <http://www.physicscentral.com/explore/pictures/>

[Math, Physics, and Engineering Applets](#)

This site provides some educational java applets to help visualize various concepts in math, physics, and engineering. Topics include oscillations and waves, acoustics, signals, electricity and magnetism, electrodynamics, quantum mechanics, thermodynamics, and more. Be sure to check out the bottom of the homepage as well for an impressively extensive list of other resources in Physics and other science and math fields.

[MyPhysics Lab](#)

MyPhysics Lab does not just provide a large variety of classic physics simulations using Java, but also includes puzzles, puzzle answers, physical explanations (including different methods), definitions, numerical solutions, analytical solutions, as well as the ability to adjust the size and speed of each simulation. This site is a perfect resource for in-class supplementary material, as well as individual student work.

[Peanut Software](#)

The "Peanut Software Homepage" provides several open source applications used to draw mathematical graphs in a coordinate system. Click on each of the options to see what they are used for and download them for free.

[AP Physics wiki](#)

This detailed teaching wiki from a Massachusetts high school teacher provides not only resources and experiments from his AP Physics class, but also showcases links to archived assignments and references for teachers. Be sure to click under "Experiments" for detailed lesson plans and instructions on student projects.

[Physics.org](#)

Physics.org is a guide to all things physics provided by the Physics in Society team at the Institute of Physics. Search from over 4,000 handpicked physics websites, read special features, play games, ask questions, try an experiment, search news articles relating to physics, and get help on homework and useful study tips. Check out the "Explore" page for highly rated websites related to Physics or the "Study" page for experiments and study-help separated by high school and college level courses.

[The Physics Classroom](#)

Developed as an online tutorial for high school physics students, The Physics Classroom is an impressive tutorial covering everything from basic to more advanced physics topics in an organized and accessible manner. Teachers will find the breakdown of each lesson and sub-lesson helpful, as well as the site's ability

to link topics from current and past subjects (an essential feature in the study of the physical world). As well as detailed lessons, students can access the "Mind on Physics" section for over 1300 carefully constructed questions to help understand basic concepts in the classroom. As well as photo galleries, animations, problem sets, and curriculum ideas, The Physics Classroom is a highly valuable resource for any high school physics teacher.

[Rader's Physics4Kids](#)

An introductory site to Physics for younger students, Physics4Kids provides a resourceful, informative website to explore topics such as motion, heat, electricity, light, modern studies, and more. Check out the sections at the bottom of the homepage for activities and quizzes, as well as real-world examples of physics in action.

[NOVA | Physics & Math](#)

This webpage presented by NOVA is a helpful link between the studies of Physics and Mathematics, often undermined in practices. Read articles, audio stories from physicists, expert Q&A, interviews, and episodes of a physics & math series produced by NOVA teachers. Explore mysterious dark matter, unbroken coded structures, and nuclear chemists' quest for new elements.

Chemistry

[Middle School Chemistry - big ideas about the very small](#)

A webpage created by the American Chemical Society (ACS), Middle School Chemistry is a collection of activities, multimedia, resources, and detailed lesson plans for teaching chemistry to middle school students. Lesson plans from several chapters include matter, changes of state, density, the periodic table, bonding, water properties, and chemical reactions.

[Chemistry Education - American Chemical Society](#)

The American Chemical Society's Education Center provides an enormous amount of resources for teachers and students alike. Explore chemistry resources for high school through graduate level studies, including textbook/homework help, fun games and puzzles, and current event resources for research and student projects.

[Rader's Chem4Kids](#)

Chem4Kids is a resourceful, informational website for students of elementary and middle school ages to explore topics such as matter, the atom, elements and their properties, reactions, biochemistry and more. Check out the sections at the bottom of the homepage for activities and quizzes, as well as real-world examples of chemistry in action.

[Chemistry Lecture Notes](#)

This database created by a biochemistry professor from RPI outlines 20 chapters of chemistry and biochemistry lecture notes in tremendous detail - from basic atomic structures to organic chemical

processes. Click on “Educator Resources” at the top of the page to see lab experiments, chemistry tests, and access to interactive tutoring software for student help.

[Chemistry Guide](#)

Chemistry Guide is customized search engine and directory of chemistry related sources on the Internet. Click on any of the subtopic links towards the bottom of the page for a more specified search. Also check out their Top 10 Chemistry websites link at the top of the page for the best-reviewed sites.

[ChemGameTutor](#)

ChemGame is an extensive chemistry game for students in middle school and high school to refine their chemistry skills in a fun, interactive way. Your goal: Rescue 12 of the most famous chemists in history by completing 12 levels based on different topics in basic chemistry (Balancing Equations, Moles, Acids and Bases, Equilibrium, and more).

Biology

[Scitable](#)

This online library from Nature Publishing Group offers classroom resources and learning tools in topics such as genetics, cell biology, and evolution. Options include building learning paths and personal online classrooms, as well as an *ask the expert* feature staffed by PhD students. Scitable is routinely peer-reviewed for journal-level quality, but also allows opportunity for personal student development on their student blogs page: <http://www.nature.com/scitable/blog/student-voices>

[Extreme Biology](#)

Ms. Baker’s Biology class may be just a blog, but *Extreme Biology* has quickly become a highly visited and resourceful compilation of a New England High school teacher’s lesson plans and activities for her biology class. This engaging science blog is both informative and accessible to students, and serves as a model for classrooms looking to explore the world of blogging.

[The Virtual Body](#)

A virtual tour of the human body produced by MEDtropolis. Detailed descriptions, animations, images, and narrated tours present the brain, skeleton, heart, and digestive tract in an informative way. *Tip: The font for this website has generally been very small in the past, so be sure to enlarge the text from your menu bar!

[Biology in Motion](#)

Biology in Motion is an online resource of exhibits and activities created by Dr. Saul. He includes animations, interactive activities, and cartoons designed to make learning biology a richer, more engaging experience. Be sure to check out the “Tips for Teachers” section for useful advice on using technologies in the classroom.

[Monterey Bay Aquarium Research Institute](#)

As one of the leading research institutes in the world, MBARI is consistently dedicated to furthering multicultural, interdisciplinary collaboration in the marine sciences. Explore exciting current research, as well as MBARI's collection of data and image galleries. Under the "News and Information" heading, be sure to check out the "Education" section for internship and career information, educational webpages, seminar series, and MBARI's very own "Education And Research: Testing Hypotheses (EARTH)," a long-term teacher workshop program that will give educators complete access to real-time and near-real-time data in the classroom.

[Monterey Bay Aquarium Teacher's Place](#)

It is no secret that the Monterey Bay Aquarium is often hailed as the best aquarium in the world. Its dedication to research, public awareness, activism, and education has made it a benchmark in the ocean sciences and is a favorite visit for ocean-lovers. This section of the MBA website, "Teacher's Place" provides trip-planning, teacher/student programs through the aquarium, an educator newsletter, as well as a host of classroom resources (located on the right side of the page) including games, self-guided exploration, ocean explorer guides, curriculum/lesson plans, and much more.

[Census of Marine Life](#)

For anyone even remotely interested in the wonders of the world's oceans, COML is an invaluable resource. Click on the link above for the Census' image galleries and witness astounding photography of newly discovered, alien-like species of the deep ocean. For more information, check out "Census Resources" at the top of the page for educational and program resources. COML's video galleries, publications, and research are also available for public viewing.

[Courseworld: Biology References](#)

Although this site is a bit scarce in design, Courseworld is a great resource for high school biology teachers. Click on the articles sections on the left side of the page to get a list of chapter topics with lessons and sub-lessons within each. Each lesson is clear and concise, and the Ocean section in particular provides visually engaging and properly cited slideshows for each of its topics. Overall, this is a good resource for overviews of biology topics and lessons for teachers.

Environmental & Earth Sciences

[Science Courseware project](#)

This interactive, online simulations project produces activities for the life sciences or earth science field study laboratories. The site allows students to be hands-on without physically being in a lab, and prompts students to make inquiries and ask questions about the material they are learning.

[Teaching with Google Earth](#)

Not since the creation of Google itself has anything truly demonstrated its wealth of knowledge towards the public quite like Google Earth. As a vast virtual geographic simulation, it has come to be used for finding

locations, analyzing terrain, and even taking a look into the past using archived satellite photography. For Earth Sciences especially, Google Earth has allowed geologists to map transects, calculate changes in terrain over time, and plot geologic hazards in a matter of minutes. This section outlines potential uses of Google Earth for students and teachers, shows how to get started, provides a user guide, and offers examples.

[EcoKids](#)

EcoKids is an award-winning website for kids that teaches about the environment through interactive, fun and educational games and activities. Categories include wildlife, climate change, energy, exploring the north, water, waste, land use, the first nations, and the inuit community. Be sure to check out the EcoKids Teacher's Lounge at the top of the home page. Sign-up for a free account and receive access to lesson plans, printable handouts, activity sheets, as well as class kits and resources for working with ESL students.

[The USGS and Science Education](#)

The U.S. Geological Survey Education website provides info on natural resources, natural hazards, geospatial data, and issues affecting quality of life. Not only does it feature lessons, data, maps, support teaching, and support learning for education (K-12), but it also provides up-to-date inquiry and research for more advance students at the university level. Some highlights include GIS Lesson Plans, USGS Fact Sheets, podcasts and online lectures for teachers.

[Teaching with GIS in the GeoSciences](#)

It is hard to imagine our current level of expansive scientific resources without GIS (Geographic Information Systems). GIS represents a graphical, analytical, computer-based means of exploring and developing data. This section of "Starting Point: Teaching Entry Level Geoscience" introduces teachers to applications, methods, and reasons for integrating GIS in Education. Although primarily geared towards undergraduate students, this resource can be a good starting point for anyone interested in learning more about GIS and it's uses.

[The Ecological Society of America](#)

The ESA is a nonprofit science organization founded in 1915 devoted to the promotion and appreciation of the ecological science community. It's website provides a vast amount of science resources from other organizations, as well as it's contributions to news and media. Check out "Educator Resources" and "Student Resources" under the "Education and Diversity" section to learn more about the ESA, other organizations, and meetings and conventions.

[Discovery: Environmental Lesson Plans](#)

Provided by the Discovery Channel online, these Environmental Studies Lesson Plans are just a few examples of the many lesson plans that Discovery has to offer. Separated by K-5, Middle School, and High School lesson plans, teachers can search based on specific topics, grade levels, and student interests.

Although there is only a small selection on this page, be sure to click the Lesson Plans link under the "Teachers" tab at the top of the page for many more resources.

[EPA Teacher Resources and Lesson Plans](#)

This page produced by the EPA (Environmental Protection Agency) lists an array of environmental and science based lesson plans, activities, and experiments. Play games, get homework help, get involved in community service, participate in earth day, and much more. Click on any of the EPA or External resources listed on the page, and be directed to several different lesson plans and activities for each one.

Space Science - Astronomy & Astrophysics

[NASA](#)

The National Aeronautics and Space Administration provides an impressive slew of resources for educators, students, and the public that is both accessible to all ages as well as richly informative. The *For Educators* section includes galleries, videos, podcasts, and more. The *For Students* section also offers research tools, podcasts, Facebook pages, videos, and interactive activities.

[Space.com](#)

Space contains a massive repository of knowledge including space flight mission information and space-related technologies. Check out videos of solar eruptions or view photographic galleries of Saturn's rings. A weekly video series entitled, "This Week in Space," provides information on recent events in Space exploration and study. Other provided links include:

- **Virtual Tours of the Moon:** <http://www.fullscreenqvr.com/moon/>
- **Hubble site photo gallery:** <http://hubblesite.org/gallery/>
- **Tour of the Moon in Google Earth:** <http://earth.google.com/tour.html>
- **Virtual Tour of International Space Station:** http://www.boeing.com/defense-space/space/spacestation/ISS%20360%20Virtual%20Tour/Boeing%20ISS_ISS%20360%20Virtual%20Tour.html
- **U.S. Army Astronauts on Facebook:** <http://www.facebook.com/usarmyastronauts?v=wall#!/usarmyastronauts?v=wall>
- **Mike Massimino (@astro_mike):** http://twitter.com/#!/astro_mike
- **Asteroid Watch (@asteroidwatch):** <http://twitter.com/#!/asteroidwatch>

[Rader's Cosmos4Kids](#)

Cosmos4Kids is a resourceful, informational website for students of elementary and middle school ages to explore topics in astronomy such as the universe, galaxies, stars, systems, solar system details, exploration and more. Check out the sections at the bottom of the homepage for activities and quizzes, as well as real-world examples of astronomical science in action.

[Space Science Institute – Resources for Educators](#)

The Space Science Institute (SSI) is a nonprofit organization formed in 1992 dedicated to the betterment of research and education collaboration. This “Resources for Educators” page lists good resources and games for astronomy and space science for middle and high school students. In particular, check out current SSI research projects on the right side of the page.

[The Space Place](#)

This NASA sponsored student website is a great resource for students in middle school and high school interested in space science and astronomy. The “Parents and Educators” section provides an extensive list of resources including other websites, activities and lesson plans for the classroom, newsletters, games, image galleries, question and answer forums, and much more.

Medicine & Nanoscience

[UVA Virtual Lab Website / Hands-on Intro to Nanoscience Class Website](#)

This virtual lab website created by the University of Virginia offers an introduction to Nanoscience with a large backlog of resources. Among them include online homework help for high school students, college freshman, and upper division college students. Virtual Lab also guides students through 50 experiments presented with text and vivid animations in order to explain the processes and designs behind things like semiconductors and generators.

[EdHeads](#)

EdHeads creators believe that the internet represents a powerful and innovative educational tool, and that teachers should promote student educational exploration outside of the classroom. EdHeads helps students learn through educational games and activities designed to meet state and national standards. Featured activities include virtual hip and knee replacements, stem cell research, brain surgery, and prosthetic research.

[GetBodySmart](#)

Since 2000, GetBodySmart has been an online anatomy & physiology textbook using animations and in-depth explanations to describe the functions of the human body. Be sure to check out the “Histology” section for several links to well-received medical professional websites, as well as the “Anatomy and Physiology Quizzes” section for helpful teacher resources.

[Clinical Diagnosis Search Engine](#)

This customized search engine powered by Google was created by an anatomy and physiology teacher. Much like Google Scholar, this customized search engine will only produce medical and professional research results for anything from the common cold to rare viruses.

[InnerBody](#)

This online anatomy guide for middle to early high school students is designed to provide an interactive

experience exploring the numerous systems of the human body. Sponsored by Lumosity, learn about the human body, in particular the brain, and how it is responsible for visual recall, spatial reasoning, problem solving, stress, reaction time, language acquisition, and much more. Just for fun, try the “Brain Training Games” listed on the left side.

[The Anatomy & Physiology Place](#)

An invaluable resource for students, the Anatomy & Physiology Place is an online accompaniment database for textbooks published by Pearson. Click on any of the textbooks to see their online versions, with additional quizzes, chapter outlines/summaries, and graphics.

iPad Apps

Recently, iPads have taken center-stage in schools looking to move towards 1-to-1 learning environments or mobile platforms. The resources below come from a [Diigo](#) feed that EdTechTeacher maintains. The most recent resource will always appear at the top of the list.

- [iPads in the Science Classroom: The Bad, The Ugly, and The Good – Greg Laden's Blog](#)
- [Vernier Video Physics](#)
- [3D 360 interactive education images](#)
- [WolframAlpha](#)
- [Exoplanet](#)
- [Molecules](#)
- [Coaster Physics](#)
- [iTeach Chemistry](#)
- [iTeach Physics](#)
- [Star Walk for iPad - interactive astronomy guide for iPad](#)
- [Free Technology for Teachers: Google Earth Gallery Now Available on iPads & Android Tablets](#)
- [40 Most Awesome iPad Apps for Science Students - Best Colleges Online](#)
- [Science360](#)
- [Best Science Apps for iPad - WSS Wiki](#)
- [Murky Reef Lite - 1st - 2nd Grade Reading, Science & Math for iPad on the iTunes App Store](#)
- [Wolfram|Alpha App](#)
- [Back to School: 40 Best Science iPad Apps for Students](#)
- [TimeLapse - Free](#)
- [Star & Planet Finder](#)
- [Leafsnap App](#)

Virtual Middle School Library

Resources for Teachers and Parents

Url: <http://www.sldirectory.com/teachf/scied.html>

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Science

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General Science Resources for Teachers

- [The National Science Education Standards](#) - Prepared by the National Research Council. The text includes standards for teaching, content, assessment, and professional development.
- [Benchmarks for Science Literacy](#) - What students should know about science, math, and technology by the time they graduate from high school. This guide to instruction and the writing of a curriculum has been developed by the American Association for the Advancement of Science.
- [Science NetLinks](#) - Lesson plans and web resources of K-12 science teachers from the American Association for the Advancement of Science.
- [Middle School Science](#) - Lesson plans for the physical and life sciences.
- [The Middle School Portal](#) - Math and science information and collaboration.
- [Science and Technology](#) - Lesson plans and web links from PBS.
- [Science Lesson Plans](#) - For all grades from Education World.
- [The National Science Digital Library](#) - Links to science resources for teaching.
- [125 Great Science Videos](#) - From Astronomy to Physics and Psychology. These are videos which may be found on YouTube, and this list is from the Open Culture web site.
- [Learning Science](#) - Here you will find links to new online technologies for teaching science, links to science sites which are related to the science learning standards, and



- cool learning tools for math. This is a collaborative project of Temple University, and teachers in Bucks County (PA) schools.
- [Learner.org](#) - Professional development and teaching resources. Videos marked VoD may be watched online. This site is by the Annenberg Foundation.
 - [42 eXplore](#) - Teaching ideas and related web sites for a variety of science topics.
 - [Science Daily](#) - Online magazine with breaking news about science.
 - [SciCentral](#) - This site helps you to keep up with science in the news.
 - [Popular Science Magazine](#) - What's new in the worlds of science and technology.
 - [Science Fair Central](#) - Help with science fair projects, and a guide to running a science fair. From Discovery School.
 - [Nova Online for Teachers](#) - Lesson plans for using the PBS television show NOVA in the classroom.
 - [Teaching with Trade Books](#) - Perhaps your students could read outside of the textbook.
 - [Outstanding Science Trade Books for Grades K -12](#) - Selected by the National Science Teachers Association.
 - [Finding the Science Behind Science Fiction through Paired Readings](#) - A middle school lesson plan from Read Write Think.
 - [The National Science Teachers Association](#)
 - [Freebies for Science Teachers](#) - By the National Science Teachers' Association.
 - [Science Printables](#) - worksheets and other printables for many science topics - all free.
 - [The Case Files](#) - The case files highlights individuals from the history of science and technology.
 - [1001 Inventions and the Library of Secrets](#) - An award winning video starring Sir Ben Kingsley which is about the Moslem contributions to science in the middle ages. You may watch it online.
 - [Why are Things Colored?](#) - This site could be used for anatomy, art, physics, or several other disciplines. There are lesson plans. This a Smithsonian Web Exhibit.
 - [Who Done It?](#) - Using forensics to hone science and laboratory skills. This is a unit for middle or high school science students. It is an introduction to laboratory investigation which would be appropriate for general science, biology, or bio-technology. It is from Teacher's First.
 - Science Study in the Philadelphia Area
 - [The Franklin Institute Online](#)
 - [The Academy of Natural Sciences](#)
 - [The Schuylkill Center for Environmental Education](#) - Educational programs for teachers and students.
 - [The Morris Arboretum](#) - Of the University of Pennsylvania.
 - [The Chemical Heritage Foundation](#)

Astronomy and Space Exploration

- [NASA Search Engine](#) - Locate teaching materials for all grades and many subjects at this NASA site.
- [The Center for Science Education](#) - Space Sciences. A directory of educational projects funded by NASA which may be searched by topic or grade level. This site is provided by the University of California at Berkeley
- [Goddard Space Flight Center](#) - Lesson plans and other materials for teachers.
- [The Challenger Center for Space Science Education](#)- Uses the theme of space exploration to improve student learning in science and mathematics.
- [Earth and Sky](#) - Activities to accompany the daily radio program, and also links to lesson plan and science sites.
- [Amazing Space](#) - Astronomy lessons, teaching tools, and a video about the night sky.
- [Space.Com](#) - This site provides current news of the space program, and also information on space, astronomy and Project SETI. It is a commercial site and sells books, astronomy programs and other materials.
- [Space and Astronomy Lesson Plans](#) - From Teachnology.
- [Astronomy and Space Lesson Plans](#) - From Discovery School.
- [Exploring Planets in the Classroom](#) - Hands on activities for studying earth, the planets, and geology.
- [NASA/MSU CERES Project Educational Activities](#) - Lesson plans for grades K-12.
- [Google Sky](#) - Google's pictures of the universe.
- [Celestia](#) - This is a space exploration program which can be run on Mac, Linux, or Windows computers. It is free.
- [Build the Solar System](#) - This site has a calculator so you can get the distances right.
- [Eyes on the Sky, Feet on the Ground](#) - Hands on Astronomy Activities for Kids. There are activities for studying the rotation of the earth, mapping, time and calendars, and the solar system and the moon.
- [Astronomy Workshop](#) - Online astronomy problems to solve, and solar system viewers.
- [Paper Plate Education](#) - The use of paper plates to demonstrate many of the concepts of astronomy. Good site when your supply budget is low.
- [Astronomy with a Stick](#) - Astronomy activities that can be done during the daytime. These activities which track the movement of the sun are for elementary and middle school students.
- [The Women of NASA](#) - Meet the women scientists at Ames Research Center. This is a K-12 initiative by NASA to interest more girls in careers in science.
- [Astronomy Cast](#) - a podcast which is a great way for you and your students to learn about astronomy.
- [Sky Maps](#) - A free monthly sky map.
- [Good Astronomy Activities on the Web](#) - This list of links is by the Astronomical Society of the Pacific.
- [Online space and Astronomy Games](#) - From NASA



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Chemistry, Physics and Technology

- [American Chemical Society](#) - Web site for chemistry teachers and students.
- [SMILE Chemistry Lesson Plans](#) - For all grade levels from the Illinois Institute of Technology
- [Chalkbored](#) - High school level resources which includes Power Point lessons, lesson handouts, labs, and other material.
- [Chemistry Lesson Plans](#) - From Teachnology.
- [Chemistry Lesson Plans](#) - From Middle School Science.
- [Chemistry Lesson Plans for Middle Schools](#) - a directory of lesson plans from The Lesson Plans Directory.
- [Creative Chemistry](#) - You will find worksheets and online chemistry games at this British site.
- [Chemistry at About.Com](#) - lesson plans, experiments, and other chemical information.
- [The Periodic Table of Videos](#) - There is a video for each chemical element. This is by the University of Nottingham.
- [School Chemistry Laboratory Safety Guide](#) - From the National Institute of Occupational Safety and Health.
- [Physical Science Lesson Plans](#) - From Discovery School.
- [Physics Lesson Plans](#) - From Teachnology.
- [Exploring the Nanoworld](#) - Lesson plans for nanotechnology and materials science by University of Wisconsin Materials Research Science and Education Center.
- [Nanotechnology Lesson Plans](#) - Plans for middle and high school from UnderstandingNano.Com.
- [SMILE Physics Lesson Plans](#) - From the Illinois Institute of Technology.
- [Physical Science Lesson Plans](#) - for all grades from Reach Out Michigan.
- [Physics Central](#) - Some teaching ideas, a middle school competition, free posters and coloring books. By the American Physical Science Society.
- [Technology Lesson Plans](#) - Links to lesson plans web sites. From Internet4Classrooms.
- [The K-8 Aeronautics Internet Textbook](#) - Explanations of aeronautics principles and lesson plans.
- [The Science of Speed](#) - A fun way to learn the physics of NASCAR racing. These videos will appeal to the car-loving students. This is by the National Science Foundation.
- [Teach Engineering K - 12](#) - This site has curriculum and lesson plans for many areas of science. It has a great many lessons for physical sciences and technology.
- [Technology Lesson Plans](#) - From Discovery School.
- [Inventors and Inventions](#) - Lesson Plans from About.Com.



- [Molecularium](#) - Site for teaching about atomic structure. There are lesson plans for you and interactive activities for students.
- [The Particle Adventure](#) - This is a great site if you need to brush up on your knowledge of atomic or nuclear physics. It has a few worksheets for students, too.

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Energy

- [Energy Lesson Plans](#) - For all grade levels from the US Department of Energy.
- [Energy Production](#) - A lesson plan for grades 6 - 12. The plan includes the use of videos which are available at the lesson plan web site. From WGBH in Boston.
- [The Energy Kid's Page](#) - an energy timeline, classroom activities, energy facts, and an energy glossary.
- [Renewable Energy Lesson Plan](#) - From the Texas State Energy Conservation Office.
- [Energy Lesson Plans](#) - From the Society of Petroleum Engineers.
- [Teaching Resources](#) - on alternative forms of energy from the Tennessee Valley Authority.
- [Marcellus Shale Lesson Plans and Resource Guide](#) - For teachers in Pennsylvania.



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Geology

- [Geology Educational Resources](#) - From the U.S. Geological Survey. Projects in earth science for students and teachers.
- [Geology Lesson Plans](#) - From ProTeacher.
- [Earth Science Lesson Plans](#) - from Teachnology.
- [Geology Lesson Plans](#) - for grades K - 12 by the Illinois State Museum.
- [Geology.Com](#) - Geology articles, maps and satellite images, a geological dictionary, and teaching materials.
- [Understanding Geologic Time](#) - This online unit for students has a teachers guide.
- [How Volcanoes Work](#) - This is a good site if you need to brush up on your knowledge of volcanoes. There are links to volcano lesson plans on the Volcano Links page.
- [Earthquake Topics: Lessons Online](#) - From the US Geological Service.
- [Earthquakes: Getting Ready for the Big One](#) - a middle school lesson plan from Discovery School.



- [Mineral Information Institute](#) - Free teaching materials and lesson plans.
- [Mining](#) - Links to web sites about mining and mine safety. There are also ideas for student activities.
- [Cavern Geology Lesson Plans](#) - by Cave and Mine Adventures.
- [The Geological Society of America](#) - Lesson plans for grades k-12.
- [Dinosaur Detectives](#) - A middle school paleontology lesson from Discovery School.
- [Explorations Through Time](#) - Units for paleontology and life sciences from the University of California Museum of Paleontology.
- [Dinosaurs!](#) - Activities and teaching ideas from Scholastic.
- [Learning From the Fossil Record](#) - Lesson plans for paleontology.
- [Geology of Pennsylvania](#) - lesson plans and other materials by the Pennsylvania Department of Conservation and Natural Resources.
- [The Geology of Pennsylvania](#) - Information (no lesson plans) from Geology.com.

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Meteorology

- [Weather Lesson Plans](#) - From the University of Oklahoma. These are mainly for middle school students.
- [Weather Lesson Plans for Elementary Teachers](#) - Lesson plans and links to weather web sites.
- [Weather Lesson Plans](#) - From Discovery School
- [Weather Wiz Kids](#) - This site, by a meteorologist, has lots of information and some lesson plans and weather activities.
- [Weather Education](#) - This site has teaching materials and ideas for activities for students. This is by the NOAA's National Weather Service.
- [The University of Michigan Weather Underground](#) - Weather information.
- [Great Sites for Teaching About Hurricanes](#) - From Education World.
- [Lightning Safety](#) - There are Tools for Teachers to assist in teaching these safety measures.
- [Tornado Lesson Plans](#) - From A - Z Teachers Stuff.
- [A Blizzard of Winter Lessons!](#) - For elementary grades from Education World.
- [Be a Meteorologist for a Day](#) - A Weather unit for middle school students.
- [Project SkyMath](#) - A six-weeks middle-school mathematics unit which incorporates real weather data.

Science (Biological, Environmental, and Oceanography)

Science Education Menu: [General Science Resources](#) | [Astronomy and Space Exploration](#) | [Biology](#) | [Chemistry, Physics and Technology](#) | [Ecology and Environment](#) | [Energy](#) | [Geology](#) | [Meteorology](#) | [Oceanography](#)

Biology

- [Action Bioscience](#) - Articles on the impact of bioscience research on our lives. There are high school lesson plans and charts of NSES correlations
- [BioZone Bio Links](#) - This is a directory of web sites dealing with many aspects of biology such as ecology, biotechnology, animal behavior, cell biology and many more.
- [Living Things](#) - Links to websites on animals, plants, and ecosystems. There are also tips for teachers. This site is prepared by the Franklin Institute in Philadelphia.
- [SMILE Biology Lesson Plans](#) - For all grade levels from the Illinois Institute of Technology.
- [Biology Lesson Plans](#) - From Teachnology.
- [Lesson Plans Inc.](#) - Biology lesson plans for all grades.
- [The Biology Corner](#) - Lesson plans, lab plans, and quizzes.
- [The Science Behind Our Food](#) - Lesson plans for many aspects of biology from the College of Agricultural and Environmental Sciences of the University of Georgia.
- [Biology 4 Teachers](#) - Mainly, lesson plans for high school students, but there is also material for elementary and middle school students.
- [The Genetic Science Learning Center](#) - Background information on current developments in genetic science, and lesson plans.
- [Teaching Evolution](#) - Information about evolution and possible perils and pitfalls to avoid while teaching about it. By the University of California Museum of Paleontology
- [The Marian Koshland Science Museum](#) - Activities and lesson plans for infectious diseases, global warming, and DNA and genetics.
- [The National Institute of General Medical Sciences](#) - Interactive games and quizzes.
- [The Entomology Index](#) - Recommended entomology sites on the web for K-12 educators.
- [US Department of Agriculture for Teachers and Students](#) - There is so much offered at this site that it is hard to describe. Visit Smokey the Bear, check out the food pyramid, and don't miss RUS the Surfing Squirrel.
- [Penn State Lesson Plans](#) - Plans for all grades for forest resources, water, earth science and wildlife from the School of Forest Resources at Penn State University.
- [Flower Delivery](#) - There is information here on gardening for kids, plant classification, photosynthesis, gardening safety, and much more. Thanks go to Abby for suggesting this site.
- [KinderGarden](#) - Gardening in the curriculum for all grades levels. This is a good starting point for any teacher interested in starting a gardening project.
- [Out! Out! Damp Sprout!](#) - A lesson plan for growing seeds which are found in the supermarket. This lesson is by Vicki Cobb.



- [Real Trees 4 Kids](#) - Activities and lesson plans for grades 3 through high school. This site is by the National Christmas Tree Association.
- [Kids Gardening](#) - Resources and grant information for teachers. By the National Garden Association.
- [Plants for Kids](#) - Experiments in botany for children from the Delaware State University.
- [Bird Sleuth](#)- A project in bird watching for middle school students. Sponsored by the Cornell Lab of Ornithology.
- [Online Biology Book](#) - If your knowledge of biology is a bit shaky, you may need to refer to this text by M. J. Farabee

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Ecology and Environment

- [Lesson Plans from EELink](#) - Environmental and ecology lesson plans for all grades.
- [Environmental Protection Agency](#) - Environmental education web site.
- [The Environmental Education Network](#)
- [Exploring the Environment](#) - This site has modules for students to use to explore various aspects of the environment such as hurricanes, rainforests, the Everglades, and the weather. There are teacher help pages, too.
- [Teaching about Waste and Recycling](#) - Lesson plans from the EPA.
- [Community Science Action Guides](#) - Teaching units and lesson plans for grades K-12. These lessons deal with water, energy, and health sciences.
- [Beyond Penguins and Polar Bears](#) - An online magazine for teachers of grades k - 5. The purpose is to integrate science, literacy, and the polar regions. There are lesson plans and links to relevant web sites.
- [The Rainforest Alliance](#) - Rainforest information and activities for kids and teachers.
- [The Rainforest Action Network](#) - Dedicated to preserving the rainforests.
- [Educational in Nature](#) - Environmental education units for 4th and 5th graders. This site includes lesson plans and worksheets.
- [Forest Food Webs](#) - An ecology lesson plan from Discovery School.
- [Activities to Celebrate Earth Day](#) - From Education World.
- [All About Global Warming](#) - In case you need to brush up on your knowledge of global warming.
- [Teachers' Guide to High Quality Educational Materials on Climate Change and Global Warming](#)- Global warming facts and lesson plans from the National Science Teachers Association.
- [Climate Change Education](#) - News and lesson plans.



- [The Pennsylvania Department of Environmental Protection](#) - Information on Pennsylvania's environment for teachers and students.

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Oceanography

- [The Ocean Portal](#) - Lesson plans for oceanography from the Smithsonian Institution.
- [Treasures@Sea](#) - Teaching oceanography through art and literature.
- [Reef Ball Educational Projects](#) - 50 ideas for teaching about oceanography.
- [National Geographic Blue Frontier](#) - Oceanography lesson plans for all grades.
- [NOAA Ocean Explorer](#) - Curriculum and lesson plans.
- [Classroom Resources from the Monterey Bay Aquarium](#) - Lesson plans, videos, and podcasts.
- [National Marine Sanctuaries](#) - This sites provides a curriculum, lesson plans and other activities.
- [Sea World/Bush Gardens](#) - Lesson plans and teaching guides.
- [The Gulf of Maine Research Institute](#) - Information and lesson plans for aquatic life.
- [Oceanography for Kids](#) - Links to lesson plans and oceanography sites by Kathi Mitchell.
- [The Intertidal Zone](#) - A lesson plan for middle school students.
- [Coral Seas](#) - A middle school lesson plan on coral reefs.
- [The COOL Classroom](#) - A project to link middle and elementary school classrooms with the Rutgers Marine and Coastal research program.
- [The Jason Project](#) - Visit the ocean with this popular interactive science project.

