

Role of the Elementary Science Teacher

Welcome








What Is The Role of the Science Teacher?

- Facilitate the learning process
- Teach the scientific method and key science concepts
- Provide an environment for exploration
- Expose students to real world tools and experiences
- Encourage high-level thinking skills
- Introduce students to online tools and resources
- Expose students to new experiences



Different Types of Learning Environments

Traditional Learning

- Teacher-centered instruction 
- Single-sense stimulation 
- Single-path progression 
- Single media 
- Isolated work 

New Learning

- Student-centered instruction
- Multi-sensory stimulation
- Multi-path progression
- Multimedia
- Collaborative work

National Educational Technology Standards for Teachers, ISTE 2000

Different Types of Learning Environments

Traditional Learning

- Information delivery
- Passive learning
- Factual, knowledge-based learning
- Reactive response
- Isolated, artificial context



New Learning

- Information exchange
- Active/exploratory/inquiry-based learning
- Critical thinking, informed decision making
- Proactive/planned action
- Authentic, real-world context

National Educational Technology Standards for Teachers, ISTE 2000

What Are Some of the Challenges in Teaching Science?

- Limited time to cover the standards
- Locating resources and tools
- Integrating math with other subjects
- Variety of student ability levels
- Teaching to the standards
- And.....

Global Approach: Best Practices

- Best Practices in Education
 - URL: <http://www.bestpraceduc.org/>
 - Current projects
 - Message board



The screenshot shows the homepage of the Best Practices in Education website. At the top, there is a blue header with the text "Best Practices in Education". Below the header is a banner image featuring several people in a classroom setting. The main content area has a light blue background with the text "a world to learn from" in a large, bold font. Below this, there is a paragraph describing the organization: "Best Practices in Education is a nonprofit operating foundation that transfers to the US effective mathematics education practices from abroad to improve teaching and learning in pre-K to grade-12 classrooms." To the right of this paragraph, there is a graphic of a human head profile with a globe inside. Below the main text, there is a section titled "Current Projects" with two entries: "Algebra - Message Board" with a "Member login" link, and "Interactive Geometry: Classroom trials in New York City high schools of geometry materials that uniquely combine Russian problem-solving practices with US-built computer technology." At the bottom left, there is a link for "News from Best Practices in Education" with a "Newsletter 2002-2003" link.



Professional Resources



National Science Teachers Association

- Professional Organization
 - <http://www.nsta.org/>



The screenshot shows the NSTA website homepage. At the top left is the NSTA logo (National Science Teachers Association) and a search bar. To the right is a member login section with fields for 'E-mail or Last Name' and 'Password or ID', and a 'LOG IN' button. Below the search bar is a navigation menu with links: 'About NSTA', 'Member Services', 'Professional Development', 'Conferences & Institutes', 'Publications & Products', 'Exhibits & Advertising', 'Get Involved', and 'Science Store'. The main content area is divided into several sections: 'CHOOSE YOUR CLASSROOM' with options for 'ELEMENTARY SCHOOL', 'MIDDLE SCHOOL', 'HIGH SCHOOL', and 'COLLEGE'; 'SELECT A NETWORK' with options for 'NSTA COMMUNITIES' and 'NSTA LEARNING CENTER'; a featured article titled 'Learn more about Year of Science 2009' with a sub-heading '40 Inquiry Exercises for the College Biology Lab' and a small image of a book cover; 'Conference Links' with a list of events including 'Summer Institute: Professional Learning Communities in Science', 'Urban Science Education Leadership Academy', and 'Minneapolis | Fort Lauderdale | Phoenix'; and a 'DID YOU KNOW?' sidebar with a promotion for NSTA Press books. At the bottom of the main content area are links for 'View All News' and 'Subscribe to NSTA News'.

PBS TeacherLine: Science

Free online resources

<http://teacherline.pbs.org/teacherline/resources/science.cfm>

The screenshot shows the PBS TeacherLine website interface. At the top left is the PBS TeacherLine logo, and at the top right is the slogan "Be more informed PBS". A navigation menu on the left includes links for HOME, ABOUT COURSES, COURSE CATALOG, MY WORKSPACE, RESOURCES (with sub-links for Math, Reading/Language Arts, Science, and Technology Integration), and HELP. A "CHECK YOUR COMPUTER" box is also present. The main content area is titled "Resources > Science" and "Science". It features a section for "PBS TeacherSource - Science" with a description: "Find hundreds of lessons and activities tied to state science standards." Below this is a "Recommended Links" section with two links: "Eisenhower Regional Consortia for Mathematics and Science Education" and "Federal Resources for Educational Excellence (FSEE)". On the right side, there is a "FREE MEMBERSHIP" section with a "Join for free!" button, a "Member login" section with input fields for "Username:" and "Password:" and an "Enter" button, and a "Password Help" button.

The NSTA Learning Center

- <http://learningcenter.nsta.org/?lid=tnavhp>
- Workshops, presentations and resources

The screenshot shows the NSTA Learning Center website. At the top, there are navigation links: "Back to NSTA.org", "Contact Us", "Help", and "Feedback". The main header features the "The NSTA Learning Center" logo and a photograph of three people. Below the header is a navigation menu with tabs for "Home", "My Account", "Subjects", "Learning Resources & Opportunities", "Professional Development Tools", and "Education Administrator".

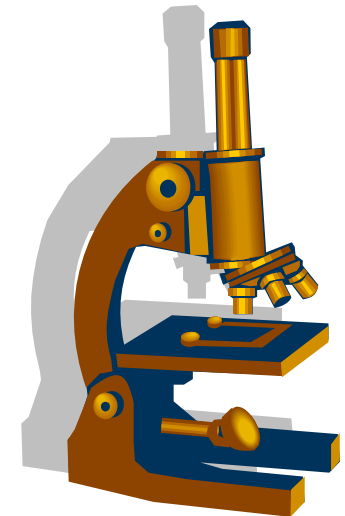
The main content area is divided into several sections:

- Welcome to Your Professional Development:** A text block explaining the center's purpose, mentioning over 3,800 resources and 1,000 journal articles. It includes a "for free" link and a "How to Guide" PDF link. A small image of a smiling woman is also present.
- Explore Learning Opportunities:** A section with a search bar and a "Go" button. Below it are filters for "By Subject" (Earth & Space Science), "By Grade Level" (Elementary), and "By State Standards" (Select your state to begin:).
- Right Sidebar:** Contains a "Login" section with a "[Click Here to Log In Now]" link, social media icons for RSS and SHRE, and a "Most Popular Science Objects" list:
 1. Energy: Different Kinds of Energy
 2. Plate Tectonics: Layered Earth
 3. Energy: Thermal Energy, Heat, and Temperature
 4. Universe: The Sun as a StarBelow this list is a "Multimedia Overview" section with a "View Overview" button.

What Are The Tools of the Science Teacher?

■ Offline

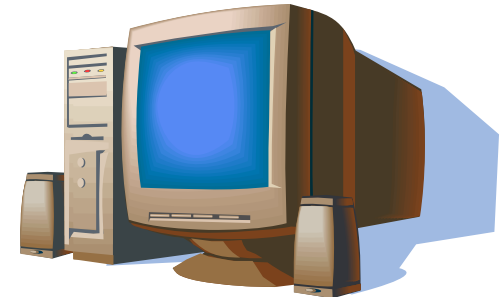
- Textbooks
- Worksheets/Lab sheets
 - AIMS
 - FOSS
- Science tools and instruments
- Lab supplies



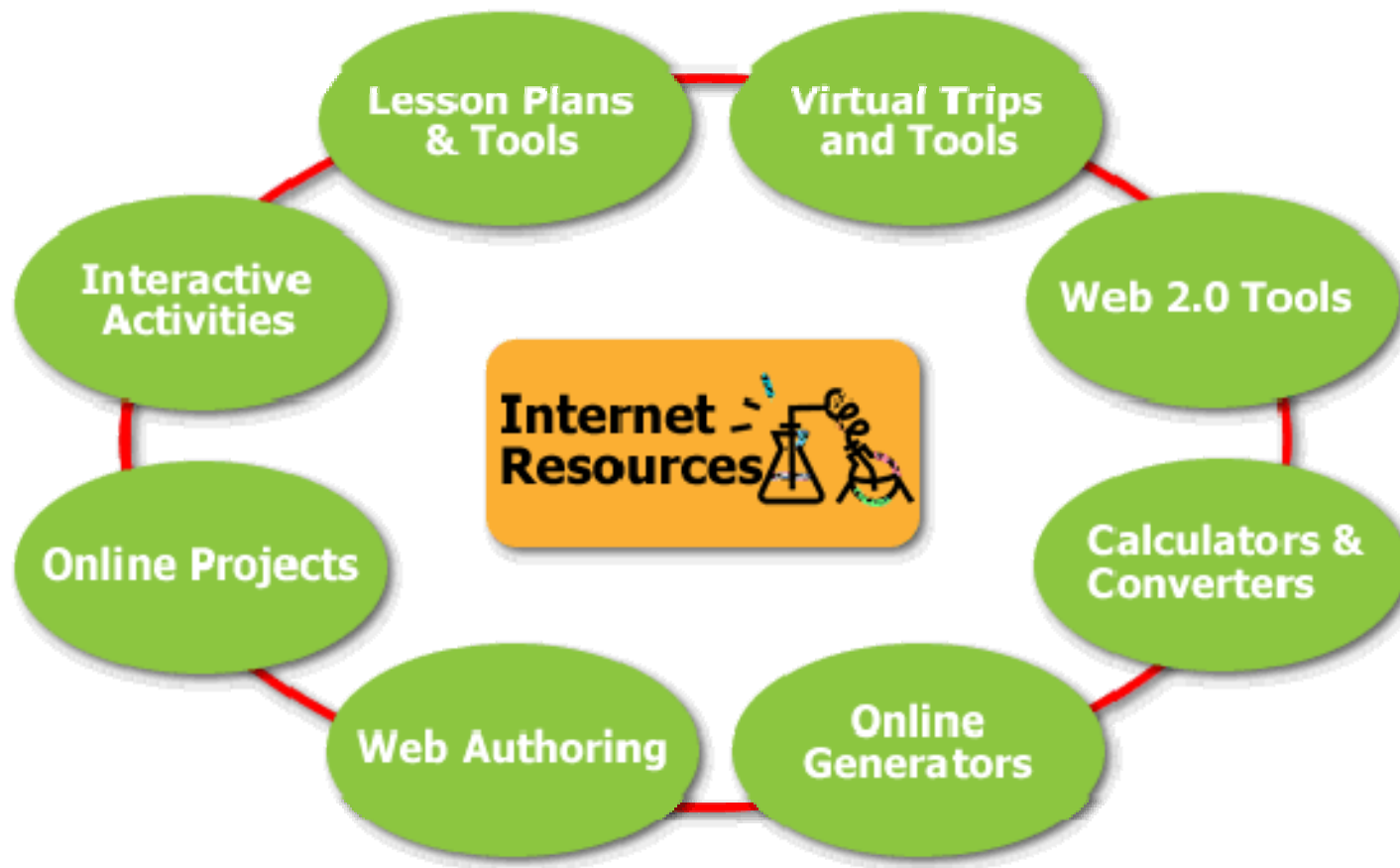
What Are The Tools of the Science Teacher?

■ Online

- Lesson plans
- Calculators, converters and tools
- Interactive activities
- Drill and Practice resources
- Projects (WebQuests)
- Lesson plan development tools
- Online generators
- Web 2.0 tools



Big Picture



Where Does One Start?

- Scientific Method

- <http://school.discovery.com/sciencefaircentral/scifairstudio/handbook/scientificmethod.html>

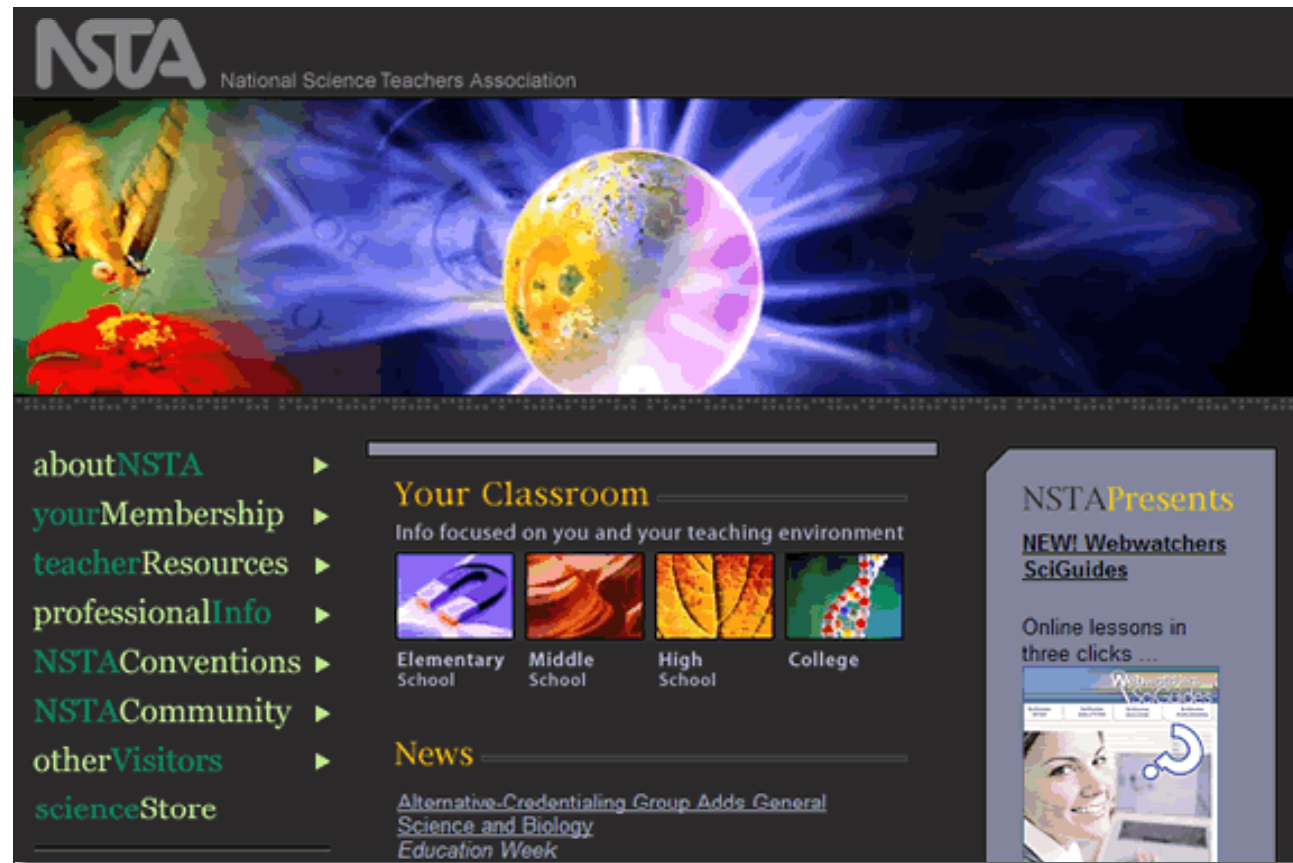




Curriculum, Standard and Key Science Ideas

National Science Teachers Association

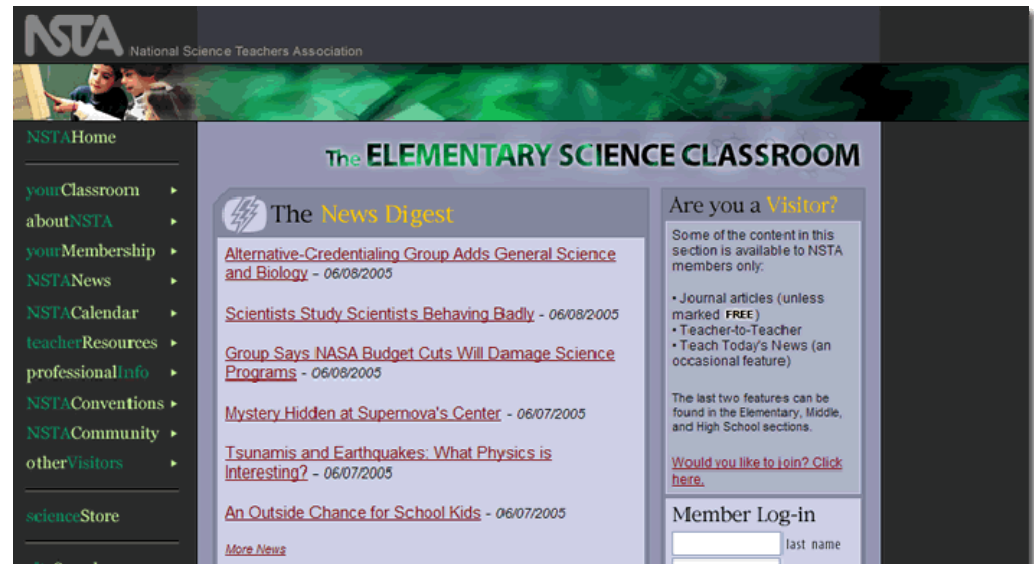
<http://www.nsta.org/>



The screenshot shows the NSTA website homepage. At the top left is the NSTA logo and the text "National Science Teachers Association". Below this is a large banner image featuring a butterfly, a globe, and a DNA helix. The main navigation menu on the left includes: aboutNSTA, yourMembership, teacherResources, professionalInfo, NSTAConventions, NSTACommunity, otherVisitors, and scienceStore. The "Your Classroom" section provides information for different education levels: Elementary School, Middle School, High School, and College. The "News" section highlights "Alternative-Credentialing Group Adds General Science and Biology Education Week". The "NSTAPresents" section features "NEW! Webwatchers SciGuides" and "Online lessons in three clicks ..." with a small image of a woman using a computer.

NSTA: Best Practices

- Elementary Science Classroom
 - <http://www.nsta.org/elementaryschool>
 - Best practices
 - Journals
 - Teachers resources
 - Teacher interaction



Education World

■ State Standards

- <http://www.education-world.com/standards/state/index.shtml>

The screenshot shows the Education World website interface. At the top, there is a navigation bar with links for 'Help', 'Contact Us', 'Advanced Search', and 'Browse Topics'. Below this is a search box with a 'Search' button and radio buttons for 'EdWorld' (selected) and 'Internet Topics'. The main content area features a 'Section Guide' with links for 'NATIONAL STANDARDS' and 'Table of Contents'. A breadcrumb trail reads 'Home > U.S. Education Standards > State Standards'. The title 'State Standards' is prominently displayed in large, bold, orange letters. Below the title, a paragraph states: 'Find quick access to all the State Standards by topic and grade level. Jump to a state's main page from the pulldown menu, or go directly to the standards for a particular subject from our menu below.' A 'State Standards:' label is followed by a dropdown menu showing 'Michigan' and a 'Find' button. At the bottom, there are two columns of subject links: 'Fine Arts', 'Language Arts', 'Mathematics', and 'PE and Health' on the left; and 'Science', 'Social Sciences', and 'Technology' on the right.

National Standards: MCREL

<http://www.mcrel.org/standards-benchmarks/>

McREL - Compendium of Standards and Benchmarks. Online Standards Database. Content Knowledge - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Mail News RSS Feeds

Address <http://www.mcrel.org/standards-benchmarks/> Go Links

MCREL Quick Links to McREL Sites Site Map Home

CONTENT KNOWLEDGE - 3rd edition
A compilation of content standards for K-12 curriculum in both searchable and browsable formats.

Interactive

- [Browse the standards](#)
- [Search the database](#)
- [Activities](#)
- [Unit Designs](#)

Background

- [Purpose](#)
- [History](#)
- [Process](#)
- [Acknowledgments](#)
- [References](#)
- [McREL's Contributions](#)

Resources

- [Hot Links by Subject](#)
- [Standards Products](#)
- [Training & Consulting Services](#)

SEARCH: GO!

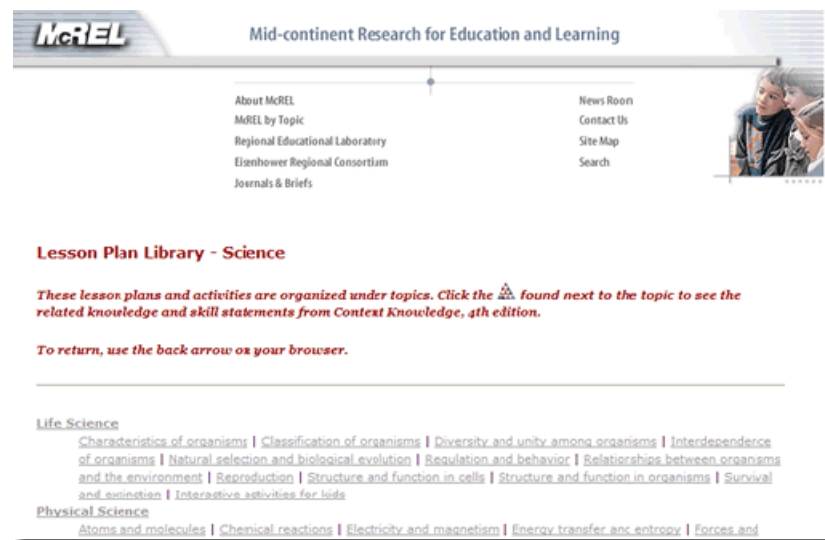
Standards
Resources
Programs
Products
Services
About Us
What's New
Jobs
Copyright Info

Done Internet

start Internet Explorer Inbox - Outlook Express Microsoft PowerPoint ... 10:22 PM

MCREL: Lesson Plans

- Lesson plans aligned with National Standards for Science
 - <http://www.mcrel.org/lesson-plans/science/index.asp>



An illustration in shades of blue and light green. A stylized human figure is riding a dolphin. The figure is holding a telescope to their eye. The background consists of overlapping curved shapes in various shades of blue, with a small light green square in the top left corner. The text "Lesson Plans and Worksheets" is written in white, bold, sans-serif font across the middle of the illustration.

Lesson Plans and Worksheets

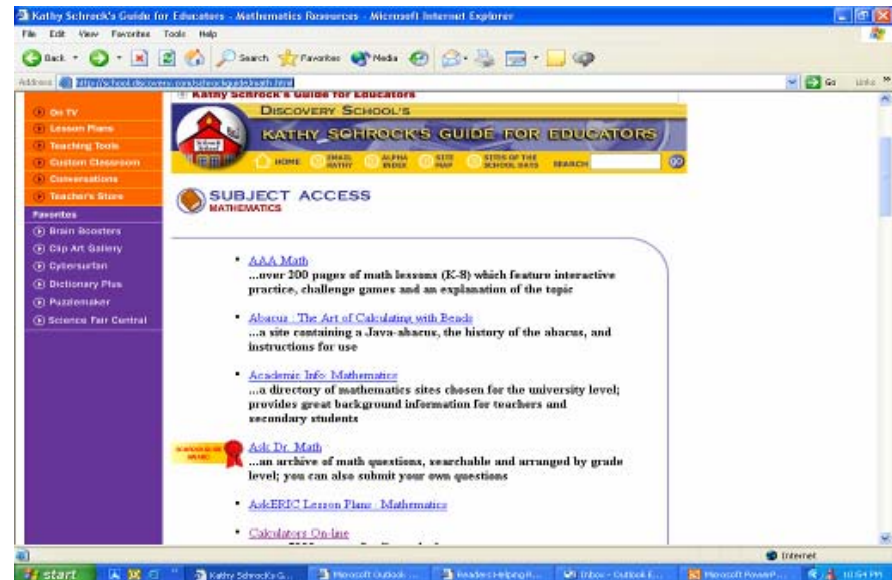
Blue Web'n

- Lesson plans
- Hotlists
- Activities
- Projects
- <http://www.kn.pacbell.com/wired/bluwebn/index.cfm>



Kathy Schrock's Guide to Science

- Lesson plans
- Web resources
- <http://school.discovery.com/schrockguide>



Science Ideas

- Science Ideas
 - Science lesson plans
 - Resources and materials
 - <http://www.teachingideas.co.uk/science/contents.htm#>

Welcome to Teaching Ideas

Today is June 8, 2003

Teaching Ideas

Need to teach children how to use the Web?

Get Free Updates! Home Teaching Ideas Share Your Ideas Search for Ideas Contact Me Print this page

Science Ideas

The table below contains links to (and descriptions of) all of the Science ideas on this site.

There are also links to some wonderful Science toys and games, recommended books about Science, and some links to other useful Science sites.

Search now

Ask Ask.co.uk

Key for symbols used on this page:

📅 Suggested for Ages 5-7 📅 Suggested for Ages 7-11 📅 Suggested for Ages 9-11

Age ranges are only suggestions, and many activities can be modified to fit children of different ages. To find out what the other symbols mean, click [here](#).

General Science Ideas / Resources

Science Toys and Games
in association with Amazon.co.uk

Ant World
Ant World is the perfect pet for your classroom! A wonderful way of encouraging children to be responsible for other creatures.

PBS TeacherSource

- Lesson plans
- Web resources
- Best practices
- <http://www.pbs.org/teachers/>

The screenshot shows the PBS TeacherSource website interface. At the top, there is a green header with the PBS logo and the text "PBS TeacherSource". To the right of the header, it says "Be more inspired PBS". Below the header, there is a navigation bar with links for HOME, SITE GUIDE, TV FOR TEACHERS, TECHNOLOGY & TEACHING, EMAIL NEWSLETTER, GET LOCAL, and MY PROFILE. The main content area is divided into several sections. On the left, there is a search bar with the text "Find 3,000+ free lesson plans and activities" and a "Go" button. Below the search bar, there is a "Browse by Subject" section with a list of subjects: ARTS & LITERATURE, HEALTH & FITNESS, MATH, SCIENCE, SOCIAL STUDIES, PRE K-2, and LIBRARY MEDIA. In the center, there is a "Science" section with the date "Wednesday, June 8, 2005". Below the date, there is a search prompt: "To view lesson plans and activities, select a grade range and topic below:". There are two dropdown menus: "High School (9-12)" and "And Select a Topic". Below the dropdowns, there is a "GO" button. To the right of the search area, there is a "Personalize TeacherSource" section with the text "Save time! Get quick access to your most relevant content for subject, grade level, and location by personalizing this site." and a "Create a profile" button. Below this, there is a "Login below:" section with fields for "Username" and "Password", and a "Login" button. At the bottom of the page, there is a "Featured Lessons and Activities" section with a link to "Secrets of the Ocean Realm" and a brief description: "Examine the biology and ecology that make up the..."

Science Worksheets

- Teachnology

- <http://www.teach-nology.com/worksheets/science/>

teAchnology
THE WEB PORTAL FOR EDUCATORS

Search Go Newsletter Enter Email Submit

The Art and Science of Teaching with Technology


Our Memberships

GOLD	PLATINUM	SILVER	SUPREME
<ul style="list-style-type: none">Teacher Resources<ul style="list-style-type: none">CurriculumLesson PlansOrganizersRubricsTeaching ThemesWorkbooksWorksheets	<ul style="list-style-type: none">Teaching Tools<ul style="list-style-type: none">Class MakersCollege ProgramsMonthly GuidePrintablesTeacher ToolsWeb Site MakerWorksheet Tool	<ul style="list-style-type: none">Teacher Talk<ul style="list-style-type: none">CraftsDaily HistoryMessage BoardTeacher SitesTeaching IdeasTutorialsWeekly Poll	
<ul style="list-style-type: none">Teaching Reviews<ul style="list-style-type: none">Best SitesDownloadsGamesHomeStudent SearchSubject MatterTeacher Research	<ul style="list-style-type: none">Memberships<ul style="list-style-type: none">Membership TourGoldPlatinumSilverSupremeCompareSite Licensing	<ul style="list-style-type: none">Services<ul style="list-style-type: none">Free CatalogFree NewsletterGlossaryHelpTell-a-FriendSite MapShare Us	

Science Worksheets

- The Science Spot

- <http://sciencespot.net/>
- Activity Sheets
 - <http://sciencespot.net/Pages/classwksts.html#Astronomy>



The Science Classroom
Lessons, links, & more!

The Science Club
Project ideas for clubs or classes!

Daily Science Trivia
A great class starter!

The Puzzle Corner
Word searches, crosswords, & more!

The Reference Desk
Find new resources for science & more!

The Nature Center
Explore the wonders of nature!

Power of Technology
Highlights from my workshops!

The Idea Factory
Share your favorite teaching tips!

Other areas to visit ...

- Site Highlights • Career Center • Roach Central •
- Site Awards • Mrs. T's Tidbits • FAQ •

An illustration in shades of blue and light green. A stylized human figure stands on the back of a leaping dolphin. The figure is holding a telescope to their eye. The background consists of overlapping curved shapes in various shades of blue, suggesting a horizon or a stylized landscape. A thin light green horizontal bar is at the top left and bottom left corners.

Online Projects: WebQuests

What Is a WebQuest?

A **WebQuest** is an inquiry-oriented activity in which most or all of the information used by learners is drawn from the Web. WebQuests are designed to use learners' time well, to focus on using information rather than looking for it, and to support learners' thinking at the levels of analysis, synthesis and evaluation. The model was developed in early 1995 at San Diego State University by [Bernie Dodge](#) with [Tom March](#).



WebQuest Matrix

- WebQuest projects in science
- <http://webquest.org/>

MATRIX OF EXAMPLES: TOP

This is a select list of WebQuests that have been evaluated and found to be good examples of the WebQuest model.

Click on a number to see a list of titles and descriptions for each level.

To suggest new additions to the list, go [here](#).

	K-2	3-5	6-8	9-12	Adult
Art & Music	3	8	27	22	8
Business	0	1	7	5	0
English/Language Arts	9	42	64	109	17
Foreign Language	0	1	7	13	3
Health/PE	1	7	11	9	6
Life Skills/Careers	0	5	17	28	8
Math	0	13	24	23	2
Social Studies	5	73	105	130	16
Science	19	44	67	57	9
Professional Skills	0	0	5	7	22
Technology	3	12	31	31	14



Student Resources and Activities



Great Plant Escape

- Online activities and mysteries
- <http://www.urbanext.uiuc.edu/gpe/gpe.html>



The screenshot shows the homepage of 'The Great Plant Escape' website. At the top, it says 'UNIVERSITY OF ILLINOIS EXTENSION' on the left and 'TEACHER'S GUIDE CREDITS' on the right. The main title 'The Great Plant Escape' is in large green letters, with a magnifying glass icon over the word 'Plant'. Below the title is a navigation bar with links: 'HOME • CASE 1 • CASE 2 • CASE 3 • CASE 4 • CASE 5 • CASE 6 • GLOSSARY • LINKS'. The main content area has a yellow background. On the left, there is a cartoon detective in a blue coat and hat, holding a magnifying glass. To the right of the detective, the text reads: 'Welcome to the Great Plant Escape! My name is Bud. My good friend Sprout and I are helping Detective LePlant on his search. You will find that plants are an important part of your life. We will need your help to find clues, do experiments, and solve problems as we journey into the world of plants. He promises lots of fun, but remember, we're here to solve a mystery! Good luck! We'll be with you all the way!'. To the right of the text is a cartoon illustration of a carrot character (Bud) and a green bean character (Sprout) standing on a red oval. A speech bubble from the bean says 'Choose a case to solve!'.

CIESE Projects

- Collaborative projects
- <http://www.k12science.org/currichome.html>

The screenshot displays the CIESE website interface. At the top, the CIESE logo is visible with the URL www.cieese.org/cieese. Below the logo, the text reads "The Center for Innovation in Engineering and Science Education". A navigation menu includes "Programs", "Curriculum", "News and Events", "About Us", and "Home". The main content area is titled "K-12 Education Curriculum" and contains a paragraph describing CIESE's focus on interdisciplinary projects that utilize real-time data and collaborative projects. Below the text are four icons representing different project types: "Collaborative Projects" (a globe), "Real Time Data Projects" (a line graph), "Projects Using Primary Sources & Archived Collections" (a book and a document), and "Partner Projects" (a hand holding a globe). At the bottom, there is an icon for "Educational Links" (a stack of books).

Explorations 4 Kids

- Experiments
- Scientific Method
- Online resources
- <http://homeschooling.gomilpitas.com/explore/sci.htm>

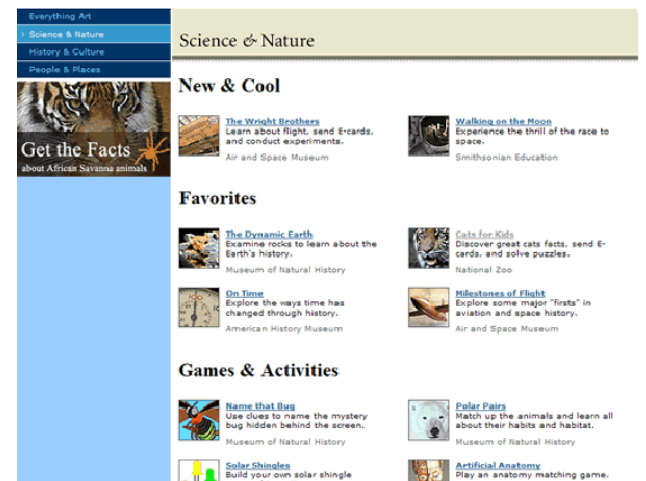


The screenshot shows a website titled "Science Experiments For Kids". On the left is a navigation menu with links for: [Home](#), [Site Structure](#), [Experiments](#), [Field Trips](#), [Games](#), [Mentors and Career Advice](#), [Science Clubs](#), [Science Fair Help](#), [Explorations 4 Kids](#), [Computer Literacy](#), [Drivers Ed](#), [Fine Arts](#), [General Interest](#), [Health & Fitness](#), [Language Arts](#), [Languages](#), [Math](#), [Science Experiments](#), [Astronomy](#), [Biology](#), [Chemistry](#), [Earth Science](#), [Physics](#), and [Social Studies](#). The main content area includes the title "Science Experiments For Kids", a subtitle "Simple, easy, cheap experiments and science fair projects you can do at home using the scientific method.", a note that "Science Fair Help has moved to its own page.", a section titled "The Scientific Method" with a list of 8 steps: 1. Defining the Question, 2. Locating Resources/Gathering Information, 3. Forming a Hypothesis/Hypotheses, 4. Planning Research Collection Methods, 5. Collecting Data, 6. Organizing & Analyzing the Data, 7. Interpreting Data & Drawing Conclusions, and 8. Communicating the Results. Below this is another section titled "The Scientific Method" with a paragraph explaining the process: "It doesn't so much matter which science you chose to study, but that you use the scientific method: chose a problem you'd like to explore, then come up with a plan on how you'll test your theory. Collect data and analyze that data against data from a control group. Form an hypothesis or conclusion."

Smithsonian for Students

- Favorite sites
- Games and Activities
 - Science & Nature

http://www.smithsonianeducation.org/students/explore_by_topi/c/science_nature.html



Any Questions

Houghton Mifflin Harcourt
<http://www.hmlt.hmco.com/>

