

TECHNOLOGY DRIVERS MATRIX

TECHNOLOGY DRIVER	DEFINITION	EXAMPLE	IMPACT ON INSTRUCTION	NEEDS	FREQUENTLY USED TERMS
1. Instructional Learning Tool	Using technology to directly deliver instruction and to disseminate concepts to students	A computer with software such as Interactive Physics connected to a large-screen monitor demonstrating laws of physics.	Students can visualize and/or experience concepts that are abstract.	Teachers need equipment (computer, videodisc player), software, and a way to show the images (LCD panel, projection system) to a group.	Computer Hard drive LCD panel Projection system TV connector Megahertz Disk drive CD-ROM drive
1.1 Computer-assisted instruction Computer-based Training (CAI/CBT)	Programs that define concepts, and allow students to read about ideas and solve problems	Student learning about algebraic notation at a computer with opportunity to input answers to questions and have them checked.	Students can remediate, accelerate, or strengthen skills, or explore new concepts.	CAI/CBT can be used on stand-alone systems or networked systems. Software is purchased specifically for each use.	CAI CBT
1.2 Multimedia and presentation software	Software that uses more than one media and usually includes graphics, animations, sound and/or text for display.	Students use Understanding Earth CD-ROM to collect images of volcanic action for a demonstration report	Multimedia and presentation software provide visual enhancement for verbal explanations.	Equipment to display the multimedia materials. Software for presentation	Multimedia Videodisc Powerpoint Persuasion Sound card
1.3 Integrated Learning Systems	Comprehensive programs that develop concepts for students with interaction, assessment, and recordkeeping.	Students scheduled to work in the computer lab 30 minutes each day developing math skills. Teacher-facilitator can access their files to check progress.	Using effective strategies with ILSs, remediation and skill development can be successful. Materials must be correlated with curriculum.	A networked computer lab or 5 computers in a classroom with current software, regular maintenance, and effective scheduling. Long-term support is needed for updates.	ILS Computer Lab Lab aide
1.4 Simulations, models, and visualizations	Programs or coding that provide electronic directions to simulate real situations, laws, or concepts.	Videodisc images of tectonic plate movement. Graphic simulation of generations of fruit flies. Real-world math vignettes for problem solving.	Allows students to see, explore, and change variables for systems too expensive, dangerous, or time consuming to use in a classroom.	Software that has been evaluated and correlated to standards with equipment needed to use it.	CD-ROM Program Videodisc Code

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1.5 Connected Communities of Learners for Sharing/ Networking and Distance learning	Connecting users with technology via email, Internet, satellite, or other connected voice, video or data equipment.	Students from multiple schools take an AP Calculus course from the same instructor using two-way interactive video.	Experts can teach courses for many and follow up with email communications to individual students. A few students in many locations can learn from and ask questions to an off-site expert.	Two-way video, two way audio, Internet, satellite connections, email, or a combination of these.	Distributed Learning Asynchronous Synchronous
1.6 Webquests- searching, analysis, and synthesis	Searching for instructional activities on the World Wide Web	Students search the Web for information on tessellations with care to use quality sources.	The Web offers current information and can be used to enhance students' ability to accept only quality resources	A computer and access to the World Wide Web. Strategies to isolate quality information and an AUP	CAI CBT
2. Tool for Productivity and Communication	A program, data, or resource that can be manipulated by the user to indirectly support teaching and learning and to communicate with others,	Students and teachers using the World Wide Web to for project-based research and word processing software for preparing a report.	Allows collection, storage, and analysis of information and resources.	Software and relevant equipment for use	Word Processor Database Spreadsheet MBL URL Email CBL WWW
2.1 Word Processing	Software that allows creating, typing, editing, and formatting online.	A group of students collaborates to create a newspaper report.	Students write more and edit their work more thoroughly when word processors are available.	Software and relevant equipment. Integrated software is especially effective	Word Works WordPerfect Control key Page Layout Master Document Integrated software
Spreadsheet	Software that allows insertion of formulas to automatically calculate and graph quantities of values.	A class inputs data for each cooperative group and can see a graph representing input from the whole class.	Large numbers of data points can be handled quickly allowing students time to analyze and synthesize based on their experimentation.	Software and relevant equipment. Integrated software allows easy insertion of spreadsheets into reports.	Cell Row Column Integrated software Formula
Presentation Software	Software that allows users to create and present a slide show report with sound, animation, and graphics.	A group of students develops a PowerPoint presentation to accompany their final project. They include new information five minutes before their presentation.	Students, teachers, and administrators can develop professional-looking presentation and alter them quickly when	Software and relevant equipment, a display system (LCD panel or projection system)	Slide show Notes pages Slide sorter Transition

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2.2 Internet (includes World Wide Web, email, threaded discussions)	An extensive network of worldwide computers that allows rapid communication and information dissemination.	Students download NOAA data on the Chesapeake Bay for water quality studies.	Students can use real data and perform analysis as real scientists and mathematicians do.	Internal or external access to the Internet, Connections from access hardware (computers, PDAs, terminals) to the Internet provider, browsing software.	WWW Email Threaded discussion PDA Terminal Browser
2.3 Programmable Handhelds and Graphing Calculators	Graphing calculators and small computers with limited storage that can be used in the field or classrooms.	Students take their handhelds on a field trip to collect data and perform analyses.	Students and teachers can take advantage of technology-based data analysis without requiring direct access to computer.	Handheld devices Special instructional programs for downloading to the device	Handhelds Graphing Calculators PDA
2.4 Probeware	Special sensor devices that can be connected directly to a computer, calculator, or programmable handhelds.	A temperature probe connected to a graphing calculator is used to measure and graph temperature changes for a fermentation experiment.	Students and other visual learners can see the graphic representation of collected data immediately upon collection.	Graphing calculators or PDAs with probeware that collects data. Laptop and desktop computers can also be used.	Probeware MBL CBL
2.5 Assistive technologies	Equipment or software that improves the functionality of disabled individuals. (more than 20,000 types are available)	A dyslexic student uses a Kurzweil machine to read and take a test.	Students with disabilities can be included in all educational environments with assistive technologies.	Specific assistive hardware or software to meet disabled person's needs.	Assistive technology Kurzweil machine
2.6 Telementoring	Providing mentoring or information using technology connections.	A student investigates an unique rock formation by "asking a geologist".	Students and staff have access to a wide variety of expertise and current information.	A computer with Internet capability.	Telementoring

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3. Instructional content	Computer Science including hardware, networking, programming, and systems.	Students learn C++ and excel on the AP Computer Science exam.	Programming enhances logical, stepwise thinking skills. A+ certification prepares students for working.	Hardware to support one student to one computer access. Networked systems. Trained/certified staff.	Programming Applications Computer science Systems MCP A+ MCSE
3.1 Computer Literacy	Understanding about and knowing how to use computers and peripherals.	Schools, following the Technology Standards, provide students with age-appropriate computer skills such as keyboarding and how computers func-	Comfort using the computer prepares students for higher education and the world of work.	Technology objectives written into the curriculum, computer access and software to support the objectives. Computer labs and 4-5 computers in a classroom can be effective.	Applications Keyboarding Scanner Digital Camera CPU Monitor DVD drive
3.2 Productivity Applications	Word processing, database, spreadsheet, graphics, Web design, presentation software	Students learn simple word processing techniques to prepare and format a business letter.	Application tools allow students to create and edit, store information, and analyze data with ease not previously available. Their work is more thorough as a result.	Access to hardware with installed software and a printer. Equity requires non-school-time access for those without home computers.	Word processor Database Spreadsheet Presentation software Graphics software Web design tool
3.3 Telecommunications Applications	The various Internet telecommunications functions including email, World Wide Web, and file transfer protocols.	Students learn the basic steps for accessing the Internet and for performing searches.	Understanding basic telecommunications enables students to access and use the variety of Internet resources.	A computer and Internet access through a network or telephone line. Strategies to isolate quality information and an AUP	Internet World Wide Web Email Web Browsers Modem AUP
3.5 Website Design	Developing a World Wide Web page using HTML or design tools.	Students use Flash to animate their graphics for a Web page.	Students understand the process necessary to design, upload, and maintain a Web site.	A computer connected to an Internet provider and a Web server. Graphics software is needed for some sites.	WWW Web Web design tools HTML Java

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4. Resource for Professional Development	Disseminating quality educator training and development involving technology.	Columbus teachers take a credit course in technology integration from Syracuse University.	Teachers can take an online courses from experts at their convenience. Technology can support connected networks of teachers to share and discuss classroom practice	Technology access must be provided through a single computer or a lab. Central training centers are cost effective but require teachers to travel. Certified instructors are critical.	Distributive Technology Online course Satellite course
4.1 Technology Competency Training	Ability to use technology as a teaching and communicating tool and knowledge of Technology Standards requirements, an understanding of how to find resources on the Web. States often have their own requirements	A first year teacher uses <i>Geometer's Sketchpad</i> in her math class. A science teacher uses <i>How Stuff Works</i> to demonstrate a diesel engine. Students collaborate with others nationwide on the <i>Journey North</i> project.	Ready access to well-maintained hardware, resources, and professional development increases the probability that teachers will use technology.	Appropriate technologies and training opportunities must be delivered in settings that are easily accessible to teachers. Adequate opportunities for school- and classroom-based uses and follow-up support are also critical.	Computer literacy Integration
4.2 Delivery of instruction	Access to professional development instructional activities in real-time or individualized delivery using distance learning.	Teachers in six states take a professional development course without having to leave their individual school sites.	Use of technology to support school-based professional development negates need for off-site coursework and is consistent with latest research on professional development methodologies.	Appropriate distance learning tools (computers, video, etc.) are essential for use by teachers in school or home settings along with multiple scheduling options.	Curriculum Integration Instructional technology
4.3 Access to instructional resources	Identifying, evaluating, and acquiring instructional resources that are available school/district wide or through the	Teachers go on-line to learn more about genetics and to identify new materials before preparing a student learning activity.	The use of technology to access instructional resources for professional development and preparing learning activities builds capacity.	Teachers require the appropriate technologies to access and download identified resources.	File Transfer Protocol (FTP) Evaluation Protocol Rubric

uces.

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5. Management, Integration and Involvement Support	Providing school-based information for analysis, decisionmaking, communicating, and administrative recordkeeping.	Teachers download student data from the system mainframe and analyze individual student needs for reinforcement.	Student needs can be identified and addressed immediately after assessment. Schools can more easily engage in data-driven decision making for school improvement.	A Student Information Management System that provides varied levels of access and information in a variety of formats. A teacher computer (or terminal) connected to the mainframe or central sys-	SIMS Mainframe Terminal Download
5.1 Accountability/Data Management/	Student data used to determine student progress toward goals	Disaggregated state assessment scores for students are stored and reported by school and classroom and are used to target instructional enrichment activi-	The effectiveness of intervention and special programs for raising student scores can be tested and evaluated more effectively.	Administrators, teachers, and parents should be able to access data in a useful form using school hardware. Professional development in interpreting data may be required.	
5.2 Administrative support	Scheduling, attendance, grading, and other administrative tasks using technology provide accurate, lasting records.	A science coordinator emails each department chair about a mini-grant opportunity recently announced.	Email allows communication that a teacher can access and respond to at his or her convenience. Electronic recordkeeping frees staff to work more with students.	Ideally, each teacher should have a computer on his or her desk that is connected to a server that has Internet access, an email account, and stores needed information.	
5.3 Assessment support	Using technology to store and administer tests with data made available for analysis.	Students take a preliminary SAT test, look at results and work to improve areas of weakness.	Teachers can look at and analyze student test results to determine areas of requiring reinforcement.	Teachers need the appropriate technology for easy access to the data as well as some assistance with analyzing the results	Computer adaptive testing
5.4 Parental communication and community engagement	Providing an opportunity for the community to communicate with schools and access educational information.	Parents access the school web site to review a curriculum to find out what their student will be learning or to look at today's	Informed parents are more supportive of schools and more involved with their students' education.	Community access to computers or terminals connected to the schools information system. Providing access in libraries, supermarkets, churches creates equity.	

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6.1 Groupware	Word-processing and communications software that allows input from a variety of users simultaneously	A group of students in several locations actively design apparatus for a project.	Group learning and activities can occur among students who are widely distributed.	Groupware software and a computer for each user that is connected with those of other users	Groupware
6.2 Artificial Intelligence	Programming that simulates human processes and/or understanding.	A computer "understands" how a student learns best and presents new content using appropriate strategies.	AI can provide individualized instruction accommodating several student learning needs simultaneously.	Computer with extensive memory and appropriate software	AI
6.3 Multiuser Virtual Environment (MUVE)	A virtual environment that more than one person experiences simultaneously	Three students set-up and perform an potentially explosive experiment without any risk.	Groupwork with 3-D virtual images provide realistic environments instead of 2-D pictures.		MUVE Virtual reality
6.4 Smartcard	A credit card with health, education, and other information imprinted	A migrant student carries her medical and educational history on a credit	Students who are mobile waste little instructional time waiting for records.	Equipment that can imprint and read smartcards.	

TECHNOLOGY INFRASTRUCTURE & CONNECTIVITY

I. CONNECTIVITY

Wide Area Networks (WAN)	Wiring that connects computers, printers, and other peripherals across a distance.	A district-wide network that allows teachers access to student data stored on a central- office main-frame.	Rapid sharing of information with maximum control and security options.	Cabling that follows a networking map connecting locations with hubs, routers, and hardware	WAN T1 Fiber T3 Hubs ISDN Routers Cables
Local Area Networks (LAN)	Wiring that connects computers, printers, and peripherals in a single location.	A networked school with PC and MAC computers in classrooms, workrooms, the office, and media center	Students can share files and data; teachers can keep automated records, and administrators can communicate with everyone efficiently	Cabling using a wiring map in a building connecting equipment, hubs, routers, and wiring closets.	
Wireless networks	Networks that use radio or microwave signals to communicate.	Students using laptop computers or handheld devices anywhere in their school without cabled connections.	Students and teachers have the freedom of using technology and the schools' resources at any time or any place.	Receivers connected to 10Base-T connector and existing wired network. They must also be connected to an electrical outlet. Some systems require computer connectors to access the network. Speed and security are issues.	Ethernet 10Base-T PCMCIA card Microwave IR GHz Roaming Station Adapter Access Point
Internet	An extensive international network of interconnected computers allowing user access to all through email and/or a browser (software). Email enables sending messages and files to other Internet users. The World Wide Web is an Internet application using either Netscape or Windows Explorer browsers for access to information	Students researching the most recent NASA exploration. Teachers using the NASA site to locate standards-based activities for all age groups.	The Internet opens unlimited opportunities for students to do research, exchange information, and participate in ad hoc and organized discussion groups.	A computer that is connected by modem or other connection to an Internet provider that connects to the Internet. A domain name, if establishing a WWW site.	Modem Internet WWW T1 T3 ISDN PCMCIA Internet provider Browser Bandwidth
Cable, telephone, satellite	Alternate types of connectivity for telecommunication and the Internet	Students can see full motion video using the Internet.	Wide bandwidth provides access options not available using T1 or T3 lines. Two-way video supports distance learning.	Appropriate hardware (monitors, telephone lines, satellite dishes, cable hooks, etc.) for the type of application.	Bandwidth Telecommunications Full-motion video

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2. HARDWARE					
Computers with peripherals	A central processing unit with input and output capabilities including drives, memory, ports, video connectors, sound cards, and an operating system.	Desktop units usually include detachable keyboards, monitors, and printers (inkjet, bubblejet, laser, or color).	Students and teachers can store and exchange data on the computer and prepare and print reports. Computers can be used for direct instructional	Computers should be upgraded as often as every three years. Older machines can still be used. Larger monitors are useful for graphics. Inkjet and bubble-jet printers are utilitarian. Laser printers give the best quality print.	MHz GB CD-ROM Windows Pentium
Videodisc players	A single or double-sided player for laser disks that provides random access to 52,000 images on each side of the disk	Middle-school students viewing a problem-solving vignette from Science Sleuths that requires data gathering, analysis, decision making, and teamwork.	Images, video-clips, vignettes can be shown in any class to provide quality real-world images for visual learners.	Videodisc players must be connected to either a television or projection system for use with students.	Videodisc Laserdisc Videodisc player Analog images Random access Barcode reader
Programmable handhelds	Graphing calculators, handheld computers, and other personal digital assistants (PDAs) that allow data manipulation and some data storage	Science students using flow-rate probes connected to graphing calculators measure varying stream rates over a year's time. Data is stored, analyzed and shared on the Internet to produce watershed profiles.	Graphical representation through this cost-effective technology of math concepts helps students develop understanding and allow them to explore variables in real time.	Graphing calculators, personal digital assistants, probeware, and connectors.	PDA Probeware MBL CBL
Assistive technology	Equipment to improve functionality for disabled individuals.	Teachers use translators to change text files into Braille for blind students.	Disabled students can become part of more mainstream educational experiences.	Technology and/or software that supports student needs.	Assistive technology
3. DISTANCE LEARNING					
	Providing synchronous or asynchronous teaching from a distant location.	A master teacher provides an AP Calculus course to several students at each of 3 high schools.	Distance learning provides widely separated students the opportunity to take courses from experts.	Simple systems can use eye-ball cameras, CUSeeMe, and the Internet. More complex systems offer two-way video and audio to several sites.	Eye-ball camera CUSeeMe Synchronous Asynchronous
Satellite	An earth-orbiting object that relays signals to receivers in other parts of the world.	American students can see and converse with students in other parts of the country or other continents in real time.	Teachers and students can see and hear from national experts or people from other cultures to expand their understanding.	Users must purchase or gain satellite time and have video and audio equipment able to download information.	Air time Satellite

INFRASTRUCTURE ISSUE	DEFINITION	EXAMPLE	IMPACT ON INSTRUCTION	NEEDS	FREQUENTLY USED TERMS
Video Internet Cable Combination	Voice, video, and data combined delivery systems for users to access.	A student takes a college course at night after work. She can interact with the professor, deliver her work, and comment on a peer's paper anytime.	Students can increase understanding of topics in a convenient time and place while taking advantage of teacher expertise.	Users must be connected to/by the system of choice	Webcourse Asynchronous
4. USER COMPETENCIES	The minimum user skills (both faculty and student) that are a prerequisite for operating specific technology applications. Teacher competencies include skills to support student users.	A principal analyzes student data by grade (using a spreadsheet). She uses presentation software to present the year to the PTA. Her messages to staff are emailed in a timely manner.	Developing a wide array of user competencies among both students and faculty increases the effective use of technology. User competencies can be built upon and expanded over time.	Administrators should be included in staff development. Knowledgeable students can provide effective technology support.	Technology leadership
5. POLICY	Directives from school boards or governing organizations that create long-term operational standards	The school board adopts an acceptable use policy (AUP) to govern how students can access the Internet and World Wide	Students and parents know about, accept, and expect guidelines for district technology.	Policy recommendations from school system, documentation, education about the needed policy, and follow-up.	Acceptable Use Policies (AUP)
6. TECHNOLOGY PLANNING	Directives from school boards or governing organizations that create long-term operational standards	The school board adopts an acceptable use policy (AUP) to govern how students can access the Internet and World Wide Web.	Students and parents know about, accept, and expect guidelines for district technology.	Policy recommendations from school system, documentation, education about the needed policy, and follow-up.	Acceptable Use Policies (AUP)

SAMPLE TECHNOLOGY RESOURCES

RESOURCE	URL/ACCESS INFORMATION	INSTRUCTIONAL LEARNING	PRODUCTIVITY	INSTRUCTIONAL CONTENT	PROFESSIONAL DEVELOPMENT	MANAGEMENT	EMERGING TECHNOLOGIES
A.D.A.M.; Human physiology software that allows visualization of all layers of the human body	http://www.education.adam.com/support/s_faq.htm	✓			✓		
APEX: Offers online AP courses for students.	http://www.apex.netu.com/	✓	✓	✓			
Ask Dr. Math: Available through The Math Forum, one of the most comprehensive math Web sites available.	http://forum.swarthmore.edu/dr.math/dr-math.html	✓		✓			✓
AUP: Acceptable Use Policies: A list of AUP links from the WV state Dept. of Ed.	http://access.k12.wv.us/manual/urlaup.htm	✓			✓	✓	
Creating the Active Classroom: A 2-CD-ROM set that demonstrates standards-based science teaching strategies, including some for ESL. A just-in-time professional development tool.	Decision Development Corp: 800-835-4332				✓		
C3 Physics- a non-traditional physics course using technology that integrates physics concepts and is based on materials and concepts known to help students understand physics.	Comprehensive Conceptual Curriculum for Physics, University of Dallas, 1845 E. Northgate Drive, Irving, Texas 75062-4799 1-800-526-8472	✓			✓		
CBL and MBL resources for classroom use: Resources for TI and Casio calculators and computers. PASCO materials are also included.	http://curie.uncg.edu/tt/workshops/agendas/mblcblresources.html		✓		✓		✓
CLASS: Online high school courses from University of Nebraska. Eleven math and science courses are offered.	http://class.unl.edu/final_web/index.html	✓		✓	✓		
Cyberschool: A collection of high school credit courses taught entirely using Internet. Housed in Eugene Oregon, the program offers more than 40 courses.	http://www.cyberschool.k12.or.us/	✓		✓	✓		

RESOURCE	URL/ACCESS INFORMATION	INSTRUCTIONAL/LEARNING	PRODUCTIVITY	INSTRUCTIONAL CONTENT	PROFESSIONAL DEVELOPMENT	MANAGEMENT	EMERGING TECHNOLOGIES
		✓	✓	✓	✓		✓
Explorasource: A searchable database of more than 500 suppliers of instructional materials	http://www.explorasource.com	✓	✓		✓		
		✓	✓	✓	✓		
Geometric Supposer: By Sunburst, this software allows students to draw and manipulate any shape easily.	http://www.serve.org/seir-tec/hardsoftware.html						
Gradebusters: Gradebook software for PC and MAC that was written by a teacher for teachers. Try the trial version online.	http://www.gradebusters.com/		✓		✓		
Hardware/software specifications: A list of four state's hardware and software specifications provide a starting point for planning.	http://www.serve.org/seir-tec/hardsoftware.html	✓	✓	✓	✓	✓	✓
How Stuff Works: A WWW site that describes and has graphic simulations for natural, industrial, and personal processes.	http://www.howstuffworks.com/	✓	✓		✓		
Integrated Learning Systems (ILS); CCC (Successmaker); Advantage by Jostens (now CompassLearning), Interactive Physics: Software from MSC Software that allows students to explore laws of motion and change variables. Simulations create all aspects of motion and create models.	http://www.workingmodel.com/products/ip.html	✓			✓		
Jason Project: A project that allows students to explore undersea and land resources worldwide. Jason integrates math, science, language arts, and social studies for upper elementary and middle school students.	http://www.jasonproject.org/	✓			✓		

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Laptop Schools: An online database of schools that use laptops. School stories are included.	http://www.microsoft.com/education/aal/search.asp				✓	✓	
LNT-Leadership and the New Technologies: A series of online workshops for educators including seven technology courses and online course resources for development.	http://www.edc.org/LNT/workshop.htm			✓	✓		
MAIS: An organization with a collection of online courses for educators.	http://www.maisplace.org/courses.htm			✓	✓		
					✓		
Mid-level Network: Urban Middle Grades Reform Network includes newsletters, a listserv, and resources for mid-level students.	http://www.nmsa.org/ http://ericeece.org/listserv/middle-1.html	✓	✓		✓		
Microsoft's Lesson Connection. Download a tool (Lesson-Plan wizard) to correlate Internet-available lessons to your standards/ and or curricula. The database can be available on your web site for teachers.	http://www.k12.msn.com/LessonConnection/AdministratorHelp.asp	✓			✓		
MiniTab: Statistics software that provides a variety of analysis tools	http://www.minitab.com/contacts/index.htm	✓				✓	
National Center for Technology Planning: Larry Anderson's comprehensive site dealing with all aspects of technology planning. This site contains a Guide for Technology Planning and it's companion, Revising Technology Plans.	http://www2.msstate.edu/~Isa2/index/html					✓	
NOAA and other U.S. Geospatial and attribute data: A wide variety of real data that can be used for student analysis.	http://www.cast.uark.edu/local/hunt/index.html#FLOOD	✓			✓		
NSF Framework for Review of Instructional Materials: A comprehensive rubric for determining the quality of instructional materials	From National Science Foundation, Directorate for Education and Human Resources' Review of Instructional Materials for Middle Schools, February 1997	✓	✓		✓		

RESOURCE	URL/ACCESS INFORMATION	INSTRUCTION/LEARNING	PRODUCTIVITY	INSTRUCTIONAL CONTENT	PROFESSIONAL DEVELOPMENT	MANAGEMENT	EMERGING TECHNOLOGIES
Online tutoring: A new web site that provide online expert tutors for students. The search is free, but there are tutoring charges	http://www.tutor.com/	✓					
Phoenix Academies: A distance learning institution in business since 1969, with print-based courses, self-paced Internet courses, and World Wide Campus Online. Phoenix has enabled thousands of students to graduate from high school, offering accredited courses in 15 areas. Four online high school math courses are offered.	http://www.phoenixacademies.org/	✓					
Robotics: Lego robotics with a comprehensive web site.	http://www.object-arts.com/wiki/html/Lego-Robotics/FrontPage.htm	✓		✓	✓		✓
Science Sleuths and Math Sleuths: Two CD-ROMs with two real-world vignettes on each. There are six levels of difficulty for each problem. Each requires students to problemsolve to find the solution.	https://www.videodiscovery.com/vdyweb/school/catalog/SSI.htm/	✓			✓		
Sim City; Sim Farm: Software allows students to design a city or farm and visualize the effect of natural disasters Maxis, Inc.	http://www.simcity.com		✓		✓		
Spreadsheets, databases and other tools for classroom use. Microsoft presents online lessons for tool use and productivity.	http://www.microsoft.com/education/tutorial/classroom/default.asp		✓		✓	✓	
Teacher Change, Improving Mathematics: A CD-ROM with professional development tools and workshop activities	Eisenhower National Clearinghouse: 800-621-5785 http://www.enc.org				✓		

RESOURCE	URL/ACCESS INFORMATION	INSTRUCTION/LEARNING	PRODUCTIVITY	INSTRUCTIONAL CONTENT	PROFESSIONAL DEVELOPMENT	MANAGEMENT	EMERGING TECHNOLOGIES
Texas Instruments-Research about and resources for graphing calculators.	http://www.ti.com/calc/docs/resource.htm http://www.ti.com/calc/docs/calchome.htm				✓		
Toolkit for Professional Development; Learning from the Best : an online outline for quality professional development by Emily Hassel	http://ncrel.org/pd/toolkit/htm				✓		
Toshiba Laptop Program: Cooperative venture with schools. Research shows improved student output quality and learning.	http://www.intouchlearning.com				✓		
Using Technology in Professional Development; A list of seven online articles about successful practices, planning, applying technology, and the future of networking	http://www.ncrel.org/pd/tech/htm				✓		
Vernier: A company that supplies interface boxes for computers and calculators, probes of all kinds, and classroom materials for probeware investigations.	http://www.vernier.com	✓	✓		✓		
Virtual Fly Lab: An online fruit fly breeding simulation.	http://vcourseware5.calstatela.edu/VirtualFlyLab/IntroVflyLab.html	✓			✓		
Virtual High School: Concord Consortium offers more than 100 high school courses and professional development online.	http://www.concord.org/	✓	✓		✓		
Virtual Resource Site for Teaching with Technology : A web site with ideas for teaching online courses with technology by type of hardware or learning styles.	http://www.umuc.edu/virtualteaching/	✓	✓	✓	✓	✓	✓
Web Sites and Resources for Teachers; A collection of K-8 resources including lesson plans, virtual museum trips, instructional resources, online activities compiled by professors at California State University, Northridge. All contents are included.	http://www.csun.edu/~vceed009/				✓		