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Section 5: Exploring New Frontiers

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THE NORTHWESTNET USER SERVICES INTERNET RESOURCE GUIDE

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Note: commands you type are shown in the left hand column in lower case (don't type the #'s!); UPPER CASE and ">" indicates prompts from the computer that will appear on your screen.

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3) PASSWORD: your-user-id@address	At the "PASSWORD:" prompt, please enter your user-id@your.full.internet.address (e.g., robessin@uwvvd.derrg.edu).
4) FTP> cd nic/nwnet/user-guide	Change directories (cd) to the directory containing FTP copies of NUSIRG.
5) FTP> get README.nusirg	Use the "get" command followed by a filename from the list on the next page to copy a file; get "README.nusirg" first, which contains the most up-to-date information about NUSIRG files.
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Files in the NUSIRG directory	Description of file's contents
README.nusirg	A detailed description of NUSIRG files.
nusirg,Index.ps	Index for all of NUSIRG
nusirg.Index.txt	
nusirg.about.nwnet.and.aup.ps	NWNET & NSFNET backbone information and policies
nusirg.about.nwnet.and.aup.ps	
nusirg.beginner.overview.ps	Overview of NUSIRG and the Internet.
nusirg.beginner.overview.txt	
nusirg.email.ftp.telnet.ps	Basic Internet tools: e-mail, FTP, TELNET and Archie
nusirg.email.ftp.telnet.txt	
nusirg.listserv.usenet.ps	Using USENET and LISTSERV.
nusirg.listserv.usenet.txt	
nusirg.online.info.resources.ps	On-line books, libraries, databases, WAIS, and directory services
nusirg.online.info.resources.txt	
nusirg.supercomputers.ps	Supercomputer use and access information.
nusirg.supercomputers.txt	
nusirg.teach.k-12.ps	The Internet and K-12 education.
nusirg.teach.k-12.txt	
nusirg.whole-guide.ps.tar.Z	All of NUSIRG in compressed and archived format.
nusirg.whole-guide.txt.tar.Z	

Notice that the file names above occur in pairs differing only in the last parts of their names. Files ending with "ps" are in PostScript format and cannot be printed unless you have access to a PostScript printer. You should not copy the files whose names end with "tar.Z" unless you know how to handle compressed and archived files, which is explained in the file "README.nusirg".

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K-12 Education

Unlike the previous sections of NUSIRG which dealt with general purpose Internet tools and resources, the chapter in this section is directed at special subsets of Internet users: K-12 educators and students.

The Internet activities described in this chapter represent rapidly evolving applications of networks for education and research. K-12 educational users are propelling the use of the Internet to new and exciting frontiers.

Chapter 15 : Using the Global Internet in K-12 Education

"Do you know what it is to be alive?"
"It's when you can do things."
"Is a cat alive?"
"Yes."
"A table?"
"No."
"Why not?"
"It can't move."
"Is a bicycle alive?"
"Yes."
"Why?"
It can go."
"Is a bicycle alive when it isn't moving?"
""Yes."
"Is the moon alive?"
"Yes, sometimes it hides behind the mountains."

From a conversation between
Jean Piaget and a seven year old boy
"The Child's Conception of the World"

THE PURPOSES AND USES OF THIS DOCUMENT

In the past few years, there has been increasing growth in the use of statewide, national and even international networks in K-12 education. This chapter provides an introduction to some of the many Internet resources which are of special interest to K-12 educators, as well as a brief overview of other providers who specialize in K-12 networking.

- ❑ If you don't know anything about such networks, you'll be introduced to some of the exciting educational potentials of computer networks.
- ❑ If your school is contemplating becoming networked, you'll gain a greater understanding of who is providing network services, what they offer, and who to contact for more detailed information.
- ❑ If you're already using computer networks, you'll be directed to a wealth of resources which will allow you to enhance the educational value of networks in your school's curriculum.

Much existing network documentation is designed for users at universities and research institutions. The information that a K-12 audience needs is often buried in a tangle of technical references not directly relevant to your purposes. The goal of this report is to focus on network services that are of immediate value to K-12 education.

This primer will prove most useful to schools which have or are contemplating gaining access to a global network called "The Internet." Nonetheless, many of the resources and references included will be useful

for schools using other wide area networks as well, especially if these networks allow direct or gatewayed communication to the Internet.

You'll get the most from this primer if you use it as a K-12 specific supplement to the rest of the chapters of the NorthWestNet User Services Internet Resource Guide (NUSIRG). We suggest that you use the body of the NUSIRG to provide information about how to access and to take full advantage of the major classes of Internet resources (i.e., electronic library resources, electronic books, data bases, and remote computing resources).

INTRODUCTION

Rapid growth is now occurring in computer networks throughout the United States among primary and secondary schools. Many proponents of K-12 education networking have as their goal the connection of a majority of the nation's schools to international computer networks by the end of the decade.

The use of computer networks in primary and secondary education is so new that the typical school is faced with a large number of questions before, during, and after linking to a wide area computer network.

- Why would our school want to connect to a global computer network?
- To what networks can K-12 schools connect?
  - What kinds of educationally relevant services does each network support?
  - To whom can we turn for user services and technical help?
  - What kind of hardware and software do we need?
- To what network should we connect?
- Are there sources of funding to help defray the costs?

And finally, the most important question is:

- How can we make the best use of networks to advantage and enhance our educational curriculum?

Because K-12 networking in particular began in earnest only a few years ago and because the networking world in general is evolving so rapidly, definitive answers to the preceding the questions simply do not exist.

In fact, there may never be definitive answers for many of these questions; and that may be a good thing! Unlike many national, federally sponsored networks which have centralized authority and administration, each K-12 school district serves a distinct and unique constituency. This diversity and plurality will be reflected in the strategies adopted by each K-12 school district, from the technical to the pedagogical. No single solution can be right for everyone.

However, sources of information do exist which will help you make informed decisions about how networks can be used to further the educational goals of your school. The rest of this primer will help you to locate and to use the information you need to answer these important questions.

WHY USE COMPUTER NETWORKS IN K-12 EDUCATION?

Computer networks offer tremendous opportunities for K-12 education.

Educational Opportunities For The Students.

For decades, visionaries have been talking about how telecommunications could lead to "a world without borders," a kind of "global village" in which it is as easy to communicate with someone on the other side of the world as it is to visit a next-door neighbor.

Computer networks can help to make the "global village" a reality for you and your students. With a few keystrokes from the classroom computer, your students can:

- ❏ engage in global dialogue with students and instructors using electronic mail;
- ❏ practice written foreign language skills with native speakers in online discussion groups;
- ❏ participate in, or even initiate meaningful projects which are based on collaboration and cooperation of thousands of students throughout the world;
- ❏ obtain supplemental instructions from online tutorials or enrollment in distance education courses at American or even foreign institutions; or
- ❏ gain "information literacy," a basic understanding of how to navigate in and take full advantage of the networked world into which they will be graduating.

Information and Hardware Resource Sharing

When a school is connected to a full-service, worldwide network like the Internet, it immediately gains access to hundreds of millions of dollars of resources for a very small investment in hardware and software. Networks can be "The Great Democratizer" of educational resources. Even the smallest and most isolated rural school can use the same service enjoyed by the largest and best endowed urban universities.

Examples of what students from a networked school can do from their desks include, but are by no means limited to:

- ❏ accessing hundreds of catalogs of the world's best libraries;
- ❏ instantaneously copying educationally rewarding software and documents from file archives such as Bulletin Board Services;
- ❏ exploring and manipulating complex databases of real research data containing information from agricultural markets, global climate simulations, or even space missions to other planets;
- ❏ enrolling in supercomputer training programs which give students access to the world's most powerful computers.

In Service Education and Teacher Enrichment

The teachers in primary and secondary schools sometimes feel isolated from the peers, professors, and facilities they had learned to depend on throughout their training in colleges and universities. By using computer networks, K-12 educators can:

- ❏ continue their professional contacts formed during their college or university education can
- ❏ increase the number and diversity of and educational resources they use while teaching,
- ❏ participate in continued education by enrollment in universities and colleges which offer distance education programs via networks;

- and, of course, utilize all of the resources listed in the two sections above.

A Quick Caveat

Appropriately deployed and utilized, computers and computer networks can contribute significantly to improvements in America's educational system. With all the ballyhoo surrounding computers in the modern world, it's crucial to remember that although computer networks do have tremendous educational value, taken alone they will not be the panacea for America's educational system.

The quality of life in our world is more dependent upon the development of day-to-day, interpersonal skills, and on nurturing basic skills such as "reading, writing, and arithmetic". Computers and computer networks are a blessing only insofar as they further this basic learning process. The most important assets of schools are skilled, dedicated teachers, and parents who have a supportive enthusiasm for their children's education. Computers are--and should always be--a tool, a supplement, not a replacement, for the human resources of our schools.

Happily, most applications of computer networks in education have taken these considerations into account. In summary, if used intelligently and with a sensitivity to the student or teacher as a person, networks can deliver such educational benefits that every K-12 school should consider joining a computer network.

A Sampler of Projects in K-12 Networking

Here we describe a few of the many current K-12 projects using computer networks. These projects are included to give you an idea of the scope and breadth of network activities available to you and your students. You are likely to find that the people involved in these projects will enthusiastically share their expertise and resources, particularly if you are interested in initiating similar efforts.

Disabled Data Link Group and Chatback:

DDLG and the Chatback Project for Children currently involves 60 schools supporting the use of networks by disabled students, in an effort to assist those with special needs.

Cliff Jones

e-mail: 2:245/71 (FidoNet)
Cliff.Jones@f71.n254.z2.fidonet.org (Internet).

EARTH KIDS:

A non-profit international kids organization to promote communication about and for hands-on, community based ecological projects around the world. For more information, contact:

Marshall Gilmore
(503) 363-1896.

e-mail: 1:105/606 (FidoNet)
Marshall.Gilmore@f606.n105.z1.fidonet.org (Internet);

NEWSDAY

A multi-curricular project in which students in each participating school produce a local newspaper based on the news dispatches submitted on the NEWSDAY news wire by student correspondents. Students become news gatherers and reporters, editors, layout and graphics artists, and publishers. Participation on a national and international scale leads to understanding of broad issues which transcend local concerns. This project can involve your students in weeks of cross-curricular activity.

Al Rogers
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e-mail: SDCOE!BONITA!AROGERS (FrEdMail)
arogers@fred.org (Internet)

Project Zero-G:

Students, teachers, and adult experts from outside schools will examine aspects of our everyday life and consider how they would have to be redesigned to function in the zero-gravity environments of orbiting space stations like SkyLab and the Soviet Solyut. This can include the design of everyday objects (silverware, shelves, rooms, buildings), and the design of everyday activities (education, sports, transportation vehicles), including the re-design of social interactions. This project can provide an

extended global network experience for students and teachers in many curricular areas: science, social studies, writing, problem solving, mathematics, art and design. The final designs will be submitted to NASA as a technical report, and will assist NASA engineers in the design of the new American space station.

Jim Levin
e-mail: jim-levin@uiuc.edu (Internet)
UIUCED2!JLEVIN (FrEdMail)

TO WHAT NETWORKS CAN K-12 SCHOOLS CONNECT?

This section tells you to how to get information on the major players in K-12 networking and what they have to offer. Even if your school is already connected to a network, you should read this section to find out if there are additional networking options which can either supplement or replace your current setup.

Overview

Like universities, K-12 schools have many choices for network connectivity:

- ❑ Internet networks, like the National Science Foundation (NSF)-sponsored regional networks.

The next four network options include some networks which are actually part of the Internet, and others which are not:

- ❑ Statewide networks
- ❑ Non-profit cooperative networks
- ❑ Commercial networks
- ❑ "Public Data Networks"

Each networking option has unique strengths and weaknesses. To help you make an informed decision, this section summarizes what services each of these categories of network providers typically can offer K-12 schools. Contact names, addresses, and phone numbers for many network providers are listed at the end of this report so you can communicate with representatives of those networks in which you are especially interested.

Overview of "The Internet"

The Internet is a global network of networks. As of September 1991 it connected an estimated 5,000 networks, 350,000 host computers, and 3,500,000 people. These already enormous numbers are continuing to grow exponentially every year.

All Internet networks, everywhere in the world, use the same "standards" for communicating, called "The TCP/IP Internet Protocols." All that you need about TCP/IP right now is that it makes an enormous variety of services available to the user, and that you can communicate to every computer on the Internet in the same way, no matter what or where it is. Within the United States, there are a number of regional and national networks which use the Internet standards. Detailed information about Internet networks is provided in Chapter 2 of NUSIRG.

Of particular interest to K-12 educators is "The National Science Foundation Network" (NSFNET), a high speed, state-of-the-art network which was created specifically to support the use of computer networks in education and research.

By time you read this, NSFNET and similar national Internet networks may have been renamed "The National Research and Education Network" (NREN). In November of 1991, President Bush signed the High-Performance Computing Act which authorized the creation of a permanent NREN. The bill allocated $2.9 billion over the next five years to enhance the United States' high-performance computing and communications infrastructure. Please see the section "For More Information" on how to keep abreast of NREN developments and funding opportunities.

Regional Internet Networks

The national NSFNET itself is a framework, or "backbone" network, currently linking NSF-sponsored regional networks distributed throughout the nation. From these NSFNET backbone sites, each regional network branches off to serve many sites throughout a specific geographic region.

Some regional networks service a geographically small but densely computerized portion of a single state (e.g., BARRNet for the San Francisco and Silicon Valley area), while others help bring large, sparsely populated regions together into the network world (e.g., NorthWestNet, which serves the United States from Alaska, south to Oregon, and east to North Dakota).

Many K-12 schools are already enjoying the benefits of direct connection to the Internet through regional Internet networks.

K-12 Users and The Internet

Here is what regional Internet networks have to offer everyone, including K-12 users.

Resources And Capabilities:

- ❏ global electronic mail
- ❏ global discussion groups
- ❏ large archives of free software and documents
- ❏ free "electronic books"
- ❏ subscriptions to "electronic journals"
- ❏ computer "white pages" and "yellow pages" to find people and resources on the Internet
- ❏ ability to login to remote computers to access:
  - ❏ hundreds of electronic library catalogs
  - ❏ a wide variety of databases for teaching and research
  - ❏ supercomputers for high speed calculations, state-of-the-art graphics, and other high technology applications

In summary, most kinds of resources that are available on computer networks are available through the Internet. In terms of comprehensive networking capabilities, the Internet has no match.

Internet Support and Training

- ❑ Almost all regional Internet networks have central Network Operations Centers (NOCs) to handle most of the day-to-day maintenance of the network as a whole. Each NOC site within a regional has staff who are devoted to technical maintenance of local sites.
- ❑ Most regionals have, or are planning, central Network Information Centers (NICs) which provide basic documents and other user services support for network users. A few regionals, like NorthWestNet, have a well-established track record in providing annual meetings, training programs, and user guides for member institutions.

K-12 Specific Internet Support and Services

The Internet offers a rapidly growing variety of resources specifically designed for use in K-12 education including:

- ❑ databases developed especially for K-12 education (e.g., Spacelink)
- ❑ documentation for K-12 networking
- ❑ summer programs at NSF-sponsored supercomputer sites for students and teachers (e.g., Cornell National Supercomputer Facility, National Center for Supercomputer Applications, National Energy Research Supercomputer Center, and Pittsburgh Supercomputer Center)
- ❑ nationwide Internet directory services specifically for K-12 educators should be available by early 1992 through Michigan's Merit network

For More Information:

Addendum 1A lists the names and contact information for the NSF-sponsored regional Internet networks.

State Networks

Another promising source of network connectivity for K-12 schools are statewide networks. A survey of statewide networks released in April, 1991, reported that most all of the 50 states either had established, or were about to initiate, state networks which would include K-12 connectivity as a central goal (Kurshan, 1991).

Resources and Abilities:

Every state network is different. The technical sophistication of statewide networks varies tremendously, between and within states; in some states, connections from K-12 schools are made through dial-up modems, while other states use more modern technologies such as high speed (T1) backbones, fiber optics, point-to-point microwave, and satellite links. Some statewide networks feature direct K-12 Internet access.

Most statewide networks offer electronic mail; though in some cases, this is still restricted to administrative purposes.

Other general network services offered by some, but not all statewide networks include:

- ❑ online dictionaries and encyclopedias

- ❏ discussion groups
- ❏ library catalogs
- ❏ bulletin board services for announcements and software
- ❏ access to the Internet and Internet services

K-12 Specific Support and Services From Statewide Networks

Since many state networks have been (or are being) developed at least in part, to support K-12 education, some offer services of special interest to K-12 students and educators.

- ❏ distance education programs through universities and colleges
- ❏ professional employment referral services
- ❏ network distribution instructional video services
- ❏ systems to teach educators how to use networks
- ❏ educational databases
- ❏ online "test-banks"
- ❏ a number of state networks are working on "menu driven" Internet access utilities to make the Internet easier for K-12 use (e.g.,California, Texas, Florida, and Virginia)

If you are in a position to make or influence decisions about the design and implementation of your state network, you can get a wealth of useful information by comparing notes with peers working with other state networks. Comprehensive overviews of state networks can be found in McAnge et al. (1990), and Kurshan (1990b, 1991)

For your convenience, addendum 2 lists the names and contacts for all statewide networks discussed in Kurshan's 1991 report.

Not-For-Profit Cooperative Networks

There are many national and even international not-for-profit, cooperative computer networks which are particularly appropriate for K-12 educational networking.

Many not-for-profit cooperative networks offer a low cost and effective basic network option for K-12 schools. These networks are particularly valuable for K-12 sites which cannot, or choose not to, connect directly to the Internet, or whose state networks are still embryonic. But even schools which currently employ other network options can gain a great deal by using these services.

An especially promising and widespread non-profit network for K-12 education is K12Net, which is an offshoot of a more general purpose network called FidoNet. A brief description of FidoNet and K12Net will give you an idea of how some of these networks work, and a general idea of the kinds of services typically offered by non-profit networks generally.

FidoNet

FidoNet is an international network with 10,000 electronic "Bulletin Board Systems" (BBS's) in more than 50 countries. It is a "grassroots," decentralized, non-profit network operated entirely through volunteer effort.

A BBS can be run with minimal hardware and software requirements. All you need is a telephone, a modem, a personal computer, a hard-disk, and free FidoNet software. A good file backup system is of course a wise investment as well.

K12Net

K12Net is a spin-off of FidoNet designed specifically for K-12 students and teachers. The goal of K12Net is to create a demand for networking services within the K-12 education community by making it as easy as possible for K-12 schools to start networking. If you have access to a telephone, a modem, and a computer, you can dial up a FidoNet or K12Net BBS, and start exploring the world of K-12 networking immediately. K12Net is an accessible, hands-on network-based technology simple enough for students to learn and even operate.

K12Net offers the following services:

- ❏ global electronic mail, which can be sent to and received from the Internet
- ❏ K-12 oriented discussion groups
- ❏ an extraordinarily rich archive of K-12 oriented educational software (currently for MS-DOS computers only), documents, and other information available at 19 major K12Net BBSs.

With 10,000 FidoNet sites around the world, chances are good that K12Net can be reached from your school by either free or low cost phone calls.

Contact information for a number of the more widespread, K-12 oriented cooperative networks is given in addendum 3, including information for the main regional K12Net system operators, and the phone numbers for calls to their modem-accessible BBS's.

National Public Telecommuncations Network

The National Public Telecomputing Network (NPTN) is a not-for-profit organization dedicated to establishing and developing free, computerized information and communication services for the general public. NPTN has just been started. As of September, 1991 there were four sites in the Midwest, but by time you read this guide, NPTN may be an international network services provider.

Current services are based on Bulletin Board Services which provide a variety of information of interest to the general public.

Contact information on NPTN is given in addendum 3.

Commercial Networks

There are many commercial networks, some of which have targeted their services very specifically at the K-12 market. Most all commercial networks offer:

- ❏ electronic mail
- ❏ conferencing systems

Commercial networks often provide many other services of interest to K-12 educators such as online encyclopedias. Some commercial networks use Internet protocols, and thus allow full access to the Internet services described earlier.

See Kurshan (1990a) and Quarterman (1990) for overviews and contact information for commercial network providers generally. Addendum 1B gives contact information for several commercial Internet network providers.

Public Data Networks

"Public data networks" tend to be relatively specialized databases which are often accessed by modem calls.

McAnge et al. (1990) and Quarterman (1990) provide an introduction to a variety of such services.

TO WHAT NETWORK SHOULD WE CONNECT?

As the previous discussion demonstrates, K-12 schools can obtain network connectivity from a wide variety of providers. How does one choose which network service is best?

If your school hasn't yet been connected to an external network, you might think that the most basic network services, such as electronic mail, would be adequate. But judging from the experience of universities and research institutions, it is likely that once you've made a connection to a global network, the use of computer networks by students and teachers at your school will grow rapidly.

If you want to be ready for this growth, you should choose a service which offers flexibility for accommodating this growth. If at all possible, you should you choose a service which allows you full access to the Internet.

Here are some of the many considerations which have to be taken into account to determine what option is best for your purposes.

- ❑ How much computer experience do your teachers and students already have?
- ❑ What sort of computer equipment does you school already have?
- ❑ What are the costs of obtaining the hardware required for connectivity and the commercial provider's annual fees?
- ❑ Do you need full service connectivity immediately, or would access to electronic mail and conferencing be sufficient to get your staff and students comfortable with networking?
- ❑ Are there any legislative restrictions which make certain options difficult?
- ❑ How well will a particular option scale as more demands are placed on it by newly enthusiastic students and teachers?

ARE THERE SOURCES OF FFUNDING TO HELP DEFRAY THE COSTS?

Full or partial funding for K-12 networking, ranging from the construction of statewide networks as a whole to the purchase of equipment for individual K-12 schools has come from a wide variety of sources.

- ❑ state departments of education, energy, or science
- ❑ federal agencies (DOE, NSF, and USDE in particular)
- ❑ private and public universities
- ❑ national and regional telecommunications companies (GTE, SNET, USWest)
- ❑ computer companies (Apple, IBM)
- ❑ contributions from various foundations and individuals
- ❑ K-12 school and school district budgets

Financial support for K-12 networking should be justifiable to any of the sources to which you normally turn for any other educational project funding.

A new and particularly notable source of funding specifically directed at K-12 networking is The Annenberg Foundation / Corporation for Public Broadcasting project. Under this project up to $5 million per year will be provided for educational applications of telecommunications for a period of 12 years. As of September 1991, there were plans to begin accepting grant proposals for K-12 networking starting in late 1991. For more information, contact:

Michael Strait, Ph.D.
Project Officer for Research and Evaluation
Corporation for Public Broadcasting
901 E. Street NW
Washington DC 20004-2006
tel: (202) 879-9646
e-mail: strait@umuc.umd.edu

USING GLOBAL NETWORKS FOR K-12 EDUCATION

This section of the document will give brief, K-12 oriented overviews of each of the major kinds of applications you'll encounter when using computer networks.

Because the Internet provides the greatest variety of resources (and because it would not be possible to explain the use of these resources on every kind of computer network in this brief document), all examples provided here use the Internet. Nonetheless, the general principles which are illustrated here should be useful even if you are not yet using the Internet.

Most of the entries in this section have the following structure:

a. A quick description of the resource.

b. A real, K-12 oriented example of an Internet application.

c. pointers to K-12 specific information about using the resource on the Internet.

Certain services which require actual connection to computers (like electronic library catalogs) can only be done through the Internet or very occasionally by using a modem for dial-in access. Much more comprehensive treatment of each of these resources can be found in the resource specific chapters of the NorthWestNet Users Service Internet Resource Guide.

Electronic Mail (or E-mail)

What is Electronic Mail?

Electronic mail (usually referred to as "e-mail") is the most basic service offered by computer networks.

E-mail is very similar to regular postal mail, except that it is sent electronically through a computer network and it arrives much faster. With e-mail, you can send messages to anyone on a network, just like you can send a letter to anyone who has a postal address.

The most exciting uses of e-mail in K-12 education are for communication and collaboration between and among students and teachers at distant schools.

A Specific K-12 Application of Electronic Mail on the Internet

E-mail can be used to send messages to computers on the network which will automatically send back information that you have requested. Such computers are called "mail servers."

For example, you can send mail to a computer service run by the Oregon Extension Service called "Almanac." This resource contains a wide variety of educationally valuable materials such as "electronic books," and an enormous amount of information from the Department of Agriculture. You can have this information sent to you simply by sending an e-mail message request.

In this example, we'll send a message to Almanac, requesting a copy of the Declaration of Independence.

Step 1. Start your mail program.

Step 2. Address a message to the following Internet user-id and address. Note: If you are not on an Internet computer, you will probably have to add additional information. Ask your colleagues if they know how to send mail to the Internet from your site)

almanac@oes.orst.edu

Step 3. You don't have to include anything in the subject line.

Step 4. In your mail editor, type the following message:

send guten dec-of-ind

where "guten" is short for "Project Gutenberg," a non-profit organization dedicated to creating free electronic versions of the world's great literature, and "dec-of-ind" is the file name for the Declaration of Independence.

Step 5. Send the mail message.

Step 6. In a short while, you should receive e-mail from Almanac. If you did everything right, it will be a copy of the Declaration of Independence! If you made a mistake, the e-mail message from Almanac will give you a hint about what you did wrong and directions for how to send a correct request.

If you want more information about Almanac, you can send an e-mail message to Almanac containing one of the following messages:

send guide	(to get a copy of the Almanac Guide)
send topic catalog	(to get a copy of Almanac's holdings)

Other Applications of Electronic Mail

E-mail is also used for accessing many of the network services described in the following sections of this document, such as subscribing to electronic journals or participating in online discussion groups.

Online Library Catalogs

What Are Online Library Catalogs?

Online library catalogs (more precisely known as "Online Public Access Catalogs", or "OPACs" for short) are electronic versions of library card catalogs. OPACs have been installed at hundreds of the world's libraries and are generally free of charge for anyone with an Internet connection.

An Example K-12 Specific OPAC Application

As an example of the potential of the Internet to provide "real-time" access to remote knowledge bases and informational resources, allow me to relate this personal episode. I was trying to compose text containing a K-12 specific OPAC application when I realized that I was just about to run through a good example while writing this chapter.

I am word processing this document on a Macintosh SE at my home in Seattle. I need to find references on the subject "distance education" for the bibliography, but it's 2 am, and all of the libraries in Seattle are closed. But because I have an Internet connection through the University of Washington, I can connect to any one of 200 OPACs in the United States and do a literature search from my home.

I've just entered the following command on my computer

```
telnet pac.carl.org
```

and in a few seconds I'm connected to the Colorado Association of Research Libraries (CARL) in Boulder, Colorado, about 1,000 miles away from my house. Because I'm doing this through the Internet, I'm not being charged a penny for the connection, nor was I charged for the connection I made to a database in England an hour ago. The cost of these connection services are defrayed in part by the National Science Foundation and in part by the dues and service fees paid by the members and partners of NorthWestNet.

CARL asks me what kind of terminal I'm using. To be certain that all of the NUSIRG examples work with the simplest equipment, I'm purposely using a basic terminal emulation program. I select HARDCOPY, which is the appropriate choice for "dumb" terminals without any fancy features.

An easy to use menu has appeared on my screen, and I've selected the library catalog option. CARL offers many other interesting databases, but I don't have time to get distracted. The names of 21 libraries in the state of Colorado appear on my screen, and I select the State Department of Education Catalog.

Now I'm given a number of options for the kind of search I want to do. I type "w" for "word", and then I type "Distance Education." In two seconds, CARL tells me that it has found 16 books with the words "Distance Education."

As it turns out, the very first reference in the list is one that someone in an online discussion group had asked about earlier in the day. The person wasn't sure of the title, so I'm going to send them an e-mail message giving them the full reference.

OPACS of Special Interest to K-12 Education

Every OPAC has something to offer K-12 education. Most of the best OPACs are only accessible through Internet connection, although a few statewide networks have started providing OPAC services via modem connections. A more complete discussion of OPACs is provided in Chapter 12 of NUSIRG.

File Archives

There are thousands of computers in the world which contain "file archives" from which files can be copied to your computer for your own use.

K12Net Libraries

Very useful file archives for K-12 education are maintained in the "K12Net Libraries" throughout the world. These K12Net libraries contain thousands of files on a wide variety of subjects including:

- ❏ educational software
- ❏ course outlines and other material for curricular development
- ❏ documents relating to education generally, including distance education and government publications

Document files can be used on most any kind of personal computer. Most of the software currently held in the K12Net Library is for MS DOS based machines, but there are plans to start adding materials for other PC's such as the Macintosh, Apple II's, and Amigas.

To access the K12Net library, all you need is a phone, a modem, and a personal computer with simple telecommuncations software. To locate the K12Net Library nearest you, get in touch with one of the K12Net contacts listed in addendum 3.

Interactive Bulletin Board Services (BBSs)

Bulletin Board Services are computers which contain information, training, and files which you can copy for your own use.

K12Net / FidoNet

All of the K12Net and Fidonet nodes are BBSs. To find the site nearest you, contact one of the main K12Net sites listed in addendum 3.

National Public Telecommuncations Network BBSs

There are currently four NPTN sites which are accessible by modem calls or with the Internet TELNET protocol.

Cleveland Free-Net	Cleveland, Ohio
modem:	(216) 368-3888
telnet:	freenet-in-a.cwru.edu
	freenet-in-b.cwru.edu
	freenet-in-c.cwru.edu
Youngstown Free-Net	Youngstown, Ohio

modem:	(216) 742-3072
	telnet: yfn.ysu.edu
TriState Online	Cincinnati, Ohio
modem:	(513) 579-1990
telnet:	tso.uc.edu
Heartland Free-Net	Peoria, Illinois
modem:	(309) 674-1100
telnet:	heartland.bradley.edu

NPTN plans to establish additional sites in the following communities: Buffalo; Chicago; Denver; Lorain County, OH, Los Angeles; Minneapolis/St.Paul; Portland, OR; Philadelphia; Summit, NJ; Washington, D.C.; Helsinki, Finland; Singapore; and Wellington, New Zealand.

Online Discussion Groups

Online discussion groups allow you to communicate with people throughout the world who share a specific interest.

By having distinct names and limited scopes, discussion groups enable highly focused, topic-specific discourses. So even though the worldwide networks are huge and used by people with many diverse interests, discussion groups make the network world a more homey place.

Once you find groups which suit your needs, you can read material "posted" by other people, you can comment on other people's postings, or you can contribute new messages to the group.

There are many different discussion group services. These differ in how they work and in how they are named.

For details on how to use two widely used discussion group services, USENET and LISTSERV, consult Chapters 7 and 8 of NUSIRG.

K-12 Specific Discussion Groups

Because each discussion group service features a huge number of topic specific groups, it is sometime hard for new users to know which groups are most likely to be useful. For example, the BITNET LISTSERV service offers nearly 3,000 groups! To help get you started, Tables 1, 2 and 3 give a sampling of LISTSERV discussion groups, Internet interest groups, and USENET newsgroups which are most likely to interest K-12 educators.

K-12 specific discussion groups are a great place to keep in touch with what other K-12 educators are doing with computer networks. Many of these groups are often used like curriculum development meetings in a world-wide school.

Use Tables 1, 2, and 3 as K-12 specific resources when you follow the detailed instructions on how to use discussion group services in the earlier chapters of NUSIRG.

Electronic Journals

Electronic Journals are like regular magazines. They feature submitted articles which are reviewed, edited, and placed in an organized format within a computer file. The big differences are that the journals are sent to your computer and that you don't have to pay personally for your subscription.

Although the number of electronic journals is currently small, it has been predicted that their number and their impact will expand greatly in the next few years.

An Example of How to Subscribe to an Electronic Journal

To subscribe to an electronic journal, you send an e-mail message to an Internet address. In some cases, the user-id you are sending mail to is that of a real person, in which case you can write a regular English language letter requesting a subscription. In other cases, you will be sending a message to a computer program which will read your message and will expect the message to be of a very specific format.

For example, to subscribe to the "Distance Education Online Symposium" (which often features articles relevant to applications of networks to K-12 education), you would send an e-mail message as follows:

```
mail:    listserv%psuvm.bitnet@cunyvm.cuny.edu
subject: (none needed)
         SUB DEOS your-full-name
```

In less than a day, you should receive a message saying that you have been subscribed to this electronic journal with information on how to obtain back issues by e-mail.

Once you have been subscribed, you will receive a copy of the journal once every month.

Electronic Journals of Special Interest to K-12 Education

Table 4 lists a number of electronic journals which are of potential interest to K-12 educators. Please refer to Chapter 9 of NUSIRG for more information about Electronic Journals.

Online Databases

There are several Internet accessible online databases which are of particular interest to K-12 educators. To use these databases, you need to know how to use TELNET, which is explained in Chapter 5 of NUSIRG.

A large catalog of many other online databases is provided in Chapter 12 of NUSIRG.

PENpages: Contains online articles and brochures on agriculture, careers, health, consumer issues, and weather; from The Pennsylvania State University. vt100 terminal emulation recommended.

```
Access:
    telnet:      psupen.psu.edu
    User-name:   PNOTPA

    e-mail:      support@psupenn.psu.edu
```

Art Hussey, Assistant Director
Computer Services
Office of Administrative Services
The Pennsylvania State University
405 Agricultural Administration Building
University Park, PA 16802
(814) 863-3449

SPACELINK: A very easy to use database and interactive system containing information about NASA and NASA activities. Includes a large number of possible curricular activities for elementary and secondary science classes. A tremendously valuable resource for elementary and secondary science teachers.

Access:
telnet: 128.158.13.250
username: newuser
password: newuser

Supercomputer Training Opportunities for K-12 Students and Teachers

Several of the NSF sponsored supercomputer sites have established programs for K-12 students.

- Cornell National Supercomputer Facility
  (607) 255-8686
- National Center for Supercomputer Applications
  (217) 244-1100
- National Energy Research Supercomputer Center
  (415) 422-1544

K-12 Network Etiquette

Just as we unconsciously internalize standards of etiquette in our everyday behavior, there are many issues of network etiquette which may not be apparent to new users of network services, especially among K-12 students. As Jack Crawford, one of the main forces behind "K12 Net," recently wrote, "the ability to keep our echoes animated, well behaved, and oriented toward K-12 curriculum increasingly depends upon the zealousness, energy and skill of moderators."

Before starting a K-12 networking project with students, it would be wise to read some of the literature on "network etiquette." Quarterman (1989 and 1990) provides a particularly good overview of the issues involved in polite and ethical use of computer networks. Passages in Chapter 3 of NUSIRG, and references in that chapter also deal with some of the etiquette issues involved in electronic mail communications specifically.

"Distance Education" Programs For K-12 Educators

There are numerous opportunities for K-12 educators and even students to enroll in courses at other institutions around the world.

Such "Distance Education" programs are the electronic equivalent of "correspondence schools," but with a major difference. "They often allow real time, interactive contact with instructors and other students via computer networks with electronic mail or even two-way video.

Moore and Thomson (1990), Moore et al. (1990) discuss distance education generally. Information on specific statewide programs for K-12 educators can be found in Kurshan (1990b). Very up-to-date information can be obtained by subscribing to one of several LISTSERV discussion groups or electronic journals included in Tables 1 and 4.

For More Information On K-12 Networking

The best information on K-12 networking can be obtained by diving headlong into the active and exciting discussions taking place on computer networks throughout the world. Several of these discussion groups have been described in this chapter. Subscribe to some of the K12Net, USENET, and LISTSERV groups, and you will be able to keep posted on collaborative projects of many sorts which will be best suited to your particular educational curriculum.

Admittedly, this strategy presents a bit of a "bootstrapping" problem for those of you who do not yet have network access, so here's a list of printed references, journals, and professional societies which are of special interest to K-12 educators.

Books and Articles

Beals, D.E. 1991. "Computer mediated communication among beginning teachers." T.H.E. Journal, 18(9), 74-77.

Carlitz, Robert D. 1991. "Common Knowledge: Networks for Kindergarten Through College." Educom Review 26(2):25-28.

Clement, John. 1990. "Networking for K-12 education: bringing everyone together." Available from Educom.

Kurshan, Barbara. 1990a. Home Market for Educational OnLine Services: Growth of Market and Strategies for Expansion (available from the author; see contact information at end of addendum 2).

Kurshan, Barbara. 1990b. "Statewide Telecommunications Networks: An Overview of the Current State and the Growth Potential." (available from the author; see contact information at end of addendum 2).

Kurshan, Barbara. 1991. "Statewide Education Networks Survey Results." (available from the author; see contact information at end of addendum 2).

Moore, M.G., Thompson, M.M. 1990. "The effects of distance learning: a summary of literature." Pennsylvania State University.

Moore, M.G., Cookson,P. J. Donaldson, and Quigley, B.A. 1990. Contemporary issues in American distance education, Pergamon Press, New York.

Phillips, G.M., Santoro, G.M., & Kuehn, S.A. 1988. "The use of computer--mediated communication in training students in group problem-solving and decision-making techniques." American Journal of Distance Education, 2(1): 38-51.

Quarterman, J. S. 1989. "Etiquette and Ethics," ConneXions--The Interoperability Report 3(4):12-16.

Quarterman, J. S. 1990. "The Matrix: Computer Networks and Conferencing Systems Worldwide." Digital Press, Bedford, MA.

Roberts, N., Blakeslee, G., Brown, M., and Lenk, C. 1990 . "Integrating Telecommunications into Education." Englewood Cliffs, NJ: Prentice- Hall.

"Rural America at the Crossroads: "Networking for the Future." U.S. Congress Office of Technology Assessment."April 1991. (S/N 052 003 0122806; available in government document repositories, or through your legislator.

"Linking for Learning: "Computer-and-Communications Network Support for Nationwide Innovation in Education." June 1991. The National Science Foundation's Directorate for Education and Human Resources.

Printed Journals

The following printed journals are particularly informative for K-12 educators using computer networks:

American Journal of Distance Education
Classroom Computer Learning
Computing Teacher
Educational Technology
EDUCOM Review
Electronic Learning
Journal of Computers in Mathematics and Science Teaching
Learning Tomorrow
Research and Education Networking
T.H.E.Journal
University Computing Times

Periodic Conferences

CAUSE
Consortium for School Networking
EDUCOM
International Conferences on Technology and Education
International Council for Distance Education Conferences
International Symposia on Telecommunications and Education
NorthWestNet
SHARE
USENIX

Organization

EDUCOM
1112 16th Street, NW
Suite 600
Washington, DC 20036
phone: (202) 872-4200.

TABLE 1: LISTSERV DISCUSSION GROUPS RELEVANT TO K-12 EDUCATORS AND STUDENTS

For more information on using LISTSERV, please refer to Chapter 8 of NUSIRG.

NOTE: The BITNET addresses listed below need to be modified and expanded to be used on other networks. For example here's how you would address a message to KIDCAFE from the Internet:

kidcafe%ndsuvm1.bitnet@cunyvm.cuny.edu

The underlined portion could be added to any of the names below. Notice also that there is a "%" between kidcafe and ndsuvm1, instead of an "@" sign. For more information on why this modification of BITNET addresses is necessary and how it works, refer to passages in Chapter 3 of NUSIRG which deal with electronic mail gateways.

List Name	BITNET address	General Topic Area, and Brief Description of List
		Student Oriented Lists
KIDCAFE	@ NDSUVM1	KIDCAFE Youth dialog
KIDS-ACT	@ NDSUVM1	KIDS-ACT What can I do now?
SCOUTS-L	@ NDSUVM1	Youth groups including Boy and Girl Scouts, etc.
SEAC-L	@ UNCVX1	Student environmental activism
SGANET	@ VTVM1	Student government global mail network
		Education Oriented Lists
EDNET6-L	@ IUBV1	K-12 Network Management Plan
KIDPLAN	@ NDSUVM1	KIDPLAN KIDS-92 Planning
KIDS-92	@ NDSUVM1	KIDS-92 Project List
K12STCTE	@ BITNIC	K-12 Steering Committee
RESPONSE	@ NDSUVM1	Response to KIDS-92
VT-HSNET	@ VTVM1	VT K-12 School Network
		Hobbies and Recreation
CHESS-L	@ GREARN	Chess discussion and organization of tournaments
DJ-L	@ NDSUVM1	Campus radio DJ's technical discussion
GAMES-L	@ BROWNV1	Computer games of any sort
SCUBA-L	@ GUV1	All aspects of scuba diving
SHOGI-L	@ TECHNION	Strategic board game, Shogi
		Subject-Specific Lists Relevant to K12 Education
BIOSPH-L	@ UBV1	Anything relevant to planetary ecology
CHEMED-L	@ UWF	Chemistry education
CW-L	@ TTUVM1	Computers and writing
DISARM-L	@ ALBNYVM1	Discussion of global disarmament

FILM-L	@ VMTECMEX	Film; art, entertainment, techniques equipment
HISTORY	@ UBV1	(Peered) History discussion list
INTERCUL	@ RPIECS	Study of intercultural communication
LITERA-L	@ TECMTYV1	Literature in English & Spanish
LITERARY	@ UCF1V1	Discussions about literature
LLTI	@ DARTCMS1	Language learning and technology international
MARINE-L	@ UOGUELPH	Marine studies / shipboard education
MCLR	@ MSU	Midwest consortium for Latino research
MULTI-L	@ BARILV1	Language and education in multilingual settings
MUSIC-ED	@ UMINN1	Music education
NATIVE-L	@ TAMVM1	Issues pertaining to aboriginal people
PEACE	@ INDYCMS	Peace studies
PHYSHARE	@ PSUV1	Sharing resources for high school physics
RURALDEV	@ KSUV1	Community and rural economic development
SAIS-L	@ UNBVM1	Science awareness and promotion
SCIMATHL	@ PSUV1	Science, math and engineering education
SCREEN-L	@ UA1V1	Discussion of TV from a pedagogical perspective
SHAKSPER	@ UTORONTO	International electronic Shakespeare conference
SPORTPSY	@ TEMPLEV1	Exercise and sports psychology
TECHED-L	@ PSUV1	Employment, training and literacy issues
TESL-L	@ CUNYV1	Teaching English as a second language
URBAN-L	@ TREARN	Urban planning information exchange

Special Education / Talented and Gifted Education

BEHAVIOR	@ ASUACAD	Behavioral and emotional disorders in children
BLIND-L	@ UAFSYSB	Computer use by and for the blind
COMMDIS	@ RPIECS	Speech disorders
DEAF-L	@ SIUCVMB	Deaf list
EDINFO-L	@ IUBV1	Educational information
L-HCAP	@ NDSUVM1	Technology for handicapped, funding info, etc.
SPCEDS-L	@ UBV1	SUNY/Buffalo special education (students)
TAG-L	@ NDSUVM1	Talented and gifted education

Teacher Oriented Lists

BIOPI-L	@ KSUV1	Secondary biology teacher enhancement
TEACHEFT	@ WCU	Teaching effectiveness

Educational Uses of Computers and Networks

CNEDUC-L	@ TAMVM1	Computer networking and education, esp. K-12
CNIDIR-L	@ UNMV1	Coalition for Networked Information
CONFER-L	@ NCSUV1	Academic interactive conferencing
COSNDISC	@ BITNIC	Consortium for School Networking
DEOS-L	@ PSUV1	The Distance Education Online Symposium
DEOSNEWS	@ PSUV1	The Distance Education Online Symposium
DISTED	@ UWAV1	Journal of Distance Ed. and Communication
EDTECH	@ OHSTVMA	Educational technology
EDUTEL	@ RPIECS	Education and information technologies
ETDIR-L	@ UBV1	Educational technology research & development
MEDIA-L	@ BINGVMB	Educational communications for media services

PACS-L	@ UHUPVM1	Public-access computer systems forum
SCIT-L	@ QUCDN	Studies in communication and info. technology

Software for Education

ACSOFT-L	@ WUVMD	Academic software development
PCSERV-L	@ RPIECS	Public domain software servers

Hardware and Operating System Oriented Lists

APPLE2-L	@ BROWNV1	Apple II List
COCO	@ PUCC	Tandy color computer List
COMMODOR	@ UBV1	Commodore computers discussion
I-AMIGA	@ UTORONTO	(Peered) Info-Amiga List
I-IBMPC	@ UIUCVMD	IBM PC discussions
IBMPC-L	@ UGA	(Peered) INFO-IBMPC Digest
INFO-APP	@ NDSUVM1	Apple II series user's mailing list
INFO-MAC	@ UIUCVMD	(Peered) INFO-MAC Digest
INFO-PC	@ IRLEARN	Distribution of Info-IBMPC
MAC-L	@ YALEV1	Macintosh news and information
MACMAIL	@ UTORONTO	MAC Mail
MACNET-L	@ YALEV1	Macintosh networking issues
MACPROG	@ WUVMD	Macintosh programming
MACSYSTM	@ DARTCMS1	Advice about Macintosh operating system
NEXT-L	@ BROWNV1	(Peered) NeXT computer list
PC-EVAL	@ IRLEARN	Personal Computer evaluation
PC-L	@ UFRJ	(Peered) Forum IBM PC
PCSUPT-L	@ YALEV1	Discussion for MS-DOS PC technical support staff
PCTECH-L	@ TREARN	MS-DOS compatibles support group
PROG-A16	@ UOGUELPH	INFO-ATARI16 Programs
SHOPTALK	@ MCGILL1	Micro Computer Users Forum
SOFTREVU	@ BROWNV1	Small computing systems software review
SYS7-L	@ UAFSYSB	Macintosh System 7.0
WIN3-L	@ UICV1	Microsoft Windows and related issues
WORD-MAC	@ HVRFORD	Microsoft Word for the Macintosh
WORD-PC	@ HVRFORD	Microsoft Word for DOS and Windows

Networking Hardware and Software

3-COM-L	@ NUSV1	3-Com users interest group
I-KERMIT	@ CUVMA	(Peered) INFO-KERMIT Digest
PCIP	@ IRLEARN	TCP/IP protocol implementations for PC
PROCOM-L	@ ATSUVAX1	Users of Procomm terminal emulators
TCP-IP-L	@ UIUCVMD	TCP-IP discussion from SRI-NIC

TABLE 2: INTEREST GROUPS OF POTENTIAL VALUE TO K-12 AUDIENCES

To subscribe to one of these groups, send an e-mail message to a special subscription user-id, which is made by adding "-request" to the discussion group's user-id. For example, to subscribe to:

kidsnet@vms.cis.pitt.edu

send e-mail to

kidsnet-request@vms.cis.pitt.edu

in the body of your message, indicate that you would like to be subscribed to the group.

A wide variety of many other online databases is provided in Chapter 12 of NUSIRG.

Subscription List Name and Address	Specific Subjects Covered
K-12 Networking Generally	
kidsnet@vms.cis.pitt.edu	Global network for kids and teachers
ai-ed@sun.com	Applications of artificial intelligence to education
Technical Issues	
info-cpm@wsmr-simtel20.army.mil	8 and 16 bit CP/M operating system
info-modems@wsmr-simtel20.army.mil	modem discussion
pcip@udel.edu	Discussion on TCP/IP for PCs
Hobby or Recreation Oriented	
bicycles@bbn.com	Bicycle sports and use
brass@dinorah.wustl.edu	Small ensemble brass musicians
cards-request@tanstaaf1.uchicago.edu	Collection and trading of sports cards/memorabilia
horses@bbn.com	Horse enthusiasts
stagecraft%cai@cs.utah.edu	Theatre sets, lighting, etc.
whitewater@iuvax.cs.indiana.edu	Whitewater kayaking, rafting

TABLE 3: POINTERS TO USENET GROUPS AND CATEGORIES OF PARTICULAR INTEREST TO K-12 EDUCATORS

There are thousands of USENET newsgroups. First time users of USENET often become overwhelmed by the diversity and are unable to find what groups are appropriate to their interests.

To help you get started, this list provides a small sampler of a few specific groups and of the hierarchy that might be of particular interest to K-12 educators. Once you've become comfortable with newsreader software and the structure of USENET, there's a huge variety of newsgroups to explore and read.

For information on how to actually use USENET, refer to Chapter 7 of NUSIRG. Note that the first section ("K-12 Lists Distributed From K12Net to USENET") are all accessible directly by accessing K12Net BBS's.

K-12 Lists Distributed From K12Net to USENET

k12.chat.elementary	Informal discussion, elementary students, K-5.
k12.chat.junior	Informal discussion, students in grades 6-8.
k12.chat.senior	Informal discussion, high school students.
k12.chat.teacher	Informal discussion, K-12 teachers.
k12.ed.art	Art curriculum in K-12 education.
k12.ed.business	Business education curriculum in grades K-12.
k12.ed.comp.literacy	Teaching computer literacy in grades K-12.
k12.ed.health-pe	Health and Physical Education in grades K-12.
k12.ed.life-skills	Home Economics & Career education, grades K-12.
k12.ed.math	Mathematics curriculum in K-12 education.
k12.ed.music	Music and Performing Arts curriculum in K-12.
k12.ed.science	Science curriculum in K-12 education.
k12.ed.soc-studies	Social Studies and History curriculum in K-12.
k12.ed.special	Education for students w/ handicaps or special needs.
k12.ed.tag	Education for Talented And Gifted students.
k12.ed.tech	Industrial Arts, vocational education, K-12.
k12.lang.art	Language Arts curriculum in K-12 education.
k12.lang.deutsch-eng	Bilingual German/English with native speakers.
k12.lang.esp-eng	Bilingual Spanish/English with native speakers.
k12.lang.francais	Bilingual French/English with native speakers.
k12.lang.russian	Bilingual Russian/English with native speakers.

A Sampling of Other USENET Newsgroups of Potential Interest to K-12

bionet.general
comp.dcom.modems
misc.consumers
misc.consumers.house
misc.education
misc.kids
misc.rural
misc.writing
news.announce.newusers
news.answers
news.newusers.questions
news.software.readers
sci.edu

Major USENET Newsgroup Hierarchies

bit.listserv.*
comp.*
rec.*
sci.*
soc.culture.*

Each of these "hierarchies" in this list of five contain numerous, very specific newsgroups which you may find interesting. For example, within "sci.*" are groups such as "sci.biology"and "sci.geo.meteorology". (The asterisk is standard computer shorthand for "this space might be occupied by much more text.")

TABLE 4: ELECTRONIC JOURNALS OF POSSIBLE VALUE TO K-12 EDUCATORS

Currents:	The use of computing in education. subscription: jebell%uncamult.bitnet@cunyvm.cuny.edu
Distance Education Online Symposium (DEOS)	Distance education; many articles on K-12 issues. subscriptions: listserv%psuvm.bitnet@cunyvm.cuny.edu message: SUB DEOS your-full-name To cancel a subscription, send mail to the same address, message UNSUB DEOS your-full-name.
Effector Online:	Computer based communication, esp. issues of freedom of speech, privacy, censorship, and policy subscription: eff-request@eff.org
Ejournal:	An electronic journal about electronic journals subscription: listserv%albnyvm1.bitnet@cunyvm.cuny.edu message: SUB EJRNL your-full-name To cancel a subscription, e-mail to the same address, message UNSUB EJRNL your-full-name
F.A.S.T. News:	Articles, bibliographies, job listings, etc. on arts, science and technology. subscription: isast@garnet.berkeley.edu
Handicap Digest:	Issues dealing with the handicapped. subscription: wtm@bunker.shelp.isc-br.com via modem: Handicap News BBS (203) 337-1607 (300, 1200 and 2400 baud) (Fidonet 1:/141/420) Compuserve 73170,1064
History and Analysis of Disabilities Newsletter:	News, and announcements of conferences, seminars, books, articles, theses, research, organizations dealing with the historical study of disabilities. subscription: fcty7310%ryerson.bitnet@cunyvm.cuny.edu
Impact Online:	Social & ethical concerns of information technology subscription: bcs-ss1@compass.com

ADDENDUM 1A: CONTACTS FOR REGIONAL INTERNET SERVICE PROVIDERS

Network Name	Service Locale Contact Name Phone Number E-mail Address
BARRNET	Bay Area, CA William Yundt (415) 723-3104 gd.why@forsythe.stanford.edu
CERFnet	Los Angeles Area, CA CERFnet Hotline (800) 876-2373 help@cerf.net
CICnet	Midwest US John Hankins (313) 998-6102 info@cic.net
CO Supernet	CO Ken Harmon (303) 273-3475 kharmon@csn.org
CONCERT	NC Joe Ragland (919) 248-1404 jrr@concert.net
JVNCNet	Eastern US and International Sergio Heker (609) 258-2400 heker@jvnc.net
Los Nettos	Los Angeles Area Ann Westine (213) 822-1511 los-nettos-request@isi.edu
MichNet/Merit	MI Jeff Ogden (313) 764-9430 jogden@merit.edu
MIDnet	NE Dale Finkelson (402) 472-5032 dmf@westie.unl.edu

MRNet	MN Dennis Fazio (612) 342-0003\ dfazio@ssesco.com
NEARnet	Northeastern US (ME, NH, VT, CT, RI, MA) John Rugo (617) 873-2935 nearnet-staff@nic.near.net
NETillinois	IL George Badger (217) 333-1637 badger@vmd.cso.uiuc.edu
NevadaNet	NV Jim Williams (702) 739-3557 greyfox@nevada.edu
NorthWestNet	Northwestern US (AK, ID, MT, ND, OR, WA, WY) Eric Hood (206) 562-3000 ehood@nwnet.net
NYSERNet	NY Jim Luckett (315) 443-4120 luckett@nysernet.org
OARnet	OH Alison Brown (614) 292-8100 alison@oar.net
PREPnet	PE Thomas Bajzek (412) 268-7870 twb+@andrew.cmu.edu
PSCNET	PE, OH, WV (Supercomputer) Eugene Hastings (412) 268-4960 pscnet-admin@psc.edu
Sesquinet	TX Farrell Gerbode (713) 527-4988 gerbode@rice.edu

SDSCnet	San Diego Area (Supercomputer) Paul Love (619) 534-5043 loveep@sds.sdsc.edu
SURAnet	Southeastern US + Territories Jack Hahn (301) 982-4600 hahn@sura.net
TENET	TX Tracy LaQuey Parker (512) 471-5046 tracy@utexas.edu
VERnet	VA James Jokl (804) 924-0616 jaj@virginia.edu
WESTNET	Western US (AZ, CO, ID, NM, UT, WY) Pat Burns (303) 491-7260 pburns@yuma.acns.colostate.edu
WiscNet	WI Tad Pinkerton (608) 262-8874 tad@cs.wisc.edu
WVNET	WV Harper Grimm (304) 293-5192 cc011041@wvnvm.wvnet.edu

ADDENDUM 1B: CONTACTS FOR COMMERCIAL INTERNET SERVICE PROVIDERS

AlterNet	US and International (703) 876-5050 info@uunet.uu.net
ANS	US and International Joel Maloff (313) 663-7610 maloff@nis.ans.net
PSInet	US and International PSI, Inc. (703) 620-6651 info@psi.net

ADDENDUM 2: STATEWIDE EDUCATION NETWORKS AND CONTACTS

This addendum is used by permission from a report entitled "Statewide Education Networks Survey Results" prepared by Barbara Kurshan and Marcia Harrington. Their contact information appears at the end of this document.

In addition to contacts for particular state networks (indicated by BOLD print names), this list also includes the contact information for many other organizations or individuals who provided information about statewide networks for Kurshan and Harrington's report. These may be useful resources for your inquiries about state networking.

Note that the survey was completed in January, 1991. Consequently some of the contact information may have changed, especially in light of the rate at which state networks are evolving.

NETWORK CONTACT LIST BY STATE

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UACN
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Kathryn Kilroy
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602/542-5024

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916/445-4591

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Business/Education Partnerships
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Denver, CO 80203
303/866-2471

Colorado Learning Network
Eric Feder
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Knowledge Network
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Sigmund Abeless
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Hawaii Intact. TV System
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IDAHO

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IOWA

UNI

IOWA Communications Network

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NCDLS Network
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STS/CDN
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We'd like to thank the following two people for allowing us to include the contact information, which they compiled, in this addendum.

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ADDENDUM 3: COOPERATIVE NOT-FOR-PROFIT NETWORK PROVIDERS

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FrEdMail Foundation
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91908-0243

contact: Al Rogers
e-mail: arogers@fred.org (Internet)
phone: (619) 475-4852

K12Net Council (board of directors)

Gordon Benedict
Calgary, Alberta, Canada
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Sysop of 1:134/49 (403/228-9525 HST 403/229-0477 2400)
UCAEDU.BITNET!BENEDICT
K12Net Zone 1 Backbone

Jack Crawford, W-FL Teacher Resource Center
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K12Net Zone 1 Backbone

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K12Net Zone 1 Backbone

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K12Net Files Library

Gleason Sackmann
Box 5164
NDSU Computer Center

Fargo, ND 58105 USA
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K12Net Echo Moderator Coordinator

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K12Net Channel Coordinator

National Public Telecommunications Network

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