

LEARNING EXPECTATIONS AND SCOPE AND SEQUENCE FOR TECHNOLOGY RELATED TEACHINGS FOR THE ISU LAB SCHOOLS

1. Students as information seekers, navigators, and evaluators.

At the end of grade two, students will:

- **Have exposure to calculators, computers, CD-ROM technology, and the Internet as a source for gathering information.**

Sample Activity: Students use scientific calculator to count by 3's using +3 keys repeatedly.

Sample Activity: Students use CD-ROM encyclopedias such as Groliers and Encarta to learn about living things and their life cycles.

- **Use software as tools for learning.**

Sample Activity: Students in groups of 3 or 4 use electronic books in learning centers as part of their language arts activities.

At the end of grade five, students will:

- **Conduct a successful information search and data retrieval using Internet search engines. This will be done with close supervision.**
- **Independently browse web sites that have been selected by the teacher and pertain to curricular topics.**
- **Explore electronic atlas, almanac, and encyclopedia resources.**
- **Discuss the soundness of sources and information available on the Internet.**
- **Use e-mail to gather information from selected experts in specific fields.**

Students as information seekers, navigators, and evaluators. (con't)

- **Use calculators and/or computers to explore data sets and investigate the relationships.**

Sample Activity: Students measure lengths of their feet and their heights and examine the relationship between the measurements using table, graphing, statistics functions on a calculator or using similar functions on a spreadsheet.

At the end of grade eight, students will:

- **Conduct a successful information search and data retrieval using Internet search engines. This will occur under/with teacher guidance.**
- **Independently browse sites that pertain to curricular topics under teacher supervision.**
- **Use electronic atlas, almanac, and encyclopedia resources in preparing reports and presentations.**
- **Evaluate the soundness of sources and information from computer resources.**
- **Use e-mail to gather information from selected experts and share information with other schools and government agencies.**

Sample Activity: Students collect data in the Illinois Rivers Project and disseminate information to other project schools and government agencies.

Sample Activity: Students in language arts communicate with students in other schools concerning regional vocabulary and pronunciation patterns.

- **Successfully complete teacher-created on-line surveys, worksheets, and assessments.**
- **Use calculators to investigate relationship between sets of data.**
- **Independently locate an assigned website, gather information, and complete assignments.**

Sample Activity: Students locate a class website and read background information on Gregor Mendel for purposes of report writing and testing.

Students as information seekers, navigators, and evaluators. (con't.)**At the end of grade eleven, students will:**

- **Conduct a successful information search and data retrieval using Internet search engines, library databases, and other media resources.**

Sample Activity: Students in mathematics retrieve data on all 50 states to plan and organize social studies “50 states in 50 days trip” (use maps, state visitors’ bureaus, telephone communication, e-mail communication).

Sample Activity: Students in foreign languages access on-line information from Spanish-speaking countries to research and present a travel portfolio.

- **Use calculators to investigate relationships among variables graphically, algebraically, and numerically.**
- **Use calculators/computers to investigate geometric relationships.**
- **Use e-mail, on-line help, newsgroups, listservs, and net forums for questioning and gathering information from classmates, teachers, outside resources, and peers in other schools.**
- **Apply information-technology resources to address life skill issues (career exploration, managing personal finances, and health and physical fitness).**
- **Evaluate the soundness of sources and information from computer resources.**
- **Use on-line newspapers, journals, and news stations (like CNN) to keep current on the state of the nation and the world.**

Sample Activity: Students in Environmental Science search on-line environmental journals (such as E! the Environmental Magazine, and GreenBeat!) and on-line news stations (such as CNN's Earth Matters site and Environmental News Network). Students write summaries and/or critical evaluations of the web sites or articles. Students deliver oral reports of their findings in seminars.

2. Students as critical thinkers, analyzers and selectors of information and technologies appropriate to the task.**At the end of grade two, students will:**

- **Organize collected data in a variety of representations using computer technology.**

Sample Activity: Class uses information gathered from surveys to create a variety of graphs and charts using Graphers.

At the end of grade five, students will:

- **Use spreadsheet programs/calculators to generate charts and graphs to illustrate mathematical problems.**

Sample Activity: Student conduct a survey and graphically illustrate the data.

Sample Activity: Students create a spreadsheet with accompanying graph to analyze income, expenses, and profit incurred during a mini-society simulation.

At the end of grade eight, students will:

- **Use graphing calculators to record and to compute data and graphically represent the data in an appropriate manner.**

Sample Activity: Students record data from a survey and analyze the data using regression models and common statistics, including mean, median, mode, box and whisker plots, histograms, and correlation coefficients.

- **Create spreadsheets and accompanying graphs to organize and analyze data and mathematical relations.**

Sample Activity: Students organize and analyze seismic readings that identify up-to-the-minute earthquake activity occurring around the world.

Sample Activity: Students organize and analyze weather data, local and global.

- **Search a database using two criteria.**

Students as critical thinkers, analyzers and selectors of information and technologies appropriate to the task. (con't.)

At the end of grade eleven, students will:

- **Analyze and describe how the selection and presentation of information in different media formats affect peoples' perception of information.**

Sample Activity: Students compare and contrast a multimedia presentation with a print presentation on the same topic.

- **Choose appropriate technology to solve the problem at hand.**

Sample Activity: Students solve mathematic problems with or without calculators and/or computers, as appropriate.

3. Students as creators of knowledge using information resources and technology.**At the end of grade two, students will:**

- **Create knowledge using information from computer resources. The class will work as a whole following a teacher-directed lesson.**

Sample Activity: Students research a topic (bears, butterflies) and create an information folder, book, poster, newsletter, or illustration to share with the class.

Sample Activity: Students compose a simple melody with music software.

At the end of grade five, students will:

- **Create knowledge using information from computer resources in small groups or individually.**

Sample Activity: Students research a topic and create an informational pamphlet, book, or report.

- **Use creativity and authoring tools to develop simple reports, presentations, and projects.**

Sample Activity: Students use Microsoft Powerpoint to present research on Illinois. The project includes downloading a map and using drawing tools to add rivers, cities, and places of interest.

At the end of grade eight, students will:

- **Create knowledge using information from computer resources both individually and as a member of a team.**

Sample Activity: Students research a topic and create a Powerpoint presentation to support a persuasive speech.

Sample Activity: Students in teams prepare a multimedia presentation to share knowledge learned about a 1900's decade. This project integrates Language Arts and Social Studies concepts.

Students as creators of knowledge using information resources and technology. (con't.)**At the end of grade eleven, students will:**

- **Create a web page with linked resources to share research information.**
- **Create an on-line survey, worksheet, or assessment.**
- **Demonstrate the ability to combine and synthesize information drawn from two or more technology-based resources to acquire new understandings.**
- **Incorporate multimedia tools into projects.**

Sample Activity: Students create musical composition and dance choreography.

Sample Activity: Students in foreign language videotape student-produced TV broadcasts in target languages.

Sample Activity: Students in foreign language videotape oral group projects of TV commercials.

- **Discover new applications for technology tools beyond those taught in the classroom.**
- **Use mathematics, science, and other software and CD-ROMS to further their knowledge and understanding in appropriate classes.**

Sample Activity: Students use CBL's (calculator based laboratory) and graphing calculators to record pressure and volume of a gas and determine the relationship between the values.

- **Use spreadsheet programs to create and select the graph to best represent the data being analyzed.**

4. Students as effective communicators using a variety of appropriate technologies/media.**At the end of grade two, students will:**

- Create a picture using software to stimulate a creative writing experience.

Sample Activity: Students use a software program, such as Kid Pix, to create a color picture that motivates writing.

At the end of grade five, students will:

- Prepare a guided project using multimedia.

Sample Activity: Students prepare a Powerpoint presentation on a selected transport system of the human body.

Sample Activity: Students, using drawing software, prepare advertisements to promote a mini-society business.

- Share completed projects with each other and with students in other grades.

Sample Activity: Students in fourth grades share their Illinois Powerpoint presentations with third grade students.

- Use e-mail to communicate.

Sample Activity: Students correspond with “key pals” around the world

Sample Activity: Students ask questions of Experts (selected by the teacher) on the history of Illinois.

Students as effective communicators using a variety of appropriate technologies/media. (con't.)**At the end of grade eight, students will:**

- **Share knowledge through multimedia presentations.**

Sample Activity: Students in teams share prepared research on a decade in the 1900's through a presentation including music, art, and other optical/electronic media.

- **Communicate and exchange ideas with students from other schools.**

Sample Activity: Students use e-mail to share and compare regional dialects and enhance vocabulary development.

At the end of grade eleven, students will:

- **Use e-mail and Net Forums for communication with classmates, teachers, outside resources, and peers in other schools.**

Sample Activity: Students in foreign language use e-mail to exchange information with partners in a country of the target language.

- **Subscribe and unsubscribe to newsgroups, bulletin boards, listservs.**

- **Access on-line information for student projects and goals.**

Sample Activity: Students in Spanish access on-line information from Spanish-speaking countries to debate current events.

- **Analyze information for its usefulness and make appropriate choices from a variety of on-line and CD-ROM information sources.**

- **Select written, audio and video elements, integrating them into a technological presentation that conveys a unified message**

5. Students as technologists.**At the end of grade two, students will:**

- **Extend their working computer vocabulary. Teacher modeling will aid in this development. (Sample vocabulary: screen/monitor, keyboard, mouse, disk drive, CD ROM, printer, etc.)**
- **Locate and use letter and number keys on a computer keyboard.**
- **Identify and acquire colors from the computer's paint palette.**
- **View and interact with multimedia books and a variety of interactive diskettes.**
- **Operate the point and click feature of the mouse and the control features of the keyboard.**
- **Recognize that when the hourglass replaces the cursor the computer is processing and should not be disturbed.**
- **Operate the calculator to add and subtract.**

At the end of grade five, students will:

- **Use the touch-type method of keyboarding with emphasis on low error rate rather than speed.**
- **Select, scan, and convert a picture to a computer graphic with teacher assistance.**
- **Open an application, save a file to disk, and quit a file or application.**
- **Apply style changes: bold, underline, size, and fonts.**
- **Edit text and sentences: center, justify, cut and paste, and use spelling and grammar checkers.**
- **Download graphics from Internet to a disk for use in projects.**
- **Operate a calculator to perform the four basic operations and grouping.**

Students as technologists. (con't.)**At the end of grade eight, students will:**

- **Construct a personal web page.**
- **Learn troubleshooting techniques in various technologies.**
- **Apply additional features of a word processing program: insert graphics, tables, clipart, charts; adjust page setup; add columns; and use thesaurus, spelling, and grammar checking programs.**
- **Use windows features: moving between open desktop files, copying from open files and the Internet.**
- **Format diskettes, check a diskette for viruses, and check properties of diskettes.**
- **Increase touch typing proficiency and speed with low error rate.**
- **Routinely make backup copies of files and print copies of work for safekeeping.**
- **Use specialized software packages for their designed purposes.**

Sample Activity: Students use Computer-Assisted Drafting (CAD) to design furniture in architectural projects.

- **Use a camcorder or digital camera to successfully record an event.**

Sample Activity: Students in humanities use a camcorder to record an interview of a student in the role of a famous artist from history.

Sample Activity: Students use digital camera to record each other's picture. The pictures are a part of a credits page in multimedia presentations.

- **Use school library's on-line catalogs to find information.**
- **Operate scientific and graphing calculators to investigate, model, and solve mathematics problems.**

Students as technologists. (con't.)**At the end of grade eleven, students will**

- Use school library on-line catalogs to find resources.
- Use sophisticated publishing tools to create newspapers, documents, or presentations.
- Use a webpage-based lesson for an independent unit within a course.
- Create a webpage that integrates written, audio and video elements.
- Develop basic database skills: design, labels, merges, reports, queries.
- Use advanced word processing skills: find, replace, paragraph and outline format, importing from databases and spreadsheets.

Sample Activity: Students in foreign language use computers to word process compositions in the target language and edit them with Spanish and French spell check program.

- Explain functions of key components of computer system: input/output devices, cards, chips. etc.
- Create a short program on a graphing calculator and send it to another calculator.
- Share data between calculators.
- Use calculator features (graphing, tables, statistical analysis) to solve mathematical problems.
- Have opportunities for learning a programming language.
- Have opportunities to demonstrate the ability to install and remove internal components of the computer.
- Analyze strengths and weaknesses of different calculators and computer hardware/software applications.

6. The student as an informed and responsible citizen in a technological age.

The following expectations apply to students at each level. Students will:

- Sign a progressively refined Ethics Agreement form in order to use Internet.
- Recognize ownership of their own work.
- Demonstrate proper care and use of technological equipment.
- Recognize the right to privacy of others.
- Recognize that one must have permission to copy another person's work.
- Use appropriate language at all times (no swearing, sexual innuendo, reference to illegal substances or violence, no slander or libel).
- Maintain good posture with an increasing awareness of ergonomic health issues (take breaks, care for wrists, avoid eye strain).
- Recognize the difference between single-use and site-licensed software.
- Identify what constitutes plagiarism; use citation and credits in their completed work.

The above expectations will be revisited and refined annually as students progress through the grades.

At the end of grade two, students will:

- Describe some of the actual and potential effects (both good and bad) of technology on people and their environment.

Sample Activity: Students are instructed by teachers in some simple wrist, hand, and shoulder relaxation exercises.

Sample Activity: Students invite grandparents in to talk about leisure time activities before the age of computers. Students compare time spent in physically active games and technology games of today.

The student as an informed and responsible citizen in a technological age. (con't.)**At the end of grade five, students will:**

- Study the history of information technology and its impact on society.

At the end of grade eight, students will:

- Use appropriate citing of resources found through the use of technology.
- Respect copyright of Internet authors (games, graphics, text, audio, multimedia). This includes the altering of existing copyrighted graphics.
- Learn the meaning and appropriate use of Shareware and Public Domain software.

At the end of grade eleven, students will:

- Keep current on news, events, and issues in the world of information technology.

Sample Activity: Students discuss in class how a nation's strength is related to its use of technology.

Sample Activity: Students explain planned and unanticipated effects of technology (increased productivity, increasingly sedentary lifestyle, isolation).

BIBLIOGRAPHY

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National Educational Technology, Standards for Students, International Society for Technology in Education, 1787 Agate Street, Eugene, OR 97403-1923, June, 1998.

The following web sites were used as resources:

<http://www.est.gov.bc.ca/curriculum/curric/lo.html> Learning outcomes in many high school curricular areas.

<http://www.sd54.bc.ca/district/library/scopeovr.htm> Technology Scope and Sequence

<http://www.hipark.austin.isd.tenet.edu/home/scope.html> Technology Scope and Sequence--K-5th grades

http://www.msvl.wednet.edu/MsvlSchools/msdhome/elementary/allen_creek/pages/7.html Scope and Sequence--k-5th grades--good table

<http://siksik.learnnet.nt.ca/CTS/ScopSeq/main.html> Career and Technology studies--vocational, high school and vocational school emphasis.

<http://www.cupertino.k12.ca.us/Do.www/Scopenseq.html> High School--some tables worth examining.

<http://www.forks.wednet.edu/partnerlink97/techhistoryscope.html> Has an example of an integrated project at the high school level.

<http://www.ncrel.org/skrs/areas/issues/methods/technlgy/te3lk75.htm> The Scope and Sequence for K-8 contains eight sections: Integrated Media Keyboarding Paint and Draw Research and References Simulations Spreadsheets Telecommunications Write and Publish with Graphics--Contains some detail worth examining.

<http://www.fsd38.ab.ca/Schools/Spitzee/scope.htm> Brief outline of a k-5 scope and sequence, very simplistic.

<http://www.academic.com/support/scopeand.html> Shows a tabular scope and sequence for high school algebra. Note: the use of graphing.

http://www.gsh.org/nsta_ssandc/ Very large site giving information on 9-12, science, scope and sequence--must look for technology uses.

<http://itdc.sbcss.k12.ca.us/curriculum/> Great curriculum resources--not necessarily for our scope and sequence work.

<http://www.uno.edu/~edci/techless.htm> Does have a site for Tech. in Grades 8-10. Other sites might have some scope and sequence information.

<http://sun1.wetmore.amphi.com/~dolphin/tech.html> Lists skills for Grades k-5 for Technology Scope and Sequence.