

NORTHERN VALLEY SCHOOLS TECHNOLOGY LITERACY CURRICULUM GUIDE

K - 12

2009

Office of Curriculum and Instruction



**NORTHERN VALLEY SCHOOLS CONSORTIUM
Member Districts**

CLOSTER

HARRINGTON PARK

DEMAREST

HAWORTH

NORTHVALE

NORWOOD

OLD TAPPAN

NORTHERN VALLEY REGIONAL HIGH SCHOOL DISTRICT

Bergen County, New Jersey

**NORTHERN VALLEY SCHOOLS
TECHNOLOGY LITERACY
CURRICULUM GUIDE**

K-12

2009

OFFICE OF CURRICULUM AND INSTRUCTION

NORTHERN VALLEY SCHOOLS

CURRICULUM CENTER

DEMAREST, NEW JERSEY 07627

PATRICIA M. RAUPERS, Ed.D., DIRECTOR

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APPROVAL LIST

Recommended

Technology Curriculum Committee	X
Instructional Council	X
Northern Valley Principals Association	X
Northern Valley Administrators Association	X

Approved

Boards of Education

Closter	X
Demarest	X
Harrington Park	X
Haworth	X
Northvale	X
Norwood	X
Old Tappan	X
Northern Valley Regional High School District	X

**CHIEF SCHOOL ADMINISTRATORS
OF PARTICIPATING DISTRICT**

Mrs. Joanne Newberry	Closter
Dr. Greg Hauser, Interim	Demarest
Dr. Adam Fried	Harrington Park
Mr. Raymond Albano, Interim	Haworth
Mr. Sylvan Hershey	Northvale
Dr. Andrew Rose	Norwood
Dr. William Ward	Old Tappan
Dr. Jan Furman	Northern Valley Regional High School District

“When used correctly, educational technology gives new meaning and utility to long-established educational paradigms.”

Matthew S. Kuhn

Preface

The tremendous growth in educational technology tools and applications has created new methodologies to assist teachers in meeting the needs of all students and has also given teachers new ways to expand both the depth and breadth of the curriculum (Kuhn, 2008). Furthermore, when used appropriately, technology provides valuable learning tools for students to enhance their thinking and problem solving skills (Bransford, Brown, & Coaking, 2002). Students appear to benefit the most when educators incorporate the use of technology to promote higher-order and critical thinking skills. In addition, technology literacy is recognized as an essential workplace competency and research conducted over the past decade reveals a clear relationship between technology assisted instruction and student achievement (D’Amico, 2001; Jossey-Bass, 2000; Wenglinsky, 2006). This guide is designed to promote all of these worthy objectives.

Educators are continually challenged by the task of preparing students for a rapidly changing world. The integration of technology into student processing of learning can help them to build perspectives and skills that better match the needs of an information-based society (Prensky, 2006). “By themselves, even the most sophisticated technologies cannot improve learning or thinking. Rather, educators, aided by technology, can create learning environments that support higher-order thinking and constructive discussion.” (LeBaron & Collier, 2001, p. 44) The authors of this guide have written student objectives, based on the New Jersey Core Curriculum Content Standards for Technology Literacy, to support the establishment of appropriate learning venues (New Jersey Department of Education, 2004).

Acknowledgements

The *Northern Valley Schools Technology Literacy Curriculum Guide* represents the efforts of a committee composed of faculty representatives from all of the districts within the Northern Valley Schools consortium. A complete listing of committee members appears on page v. This committee worked for a year to conduct research, discuss national and statewide trends in technology education, analyze the Standards, share strategies, and write the guide. These experts devoted many hours to the task and their work is most appreciated.

A special expression of thanks is extended to Mrs. Debbie Stevens, Administrative Secretary for her efforts and expertise in the preparation of this document.



Dr. Patricia M. Raupers
Director of Curriculum and Instruction

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TECHNOLOGY CURRICULUM COMMITTEE

Rita Monteleone	Tenakill Middle School, Closter
Joanne L. Iyo	Hillside School, Closter
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Victoria Zimmerman	Demarest Middle School, Demarest
Maria Cogelia	Harrington Park
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Lauren Syre	Northvale
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Cathy Troia	Regional Programs Northern Valley Regional HSD
David Janosz	Supervisor of Related Arts, Northern Valley Regional HSD
Dr. Patricia M. Raupers	Northern Valley Schools

OBJECTIVES TO BE ADDRESSED THROUGHOUT THE TECHNOLOGY IN EDUCATION CURRICULUM

As we move forward into the Web 2.0 generation of web development and design, the Northern Valley Technology Committee aims to facilitate communication and information sharing through applications such as social networking sites, video-sharing, wikis, blogs and social-bookmarking.

"Web 2.0 - Wikipedia, the free encyclopedia." Wikipedia, the free encyclopedia. 3 Mar. 2009 <http://en.wikipedia.org/wiki/Web_2.0#Technology_overview>.

The use of technology is integrated in all subject areas. Selected software and hardware should relate appropriately to the curriculum and to the developmental level of the students.

The Northern Valley Regional Technology Committee has addressed the following areas of Technology Instruction including but not limited to:

- Word Processing
- Keyboarding
- Internet Usage
- Spreadsheets
- Database Concepts and Usage
- Publications and Presentations
- Basic Computer Tools

OVERVIEW OF CURRICULUM STANDARDS AS EXPRESSED BY THE STATE OF NEW JERSEY

In grades K- 2, students are formally introduced to the basic features/functions of a computer and demonstrate understanding that technology enables them to communicate beyond the classroom on a variety of topics.

K-2 students are also exposed to elements of the design process, design systems, a variety of technology resources and understand the importance of safety when using technological tools.

In grades 3-4, students understand the purpose of and are able to use various computer applications. They continue to develop information literacy skills and increasingly use technology to communicate with others to support and enhance content knowledge and skills while recognizing the need for cyber safety and acceptable use policy.

Students in grades 3-4 also investigate the impact of technology systems, understand the design process and use it for problem solving.

In grades 5-8, students expand their capacity to use operations and applications, apply information literacy skills and select the appropriate tools and resources to accomplish a variety of tasks as they develop digital citizenship. Participation in online learning communities builds understanding of the perspectives of learners from other countries as students collaborate in the design of products that address local and global issues across the curriculum.

In grades 9-12, students demonstrate advanced computer operation and application skills by publishing products related to real world situations (e.g., digital portfolios, digital learning games and simulations) and understand the impact of unethical use of digital tools. They collaborate adeptly in virtual environments and incorporate global perspectives into problem solving at home, school and in structured learning experiences with the growing realization that people in the 21st century are interconnected economically, socially and environmentally and have a shared future.

"New Jersey Department of Education." The Official Web Site for The State of New Jersey. March 3, 2009: <http://www.state.nj.us/education/aps/cccs/2009/tech/index.html>

GENERAL OBJECTIVES

GRADES K – 12

OBJECTIVES TO BE ADDRESSED THROUGHOUT THE TECHNOLOGY IN EDUCATION CURRICULUM

The use of technology is integrated in all subject areas. Selected software and hardware should relate appropriately to the curriculum and to the developmental level of the students.

K - 12 General Objectives

Students will demonstrate:

1. Respect for ethical considerations, as delineated in each district's acceptable use policy.
2. Proper care and safe use of hardware and software.
3. Decision making and problem solving skills, individually and collaboratively.
4. Effective technological skills across subject areas.
5. Communication skills in a global environment.
6. Skills necessary to access, retrieve, analyze, evaluate, and apply information.
7. Awareness of the relationship between technology and career choices.
8. Awareness of technology as an agent of change and its impact on society.
9. An ability to use technology in daily learning activities.
10. Use appropriate technology vocabulary.
11. Use common features of an operating system (e.g. creating and organizing files and folders).
12. Demonstrate an understanding of how changes in technology impact the workplace and society.
13. Explain the purpose of an Acceptable Use Policy and the consequences of inappropriate use of technology.
14. Use computer applications to modify information independently and/or collaboratively to solve problems.
15. Identify basic hardware problems and demonstrate the ability to solve common problems.
16. Determine when technology tools are appropriate to solve a problem and make a decision.

GRADES K – 4
TECHNOLOGY LITERACY CURRICULUM

Grades K – 4

I. Technology Operations and Concepts																										
Essential Questions:																										
1. How can technology and related digital tools be used to facilitate communication? 2. How can technology and digital tools be used to gather and organize information? 3. How can technology and digital tools be used to create, format and publish a document?																										
Objectives: K - 2		New Jersey Standards																								
1. Identify and use the basic features of a computer and its operating system		8.1. (4) A.1, 2, 9																								
2. Identify basic hardware problems and solve simple problems (i.e. freezing, refresh/stop, force quit, restart, minimizing/closing windows, empty trash, quitting applications, login/log out).		8.1 (4) B.9, 10																								
3. Use technology terms in daily practice.		8.1. (4) A.1																								
4. Discuss the common uses of computer applications and hardware and identify their advantages and disadvantages both at home and at school. Example: researching on the computer vs. books.		8.1 (4) B.1																								
5. Demonstrates appropriate keyboarding/mouse skills and correct posture.		8.1 (4) A.3																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Keyboarding</th> <th style="width: 33%;">Mouse</th> <th style="width: 33%;">Posture</th> </tr> </thead> <tbody> <tr> <td>Character keys</td> <td>Pointing</td> <td>Feet flat</td> </tr> <tr> <td>Return/enter</td> <td>Clicking</td> <td>Sit tall</td> </tr> <tr> <td>space bar</td> <td>Dragging</td> <td>Home row</td> </tr> <tr> <td>Arrows</td> <td>Pulldown/dropdown menu</td> <td>Thumbs on space bar</td> </tr> <tr> <td>Shift/caps lock</td> <td>Scroll bar</td> <td>Elbows at side</td> </tr> <tr> <td>Delete/backspace</td> <td></td> <td>Curved wrists</td> </tr> <tr> <td>Esc(ape)</td> <td></td> <td>Eyes front</td> </tr> </tbody> </table>			Keyboarding	Mouse	Posture	Character keys	Pointing	Feet flat	Return/enter	Clicking	Sit tall	space bar	Dragging	Home row	Arrows	Pulldown/dropdown menu	Thumbs on space bar	Shift/caps lock	Scroll bar	Elbows at side	Delete/backspace		Curved wrists	Esc(ape)		Eyes front
Keyboarding	Mouse	Posture																								
Character keys	Pointing	Feet flat																								
Return/enter	Clicking	Sit tall																								
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Arrows	Pulldown/dropdown menu	Thumbs on space bar																								
Shift/caps lock	Scroll bar	Elbows at side																								
Delete/backspace		Curved wrists																								
Esc(ape)		Eyes front																								
6. Create a document with text using a word processing program.		8.1. (4) A.4																								
7. Create a visual composition using basic tools (brush, bucket, spray can, color palette, eraser, shape, line and text tools).																										
8. Demonstrate the ability to navigate in developmentally appropriate virtual environments (websites).		8.1. (4) B.6																								

K – 4: Technology Operations and Concept - Continued

Objectives: 3 – 4	New Jersey Standards
1. Demonstrate effective input of text formatting and graphics using an input device (keyboard, AlphaSmart, dana).	8.1. (4) A.3, 4
2. Using word processing create a document with text formatting (font, size, color, bold, italic, underline, align text, and spell check) and graphics (resize, scale, rotate, duplicate, group, and arrange).	8.1. (4) A.3, 4
3. Edit text using cut, copy, paste and delete as appropriate.	8.1 (4) A.3, 4
4. Create, edit and present a multi-media presentation (with at least 3 slides) that includes formatted text, graphics, transitions, slide layout and is in a logical order.	8.1. (4) A.6
5. Create a simple spreadsheet, enter data of at least five numbers, create a graph (pie, bar, picto), and interpret the information.	8.1. (4) A.5
6. Create and maintain files and folders (including saving, retrieving and deleting).	8.1. (4) A.7
7. Create and use graphic organizers (flow chart, timeline, Venn diagram, concept map/web, etc.) to categorize and present information.	8.1. (4) A.8
8. Determine the benefits of a wide range of digital tools by using them to solve problems (such as a digital camera, scanner, computer/laptop, SMART Board, document camera, electronic card catalog, etc.).	8.1 (4) B.9
<p>Key vocabulary (computer parts): monitor, screen, icon, CPU, keyboard, mouse, speakers, headphones, printer, flashdrive, (USB, jumpdrive, external hard drive, thumb drive, memory stick)</p> <p>Key vocabulary (applications): icon, shortcut (MAC - apple/command key; PC - control key), scroll bar, software, drop-down menu, formatting palette/tool bar</p>	

K – 4 – Continued

II. Ethical and Social Aspects of Technology	
Essential Questions:	
1. What are the ethical and legal aspects of technology?	
2. How can a student demonstrate ethical use of technology?	
Objectives: K - 2	New Jersey Standards
1. Recognize and practice responsible behaviors when using technology and understand the consequences of inappropriate use including: ~ Internet access ~ Copyrighted materials ~ On-line resources ~ Equipment ~ Acceptable Use Policy (AUP)	8.1 (4) B.2, 4
2. Works in a group setting on collaborative projects such as a presentation or Internet research.	8.1 (4) B.9
Objectives: 3 - 4	
1. Recognize and practice responsible behaviors when using technology and understand the consequences of inappropriate use including: ~ Internet access ~ Copyrighted materials/plagiarism ~ On-line resources ~ Equipment ~ Acceptable Use Policy (AUP) ~ Personal security and safety issues (including passwords)	8.1 (4) B.2, 4
2. Practice appropriate Internet etiquette (i.e. email, chat rooms, blogging, etc.)	8.1 (4) B.3
III. Information Access and Research	
Essential Questions:	
1. How can a computer be used to access, retrieve, synthesize, and evaluate information?	
2. How are computers used to communicate, transfer, and access information electronically in a global environment?	
Objectives: K - 2	New Jersey Standards
1. Access a website.	8.1 (4) B.6
2. Navigate within a browser.	8.1 (4) B.6
3. Participate in on-line activities.	8.1 (4) B.2, 3
Objectives: 3 - 4	
1. Follow a guided search.	8.1 (4) B.5, 6
2. Utilize bookmarks.	8.1 (4) B.6
3. Use electronic resources as a research tool.	8.1 (4) B.5, 6, 7, 8
4. Initiate a search	8.1 (4) B.5, 6
5. Cite electronic resources (i.e. copyright, URL, website title, date retrieved, author)	8.1 (4) B.2, 4
6. Capture images and texts.	8.1 (4) B.6
7. Retrieve, synthesize, and summarize information.	8.1 (4) B.5, 6, 7, 8
8. Copy and paste text and graphics from the Internet into a word processing document.	8.1 (4) A.3; (4) B.2, 4
9. Recognizes/explores accuracy among fact, opinion and bias.	8.1 (4) B.5, 8
Key Vocabulary (Internet terms): URL, webpage, browser, search engine, domain name (tags – i.e. – .com, .net, .edu, .gov, .org), directories, and online databases	

Strategies and Resources for K-4 Technology Curriculum

<u>Word Processing /Keyboarding</u>	<u>Multimedia</u>
<p>Strategies: Letters Signs Posters Cards Poems Speeches</p> <p>Resources: Commercial Keyboarding Programs <u>Type to Learn</u> <u>All the Right Type</u></p> <p>Free online keyboarding programs: http://www.bbc.co.uk/schools/typing/ (Dancemat) http://www.freetypinggame.net/ http://www.sense-lang.org/typing/ http://www.goodtyping.com/ www.davis.k12.ut.us/cjh/appliedtech/Business/Keyboarding/ http://www.powertyping.com/</p> <p>Word Processing Programs: Microsoft Office Word iWorks (Pages) Google Documents Microsoft Publisher Stationary Studio PrintShop</p> <p>Tutorials: :http://www.internet4classrooms.com/online2.htm</p> <p>Graphic Organizers: Kidspiration Pixie www.enchantedlearning.com</p>	<p>Strategies: Slide Show Podcasts Movies</p> <p>Resources: Multimedia Programs Pixie KidPix Microsoft PowerPoint iWorks Keynote Windows Movie maker Microsoft Photostory iMovie, iPhoto Garageband Quicktime</p> <p>Online: Streaming.discoveryeducation.com www.adobe.com/education/digkids/lessons/main.html</p> <p>Tutorials: http://www.quasar.ualberta.ca/edit202/tutorial/PowerPoint/PowerPoint.htm http://www.microsoft.com/education/Word97Tutorial.msp http://www.intelligentedu.com/newly_researched_free_training/Office_and_Desktop_Apps_Training.html</p>

**Strategies and Resources for K-4 Technology Curriculum
Continued**

<u>Databases/Spreadsheets</u>	<u>Information Access and Research</u>
<p>Strategies: Sorting Creating graphs Analyzing data</p> <p>Resources: Microsoft Office Excel iWorks- Numbers Inspire Data Google Documents</p> <p>Tutorials: http://www.internet4classrooms.com/online2.htm</p>	<p>Strategies: Research Maps</p> <p>Resources: EBSCO Host: http://search.ebscohost.com <u>Search Engines</u> - Yahoo!igans, Google, AskforKids, DogPile, Wikipedia, Hotbot, Webcrawler, Kartoo, Answers, http://www.worldalmanacforkids.com/WA-KI-Home.aspx http://www.worldbookonline.com http://www.dictionary.reference.com/ www.visualthesaurus.com www.nationalgeographic.com/homework www.educplace.com www.enchantedlearning.com http://www.state.nj.us/hangout_nj/ www.educationworld.com</p>
<p><u>Social Aspects</u></p>	
<p>Strategies: Discussion Online Worksheets Citation</p> <p>Resources: Acceptable Use Policy http://www.CyberSafety.com http://www.iSafe.com http://www.WebWiseKids.com http://www.NetSmart.com http://www.WiredSafety.com http://usatodayeducate.com/wordpress/index.php/technology-cyber-security Citation Maker</p>	

GRADES 5 - 8
TECHNOLOGY LITERACY CURRICULUM

Grades 5 - 8

I. Technology Operations and Concepts: Word Processing, Keyboarding	
Essential Questions:	
1. How can a computer and related technologies be used to facilitate the writing and publishing process? 2. How can inputting techniques be improved by the correct use of the keyboard and other devices?	
Objectives	New Jersey Standards
1. Demonstrate (Input) how to compose, revise, and insert special characters and/or merging documents.	8.1.(8)A.3,4
2. Demonstrate (Edit) how to cut, copy, paste, use the thesaurus, and use find/replace.	8.1.(8)A.5
3. Explain (format) how to create/use page breaks, columns, paragraph styles, margins, tabs, and text rulers.	8.1.(8)A.5
4. Demonstrate (Print) how to change orientation and scale.	8.1.(8)A.4,5
5. Utilize information from multiple files and applications that are open simultaneously.	8.1.(8)A.2
6. Format a research document.	8.1.(8)A.4
7. Enhance documents using advanced formatting tools. (e.g., a newsletter, personalized learning plan, business, or flyer)	8.1.(8)A.5
8. Strike keys with correct fingers using the home row position.	8.1.(8)A.3
9. Utilize shortcut keystrokes	8.1.(8)A.2,3
Key vocabulary: Word Processing: edit, save, bold, select, font, alignment (e.g., left, center, right), format, document, print, text, line spacing, margins, text box, landscape, portrait, bullets, header, footer, hyperlink, layout Keyboarding: home row, keystroke, shortcuts, tab, accuracy, cursor, words per minute (wpm), delete, format, text wrap	

Suggested Strategies and Resources:

<p>Strategies: Friendly & Business Letters Newsletter Brochures Booklets</p> <p>Resources: Commercial Keyboarding Programs Type to Learn All the Right Type</p> <p>Free online keyboarding programs: http://www.bbc.co.uk/schools/typing/ http://www.freetypinggame.net/ http://www.sense-lang.org/typing/ http://www.goodtyping.com/ www.davis.k12.ut.us/cjh/appliedtech/Business/Keyboarding/ http://www.powertyping.com/</p>	<p>Word Processing Programs: Microsoft Office Word iWorks Google Documents Microsoft Publisher</p> <p>Tutorials http://www.internet4classrooms.com/online2.htm</p>
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Grades 5-8, Continued

II. Technology Operations and Concepts: Multimedia

Essential Questions:

1. How can a computer and related technologies be used as a tool to create digital graphic compositions as enhancements to presentations and documents or artwork?
2. How can information be effectively presented in multimedia format?
3. In what way can a computer and appropriate applications be used to organize information or project planning?

Objectives	New Jersey Standards
1. Demonstrate (input) how to compose, revise, and insert special characters and/or merging documents.	8.1.(8)A.6
2. Learn how to resize, scale, rotate, duplicate, group, arrange, reshape, and manipulate objects.	8.1.(8)A.5
3. Author a presentation using hypermedia that integrates text, sound, static, and animated graphics.	8.1.(8)A.8
4. Create hyperlinks to documents, web pages, or other media.	8.1.(8)A.5, 8
5. Demonstrate and explain how the design process is not linear.	8.2.(8)B.2
6. Chose appropriate computer applications for organizing information.	8.1.(8)A.2
7. Use appropriate graphic organizing software to create, construct, or design a document.	8.1.(8)A.11
Key vocabulary: hyperlink, animation, audio, video, transition, podcast, vodcast, blog, multimedia, background, button, hypertext, pixel, video, timeline, story board, file extensions (video-mov, mpeg, mp4, picture-jpeg, gif)	

Suggested Strategies and Resources:

Presentations (Subject matter topics such as Social Studies reports, Author Studies or Book Reviews, Informercials, World Language, Artists and Works of Art, Scientific Method)

Movies (Subject matter topics such as Public Service Announcements, Science Topics, Hertiage)

Podcasts-(Subject matter topics Nursery Rhymes, Commercials, Poetry Reading, Book Talks, Interviews)

Resources:

Microsoft Office PowerPoint

Windows Movie maker

iMovie, iPhoto

Adobe Premier

Audacity

iWorks Keynote

Microsoft Photostory

Garageband

Quicktime

Tutorials:

<http://www.quasar.ualberta.ca/edit202/tutorial/PowerPoint/PowerPoint.htm>

<http://www.microsoft.com/education/Word97Tutorial.msp>

http://www.intelligentedu.com/newly_researched_free_training/Office_and_Desktop_Apps_Training.html

Grades 5-8, Continued

III. Technology Operations and Concepts: Spreadsheets and Databases	
Essential Questions:	
1. How can a spreadsheet program be used to collect, manipulate, calculate, and present information?	
2. How can a database be used to search, organize, present data, solve problems, and think analytically?	
Objectives	New Jersey Standards
1. Enter and edit text and values.	8.1.(8)A.7
2. Create a chart from a spreadsheet.	8.1.(8)A.7
3. Use mathematical formulas in a spreadsheet format.	8.1.(8)A.7
4. Create and modify a spreadsheet by entering, formatting, and manipulating cells.	8.1.(8)A.7
5. Create a database.	8.1.(8)A.9
6. Sort, search and arrange data.	8.1.(8)A.9
7. Use data to produce a report.	8.1.(8)A.9
Key vocabulary:	
Spreadsheet: cell, column, row, worksheet, workbook, sort, fill, auto sum, sheet tab, chart, paste, value, formula, label, data entry	
Database: file, record, field, template, search, find, match, sort, arrange, ascending, descending	

Suggested Strategies and Resources:

Strategies:

Averaging (Subject matter topics Stock market, Grades, Cost of Items, Temperatures)

Sorting (Subject matter topics Vocabulary Words, States and Capitals)

Sums (Subject matter topics Shopping Spree, Party Planner, Trips)

Creating graphs (Subject matter topics Surveys)

Resources:

Microsoft Office Excel

iWorks- Numbers

Inspire Data

Google Documents

Tutorials:

<http://www.internet4classrooms.com/on-line2.htm>

Grades 5-8, Continued

IV. Social Aspects of Technology	
Essential Question: How can a student demonstrate ethical use of technology?	
Objectives	New Jersey Standards
1. Demonstrate an understanding of how changes in technology impact the workplace and society.	8.1.(8)B.1
2. Explain the purpose of an Acceptable Use Policy and the consequences of inappropriate use of technology.	8.1.(8)B.3
3. Describe and practice safe Internet usage.	8.1.(8)B.4
4. Describe and practice “etiquette” when using the Internet and electronic mail.	8.1.(8)B.5
5. Exhibit legal and ethical behaviors when using information and technology.	8.1.(8)B.2
Key vocabulary: Acceptable Use Policy (AUP), copyright, plagiarism, netiquette, shareware, spam, url, work virtual reality	

Suggested Strategies and Resources:

Strategies:

Discussion

Online Worksheets

Citation

Resources:

Acceptable Use Policy

<http://www.CyberSafety.com>

<http://www.iSafe.com>

<http://www.WebWiseKids.com>

<http://www.NetSmart.com>

<http://www.WiredSafety.com>

<http://usatodayeducate.com/wordpress/index.php/technology-cyber-security>

<http://www.safeteens.com/>

Grades 5-8, Continued

V. Research and Information Fluency	
Essential Question: How can a computer be used to access, retrieve, synthesize, and evaluate information?	
Objectives	New Jersey Standards
1. Initiate a search	8.1.(8)B.6
2. Use advanced search strategies to identify key words and narrow or broaden searches and appropriate search techniques.	8.1.(8)B.6
3. Retrieve, synthesize, and summarize information.	8.1.(8)B.7
4. Evaluate information to determine relevancy and accuracy.	8.1.(8)B.7
5. Cite electronic resources.	8.1.(8)B.2
6. Communicate through networks and telecommunications.	8.1.(8)B.6
7. Use data to produce a report	8.1.(8)A.7, 9
Key vocabulary: host name, keyword, search engine, search directory, meta search engines, bookmark/favorites, browser, cache, cookies, search strategies	

Suggested Strategies and Resources:

Strategies:

Scavenger Hunts

Keywords

Resources:

EBSCO Host

Search Engines- Yahoo, Google, Ask Jeeves, DogPile, Wikipedia, Hotbot, Webcrawler, Kartoo

<http://www.Bibme.org>

<http://www.Noodletools.com>

<http://www.worldbookonline.com>

Grades 5-8, Continued

VI. Problem Solving and Decision Making	
Essential Questions:	
1. How can technology help solve a problem?	
2. When is it appropriate to use technology?	
Objectives	New Jersey Standards
1. Use computer applications to modify information independently and/or collaboratively to solve problems.	8.1.(8)B.8
2. Identify basic hardware problems and demonstrate the ability to solve common problems.	8.1.(8)B.9
3. Determine when technology tools are appropriate to solve a problem and make a decision	8.1.(8)B.10

Suggested Strategies:

Students present possible solutions to topics

Ex: Video conferencing about better ways to recycle

Global Warming

Debating issues

Stock market

Career awareness and technology

GRADES 9 - 12
TECHNOLOGY LITERACY CURRICULUM

GRADES 9 – 12

WORD PROCESSING

Keyboarding/Inputting, Publishing

Essential Question:

How can a student use a computer and related technologies to facilitate the writing process?

9 – 12 Objectives:

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students will be able to:

1. Create a multi-page document with citations using word processing software in conjunction with other tools that demonstrate the ability to format, edit, and print. 8.1.(12)A.1 {English, Social Studies}
2. Create documents including a resume and a business letter using professional format. 8.1.(12)A.2 {English, Business}
3. Produce and edit page layouts in different formats using desktop publishing and graphics software. 8.1.(12)A.6 {Business, Journalism}
4. Develop a document or file for inclusion into a website or web page. 8.1.(12)A.7 {Business, Technology}
5. Merge Information from one document to another. 8.1.(12)A.9 {English, Business}

VISUAL LEARNING

Essential Question:

How can a computer and related technologies be used as a tool to create digital graphic compositions as artwork or enhancements to presentations and documents?

9 – 12 Objectives:

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students will be able to:

1. Produce a multimedia project using text, graphics, moving images, and sound. 8.1.(12)A.5 {Social Studies, Science, Health, English, World Language, Mathematics, and Related Arts}
2. Use a Computer assisted design system in the development of an appropriate design solution. 8.2.(12)B.4 {Technology}
3. Identify a problem and formulate a strategy to solve the problem using brainstorming, flow charting, and appropriate resources. 8.1.(12)B.11 {Science, Social Studies, Technology}
4. Develop a graphic organizer electronically. {Science, Mathematics}

SPREADSHEETS AND DATABASES

Essential Questions:

1. How can a spreadsheet program be used to collect, manipulate, calculate, and present information?
2. How can a database be used to search, organize, present data, solve problems, and think analytically?

9 – 12 Objectives:

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students will be able to:

1. Construct a spreadsheet, enter data, use mathematical or logical functions to manipulate and process data, generate charts and graphs, and interpret results to solve real world problems. 8.1.(12)A.3; (12)B.5 {Mathematics, Science}
2. Given a database, define fields, input data for multiple records, produce a report using sort and query, and interpret the data. 8.1.(12)A.4 {Science, Business}
3. Abstract and import data from a spreadsheet and database into other applications. {Science}

INFORMATION ACCESS AND RESEARCH

Essential Question:

How can students use a computer to access, retrieve, synthesize, and evaluate information?

9 – 12 Objectives:

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students will be able to:

1. Evaluate information sources for accuracy, relevance, and appropriateness. 8.1.(12)B.7 {Social Studies, English, Science, and Health}
2. Compose, send, and organize email messages with or without attachments. 8.1.(12)B.8 {All}
3. Integrate new information into an existing knowledge base and communicate results in a project or presentation. 8.1.(12)B.12 {Social Studies, Science, Health, and English}
4. Communicate through the network and email. {All}

SOCIAL ASPECTS OF TECHNOLOGY

Essential Question:

How can a student demonstrate ethical uses of technology?

9 – 12 Objectives:

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 12, students will be able to:

1. Describe the potential and implications of contemporary and emerging computer applications for personal, social, lifelong learning, and workplace needs. 8.1.(12)B.1 {Related Arts}
2. Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse. 8.1.(12)B.2 {All}
3. Make informed choices among technology systems, resources, and services in a variety of contexts. 8.1.(12)B.3 {English, Social Studies, and Related Arts}
4. Use appropriate language when communicating with diverse audiences using computer and information literacy. 8.1.(12)B.4 {All}

APPENDIX A

Recommendations for Implementation

Role of the Instructional Technology Coordinator

IMPLEMENTATION RECOMMENDATIONS
(Written by the Regional Technology Teachers and Coordinators)

The following elements are important to the full implementation of the district educational technology plans:

1. The commitment of the Boards of Education, superintendents, principals, professional staff, and the community to endorse and fund the technology plan is necessary to the implementation plan.
2. A sufficient percentage of the school budget to implement the technology plan needs to be allocated on an annual basis. Monies for hardware/software (including up-grades), facilities, wiring, access fees, maintenance, and staff development (as per the New Jersey Department of Education Technology Plan) should be provided.
3. The up-grading and maintenance of networking and electronics on both a local and regional level should continue.
4. Continuous assessment of technology needs is an integral part of each content area.
5. A flexible scheduling framework is needed to support the infusion of technology and the role of the Instructional Technology Coordinator.
6. Instructional Technology Coordinators/Technology Curriculum Committee need to meet regularly to share information, strategies and practices, plan staff development activities, identify technical guidelines and specifications, and facilitate cost effective purchasing.
7. Districts should continue to support New Jersey State technology entitlement legislation.

ROLE OF THE INSTRUCTIONAL TECHNOLOGY COORDINATOR

(Written by the Regional Technology Teachers and Coordinators)

For successful technology integration to occur, it is important to maintain and uphold the implementation recommendations. In addition, each school district should have a full-time Instructional Technology Coordinator who will:

1. Be provided with sufficient time and funds to:
 - a. meet with staff members to coordinate activities throughout the curriculum.
 - b. plan, train, and assist teachers with the implementation of technologies in the curriculum.
 - c. team teach and support instructional activities that integrate the curriculum and the practical skills of computer applications and related technologies.
2. Maintain and improve professional knowledge and competence in an ongoing and evolving role.
3. Assist in the development of curriculum and implementation of the district's computer and related technology applications.
4. Inform and motivate staff and students to develop the necessary skills, attitudes, and knowledge in the area of educational technology with administrative support.
5. Be provided with a flexible scheduling framework for ongoing staff development, support, and leadership in educational technology.
6. Coordinate the evaluation, selection and ordering of technological hardware and software.
7. Assist in the coordination and integration of educational technology into the curriculum, as well as program evaluation.
8. Supervise the operation, repair, and maintenance of instructional computer technology networks and equipment in the district and serve as the liaison to outside vendors and services.
9. Communicate with parents, staff, administrators, and the community to discuss and interpret the educational technology program.
10. Meet with all other regional Instructional Technology Coordinators on a regular basis to network and share information.
11. Serve as a member of the Technology Curriculum Committee.

APPENDIX B

**New Jersey Core Curriculum Content Standards
for
Technological Literacy**

New Jersey Core Curriculum Content Standards for Technological Literacy

INTRODUCTION

The Vision

Technology, any modification of the natural world designed by human beings to solve human problems, enhance human life, or extend human capability, was identified by the United States Department of Labor as an essential workplace competency in a 1992 report called the Secretary's Commission on Achieving Necessary Skills (SCANS). SCANS stated that students should be able to select equipment and tools, apply technology to specific tasks, and maintain and troubleshoot equipment. The Department of Education recognized its importance by including technology in the original cross-content workplace readiness standards. In keeping with today's technological society, technological literacy has been further emphasized by its inclusion as a separate standards area which focuses on both computer and information literacy and technology education.

Technology is evolving at an amazing rate, with both frequent advancements of existing technology and the creation of new technologies. All students must understand and be comfortable with the concepts and application of technology, not only in order to function in today's complex society, but also to become informed and productive adults of tomorrow.

Computer and Information Literacy

Computer and information literacy, which supports skills in information-gathering, information-organizing, and problem solving, has become critical for every student whether college- or workplace-bound. Colleges and employers are now demanding that students and employees possess a broad range of computer and information literacy proficiencies. More and more retail purchasing is being done on-line every year, and all but the most menial of positions now require a significant understanding of computer and information literacy. To ensure that students are computer literate, a separate standard that defines rigorous, in-depth learning has been included. The computer and information literacy standard is designed to be integrated and applied in all of the content areas of the Core Curriculum Content Standards.

Technology Education

The technology education standard was developed to ensure the literacy needed by all students to succeed in a highly technological world. Business and industry has clearly stated the need for technological skills in the workplace of the 21st Century.

This standard is based on the *Standards for Technological Literacy (STL): Content for the Study of Technology (ITEA, 2000)*, developed as part of the National Science Foundation (NSF)/National Aeronautics and Space Administration (NASA) funded by the *Technology for All Americans (TfAA)* project.

A study by DeKlerk has found that students form negative attitudes about the technological world if there are no formal technological experiences during the early school years. This finding is a great concern to New Jersey business and industry. Other cognitive research suggests that "design-based learning" is important. Early studies with design and technology curriculum indicate that students who learn important technological concepts develop positive attitudes about technology, math, science and learning in general. For these reasons, an introduction to technology education, including engineering and technological design, is an essential component of a thorough and efficient K-12 education.

Standards and Strands

There are two technological literacy standards, each of which has a number of lettered strands. The standards and strands include:

8.1 Computer and Information Literacy

A. Basic Computer Tools and Skills

- Keyboarding
- Word processing
- Internet usage
- Spreadsheets
- Database concepts and usage
- Publications and presentations

B. Application of Productivity Tools

- Social Aspects
- Information Access and Research
- Problem Solving

8.2 Technology Education

A. Nature and Impact of Technology

B. Design Process and Impact Assessment

C. Systems in the Designed World

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- International Society for Technology in Education. (1998). National educational technology standards for students. Eugene, OR: Author.
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- National Business Education Association. (2001). National standards for business education. Online: <http://www.nbea.org/curriculum/bes.html> .

STANDARD 8.1 (COMPUTER AND INFORMATION LITERACY)

ALL STUDENTS WILL USE COMPUTER APPLICATIONS TO GATHER AND ORGANIZE INFORMATION AND TO SOLVE PROBLEMS.

Descriptive Statement: Using computer applications and technology tools students will conduct research, solve problems, improve learning, achieve goals, and produce products and presentations in conjunction with standards in all content areas, including career education and consumer family, and life skills. They will also develop, locate, summarize, organize, synthesize, and evaluate information for lifelong learning.

Strands and Cumulative Progress Indicators

By the end of Grade 4, students will:

A. Basic Computer Skills and Tools

1. Use basic technology vocabulary.
2. Use basic features of an operating system (e.g., accessing programs, identifying and selecting a printer, finding help).
3. Input and access text and data, using appropriate keyboarding techniques or other input devices.
4. Produce a simple finished document using word processing software.
5. Produce and interpret a simple graph or chart by entering and editing data on a prepared spreadsheet template.
6. Create and present a multimedia presentation using appropriate software.
7. Create and maintain files and folders.
8. Use a graphic organizer.
9. Use basic computer icons.

B. Application of Productivity Tools

Social Aspects

1. Discuss the common uses of computer applications and identify their advantages and disadvantages.
2. Recognize and practice responsible social and ethical behaviors when using technology, and understand the consequences of inappropriate use including:
 - Internet access
 - Copyrighted materials
 - On-line library resources
 - Personal security and safety issues
3. Practice appropriate Internet etiquette.
4. Recognize the ethical and legal implications of plagiarism of copyrighted materials.

Information Access and Research

5. Recognize the need for accessing and using information.
6. Identify and use web browsers, search engines, and directories to obtain information to solve real world problems.

7. Locate specific information by searching a database.
8. Recognize accuracy and/or bias of information.

Problem Solving and Decision Making

9. Solve problems individually and/or collaboratively using computer applications.
10. Identify basic hardware problems and solve simple problems.

Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:

A. Basic Computer Skills and Tools

1. Use appropriate technology vocabulary.
2. Use common features of an operating system (e.g., creating and organizing files and folders).
3. Demonstrate effective input of text and data, using touch keyboarding with proper technique.
4. Input and access data and text efficiently and accurately through proficient use of other input devices, such as the mouse.
5. Create documents with advanced text-formatting and graphics using word processing.
6. Create a file containing customized information by merging documents.
7. Construct a simple spreadsheet, enter data, and interpret the information.
8. Design and produce a basic multimedia project.
9. Plan and create a simple database, define fields, input data, and produce a report using sort and query.
10. Use network resources for storing and retrieving data.
11. Choose appropriate electronic graphic organizers to create, construct, or design a document.
12. Create, organize and manipulate shortcuts.

B. Application of Productivity Tools

Social Aspects

1. Demonstrate an understanding of how changes in technology impact the workplace and society.
2. Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.
3. Explain the purpose of an Acceptable Use Policy and the consequences of inappropriate use of technology.
4. Describe and practice safe Internet usage.
5. Describe and practice .etiquette. when using the Internet and electronic mail.

Information Access and Research

6. Choose appropriate tools and information resources to support research and solve real world problems, including but not limited to:
 - On-line resources and databases
 - Search engines and subject directories
7. Evaluate the accuracy, relevance, and appropriateness of print and non-print electronic information sources.

Problem Solving and Decision Making

8. Use computer applications to modify information independently and/or collaboratively to solve problems.
9. Identify basic hardware problems and demonstrate the ability to solve common problems.
10. Determine when technology tools are appropriate to solve a problem and make a decision.

Building upon knowledge and skills gained in preceding grades, by the end of Grade 12, students will:

A. Basic Computer Skills and Tools

1. Create a multi-page document with citations using word processing software in conjunction with other tools that demonstrates the ability to format, edit, and print.
2. Create documents including a resume and a business letter using professional format.
3. Construct a spreadsheet, enter data, use mathematical or logical functions to manipulate and process data, generate charts and graphs, and interpret the results.
4. Given a database, define fields, input data from multiple records, produce a report using sort and query, and interpret the data.
5. Produce a multimedia project using text, graphics, moving images, and sound.
6. Produce and edit page layouts in different formats using desktop publishing and graphics software.
7. Develop a document or file for inclusion into a website or web page.
8. Discuss and/or demonstrate the capability of emerging technologies and software in the creation of documents or files.
9. Merge information from one document to another.

B. Application of Productivity Tools

Social Aspects

1. Describe the potential and implications of contemporary and emerging computer applications for personal, social, lifelong learning, and workplace needs.
2. Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.
3. Make informed choices among technology systems, resources, and services in a variety of contexts.
4. Use appropriate language when communicating with diverse audiences using computer and information literacy.

Information Access and Research

5. Select and use specialized databases for advanced research to solve real world problems.
6. Identify new technologies and other organizational tools to use in personal, home, and/or work environments for information retrieval, entry, and presentation.
7. Evaluate information sources for accuracy, relevance, and appropriateness.
8. Compose, send, and organize e-mail messages with and without attachments.

Problem-Solving and Decision Making

9. Create and manipulate information, independently and/or collaboratively, to solve problems and design and develop products.
10. Identify, diagnose, and suggest solutions for non-functioning technology systems.
11. Identify a problem in a content area and formulate a strategy to solve the problem using brainstorming, flowcharting, and appropriate resources.
12. Integrate new information into an existing knowledge base and communicate the results in a project or presentation.

STANDARD 8.2 (TECHNOLOGY EDUCATION)**ALL STUDENTS WILL DEVELOP AN UNDERSTANDING OF THE NATURE AND IMPACT OF TECHNOLOGY, ENGINEERING, TECHNOLOGICAL DESIGN, AND THE DESIGNED WORLD AS THEY RELATE TO THE INDIVIDUAL, SOCIETY, AND THE ENVIRONMENT.**

Descriptive Statement: The following indicators are based on the Standards for Technological Literacy (STL, 2000) and support the National Academy of Engineering's (2002) call for students to gain technological literacy. Students will be expected to understand the various facets of technology and the design process. They will analyze and evaluate design options and then apply the design process to solve problems. A systems perspective is employed to emphasize the interconnectedness of all knowledge and the impact of technology and technological change. Students will be expected to use technology as it applies to physical systems, biological systems, and information and communication systems. The intent at the elementary and middle school levels is that all students develop technological literacy and are prepared for the option of further study in the field of technology education. At the elementary level, the foundation for technology education is found in the science standards, particularly standards 5.2 and 5.4.

Strands and Cumulative Progress Indicators**By the end of Grade 4, students will:****A. Nature and Impact of Technology**

Refer to Science Standards 5.2 and 5.4.

B. Design Process and Impact Assessment

Refer to Science Standards 5.2 and 5.4.

C. Systems in the Designed World

Refer to Science Standards 5.2 and 5.4.

Building upon knowledge and skills gained in the preceding grades, by the end of Grade 8, students will:**A. Nature and Impact of Technology**

1. Describe the nature of technology and the consequences of technological activity.
2. Describe how components of a technological product, system, or environment interact.
3. Describe how one technological innovation can be applied to solve another human problem that enhances human life or extends human capability.
4. Describe how technological activity has an affect on economic development, political actions, and cultural change.
5. Explain the cultural and societal effects resulting from the dramatic increases of knowledge and information available today.

B. Design Process and Impact Assessment

1. Demonstrate and explain how the design process is not linear.
2. Use hands on activities to analyze products and systems to determine how the design process was applied to create the solution.

3. Identify a technological problem and use the design process to create an appropriate solution.
4. Describe how variations in resources can affect solutions to a technological problem.
5. Select and safely use appropriate tools and materials in analyzing, designing, modeling or making a technological product, system or environment.

C. Systems in the Designed World

1. Explain technological advances in medical, agricultural, energy and power, information and communication, transportation, manufacturing, and construction technologies.
2. Explain reasons why human-designed systems, products, and environments need to be monitored, maintained, and improved to ensure safety, quality, cost efficiency, and sustainability.
3. Explain the functions and interdependence of subsystems such as waste disposal, water purification, electrical, structural, safety, climatic control, and communication.

Building upon knowledge and skills gained in preceding grades, by the end of Grade 12, students electing courses in technology education will:

A. Nature and Impact of Technology

1. Use appropriate data to discuss the full costs, benefits and trade-offs, and risks related to the use of technologies.
2. Explain how technological development is affected by competition through a variety of management activities associated with planning, organizing, and controlling the enterprise.
3. Provide various examples of how technological developments have shaped human history.

B. Design Process and Impact Assessment

1. Analyze a given technological product, system, or environment to understand how the engineering design process and design specification limitations influenced the final solution.
2. Evaluate the function, value, and appearance of technological products, systems, and environments from the perspective of the user and the producer.
3. Develop methods for creating possible solutions, modeling and testing solutions, and modifying proposed design in the solution of a technological problem using hands-on activities.
4. Use a computer assisted design (CAD) system in the development of an appropriate design solution.
5. Diagnose a malfunctioning product and system using appropriate critical thinking methods.
6. Create a technological product, system, or environment using given design specifications and constraints by applying design and engineering principles.

C. Systems in the Designed World

1. Explain the life cycle of a product from initial design to reuse, recycling, remanufacture, or final disposal, and its relationship to people, society, and the environment, including conservation and sustainability principles.
2. Analyze the factors that influence design of products, systems, and environments.
3. Compare and contrast the effectiveness of various products, systems, and environments associated with technological activities in energy, transportation, manufacturing, and information and communication.