Derry Cooperative School District

Computer and Technology Curriculum

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Introduction

The Derry Cooperative School District Computer and Technology Curriculum has been written to meet the needs of a changing educational landscape. The 21st Century demands new skills, knowledge, understandings and values of students, educators and administrators. This document addresses the need for a systematic and standardized approach to teaching and learning technology skills, knowledge, understandings and values.

Some key guiding principles...

The Computer and Technology Curriculum is founded on the **National Educational Technology Standards** developed by the International Society for Technology in Education (ISTE)

The Derry Cooperative School District Technology 4-Year Plan calls for an alignment of the district curriculum with National Educational Technology Standards (NETS). This document aligns the Computer and Technology Curriculum with NETS.

An aim of this document is to align or map computer and technology skills and knowledge across grades 1-8 to provide consistency and a snapshot of where students are coming from and where they are heading.

There has been an effort to cross reference the Derry Cooperative School District Computer and Technology Curriculum with...
1. **National Educational Technology Standards NETS (for students)**
2. **NH Public Schools Minimum Standards (Revision)** http://nheon.org/oet/standards/index.htm
3. **NH Information Technology Career Pathways (16 Benchmark goals)**
4. Techworks (a teaching resource of 14 essential skills)
5. NH Curriculum Frameworks (for cross curricula integration)
6. Levels of Technology Integration LoTI (Integration resource for educators)
7. Information Literacy Competency Standards for Higher Education from the American Library Association (Information Literacy)

The **Knowledge and Skills Guidelines/Matrix** contained in this document is a guide to be used in conjunction with district performance standards and the National Educational Technology Standards.

Standards and Performance Indicators (NETS) are used in this document. The standards include NETS, NH Career Pathways, NH Minimum Public Schools Standards and Techworks (as a resource). These standards can be used for curriculum planning needs.

Assessment...

Assessment indicators are suggested. This assessment guide is based on the NETS Performance Indicators for technology-literate students. Pre- and Post- tests in "productivity tools" are available for educators to use. (See Appendix)

In grades 6-8 students will be measured for skill acquisition as this directly relates to gaining computer credit in high school.

Across the district a move to **ePortfolios** will provide students, parents and educators with a way to measure progress in technology. Public Schools Minimum Standards NH calls for creation of digital portfolios of artifacts which address the following NETS components:

> 1. Basic operations and concepts;
> 2. Social, ethical, and human issues;
> 3. Technology productivity tools;
> 4. Technology communication tools;
> 5. Technology research tools; and
> 6. Technology problem solving and decision making tools.

Included, at a minimum, in the portfolio are such digital artifacts as: 1. Standardized tests; 2. Observation; 3. Student work; and 4. Student reflection.
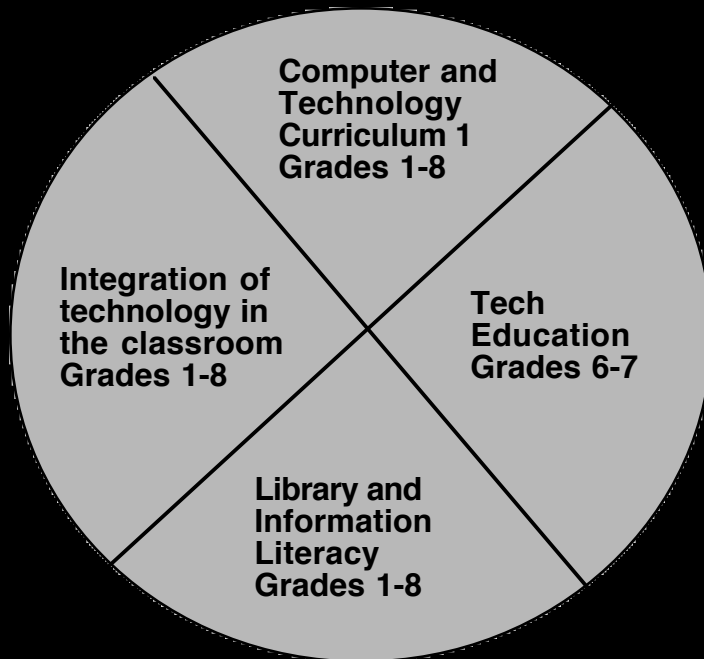
Those who will benefit from this curriculum...

By aligning the computer and technology skills across the district there are a number of beneficiaries.

1. **Students**... being part of a sequential and developmentally appropriate program students will gain skills and be able to judge where they are, where they have been and where they are aheading.

2. **New teachers to the district**... New classroom teachers, and especially new computer and technology teachers, will be able to see a progression of skills across the district. The introduction, emphasis and mastery phases of skill and knowledge acquisition can be seen at glance so that learning experiences can be planned.

3. **Elementary school teachers**... will be able to integrate technology into their classroom based on the skill acquisition of their students.

4. **Elementary computer lab assistants**... the curriculum provides a guide for the lab assistants to decide when to introduce or emphasize skills.

5. **Middle school teachers**... will be able to integrate technology into their classroom based on the skill acquisition of their students.

6. **Middle school computer lab teachers**... will be prepared for Computer Application classes with knowledge of acquired skills.

7. **High school teachers**... Most students from the Derry Cooperative School District attend Pinkerton Academy for high school. High school teachers have expressed their delight in being able to see what has been taught in elementary and middle school.

8. **Parents and Community**... knowing what skills students are expected to know to be literate in the 21st Century allows for outside school support and for high expectations as students enter the community.

Derry Cooperative School District Computer and Technology Curriculum An Overview

The whole picture of computer and technology education in the school district

Computer and Technology Curriculum 1 Grades 1-8

Integration of technology in the classroom Grades 1-8

Tech Education Grades 6-7

Library and Information Literacy Grades 1-8

These four components make the Derry Cooperative School District information and technology literacy.

Elementary school Grades 1-5

1. **Computer Lab classes - one per week**
2. **Techworks skills**
3. **Library lessons**
4. **Integration in the classroom**

Middle school Grades 6-7

1. **Computer Applications 1**
2. **Computer Applications 2**
3. **Library**
4. **Tech Education (Grades 6, 7)**
5. **Integrated by core teachers**

Middle school Grade 8

1. **Integrated by core teachers**

High School - Pinkerton Academy

Most students attend Pinkerton where they continue their technology education

Theory Into Practice

For a comprehensive computer and technology education the following concepts are to be addressed

CURRICULUM IS BASED ON...	NETS	CONCEPTS	STANDARDS	ADDRESSED BY...	RESOURCE
NETS Techworks skills Career Pathways Public Schools Min Standards Classroom Integration	Basic operations and concepts	General Technology Awareness	Techworks, Minimum Standards	Techworks	Techworks
		Keyboarding	Techworks, Career Pathways	Techworks	Learn to Type 3
		Network Awareness	Techworks, Pathways, Minimum Standards	Techworks	Techworks
		Technology and Society	Career Pathways, Minimum Standards	Integration	
	Social, ethical, human issues	Copyright/Fair use	NETS	Library	
		Self Management	Career Pathways	Integration	
		Teamwork	Career Pathways	Integration	
		Technology Leadership	Career Pathways	Integration	
		Communication Skills	Career Pathways	Integration	
		Positive Attitudes	Minimum Standards	Integration	
	Productivity tools	Word Processing	Techworks, Career Pathways	Techworks	Appleworks
		Spreadsheets	Techworks, Career Pathways	Techworks	Appleworks
		Databases	Techworks, Career Pathways	Techworks	Appleworks
		Graphics - Drawing/Painting	Techworks, Career Pathways	Techworks	Appleworks, iPhoto
		Desktop Publishing	Techworks	Techworks	Appleworks
	Communication tools	Internet/Telecommunications	Techworks, Minimum Standards	Techworks	Safari, IE, Netscape
		Multimedia	Techworks, Minimum Standards	Techworks	Presentation/Keynote
		Electronic Presentation	Techworks, Minimum Standards	Techworks	Presentation/Keynote
		Video	Techworks	Techworks	iMovie
		(Email)	NA	NA	NA
	Research tools	Information Systems	Techworks	Techworks	CD ROM, World Book
		Information Literacy	Career Pathways	Library	
		World Wide Web www	Career Pathways	Library	
		Acceptable Use		Integration	
	Problem solving, decision making	Programming	Techworks, Pathways, Min Standards	Techworks	Logo, Lego, HTML
		Problem Solving	Minimum Standards	Integration	
		Decision making	Minimum Standards	Integration	

Assessment

All students should have opportunities to demonstrate the following performances.

Prior to completion of Grade 2, students will:

1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. (1)

2. Use a variety of media and technology resources for directed and independent learning activities. (1, 3)

3. Communicate about technology using developmentally appropriate and accurate terminology. (1)

4. Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)

5. Work cooperatively and collaboratively with peers, family members, and others when using technology in the classroom. (2)

6. Demonstrate positive social and ethical behaviors when using technology. (2)

7. Practice responsible use of technology systems and software. (2)

8. Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)

9. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)

10. Gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners. (4)

All students should have opportunities to demonstrate the following performances.

Prior to completion of Grade 5, students will:

1. Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1)

2. Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide. (1, 2)

3. Discuss basic issues related to responsible use of technology and information and describe personal consequences of inappropriate use. (2)

4. Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)

5. Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)

6. Use telecommunications efficiently to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests. (4)

7. Use telecommunications and online resources (e.g., e-mail, online discussions, Web environments) to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom. (4, 5)

8. Use technology resources (e.g., calculators, data collection probes, videos, educational software) for problem solving, self-directed learning, and extended learning activities. (5, 6)

9. Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems. (5, 6)

10. Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources. (6)

All students should have opportunities to demonstrate the following performances.

Prior to completion of Grade 8, students will:

1. Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use. (1)

2. Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society. (2)

3. Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse. (2)

4. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)

5. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)

6. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)

7. Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom. (4, 5)

8. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

9. Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving. (1, 6)

10. Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems. (2, 5, 6)

Grade 6

In the following pages are contained some guidelines for the Grade 6 and Grade 7 curriculum.

In Grade 6 and Grade 7 two courses will be offered - Computer Applications 1 and Computer Applications 2.

Satisfactory completion of Computer Applications 1 and 2 will result in high school computer credit being awarded to successful students.

The following knowledge and skills must be covered;
Computer Basic Skills, Word Processing, Graphics - Drawing/Painting, Presentation/Keynote, Keyboarding, Spreadsheets, Databases.

Grade 6 Assessment

There will be a minimum of two pieces of assessment, one of which will be a culminative test. The other piece of assessment is a capstone project(s) that students use to show skill acquisition.

Test:
Students will be tested for knowledge and skills at the end of Computer Applications 1 and Computer Applications 2.

Capstone Project:
By the end of Computer Applications 1 students will submit a project (or projects) that display skill and knowledge acquisition.

Rubric:
It is suggested that teachers create a rubric based on the skills for each Computer Application course.

Computer Applications 1

Suggested Plan for Grades 6 and 7
Based on a 12 week program
Word Processing, Computer basics, Graphics - Painting,/Drawing, Presentation/Keynote, Keyboarding

This table shows a suggested order (sequence) of skills for Computer Applications 1. It is expected that skills are incorporated throughout the whole course once the skills have been introduced.

WEEK	SUGGESTED ORDER ONLY	NOTES
1	Computer Basics	Keyboarding (Introduction and expectations of keyboarding at this level)
2		Keyboarding (10 mins at beginning of each lesson)
3	Graphics - Drawing	Keyboarding (10 mins at beginning of each lesson)
4	and Painting	Keyboarding (10 mins at beginning of each lesson)
5		Keyboarding (10 mins at beginning of each lesson)
6	Word Processing	Keyboarding (10 mins at beginning of each lesson)
7		Keyboarding (10 mins at beginning of each lesson)
8		Keyboarding (10 mins at beginning of each lesson)
9	Presentation/Keynote	Keyboarding (10 mins at beginning of each lesson)
10		Keyboarding (10 mins at beginning of each lesson)
11		Keyboarding (10 mins at beginning of each lesson)
12	Test/Assessment	Student will submit a piece of work for Portfolio

Computer Applications 2

Suggested Plan for Grade 6 and 7
Based on a 12 week program
Spreadsheets, Databases, Keynote

WEEK	SUGGESTED ORDER ONLY	NOTES
1	Review	Keyboarding (Introduction and expectations of keyboarding at this level)
2	Spreadsheets	Keyboarding (10 mins at beginning of each lesson)
3		Keyboarding (10 mins at beginning of each lesson)
4		Keyboarding (10 mins at beginning of each lesson)
5	Databases	Keyboarding (10 mins at beginning of each lesson)
6		Keyboarding (10 mins at beginning of each lesson)
7		Keyboarding (10 mins at beginning of each lesson)
8		Keyboarding (10 mins at beginning of each lesson)
9		Keyboarding (10 mins at beginning of each lesson)
10	Keynote	Keyboarding (10 mins at beginning of each lesson)
11		Keyboarding (10 mins at beginning of each lesson)
12		Student will submit a piece of work for Portfolio

Skill Guidelines/Matrix

The knowledge and skills guidelines/matrix in the following pages outline for users of this document scope and sequence across the Derry Cooperative School District

Introduction to the Knowledge and Skills Guidelines/Matrix

This document brings the district computer curriculum in line with National Educational Technology Standards. (NETS)

Each knowledge and skill guideline in this part of the document makes reference to:

1. **Standards** (NETS, NH Information Technology Career Pathways, Minimum Standards for Public Schools NH)
2. **Assessment** (based on NETS performance indicators for technology literate students, district based assessments
3. **Skill Guidelines/Matrix** (checklist for basic skills, word processing, spreadsheets, databases, drawing, painting, presentation)
4. **Curriculum Integration** (skills are cross-referenced with technology and all NH Curriculum Frameworks)

Knowledge and Skills Guidelines/Matrix - A Key to I-E-M

Each item in the knowledge and skill guideline/matrix that follows contains an indication of whether the knowledge or skill is being introduced, emphasized or mastered. The code is included as a key for educators to get a sense of what knowledge and skills students are expected to achieve by the end of any particular school year.

I = Introductory   E = Emphasize   M = Mastery

Basic Computer Skills

Basic Computer Skills Related Standards

<u>National Educational Technology Standards - Technology Foundation Standards 1, 3, 4, 5, 6</u>
1. Basic operations and concepts
   • Students demonstrate a sound understanding of the nature and operation of technology systems.
   • Students are proficient in the use of technology.
3. Technology productivity tools
   • Students use technology tools to enhance learning, increase productivity, and promote creativity.
   • Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.
4. Technology communications tools
   • Students use telecommunications to collaborate, publish, and interact with peers, experts, and other audiences.
   • Students use a variety of media and formats to communicate information and ideas effectively to multiple audiences.
5. Technology research tools
   • Students use technology to locate, evaluate, and collect information from a variety of sources.
   • Students use technology tools to process data and report results.
   • Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.
6. Technology problem-solving and decision-making tools
   • Students use technology resources for solving problems and making informed decisions.
   • Students employ technology in the development of strategies for solving problems in the real world.

<u>New Hampshire's Information Technology Career Pathway - Sixteen Benchmark IT Skill and Knowledge Goals</u>
1. PC Principles and Operations
   • *IT fluency Grade 4: Career awareness and IT skills for learning -* Determines when technology is useful and selects appropriate technology tools and resources • Installs and uses programs (disc, CD, download) and uses new simple learning programs • Uses computer   independently
   • *IT fluency Grade 8: Career exploration and transition for IT skills for learning to IT skills for working -* Uses PC and MAC computers independently • Can teach others to operate computers (turn on, use mouse, call up programs, save and locate files)
2. Software and Systems Integration
   • *IT fluency Grade 4: Career awareness and IT skills for learning -* Recognizes that files/software/hardware have different formats (file types, extensions, operating systems) • Selects and uses software appropriate to task (e.g., KidPix, Word)
   • *IT fluency Grade 8: Career exploration and transition for IT skills for learning to IT skills for working -* Integrates various pieces of software (word processing, images from Illustrator, photos from PhotoShop) into one product/project

- **Minimum Standards for Public Schools NH**
  1. Basic operations and concepts
    - Opportunities for students to develop an **understanding of the technological world** in which they live and will someday work
    - Opportunities for students to develop a knowledge and understanding of the **free enterprise system**
    - Development of **problem solving skills** as well as basic skills in planning, designing, fabricating, and evaluating technical processes.
    - Acquire an **understanding of technical processes**, the practical application of mathematics and scientific principles, and the interrelationships between technology education and other subject areas in the school curriculum
    - Become familiar with opportunities and requirements for **careers** in communications, energy/power/transportation, and materials and process technology cluster areas.
    - Use 21st century tools to develop technical proficiency at a foundational knowledge level in: **hardware**, **software applications**,**networks**; and elements of **digital technology**.
    - Configuring computers and basic **network** configurations
    - Applying **programming** concepts used in software development.

  3. Technology productivity tools
    - Become proficient in the use of 21st century tools to **access, manage, integrate, evaluate, and create information** within the context of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government, economics, history, and geography), arts; and world languages.
    - Use 21st century tools to develop **cognitive proficiency** in: literacy, numeracy and spatial/visual literacy.
    - Use 21st century tools to develop **technical proficiency** at a foundational knowledge level in: **hardware, software applications**,**networks**; and elements of **digital technology**.
    - Use of common **productivity and web based software**

  4. Technology communications tools
    - Create **digital portfolios** of artifacts which addresses National Educational Technology Standards
    - Create **digital portfolios** of artifacts which represent proficient, ethical, responsible use of 21st century tools within the context of the core subjects
    - Include, at a minimum, such **digital artifacts** as: Standardized tests; Observation; Student work; and Student reflection.
    - Use 21st century tools to develop technical proficiency at a foundational knowledge level in: **hardware, software applications**,**networks**; and elements of **digital technology**.
    - Use of a variety of **multimedia software** and equipment

  5. Technology research tools
    - Become proficient in the use of 21st century tools to **access, manage, integrate, evaluate, and create information** within the context of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government, economics, history, and geography), arts; and world languages.

  6. Technology problem-solving and decision-making tools
    - Development of **problem solving skills** as well as basic skills in planning, designing, fabricating, and evaluating technical processes.
    - Use 21st century tools to develop cognitive proficiency in: **problem solving and decision making**.

- **Assessment Guide (see NETS performance indicators for technology-literate students)**
  Performance Indicators for technology-literate students in basic skills

Grades 1-2
1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. (1)
2. Use a variety of media and technology resources for directed and independent learning activities. (1, 3)
3. Communicate about technology using developmentally appropriate and accurate terminology. (1)
4. Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)
5. Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)
6. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)
7. Gather information and communicate with others using telecommunications, with support from teachers, family members, or student partners. (4)

Grades 3-5
1. Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1)
2. Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide. (1, 2)
3. Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)
4. Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)
5. Use telecommunications efficiently to access remote information, communicate with others in support of direct and independent learning, and pursue personal interests. (4)
6. Use telecommunications and online resources (e.g., e-mail, online discussions, Web environments) to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom. (4, 5)
7. Use technology resources (e.g., calculators, data collection probes, videos, educational software) for problem solving, self-directed learning, and extended learning activities. (5, 6)
8. Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems. (5, 6)
9. Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources. (6)

Grades 6-8
1. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)
2. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)
3. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)
4. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

Basic Computer Skills PART 1	1	2	3	4	5	6	7	8
Starting and quitting an application	I,E, M							
Interfaces • knowing the elements of application interfaces • Identify icons for files, programs, folders and disks • Identify active/inactive options	I	E	E	E	M			
Creating a document • Creating a blank document • Using an assistant • Using a template			I	E	M			
Opening a document • Opening a document within an application • Opening a document created in another application • Opening a document from the Mac OSX Finder	I	E	E	E	M			
Inserting a file into a document • Preparing a document for inserted information • Inserting a file						I	E	E
Reverting to the last saved version						I	E	E
Closing a document	I, M							
Saving a document (relates to word processing, spreadsheets, drawing, painting, databases, presentation) • Saving a document for the first time • Saving changes to an existing document • Saving an existing document under a new name • Auto-Save • Saving a document for use in another application	I	E	E	E	M			

Basic Computer Skills PART 2	1	2	3	4	5	6	7	8
Previewing and printing documents • Selecting a printer and print options • Previewing a document before printing • Printing a document	I	E	E	E	M			
Moving around within a document • scroll arrows, scroll bar, scroll mouse • Going to a specific page in a document	I, M							
Changing your view of documents A • Zooming in and out • Viewing multiple pages	I	E	E	E	M			
Changing your view of documents B • Viewing a document in multiple windows • Splitting a document window into panes • Arranging windows						I	E	E
Formatting documents (see Word processing, spreadsheet, drawing, and painting) • Setting document margins • Adding document headers and footers • Adding page numbers, date, and time • Using document rulers			I	E	E	E	E	E
General keyboard shortcuts • Shortcuts for manipulating windows • Shortcuts for basic operations			I	E	E	E	E	E
Linking within a document or between documents • Using anchors within a document • Using links within or between documents • Organizing anchors and links						I	E	E

Basic Computer Skills PART 3	1	2	3	4	5	6	7	8
Including movies and sounds • Adding movies or sounds to a document • Playing movies or sounds • Setting movie or sound playback options • Editing movies or sounds in a document								I, E
Input devices • What is a mouse? using mouse • Using a touchpad (laptop)	I	E	E	E	M			
Computer structure • Computer parts/operation • Basics of a computer • Hard drive size • Dos and don'ts of computers • Start/restart/shut down • Computer history • Identify floppy disk parts	I	E	E	E	E	M		
Network Awareness (Techworks) • Printing (Chooser in OS 9) • Logging on to network	I	E	E	E	E	M		
Miscellaneous • Move, resize change view of window • Change file name • Write–protect • Respect copyright laws • Create folder, move files, delete folder • Delete files, Copy files, Backup files	I	E	E	E	E	M		

Keyboarding Related Standards

National Educational Technology Standards - Technology Foundation Standards 1, 3, 5

1. Basic operations and concepts
- Students demonstrate a sound understanding of the nature and operation of technology systems.
- Students are proficient in the use of technology.

3. Technology productivity tools
- Students use technology tools to enhance learning, increase productivity, and promote creativity.
- Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

New Hampshire's Information Technology Career Pathway - Sixteen Benchmark I. T. Skill and Knowledge Goals

1. Keyboarding
- *By the end of Grade 4:* Familiar with keyboard functions • Keyboards with minimal frustration
- *By the end of Grade 8:* Keyboards to 20 words per minute (Pinkerton recommendation 30-35 words per minute)

- **Minimum Standards for Public Schools NH**
  1. Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of Reading; Mathematics; English and language arts; Science; Social studies, including civics, government, economics, history, and geography; Arts; and World languages.
  2. Use 21st century tools to develop cognitive proficiency in: Literacy; Numeracy; Problem solving; Decision making; and Spatial/visual literacy.

Keyboarding Assessment (see NETS performance indicators for technology-literate students)

Performance Indicators for technology-literate students
Grades1-2
1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. (1)
2. Use a variety of media and technology resources for directed and independent learning activities. (1, 3)
3. Communicate about technology using developmentally appropriate and accurate terminology. (1)
4. Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)
5. Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)
6. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)

Grades 3-5
1. Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1)
2. Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide. (1, 2)
3. Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)
4. Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)

Grades 6-8
1. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)
2. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)

Grade 1	Grade 2	
Performance Indicator 1. Use input devices (e.g. mouse, keyboard, remote control) and output devices (e.g. monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. KB 0.1 Key positions KB 0.2 Letter and number keys KB 0.3 Punctuation and symbol keys KB 0.4 Space bar, return/enter,delete/backspace KB 1.1 Relative key positions KB 1.2 Letter and number keys KB 1.3 Punctuation and number keys KB 1.4 Space bar, return/enter,delete/backspace key KB 1.5 Type words, type phrases KB 1.6 Type sentences	Performance Indicator 1. Use input devices (e.g. mouse, keyboard, remote control) and output devices (e.g. monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. KB 2.1 Type words KB 2.2 Type phrases KB 2.3 Type sentences, type paragraphs KB 2.4 Shift, caps lock, tab and arrow keys KB 2.5 Special keys (command, option, control)	**Keyboarding Notes** **Introductory keyboarding skills are taught in Grades 1 and 2.** **It is not until Grades 3-5 that "official" keyboarding skills are taught using a computer software program.** **Performance Indicators referred to in this section relate to the Elementary resource "Techworks"** **Keyboarding is continued into Grades 6 and 7. Educators use a keyboarding text and software program.**
Grades 1	Grade 2	
Performance Indicator 3. Communicate about technology using developmentally appropriate and accurate terminology. (1) KB 0.1 Understand the relative position of keys on a keyboard KB 0.2 Identify letters and numbers KB 0.3 Identify punctuation and number keys KB 1.4 Shift, caps lock, tab, and arrow keys KB 1.5 Special keys	Performance Indicator 3. Communicate about technology using developmentally appropriate and accurate terminology. (1) KB 2.1 Informal keyboarding skills to type words KB 2.2 Informal keyboarding skills to type phrases KB 2.3 Informal keyboarding skills to type sentences and paragraphs KB 2.4 Shift, caps lock, tab, and arrow keys KB 2.5 Special keys	**By the end of Grade 8 students will be proficient in keyboarding.** **As of 2005/2006 the high school (Pinkerton) will not be offering keyboarding classes and will expect students arriving into Grade 9 to be "keyboard proficient".**

Grade 3	Grade 4	Grade 5
Performance Indicator 1. Use keyboard and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1) KB 3.1 Letters F, J, and K KB 3.2 Letters S, L, and A KB 3.3 Letters G and H KB 3.4 Letters R and U KB 3.5 Letters E and I KB 3.6 Letters W and O KB 3.7 Left shift, period, and semicolon KB 3.8 Right shift, letters Q and P KB 3.9 Letters T and Y KB 3.10 Letters N and M, apostrophe KB 3.11 Letters V and B, : ", KB 3.12 Letter C, comma, ? KB 3.13 Letters X and Z	Performance Indicator 1. Use keyboard and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1) KB 4.1 Review keys F, J, D, and K KB 4.2 Review keys G and H KB 4.3 Review F, J, D, S, L, A, K, ; KB 4.4 Review keys G and H KB 4.5 Review keys R and U KB 4.6 Review keys E and I KB 4.7 Review keys W and O KB 4.8 Review keys N, M, and ' KB 4.12 Review keys V, B, and "" KB 4.13 Review keys C, comma, and ? KB 4.14 New keys 2, 9, @, and (KB 4.18 New keys 1, 0, !, and) KB 4.19 New keys 5, 6, %, and ^	Performance Indicator 1. Use keyboard and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1) KB 5.1 Keys F, J, D, and K KB 5.2 Keys S, L, A, : KB 5.3 Keys F, J, D, K, S, L, A, and : KB 5.4 Keys G and H KB 5.5 Keys R and U KB 5.6 Keys E and I KB 5.7 Keys W and O KB 5.8 Keys left shift, . :; KB 5.9 Keys right shift, Q, and P KB 5.10 Keys T and Y KB 5.11 Keys N, M, and apostrophe KB 5.12 Keys V, B, and "" KB 5.13 Keys C, ? and , KB 5.14 Keys X and Z KB 5.15 Keys 4, 7, $, and & KB 5.16 Keys 5, 6, %, and ^ KB 5.20 Keys 4, 5, and 6 on the numeric keypad KB 5.21 Keys 7, 8, and 9 on the numeric keypad KB 5.22 Keys 1, 2, and 3 on the numeric keypad KB 5.23 Keys 0, decimal point and enter on the numeric keypad

Word Processing

Word Processing Related Standards

<u>National Educational Technology Standards - Technology Foundation Standards 1, 3, 5</u>
1. Basic operations and concepts
- Students demonstrate a sound understanding of the nature and operation of technology systems.
- Students are proficient in the use of technology.

3. Technology productivity tools
- Students use technology tools to enhance learning, increase productivity, and promote creativity.
- Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

5. Technology research tools
- Students use technology to locate, evaluate, and collect information from a variety of sources.
- Students use technology tools to process data and report results.
- Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

<u>New Hampshire's Information Technology Career Pathway - Sixteen Benchmark I. T. Skill and Knowledge Goals</u>
1. Word processing to Desktop Publishing
- *By the end of Grade 4* - Uses word processing for documents, letters and reports (edit, format, spell check)
- *By the end of Grade 8* - Creates complex word processed letters, memos and reports which include tables and footnotes / endnotes in teams

2. Software and Systems Integration
- *By the end of Grade 4* - Recognizes that files/software/hardware have different formats (file types, extensions, operating systems) • Selects and uses software appropriate to task.
- *By the end of Grade 8* - Integrates various pieces of software (word processing, images, photos) into one product/project.

- <u>**Minimum Standards for Public Schools NH**</u>
- **1. Basic operations and concepts**
    - Use 21st century tools to develop technical proficiency at a foundational knowledge level in: hardware, software applications,networks; and elements of digital technology.
    - Become familiar with opportunities and requirements for careers in communications, energy/power/transportation, and materials and process technology cluster areas.
    - Acquire an understanding of technical processes, the practical application of mathematics and scientific principles, and the interrelationships between technology education and other subject areas in the school curriculum
- **3. Technology productivity tools**
    - Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government,

economics, history, and geography), arts; and world languages.
  • Use 21st century tools to develop cognitive proficiency in: literacy, numeracy and spatial/visual literacy.
  • Use 21st century tools to develop technical proficiency at a foundational knowledge level in: hardware, software applications,networks; and elements of digital technology.
  • Use of common **productivity and web based software**

5. Technology research tools
  • Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government, economics, history, and geography), arts; and world languages.

Assessment

Performance Indicators for technology-literate students
Grades 1-2
  1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. (1)
  2. Use a variety of media and technology resources for directed and independent learning activities. (1, 3)
  3. Communicate about technology using developmentally appropriate and accurate terminology. (1)
  4. Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)
  5. Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)
  6. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)
Grades 3-5
  1. Use keyboards and other common input and output devices (including adaptive devices when necessary) efficiently and effectively. (1)
  2. Discuss common uses of technology in daily life and the advantages and disadvantages those uses provide. (1, 2)
  3. Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)
  4. Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)
  5. Use telecommunications and online resources (e.g., e-mail, online discussions, Web environments) to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom. (4, 5)
  6. Use technology resources (e.g., calculators, data collection probes, videos, educational software) for problem solving, self-directed learning, and extended learning activities. (5, 6)
  7. Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems. (5, 6)
  8. Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources. (6)
Grades 6-8
  1. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)

2. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)
3. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)
4. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

Word Processing PART 1	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
Entering and editing text • entering text • selecting text • moving text • copying text • deleting text • undoing most recent change	I	E	E	M				
Changing the appearance of text • Font • Size • Style • Text Color	I	E	M					
Finding and changing specific text • find text • replace text				I	E	M		
Formatting paragraphs • Changing paragraph alignment • Changing paragraph indentation • Changing line and paragraph spacing • Setting tab markers in text • Duplicating a paragraph's formatting			I	E	E	M		

Word Processing PART 2	1	2	3	4	5	6	7	8

Formatting word-processing documents
  • Using document rulers
  • Dividing a document into sections
  • Formatting a document in multiple columns
  • Inserting page breaks or column breaks
  • Setting document margins
  • Adding document headers and footers
  • Adding page numbers, date, and time
  • Showing formatting characters (invisibles)
				I	E	M		

Incorporating graphics into text
  • adding an inline graphic or frame
  • adding a floating graphic or frame
  • wrapping text around a floating object
  • changing objects from floating to inline and vice versa
		I	E	E	M			

Creating a list (using the list function) • Bullet, Checkbox, Letter Caps (uppercase Arabic letters), Letter (lowercase Arabic letters), Numeric (Arabic numbers), Roman Caps (uppercase Roman numerals), or Roman (lowercase Roman numerals)				I	E	M		

Word Processing PART 3	1	2	3	4	5	6	7	8
Using outlines • Creating an outline • Rearranging the topics of an outline • Viewing more or fewer levels of an outline • Changing outline topic labels and styles						I	E	E
Adding special elements to a document • Adding a title page • Adding tables to a document • Inserting footnotes • Inserting specially formatted equations						I	E	E
Merging data into another document (mail merge)						I	E	E
Word-processing utilities • Checking spelling • Finding synonyms • Hyphenating words • Getting word count and other document statistics • Sorting paragraphs			I	E	E	M		
Word-processing keyboard shortcuts • There are general, navigation, selection, and formatting shortcuts that apply specifically to word-processing documents and text frames. Some actions have two or more shortcuts.				I	E	E		E

PART 4 - Tables	1	2	3	4	5	6	7	8
Adding tables to a document						I	E	E
Inserting and deleting table cells						I	E	E
Typing and moving around in a table						I	E	E
Moving and copying tables and table cells						I	E	E
Resizing tables and table cells						I	E	E
Changing table borders, cell borders, and backgrounds						I	E	E
Aligning table text						I	E	E
Converting data between text and tables						I	E	E
Subdividing or merging table cells						I	E	E
Selecting and deselecting tables, table cells, and cell borders						I	E	E

Word Processing - Curriculum Integration

References to Computers and Technology in the New Hampshire: *English Language Arts* Curriculum Framework
English Language Uses
Curriculum Standard 7. Students will demonstrate competence in applying the interactive language processes of reading, writing, speaking, listening, and viewing to succeed in educational, occupational, civic, social, and everyday settings.
End-of-Grade 6 (Intermediate) Proficiency Standards
  • Understand that word processing packages, *computer* games, business inventory databases, and other software applications result from a series of messages written according to the rules of a computer-programming languages.

Spreadsheets

Spreadsheet Related Standards

National Educational Technology Standards - Technology Foundation Standards 1, 3, 5
1. Basic operations and concepts
- Students demonstrate a sound understanding of the nature and operation of technology systems.
- Students are proficient in the use of technology.

3. Technology productivity tools
- Students use technology tools to enhance learning, increase productivity, and promote creativity.
- Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

5. Technology research tools
- Students use technology to locate, evaluate, and collect information from a variety of sources.
- Students use technology tools to process data and report results.
- Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

New Hampshire's Information Technology Career Pathway - Sixteen Benchmark I. T. Skill and Knowledge Goals
1. Spreadsheets
- *By the end of Grade 4* - Creates graphs and charts • Defines spreadsheet terms • Enters data into prepared spreadsheet • Performs simple mathematical calculations and notices changes.
- *By the end of Grade 8* - Uses spreadsheets for managing finances, addresses, purchases.

2. Software and Systems Integration
- *By the end of Grade 4* - Recognizes that files/software/hardware have different formats (file types, extensions, operating systems) • Selects and uses software appropriate to task.
- *By the end of Grade 8* - Integrates various pieces of software (word processing, images, photos) into one product/project.

• **Minimum Standards for Public Schools NH**
• **1. Basic operations and concepts**
- Use 21st century tools to develop technical proficiency at a foundational knowledge level in: hardware, software applications,networks; and elements of digital technology.
- Become familiar with opportunities and requirements for careers in communications, energy/power/transportation, and materials and process technology cluster areas.
- Acquire an understanding of technical processes, the practical application of mathematics and scientific principles, and the interrelationships between technology education and other subject areas in the school curriculum

3. Technology productivity tools
- Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government,

economics, history, and geography), arts; and world languages.
  • Use 21st century tools to develop cognitive proficiency in: literacy, numeracy and spatial/visual literacy.
  • Use 21st century tools to develop technical proficiency at a foundational knowledge level in: hardware, software applications,networks; and elements of digital technology.
  • Use of common **productivity and web based software**

5. Technology research tools
  • Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government, economics, history, and geography), arts and world languages.

Assessment

Performance Indicators for technology-literate students
Grades 1-2
  1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. (1)
  2. Use a variety of media and technology resources for directed and independent learning activities. (1, 3)
  3. Communicate about technology using developmentally appropriate and accurate terminology. (1)
  4. Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)
  5. Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)
  6. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)
Grades 3-5
  1. Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)
  2. Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)
Grades 6-8
  1. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)
  2. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)
  3. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)
  4. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

Spreadsheets PART 1	1	2	3	4	5	6	7	8
About spreadsheets • **Definition** • **Use for spreadsheets** • **Terminology**; Row heading - Active cell address - Column heading - Active cell - Entry bar			I	E	M			
Entering and editing spreadsheet data B • **Automatically filling spreadsheet cells with data**			I	E	E	E	M	
Entering and editing spreadsheet data A • Selecting spreadsheet cells • Entering spreadsheet data • **Editing spreadsheet data** • Moving or copying spreadsheet data • Deleting spreadsheet data • **Saving spreadsheets** (see Basic Skills)			I	E	M			
Working with spreadsheet cells, rows, and columns A • **Inserting and removing spreadsheet cells, rows, or columns** • Resizing spreadsheet rows or columns			I	E	M			
Working with spreadsheet cells, rows, and columns B • Hiding spreadsheet rows or columns • Transposing spreadsheet rows and columns • Locking spreadsheet row or column titles • Locking spreadsheet cells • Naming spreadsheet cells							I, E	E

Spreadsheets PART 2	1	2	3	4	5	6	7	8

Using formulas and functions in a spreadsheet
   • Entering spreadsheet formulas and functions
   • Using spreadsheet cell references in formulas
							I, E	E

Sorting spreadsheet data							I, E	E

Formatting spreadsheet cells
   • Formatting text and numbers in spreadsheet cells
   • Aligning data in spreadsheet cells
   • Adding colors and patterns to spreadsheet cells
   • Adding borders to spreadsheet cells
   • Duplicating spreadsheet cell formats
   • Clearing spreadsheet cell formats
			I	E	E	E	E	E

Formatting spreadsheet documents
   • Setting spreadsheet display options
   • Inserting or removing a spreadsheet page break
   • Setting document margins
   • Adding document headers and footers
   • Adding page numbers, date, and time
							I, E	E

Spreadsheets PART 3	1	2	3	4	5	6	7	8
Special printing options for spreadsheets • Previewing a document before printing • Printing a document • Hiding spreadsheet rows or columns			I	E	E	E	M	
Creating Charts A • About charts • Types of charts • Making a chart			I	E	M			
Creating Charts B • Formatting the chart data • Formatting the chart axes • Adding and formatting chart text • Working with the chart data • Adding special effects to charts • Manipulating and positioning charts • Charting data in a spreadsheet frame							I, E	E
Spreadsheet keyboard shortcuts • There are general, navigation, selection, and formatting shortcuts that apply specifically to spreadsheet documents and text frames. Some actions have two or more shortcuts.							I, E	E

Spreadsheet Curriculum Integration

References to Spreadsheets in the New Hampshire: *Mathematics* Curriculum Framework
Data Analysis, Statistics, and Probability
5a. K-12 Broad Goal: Students will use data analysis, statistics and probability to analyze given situations and the outcomes of experiments.
Curriculum Standards (5a), Building upon the K-6 experiences, in grades 7-12:
   • Use a variety of techniques which include but are not limited to *spreadsheets*, tables, stem and leaf plots, box and whisker plots, to analyze data and make predictions.
   • Use graphics *technology* to analyze real world data.
   • Use *simulations* to estimate probabilities.

References to Spreadsheets in the New Hampshire: *Science* Curriculum Framework
Science, Technology, and Society
2c. Curriculum Standard: Students will demonstrate an increasing ability to analyze, synthesize, and communicate scientific information using *technology*.
Proficiency Standards, End of Grade 10:
   • Store data in an appropriate *technological* device.
   • Manipulate data on a *database*, e.g. rearranging, sorting, selecting, using a *spreadsheet*.
   • Analyze data graphically with *technological* assistance, e.g. graphing calculator.
   • Communicate data through an electronic medium, e.g. camera, tape recorder, *computer* modem.

Databases

Database Standards

<u>**National Educational Technology Standards - Technology Foundation Standards 1, 3, 5**</u>
1. Basic operations and concepts
  • Students demonstrate a sound understanding of the nature and operation of technology systems.
  • Students are proficient in the use of technology.
3. Technology productivity tools
  • Students use technology tools to enhance learning, increase productivity, and promote creativity.
  • Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.
5. Technology research tools
  • Students use technology to locate, evaluate, and collect information from a variety of sources.
  • Students use technology tools to process data and report results.
  • Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

<u>**New Hampshire's Information Technology Career Pathway - Sixteen Benchmark I. T. Skill and Knowledge Goals**</u>
1. Database Software: Use to Management
  • *By the end of Grade 4* - Searches and sorts prepared databases • Defines parts of a database • Develops simple databases and enters information.
  • *By the end of Grade 8* - Uses database to manage personal information (music collections, phone numbers) • Creates, modifies and prints database reports • Applies search and sort strategies • Accesses local, national, regional databases (e.g., DOL, occupation information) for project work.
2. Software and Systems Integration
  • *By the end of Grade 4 -* Recognizes that files/software/hardware have different formats (file types, extensions, operating systems) • Selects and uses software appropriate to task.
  • *By the end of Grade 8 -* Integrates various pieces of software (word processing, images, photos) into one product/project.

• <u>**Minimum Standards for Public Schools NH**</u>
• **1. Basic operations and concepts**
  • Use 21st century tools to develop technical proficiency at a foundational knowledge level in: hardware, software applications,networks; and elements of digital technology.
  • Become familiar with opportunities and requirements for careers in communications, energy/power/transportation, and materials and process technology cluster areas.
  • Acquire an understanding of technical processes, the practical application of mathematics and scientific principles, and the interrelationships between technology education and other subject areas in the school curriculum

3. Technology productivity tools
- Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government, economics, history, and geography), arts; and world languages.
- Use 21st century tools to develop cognitive proficiency in: literacy, numeracy and spatial/visual literacy.
- Use 21st century tools to develop technical proficiency at a foundational knowledge level in: hardware, software applications,networks; and elements of digital technology.
- Use of common productivity and web based software

5. Technology research tools
- Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government, economics, history, and geography), arts and world languages.

Assessment

Performance Indicators for technology-literate students
Grades1-2
1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. (1)
2. Use a variety of media and technology resources for directed and independent learning activities. (1, 3)
3. Communicate about technology using developmentally appropriate and accurate terminology. (1)
4. Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)
5. Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)
6. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)

Grades 3-5
1. Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)
2. Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)

Grades 6-8
1. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)
2. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)
3. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)
4. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

Database PART 1	1	2	3	4	5	6	7	8
About databases • Definition • Use for databases • Terminology; view, sort, retrieve, fields, records, layout							I-M	
Defining and working with database fields A • Defining or deleting database fields • Setting database field options							I-M	
Defining and working with database fields B • Entering a formula in a database field • Changing a field definition or formula							I	
Entering and editing database data							I -M	
Creating and working with database records • Adding or deleting database records • Inserting records from another database • Selecting database records • Moving or copying records within a database • Moving or copying records to another document • Viewing multiple records in Browse mode • Comparing data by viewing in List mode • Hiding or showing database records							I	

Database PART 2	1	2	3	4	5	6	7	8
Moving through a database • Moving through the fields in a record • Moving through records							I-M	
Finding information in a database • Finding records with a find request • Reusing the same find request (named search) • Matching records using a formula							I-M	
Sorting database records • Defining sorting instructions • Reusing the same sorting instructions (named sort)							I-M	
Creating and working with database layouts • Creating or deleting layouts • Inserting or removing fields on a layout • Adding objects to layouts • Formatting fields on a layout • Setting the tab order for data entry • Inserting a database header or footer part • Resizing or deleting layout parts • Setting up a database to print records in columns							I	

Database PART 3	1	2	3	4	5	6	7	8
Summarizing database data • Defining a summary field • Inserting summary parts • Inserting summary fields • Sorting records for a subsummary • Viewing the summarized data							I	
Formatting documents • Setting document margins • Adding document headers and footers • Adding page numbers, date, and time • Using document rulers							I-M	
Creating and working with database reports							I	
Creating and printing labels • Creating a Labels layout • Printing mailing labels							I	
Special printing options for databases • Printing specific records							I	
Database keyboard shortcuts • There are general, navigation, selection, and formatting shortcuts that apply specifically to spreadsheet documents and text frames. Some actions have two or more shortcuts.							I	
Merging data into another document (mail merge) • Setting up a database for mail merge • Merging two documents • Saving the merged document							I	

Drawing Related Standards

National Educational Technology Standards - Technology Foundation Standards 1, 3, 5
1. Basic operations and concepts
- Students demonstrate a sound understanding of the nature and operation of technology systems.
- Students are proficient in the use of technology.

3. Technology productivity tools
- Students use technology tools to enhance learning, increase productivity, and promote creativity.
- Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

5. Technology research tools
- Students use technology to locate, evaluate, and collect information from a variety of sources.
- Students use technology tools to process data and report results.
- Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

New Hampshire's Information Technology Career Pathway - Sixteen Benchmark I. T. Skill and Knowledge Goals
1**. Graphics and Image Processing to Multimedia Publishing**
- *By the end of Grade 4: Career awareness and IT skills for learning* - Creates simple graphics using drawing and painting software programs • Uses scanner and digital camera and images from the web • Creates thematic slide shows
- *By the end of Grade 8: Career exploration and transition for IT skills for learning to IT skills for working* - Creates composite imagery integrating photos, drawings and text using drawing or painting software programs • Creates a hypermedia presentation

2. Software and Systems Integration
- *By the end of Grade 4* - Recognizes that files/software/hardware have different formats (file types, extensions, operating systems) • Selects and uses software appropriate to task.
- *By the end of Grade 8* - Integrates various pieces of software (word processing, images, photos) into one product/project.

- **Minimum Standards for Public Schools NH**
- **1. Basic operations and concepts**
  - Use 21st century tools to develop technical proficiency at a foundational knowledge level in: hardware, software applications,networks; and elements of digital technology.
  - Become familiar with opportunities and requirements for careers in communications, energy/power/transportation, and materials and process technology cluster areas.
  - Acquire an understanding of technical processes, the practical application of mathematics and scientific principles, and the interrelationships between technology education and other subject areas in the school curriculum
- **3. Technology productivity tools**
  - Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context

of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government, economics, history, and geography), arts; and world languages.
  • Use 21st century tools to develop cognitive proficiency in: literacy, numeracy and **spatial/visual literacy**.
  • Use 21st century tools to develop technical proficiency at a foundational knowledge level in: hardware, **software** applications,networks; and elements of **digital technology**.
  • Use of common productivity and web based software

5. Technology research tools
  • Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and **create** information within the context of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government, economics, history, and geography), arts and world languages.

Assessment

Performance Indicators for technology-literate students
Grades1-2
  1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. (1)
  2. Use a variety of media and technology resources for directed and independent learning activities. (1, 3)
  3. Communicate about technology using developmentally appropriate and accurate terminology. (1)
  4. Use developmentally appropriate multimedia resources (e.g., interactive books, educational software, elementary multimedia encyclopedias) to support learning. (1)
  5. Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)
  6. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)

Grades 3-5
  1. Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)
  2. Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)

Grades 6-8
  1. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)
  2. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)
  3. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)
  4. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

Drawing PART 1	1	2	3	4	5	6	7	8
About drawing • When to draw instead of paint • When to start with a drawing document			I	E	E	M		
Drawing objects • Drawing shapes • Drawing straight lines, arcs, and curves • Drawing freehand objects • Drawing keyboard shortcuts			I	E	E	M		
Changing colors and other attributes • Changing pen colors and other attributes • Changing fill colors and other attributes			I	E	E	M		
Manipulating and positioning objects • Selecting objects • Resizing objects • Copying or duplicating objects • Deleting objects • Locking or unlocking objects • Grouping or ungrouping objects • Moving objects • Aligning objects • Flipping objects • Rotating objects • Moving objects forward or backward • Making items align to a grid (autogrid)			I	E	E	M		

Drawing PART 2	1	2	3	4	5	6	7	8
Copying an object's color and other attributes						I	E	
Customizing the available colors and other attributes • Customizing available colors • Customizing available patterns • Customizing available wallpaper • Customizing available gradients						I	E	
Formatting a drawing document • Adding and removing pages in a drawing document • Setting document margins • Adding document headers and footers • Adding page numbers, date, and time						I-M		
Creating a common background or border for multiple pages						I	E	
Drawing keyboard shortcuts • There are general, navigation, selection, and formatting shortcuts that apply specifically to drawing documents and text frames. Some actions have two or more shortcuts.						I	E	

Painting Related Standards

National Educational Technology Standards - Technology Foundation Standards 1, 3, 5

1. Basic operations and concepts
- Students demonstrate a sound understanding of the nature and operation of technology systems.
- Students are proficient in the use of technology.

3. Technology productivity tools
- Students use technology tools to enhance learning, increase productivity, and promote creativity.
- Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

5. Technology research tools
- Students use technology to locate, evaluate, and collect information from a variety of sources.
- Students use technology tools to process data and report results.
- Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.

New Hampshire's Information Technology Career Pathway - Sixteen Benchmark I. T. Skill and Knowledge Goals

1. Graphics and Image Processing to Multimedia Publishing
- *By the end Grade 4 -* Creates simple graphics using drawing and painting software programs • Uses scanner and digital camera and images from the web • Creates thematic slide shows
- *By the end Grade 8 -* Creates composite imagery integrating photos, drawings and text using drawing or painting software programs • Creates a hypermedia presentation

2. Software and Systems Integration
- *By the end of Grade 4 -* Recognizes that files/software/hardware have different formats (file types, extensions, operating systems) • Selects and uses software appropriate to task.
- *By the end of Grade 8 -* Integrates various pieces of software (word processing, images, photos) into one product/project.

- **Minimum Standards for Public Schools NH**
- **1. Basic operations and concepts**
    - Use 21st century tools to develop technical proficiency at a foundational knowledge level in: hardware, software applications,networks; and elements of digital technology.
    - Become familiar with opportunities and requirements for careers in communications, energy/power/transportation, and materials and process technology cluster areas.
    - Acquire an understanding of technical processes, the practical application of mathematics and scientific principles, and the interrelationships between technology education and other subject areas in the school curriculum
- **3. Technology productivity tools**
    - Become proficient in the use of 21st century tools to access, manage, integrate, evaluate, and create information within the context

of the core subjects of: reading; mathematics; english and language arts; science, social studies, (including civics, government, economics, history, and geography), arts; and world languages.
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- Use of common productivity and web based software

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Assessment

Performance Indicators for technology-literate students
Grades 1-2
1. Use input devices (e.g., mouse, keyboard, remote control) and output devices (e.g., monitor, printer) to successfully operate computers, VCRs, audio tapes, and other technologies. (1)
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5. Create developmentally appropriate multimedia products with support from teachers, family members, or student partners. (3)
6. Use technology resources (e.g., puzzles, logical thinking programs, writing tools, digital cameras, drawing tools) for problem solving, communication, and illustration of thoughts, ideas, and stories. (3, 4, 5, 6)

Grades 3-5
1. Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum. (3)
2. Use technology tools (e.g., multimedia authoring, presentation, Web tools, digital cameras, scanners) for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom. (3, 4)

Grades 6-8
1. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research. (3, 5)
2. Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum. (3, 6)
3. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)
4. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

Painting PART 1	1	2	3	4	5	6	7	8
About painting When to paint instead of draw	I	E	E	E	E	M		
Using the painting tools • Painting freehand brushstrokes • Painting freehand lines • Filling enclosed areas with colors or other attributes • Spray painting • Painting keyboard shortcuts	I	E	E	E	E	M		
Changing colors and other attributes • Changing pen colors and other attributes • Changing fill colors and other attributes	I	E	E	E	E	M		
Manipulating and positioning painted images • Selecting all or part of a painted image • Copying or duplicating painted images • Resizing painted images • Deleting painted images • Moving painted images • Flipping painted images • Rotating painted images • Making items align to a grid (autogrid)		I	E	E	E	M		

Painting PART 2	1	2	3	4	5	6	7	8
Erasing portions of a painted image		I	E	E	E	M		
Copying a painted image's color and other attributes • Picking up the color of an existing image • Applying the attributes of one image to another						I	E	E
Customizing the available colors and other attributes • Customizing available colors • Customizing available patterns • Customizing available wallpaper • Customizing available gradients						I	E	E
Setting image and resolution and color depth						I	E	E
Formatting a painting document • Adding and removing pages in a drawing document • Setting document margins • Adding document headers and footers • Adding page numbers, date, and time						I	E	E
Painting keyboard shortcuts • There are general, navigation, selection, and formatting shortcuts that apply specifically to painting documents and text frames. Some actions have two or more shortcuts.						I	E	E

Presentation Related Standards

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  3. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4, 5, 6)
  4. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. (5, 6)

Presentation PART 1	1	2	3	4	5	6	7	8
Overview of presentation software • Definition • Use for presentations • Terminology;				I	E	M		
Creating and deleting slides				I	E	M		
Using master slides				I	E	M		
Arranging slides • Moving a slide to a new place in a presentation • Grouping, reordering, or deleting groups of slides				I	E	M		
Running and stopping slide shows				I	E	M		
Adding slide transitions				I	E	M		
Setting slide show options • Controlling which slides appear during a slide show • Setting slide show options in the slide show panel				I	E	M		
Making slide notes				I	E	M		
Special printing options for slides				I	E	M		
Presentation keyboard shortcuts • There are general, navigation, selection, and formatting shortcuts that apply specifically to presentation documents and text frames. Some actions have two or more shortcuts.				I	E	M		

Resources

The resources contained here were used, in part, to put together the Derry Cooperative School District Computer and Technology Curriculum. Other resources contained in this collection are useful for educators who are moving to teach and learn in the 21st digital age.

New Hampshire's Information Technology Career Pathway
http://www.nheon.org/nh_projects/pathways/itpathway.php
" The Information Technology Pathway is a recommended guide for middle/high schools and vocational centers. The Pathway is built on industry standards, which define Information Technology (IT) as the study, design, development, implementation, support or management of computer-based systems, particularly software applications and computer hardware."

San Diego City Schools
http://www-internal.sandi.net/standards/HTML/ApplLrngK12.html
"The Technology Embedded into the Curriculum Handbook (TECHandbook) is a planning guide developed by the San Diego City Schools Educational Technology Department. As educators, it is important for all of us to participate in determining how technology will be used for the students we serve. Site planning teams should have an annual process that integrates curriculum development and student assessment with decisions about the tools and resources needed to support academic content and standards."

New Hampshire Educators Online - Public School Minimum Standards (Currently in Effect 2005)
http://nheon.org/oet/standards/index.htm
"The State Board of Education is overseeing a revision of the NH School Minimum Standards. See a side by side comparison of current standards and their corresponding proposed revisions. You can read the entire set of current NH Administrative Rules and the Revised Statutes related to School Standards, located on the NH General Court web site."

Levels of Technology Integration (LoTI)
http://www.loticonnection.com/
The LoTi Connection is your one-stop, online resource for elevating levels of technology implementation in your classroom, at your school, in your district, or around the world! This site was designed to provide information about LoTi, what it is, who uses it, and how you can get involved.

Partnership for 21st Century Skills
http://www.21stcenturyskills.org/index.php
The Partnership for 21st Century Skills has emerged as the leading advocacy organization focused on infusing 21st century skills into education. The organization brings together the business community, education leaders, and policymakers to define a powerful vision for 21st century education to ensure every child's success as citizens and workers in the 21st century. The Partnership encourages schools, districts and states to advocate for the infusion of 21st century skills into education and provides tools and resources to help facilitate and drive change.

Partnership for 21st Century Skills - Information and Communication Technology (ICT) Literacy Maps
http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=31&Itemid=33
"In collaboration with several content area organizations, the Partnership for 21st Century Skills developed a series of ICT Literacy Maps illustrating the intersection between Information and Communication Technology (ICT) Literacy and core academic subjects including geography, math, English, and science. The maps enable educators to gain concrete examples of how ICT Literacy can be integrated into core subjects, while making the teaching and learning of core subjects more relevant to the demands of the 21st century."

State Educational Technology Directors Association (SEDTA)
http://www.setda.org/content.cfm?SectionID=265
Founded in the fall of 2001, the State Educational Technology Directors Association (SETDA) is the principal association representing the state directors for educational technology. SETDA's goal is to improve student achievement through technology.

Techworks from Teacher Created Materials
http://www.teachercreatedmaterials.com/technology/techWorks/techworks-order.html
Teacher Created Materials is a trusted provider of supplemental educational materials for the classroom with innovative curriculum solutions, professional staff development, and dedicated customer service.

North Central Regional Educational Laboratory (NCREL)
http://www.ncrel.org/
NCREL is a wholly owned subsidiary of Learning Point Associates. "Schools face the challenge of preparing students to live, learn, and work successfully in today's knowledge-based digital society. To do so will require high-performance learning of academic content using 21st-century skills and tools. To accomplish this, schools must become high-performance learning organizations. The enGauge framework identifies Six Essential Conditions—systemwide factors critical to effective uses of technology for student learning." (see also *enGauge*®: A Framework for Effective Technology Use http://www.ncrel.org/engauge/)

Appendix

Included in this Appendix are:

1. Post tests for knowledge and skill guideline/matrix
2. Minimum Standards for Public Schools NH
3. Information Technology Career Pathway - Benchmark IT Skill and Knowledge Goals
4. US Department of Education "Enhancing Education Through Technoogy Act of 2001" (extract)
5. Techworks (resource) section headngs.