We're All in This Together:
Integrating the Computer/Technology Skills into Your Curriculum

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As a computer skills teacher, I quickly learned one important fact—I was teaching in a vacuum. I realized for students to learn the necessary skills, all curricular areas needed to incorporate the technology skills required to pass the North Carolina Test of Computer Skills. We as teachers need to model technology use and should consider the test to be a benchmark for learning lifelong skills not an end in itself.

> "To succeed in today's workplace; young people need more than basic reading and math skills. They need substantial content knowledge and information technology skills; advanced thinking skills, flexibility to adapt to change; and interpersonal skills to succeed in multi-cultural, cross-functional teams". (J. Willard Marriott, Jr., Chairman and CEO, Marriott International, Inc.)
>
> (Partnership for 21st Century Skills, 2006)

The Partnership for 21st Century Skills defined a set of skills needed to survive in business today and in the future. They are outlined here:

Critical Thinking/Problem Solving—Exercise sound reasoning and analytical thinking; Use knowledge, facts, and data to solve workplace problems; apply math and science concepts to problem solving.
Oral Communications—Articulate thoughts, ideas clearly and effectively; have public speaking skills.
Written Communications—write memos, letters and complex technical reports clearly and effectively.
Teamwork/Collaboration—Build collaborative relationships with colleagues and customers; be able to work with diverse teams, negotiate and manage conflicts.
Diversity—Learn from and work collaboratively with individuals representing diverse cultures, races, ages, gender, religions, lifestyles, and viewpoints.
Information Technology Application—select and use appropriate technology to accomplish a given task, apply computing skills to problem-solving
Leadership—Leverage the strengths of others to achieve common goals; use interpersonal skills to coach and develop others.
Creativity/Innovation—Demonstrate originality and inventiveness in work; communicate new ideas to others; integrate knowledge across different disciplines.
Lifelong Learning/Self Direction—be able to continuously acquire new knowledge and skills; monitor one's own learning needs; be able to learn

from one's mistakes.
Professionalism/Work Ethic—Demonstrate personal accountability, effective work habits (e.g., punctuality, working productively with others, and time and workload management)
Ethics/Social Responsibility—Demonstrate integrity and ethical behavior; act responsibly with the interests of the larger community in mind.

(Partnership for 21st Century Skills, 2006)

All of the highlighted areas in the table above are covered in the Computer/Technology Skills Curriculum. Precise implementation within cooperative groupings and teaming will help to cover many of the non-highlighted skills in this list.

Inadequate teaching of these skills in a middle school program leaves holes in students' educational fabric. The problem is exacerbated if the Computer/Technology Skills curriculum standards are also not covered each year in the elementary grades. This leaves all skills to be taught, in some cases, by one computer teacher for one six-week period in the sixth grade and one six-week period in the seventh grade.

What are we thinking here? How simply we could all cover the vocabulary and application concepts that fit in our curricular area. Students need to have these skills reinforced in relevant contexts. No math, science, social studies, or language arts teacher would expect their curriculum to be covered in twelve weeks over a three year period and achieve mastery. "We're all in this together."

Here is a suggested list of where the Computer/Technology Skills curriculum strands easily fit into other areas of the curriculum.

Language Arts	Word Processing Multi Media Presentation Ethics Internet
Math	Spreadsheets Graphing Charts Ethics Internet
Science	Word Processing Spreadsheets Graphing

	Charting Multimedia Presentation Ethics Internet
Social Studies	Word Processing Multimedia Presentation Spreadsheet Database Charting Graphing Ethics Internet
Health and PE	Word Processing Multimedia Presentation Spreadsheet Database Charting Graphing Ethics Internet
CTE	Multimedia Presentation Spreadsheet Database Charting Graphing Ethics Internet

This list is not limited to the curricula or the items listed but are there to provide a representation of each Computer Skill Curriculum area that can be integrated into other curriculum areas. Here are some suggestions on how to easily tailor instruction to that embeds technology skills at the same time.

Let's start with Word Processing

We have all had students type an assignment for class. It is simple to incorporate the following requirements for students and address skill sets for the computer test. This will also teach them that everything they complete must meet a certain quality standard. The following is a list of statements that can be used with student assignments. It provides a few common style options and other options can be added. It may be helpful to begin with a few requirements and add requirements as the year progresses.

…Please make sure your title is Size 14 Font.
…Please make sure your title is centered on the page.
…Set your left and right margins to one inch. *(Default is 1.5 inches)*
…Choose either, Arial, Tahoma, or Times New Roman as the font for your document.
…Set the body of your text to a font size of 12. *(Generally two sizes smaller than the title)*
…Set the body of your text to single space. *(Double or 1.5 is also available)*
…Make sure you quote your sources properly within your document.
…Provide a bibliography page at the end of your document.
…Make sure you spell check your document carefully.
…You may add only one graphic per page. Make sure your graphic is kept to a minimal size.

I'm sure with a quick look at the technology standards you can come up with more examples. The point here is to utilize the proper word processing terminologies used on the state test. A list of these terms is found in the accompanying Appendix.

Multimedia

Multimedia is one area that is not directly tested as an application but the concepts and terms are addressed. Therefore we need to use the terms when giving instructions to the students when using PowerPoint, iMovie, Movie Maker, Photo Story, or mPower productions. All of these projects should start with a storyboard. Storyboards can be elaborate or as simple as note cards laid out in order with drawings and details of items students want included in the scene. If students are creating software that is interactive, the storyboard must contain where they are headed from one slide or card to the next. This is all part of the planning process that all too often we do not allow time for. Planning is primary to the success of these projects and teachers will find that quality of student work will greatly improve. Here are some examples of statements you could include in your instructions.

…Make sure you have had your storyboard(s) approved before you begin assembling your first draft.
…Include in your project a Resource Listing
…Footnote properly all resources
…Make sure that your background colors and transitions enhance and do not detract from your project.
…Make sure all your navigation items work before turning your project in.
…Include navigation in this project.

…This project needs to be non-linear and include navigation items for the user.

The Appendix contains a list of Multimedia terms for this strand.

Spreadsheets

Spreadsheets do not have to be created by students from scratch. You can put the basics on the sheet, such as headings or formulas, and have them enter and observe the changes in the data. In the NCDesk online test, students will only have four functions or formulas to work with. They are sum, minimum, maximum and average. In an Excel or Works spreadsheet you can have students insert formulas for mean, median, range, and mode as well as a host of others.

Here are suggested ways to include in the instructions of spreadsheet activities.

…After you sort the following data, predict the next entry that may be made in column D.
…Collect your data from your experiment, place it into your spreadsheet in column B, and create a graph of your data. Place the times of your data collections in the corresponding cells in column A before creating the graph.
…Sort the data in column F in ascending order.

The Spreadsheet terms are listed in the Appendix.

Database

The terms database, phonebook, and encyclopedia have much in common. They are all collections of data under specific topics. A phone number can be found in a phone book by looking for a specific name or title of a business. Then, if you have more than one entry with that name you would narrow down or filter the information based on other criteria, such as the address. A database is a collection of information that can be sorted and or filtered more than once. All the information is connected together as a record.

Databases can be searched online; even a search engine is a database that allows us to filter the contents of the internet to get a report by relevance to what we are looking for. The results are reports of information narrowed down to just what we need to see from hundreds or thousands of records.

Some possible instructions for a prepared database would be:

…Filter this database to find Old Grist Mills that were built before 1800 but have a wheel size of 22 feet.

…Sort the results of the filter in descending order.
…Analyze the statement above and filter the database based on the criterion found in the statement.

There are many databases already created for use in Works, Access, or NCDesk formats. Check online for database files already formatted for the NCDesk and other software formats. A list of the database resource terms can be found in the Appendix.

Telecommunications/Internet

This topic is possibly the most obscure section for the individual classroom teacher to cover but these terms can be added into instructions as well. A list of the terms is found in the Appendix. For some of the some of the more common terms I have provided a definition to make them easier to understand. This list follows:

Intranet **–** this is what is called "the network". All the computers can share items and store items within the walls of the school on the server. All these computers "on the server" are part of an Intra**-**net.

Password **–** the thing students and teachers have trouble remembering…just kidding…it is a secret word or code that allows you to complete the login to your part of the Intranet.

Spam – a strange yet edible meat product…or e-mail that you did not want

Fair Use – this term, often abused, is the part of the copyright law that allows teachers and students to use copyrighted materials for educational use. It is very limited however. See the Resources section for online links to specific information.

Internet/WWW **–** the World Wide Web a series of computers connected by wires and or wireless connectivity

Mobile phone **–** that wireless thing we pay a monthly fee for that after a time runs our lives, a telephone without a wire

Search strategies/keyword/Search Engine **-** these are all jumbled together. To get them out of the way in one breath, software engineers very early on found the Internet was so massive it was hard to know where certain information centers were and what the centers had in them so they wrote software to search the Internet for certain specified pieces of information. By using keywords you can now search billions of pages of information in an instant. These software engines such as Google and Yahoo have search strategies. Here are some examples in a recent search: Entering North Carolina without quotes returns

159,000,000 resulting pages. “North Carolina” within the quotes cuts that number down to 140,000,000. But adding “+ apples” returns 980,000 pages. Although this is still a lot, this strategy cuts down the stuff you don’t need. +,-,” “, and, or, not, are types of strategies you can use in most search engines.

Web browser **–** Internet Explorer, Safari, and Foxfire are all web browsers, software that allows us to connect to and browse the Internet web. We just need to know the web address to get us to the Webpage. Every page of information on the Internet has a URL or address to tell it’s location down to even the folder and file on the web server.

Navigation **–** navigation is the set of buttons, active graphics, or links in web pages or software that allows us to get from the current point to a new location. This allows us to have interactivity. We give people choices in how they want to apply, access, or gather the information.

Bookmarks/ favorites **–** all web browsers give the user the ability to save URL locations in a list. This list is known as a bookmark or favorites list. The user can then go to the list, click on the bookmark, and they are taken directly to the page.

Blog **–** this is short for Web Log. Blogs are great sites to work on writing skills. You or your students can start a topic discussion online and others in the class add to it or comment on the other student’s blog entries. As an example of a blog site in which you can set up accounts without an E-mail address for students, check out classblogmeister.com. Register for an account by contacting David Warlick**.** Follow instructions or print a full set of instructions from the .pdf file.

Societal/Ethical Issues

This section is also limited in the items the individual classroom teacher can cover but these terms can be added into instructions as well. See the Appendix for the list of these terms.

Most of the terms may look very common. Looks can be deceiving. If we the teachers do not use these terms correctly the students will not. Examples of how to include and use the correct terms:

Use	**Instead of**
Load or retrieve your file…	Open what you worked on yesterday.
On your monitor….	On your screen…
On your desktop click on the NCDesk icon	On your screen click on the NCDesk “thingie”…

Here are a few simplified definitions of words you might not recognize:

GPS **–** Global Positioning Satellite - handheld devise that uses satellites to help you navigate

Optical storage devices **–** Digital Camera – DVD – Laser Disk

Probeware **–** Some Palm or Hand held PC's have attachments for measuring temperature, wind speed, light level and the like… These attachments are called probes.

Stand alone **–** a computer not on a network

Network **–** a series of computers and printers connected by wires or wireless that can communicate with a file server or each other

File server **–** a computer dedicated to store and deliver software or data storage to all computers attached to it on the network

LAN **–** Local Area Network … the network in your school is a LAN

WAN **–** Wide Area Network - your LAN is connected to the WAN of the worldwide web

Copyright Law/ Fair Use **–** Face it we have laws to protect what is Intellectual Property of composers, authors, manufacturers and others. We can not re-produce a copy of anything without their permission. Fair Use - this term, often abused, is the part of the copyright law that allows teachers and students to use copyrighted materials for educational use. The law limits more than we think. For detailed guidelines and activities check the Resources section of this article.

AUP/IUP **–** Acceptable Use Policy/ Internet Use Policy - A set of guidelines that set the limits for what you can do on the computer or the Internet without being prosecuted.

Cyber crime **–** stealing information or property over the Internet or on your computer

Virus protection **-** a vaccination for your computer
Trojan horse, or worm **-** these are the nicknames of the types of files used as viruses. A virus is software that installs specific files onto your computer, created by people who want to do harm to the computer software industry.

Encryption – Many software packages that deal with secure items like bank account numbers or credit information. It basically turns files that need to be secure into a secret code so others can't understand it.

Malware, Hacking, Phishing, and Spyware- are all items used on the Internet and delivered through software, which is placed on your computer without your knowledge by hackers and Internet companies. These allow others to get information off of your computer or the network. Many of these tiny software packages can cause your computer to fail or allow companies or hackers know what you are looking at on the Internet. All of this affects network and computer security.

Here are the concepts that are tested using this set of vocabulary:

> As a class/group/individual- identify, discuss, and use:
>
> … chart changes in information technologies & the effect changes have on North Carolina & society
>
> …technology terms/concepts to describe & explain strategies used to collect, organize & present findings
>
> …ethical behavior relating to security, privacy, passwords, & personal information, and recognize possible consequences of misuse
>
> …copyright laws protect ownership of intellectual property & identify & discuss consequences of misuse
>
> …and investigate computer/technology-related careers/occupations in NC past/present/future
>
> …to recognize & describe strategies for identifying, solving, & preventing minor hardware/software problems
>
> …varieties of technology tools to collect, analyze, & present
>
> (LearnNC.org, 2006)

As an example of how to incorporate these skills into your curriculum, I will tell you how one teacher has taken this to heart. A social studies teacher, trying to get her students to learn more about Africa set up a database that included fields for information that was crucial to their understanding of each country's political, religious, and industrial make-up. The students were divided into groups to research and answer the questions needed to fill the information in the database. Students then entered this information. The database was used to make comparisons and draw conclusions as they explored the continent. This is taking the existing technology and using it as a teaching tool.

If all teachers simply incorporated the examples found in this article in their instruction, our students would show progress in the proper use of computers and other technologies. It's up to all of us to teach these skills and to properly model them as well.

Appendix

The following are the lists of terms that are associated by strand. They are all located on a North Carolina Department of Instruction document found at the following address.

http://community.learnnc.org/dpi/tech/archives/Voc.8.06.doc

Word Processing:

Header/footer, columns, tables, using multiple files &/or applications; minimize document, resize document, toggle between two open documents on the desktop, import, portrait/landscape, copy/paste between two documents, print preview, WYSIWIG, page setup, Spell Check, thesaurus, design, layout; formatting concepts- font size/style, line spacing, margins, italic, file, menu bar, word processing, tool bar functions, text, document, respect, computer-generated, template

Multimedia:

Multimedia, authoring, web tools, ethical guidelines, non-linear, navigation buttons, transitions, links/hyperlinks, animation, branching, menu, multimedia, text, sound, audio, images, color, linear/sequential, slide/card, link/button, text box, navigate, transition, audio/video clips, storyboard

Spreadsheet:

data, cell, column, row, values, labels, chart, graph, formula, (+, -. *, /) function, average, range, median, mode, collect, organize, classify, manipulate, pattern, display, calculate, sort, predict

Database:

database, field(s), record(s), data entry, list, sort, ascending/descending numerically /alphabetically, keyword, search/filter, database search strategies, features/functions, operations, reports, layout, format, one criterion, criteria, analyze/evaluate/ interpret, & cite sources, relational database

Societal Ethical:

computer, monitor, CPU, mouse, keyboard, desktop, file, save, retrieve/load, icon, draw, digital cameras, printer, bar code scanners, handhelds, mobile phones, optical storage devices, GPS, CD, DVD, hard drive, data, input, output, processing, probe ware, stand alone, network, file server, LANs, WANs, network resources, features/ functions, hardware/software, file extension, FTP, networked/ non-networked, Copyright Law collect/analyze/display data, AUP/IUP, protection of computers, networks/digital information, cyber crime, virus protection, spam, Trojan horse, worm, encryption, malaria, hacking, phishing,

spyware, network security, passwords, firewalls, personal information, protect computers, networks, Internet connectivity, USB port, flash drive, bandwidth

Resources

Copyright and Fair Use Guidelines for Teachers
http://www.nccei.org/blackboard/copyright.html

More Copyright Resources: http://www.mediafestival.org/downloads.html

References:

[1] "Partnership for 21st Century Skills, (2006.September.29). Are They Really Ready to Work? *Final Report PDF.*, Retrieved May, 14, 2007, from http://www.21stcenturyskills.org/documents/FINAL_REPORT_PDF09-29-06.pdf

[2] LearnNC.org, (2006, May,). Computer /Technology Skills Grade 8: Terms and Concepts. Retrieved May 14, 2007, from Computer /Technology Skills Grade 8: Terms and Concepts. Web site: http://community.learnnc.org/dpi/tech/archives/Voc.8.06.doc

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