Grade Expectations for Vermont's Framework of Standards and Learning Opportunities

Summer 2004

(Information Technology)

Acknowledgments

STATE OF VERMONT
Vermont Department of Education
120 State Street
Montpelier, VT 05620-2501

July 2004

Dear Vermont Educational Leader:

In the fall of 1996, the State Board of Education adopted *Vermont's Framework of Standards and Learning Opportunities*. Over the years thousands of Vermont teachers, parents and students have participated in group meetings and reviews aimed at improving the standards with the goal of making them more useful as guides to curriculum development. In 2000, the standards were formally revised and again adopted by the State Board.

Now, in the summer of 2004, another chapter in the standards, *Grade Expectations for Vermont's Framework of Standards and Learning Opportunities*, has been written. Each of the existing standards for Information Technology has been carefully studied and applied to a process of development that has produced Grade Cluster Expectations (GCEs).

Like the Grade Level Expectations in Mathematics, Reading, and Writing, these GCEs are more specific statements of the Vermont standards in *Vermont's Framework*. Unlike the Grade Level Expectations (GLEs), which delineate specific grade levels, these Grade Expectations are organized by Grade Clusters (pre-K and K; 1 and 2; 3 and 4; 5 and 6; 7 and 8; and high school). The purpose of using grade clusters is to provide additional flexibility for alignment of local curriculum and local comprehensive assessment systems.

As in the development of the GLEs, the development and review of these Grade Expectations involved Department of Education and Vermont Institutes staff, teachers, administrators, content experts and professional associations. Nationally recognized standards, research and curriculum, standards from other states, and Vermont local curriculum were reviewed and considered as part of the development process.

I want to thank everyone who participated in this process.

Sincerely,

Richard H. Cate
Commissioner

As Vermont educators work toward meeting the challenges of the School Quality Standards in Act 68 (formerly Act 60), open communication is critical. The School Quality Standards state:

> Vermont schools will have fully implemented a local comprehensive assessment system by which students are assessed in those *Framework* or comparable standards associated with the Fields of Knowledge and Vital Results and those standards associated with the arts, health and safety education, physical education, foreign languages and applied learning.

In response to this challenge, Grade Cluster Expectations (GCEs) have been developed. Grade Expectations (GEs), encompass both Grade Level Expectations in Reading, Writing and Math, and Grade Cluster Expectations. Assessment items are currently being developed for technology. These GEs will serve multiple purposes in terms of teaching, student learning, and local assessment.

What are GEs?

Vermont's Framework of Standards and Learning Opportunities provides the foundation for Local Comprehensive Assessment Systems. The creation of GEs will provide more explicit guidance. GEs will:

- provide a valuable resource for teachers and schools as they implement the Vermont Framework

- relate directly to the Vermont Standards and associated evidences

- differentiate performance on content knowledge or skills between adjacent grade clusters

- lead to focused, coherent and developmentally appropriate instruction without narrowing the curriculum

The purposes of the Vermont Framework will not change with the development of GEs.

Why two-grade clusters?

The GCEs specify two-grade cluster skills and content (PreK-K, 1-2, 3-4, 5-6, 7-8, and high school). Two-grade clusters will:

- provide more flexibility in creating local curriculum

- allow for a broader time span in which developmental changes can be addressed

- take into account local opportunities to learn

How were the GEs developed?

Grade Expectation development in Vermont involved many educators in order to get the best thinking for this important effort. This required work of teachers, content experts, curriculum coordinators, and administrators. Using background research in national, state, and local documents, committees of teachers came together to discuss and debate what was essential for Vermont's students to know and be able to do. These essential skills and concepts became the GEs, which were then reviewed by hundreds of teachers around the state during the field review process.

What are assessment items?

An assessment item could include performance, a product, a response to a prompt, a reflection, or a portfolio of work over time – a way of documenting what a student knows and is able to do.

Ideally, taken as a group, assessment items should:

- focus on depth of understanding by identifying key knowledge and skills that progress developmentally

- provide clear guidance to classroom teachers on content and skills that can be adequately assessed

- assess what is essential for our learners right now <u>and</u> what will be essential for our students 5, 10, or 20 years from now

- be designed to help the learner revise his or her performance independently

- Assessments will be available at: http://www.vermontinstitutes.org/assessment/index.htm

How do you read the GEs?

As you read the GEs, remember that each has four parts:

- A bolded statement called the "stem" is at the beginning of each GCE. Each "stem" remains the same across the grades, and is meant to communicate the focus of the GCE across the grades.

- Bullets in a GCE indicate how the GCE is specified at that grade cluster.

- Differences between adjacent grades are <u>underlined</u>.

- "E.g.s" are **examples** (not requirements or limited sets) of student demonstration or further clarification of a GCE.
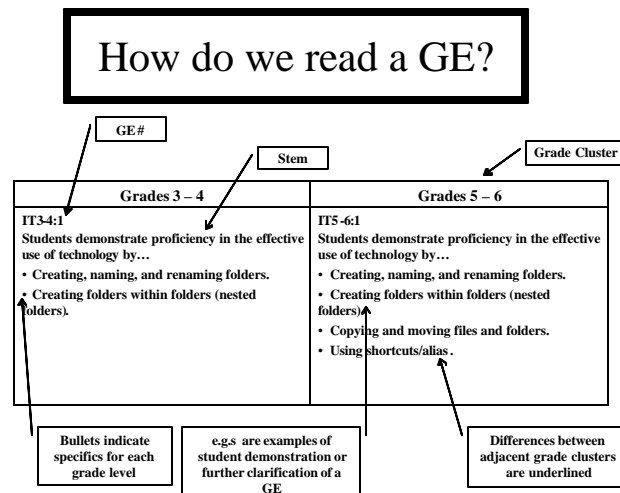
How do GEs fit into the curriculum?

The GEs are designed to work in conjunction with local decisions to help develop assessments and curricula, as represented by the following formula:

Content + Assessment (GEs) + Learning Opportunity + Teaching Opportunity = Curriculum

Vermont Technology Grade Cluster Expectations Overview

Essential Conditions

To live, learn, and work successfully in an increasingly complex and information-rich society, students must be able to use technology effectively. Within an effective educational setting, technology can enable students to become:

- Capable information technology users

- Information seekers, analyzers, and evaluators

- Problem solvers and decision makers

- Creative and effective users of productivity tools

- Communicators, collaborators, publishers, and producers

- Informed, responsible, and contributing citizens

A combination of essential conditions are required to create learning environments conducive to powerful uses of technology, including:

- Vision with support and proactive leadership from the education system

- Educators skilled in the use of technology for learning

- Content standards and curriculum resources

- Student-centered approaches to learning

- Assessment of the effectiveness of technology for learning

- Access to contemporary technologies, software, and telecommunications networks

- Technical assistance for maintaining and using technology resources

- Ongoing financial support for sustained technology use

- Policies and standards supporting new learning environments

These new learning environments provide rich opportunities for students to find and utilize current information and resources, and apply academic skills for solving real-world problems. These environments engage students in activities that have educational technology skills and relevant curricular content interwoven.

From ISTE NETS-S, Essential Conditions (http://cnets.iste.org/students/s_esscond.html)

Introduction

Since the late 1980's, Vermont has invested millions of dollars in acquiring computer and telecommunications technology in its schools and hundreds of thousands of dollars in professional development in the integration of information technology for its teachers. These investments are a result of the State's beliefs that all students in Vermont should know how and when to use information technology to improve and extend their learning as supported in the *Vermont Framework of Standards and Learning Opportunities.* Information technology skills, concepts and applications are listed as one of the "vital results" expected of our Vermont students. Therefore, the Vermont Department of Education believes that all Vermont students should graduate from high school with a level of technology literacy that enables them to use technology effectively, productively, and ethically throughout their lives. These standards support national goals from the U.S. Department of Education under the No Child Left Behind (NCLB) legislation and previously through Technology Literacy Challenge Grant Funds supported by Goals 2000 legislation. "All students will be technologically literate by the end of grade eight" is now part of this legislation. With this commitment to technology infusion, it is essential that we know whether or not Vermont students are prepared to enter the workforce with the technological skills and knowledge they will need to succeed.

To move Vermont schools forward in evaluating and assessing information technology literacy, this document presents a framework for assessing the skills, concepts, and applications of information technology for students in grades three through twelve. It is based on the *National Educational Technology Standards (NETS)* developed by the **International Society for Technology in Education (ISTE)** and the *Vermont Framework of Standards and Learning Opportunities*. The document provides teachers and administrators with specific guidelines to assess student performance in meeting information technology standards by grade cluster. It employs a matrix format to illustrate how skill and knowledge areas are matched by grade clusters to Vermont and National standards.

This document provides a basic framework that schools/districts can use to assess students' abilities to use information technology tools to improve their own performance. There are components of this document that the developers believe should not be changed but rather remain constant. These would include the standards themselves, the specific skills and knowledge developed within each standard, the matching of skills and knowledge to grade clusters as shown in the matrix.

It should be noted that the skills and concepts covered in this document represent the basic, minimal standards. This document outlines the minimum skill level for *each and every student* in your school/district. They represent only a basic level of expectation. Most teachers will, and should, integrate information technology well beyond the minimum standards outlined in this document.

For a document to be effective, it must be dynamic and ever changing. As information technologies evolve and new opportunities become available, so too will this document reflect the latest developments and trends in the field. Remember, there is nothing as constant as change.

Scaffolding

Teachers will be expected to provide a variety of specific technology experiences for students prior to assessing them. Ideally, each teacher in each grade will build upon the previous year's work even when they are not directly responsible for assessing student skills in that area. Instruction must be intentionally built into their curriculum. Otherwise, the job of teaching a particular (set of) skill(s) is left to the grade level teachers who also must perform the assessment. With this in mind, it is our hope to follow this document with another called *A Guide to Information Technology Instruction.* This document will provide a guide to school districts that shows where specific information technology skills might be taught and reinforced prior to being assessed.

Content Based Software

The expectations described in this document, in general, do not address the use of content specific software. Drill and practice software for literacy, geometry software for math, and social studies simulations are all examples of software that are not directly included. However, teachers are encouraged to make these types of application software available to their students to enrich and extend their learning experiences and to provide new learning opportunities when appropriate.

Information Technology Integrated into Content Areas

The Grade Expectations described in this document should be integrated into content area lessons appropriate to each grade cluster. In most cases, they are *not* intended to be taught as independent information technology learning skills.   Therefore, teachers working with their principals and/or district curriculum coordinators must decide where they will be integrated into appropriate content areas and units/lessons. It is imperative that the use of information technologies become an integral part of a larger task or activity that is helping the students meet additional field of knowledge or vital result standards.

Educators from around the state, with the help of The Vermont Institutes, developed Vermont Technology Grade Cluster Expectations as a means to identify the technology content knowledge and skills expected of all students for local assessment required under Act 68. This work was accomplished using the *Vermont's Framework of Standards and Learning Opportunities*, Vermont curricula, the National Educational Technology Standards, state standard documents, and current research as resources. The GEs were reviewed by technology educators from around the state. The data from field review was collected, reviewed, and used to revise the GEs. They were then sent out for Expert Review and revised one final time.

Technology GEs are not intended to represent the full curriculum for instruction at each grade cluster; they are meant to capture the "big ideas" of technology that can be assessed locally. In other words, the Technology GEs are a guide to assessment and should not "narrow" the curriculum for instructional purposes.

The Technology GEs include concepts and skills not easily assessed in an on-demand setting. Many technology processes are ongoing throughout the school year and are best assessed within the classroom.

GE Number	Component	Grouped with Vermont Standards	National Educational Technology Standards (NETS -S)	Stem
IT1	**Basic Operations and Concepts** Use of Hardware Use of Operating System and standard features of applications Organization and Navigation Working with Files	1.18, 1.19, 1.20	Students demonstrate a sound understanding of the nature and operation of technology systems. Students are proficient in the use of technology.	Students demonstrate proficiency in the effective use of technology by...
IT2	**Social, Ethical and Human Issues** Intellectual Property Acceptable Use Working with Content/ Information	5.14	Students understand the ethical, cultural, and societal issues related to technology. Students practice responsible use of technology systems, information, and software. Students develop positive attitudes toward technology uses that support life-long learning, collaboration, personal pursuits, and productivity.	Students demonstrate responsible use of technology systems, information, and software by...

GE Num-ber	Component	Grouped with Vermont Standards	National Educational Technology Standards (NETS -S)	Stem
IT3	**Productivity Tools** Word Processing Databases Spreadsheets Paint/Draw Visual Organizer	1.19, 1.20, 1.21, 1.25	Students use technology tools to enhance learning, increase productivity, and promote creativity. Students use productivity tools to collaborate in constructing technology-enhanced models, preparing publication, and producing other creative works.	Students use technology/productivity tools to enhance learning, increase productivity, and promote creativity by...
IT4	**Communication** Multi-media World Wide Web Email	1.17, 1.19, 1.11, 5.15	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.	Students demonstrate the use of a variety of media and formats to communicate information and ideas effectively to multiple audiences by… Students use telecommunication to collaborate, publish, and interact with peers, experts and other audiences by...
IT5	**Research, Problem Solving and Decision Making** Digital Resources Searching and Search Engines Browser Problem Solving and Decision Making	1.12, 1.13, 2.2, 2.3, 5.14	Students use technology to locate, evaluate, and collect information from a variety of sources. Students use technology to process data and report results. Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks. 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.	Students demonstrate use of technology for research by… Using technology, students demonstrate processing data, solving problems, reporting results, and making decisions by...

Grades PreK-K	Grades 1-2
ITPK-K:1 Students demonstrate proficiency in the effective use of technology by …	**IT1-2:1 Students demonstrate proficiency in the effective use of technology by…**
Use of Hardware	**Use of Hardware**
• Navigating with a mouse, recognizing and using keys (e.g., letters, numbers, and space bar).	• Differentiating between right and left mouse click [Windows] or click, hold, and drag [Mac/Windows], recognizing and using keys letters, numbers, and space bar, shift, return/enter, punctuation, delete/backspace keys). • Using removable media (e.g., floppy disk, CD, DVD).
Use of Operating System and Standard Features of Applications **No ITPK-K:1 at this level**	**Use of Operating System and Standard Features of Applications** • Launching a program from the desktop using a shortcut or alias. • Minimizing applications. • Logging in and out of a computer. • Creating, opening, saving, and printing a document.

Grades 3-4	Grades 5-6

IT3-4:1 Students demonstrate proficiency in the effective use of technology by…

Use of Hardware

- Recognizing and using keys: shift, return/enter, punctuation, delete/backspace, control/ command, tab, escape keys).

- Using removable media (e.g., CD, DVD, flash drive).

- Using effective keyboarding

  - posture (i.e., back straight, body leaning slightly forward, etc.

  - techniques (e.g., eyes on monitor or copy-not the keyboard, etc)

  - and attitudes (e.g., willingness to change habits, persistence and diligence)

- Using digital tools to capture images (e.g., scanner, digital camera).

Use of Operating System and Standard Features of Applications

- Launching a program from the desktop.

- Navigating between open windows.

- Logging in and out of a network.

- Opening documents from and saving documents to multiple locations (e.g.,: c drive, network drive, removable media).

- Locating files and folders using the Find command.

IT5-6:1 Students demonstrate proficiency in the effective use of technology by…

Use of Hardware

- Right clicking [Windows] or clicking, holding, and dragging [Mac/Windows] presents a contextual menu (e.g., right clicking on an image offers a menu of choices about what you want to do with the image), control/command, escape keys.

- Using effective keyboarding:

  - posture (i.e., back straight, body leaning slightly forward, etc.)

  - techniques (e.g., eyes on monitor or copy-not the keyboard, etc.)

  - attitudes (e.g., willingness to change habits, persistence and diligence)

- Using digital tools to capture images and other information (e.g., temperature, light, sound, etc.) and import them into a computer.

Use of Operating System and Standard Features of Applications

- Launching a program by locating it on the internal, external, or network drive.

- Navigating between open windows and applications.

- Opening documents from and saving documents to nested folders.

- Locating files and folders using the Find command.

- Identifying and saving documents in multiple formats (e.g., .doc, .jpg, .pdf, .rtf).

Technology—Basic Operations & Concepts

Basic Operations and Concepts: Vermont Standards 1.18, 1.19, 1.20; National Educational Technology Standards (NETS-S—See introduction)

Grades 5-6	Grades 7-8

IT5-6:1 Students demonstrate proficiency in the effective use of technology by…

Use of Hardware

- Right clicking [Windows] or clicking, holding, and dragging [Mac/Windows] presents a contextual menu (e.g., right clicking on an image offers a menu of choices about what you want to do with the image), control/command, escape keys.

- Using effective keyboarding:

    - posture (i.e., back straight, body leaning slightly forward, etc.)

    - techniques (e.g., eyes on monitor or copy-not the keyboard, etc.)

    - attitudes (e.g., willingness to change habits, persistence and diligence)

- Using digital tools to capture images and other information (e.g., temperature, light, sound, etc.) and import them into a computer.

Use of Operating System and Standard Features of Applications

- Launching a program by locating it on the internal, external, or network drive.

- Navigating between open windows and applications.

- Opening documents from and saving documents to nested folders.

- Locating files and folders using the Find command.

- Identifying and saving documents in multiple formats (e.g., .doc, .jpg, .pdf, .rtf).

IT7-8:1 Students demonstrate proficiency in the effective use of technology by…

Use of Hardware

- Using effective keyboarding:

    - posture (i.e., back straight, body leaning slightly forward, etc.)

    - techniques (e.g., eyes on monitor or copy-not the keyboard, etc.)

    - attitudes (e.g., willingness to change habits, persistence and diligence) and key with speed and accuracy (e.g., 30 words/min with 90% accuracy)

- Using digital tools to capture images and other information (e.g., temperature, light, sound, etc.) and import them into a computer.

Use of Operating System and Standard Features of Applications

- Launching a program by locating it on the internal, external, and network drive.

- Opening documents from and saving documents to nested folders.

- Locating files and folders using multiple criteria within the Find command.

- Saving documents in multiple formats (e.g., .doc, .jpg, .pdf, .rtf, source and txt).

- Compressing and decompressing files.

Grades 9-12

Use of Hardware

No IT9-12:1 at this level

- Using digital tools to capture images and other information (e.g., temperature, light, sound, etc.) and import them into a computer.

Use of Operating System and Standard Features of Applications

- Saving documents in multiple formats (e.g., .doc, .jpg, .pdf, html, gif).

- Compressing and decompressing files.

- Using electronic Help to solve a problem or to learn something new.

Technology—Basic Operations & Concepts

Basic Operations and Concepts: Vermont Standards 1.18, 1.19, 1.20; National Educational Technology Standards (NETS-S—See introduction)

Grades PreK-K	Grades 1-2
ITPreK-K:1 Students demonstrate proficiency in the effective use of technology by …	**IT1-2:1 Students demonstrate proficiency in the effective use of technology by …**
Organization and Navigation	**Organization and Navigation**
No ITPK-K:1 at this level	**No IT1-2:1 at this level**
Working with Files	**Working with Files**
No ITPK-K:1 at this level	• Cutting, copying, and pasting within a document.

Grades 3-4	Grades 5-6

IT3-4:1 Students demonstrate proficiency in the effective use of technology by …

IT5-6:1 Students demonstrate proficiency in the effective use of technology by …

Organization and Navigation

- Creating, naming, and renaming folders.

- Creating folders within folders (nested folders).

Organization and Navigation

- Creating, naming, and renaming folders.

- Creating folders within folders (nested folders).

- Copying and moving files and folders.

- Using shortcuts/alias.

Working with Files

- Cutting, copying, and pasting within a document and across documents.

Working with Files

- Cutting, copying, and pasting within a document, across documents, and across applications.

Technology—Basic Operations & Concepts

Grades 5-6	Grades 7-8
IT5-6:1 Students demonstrate proficiency in the effective use of technology by …	**IT7-8:1 Students demonstrate proficiency in the effective use of technology by …**

Organization and Navigation

*   Creating, naming, and renaming folders.

*   Creating folders within folders (nested folders).

*   Copying and moving files and folders.

*   Using shortcuts/alias.

Working with Files

*   Cutting, copying, and pasting within a document, across documents, and across applications.

Organization and Navigation

*   Creating, naming, and renaming folders.

*   Creating folders within folders (nested folders) in a purposeful structure.

*   Copying and moving files and folders.

*   Creating shortcuts/alias.

Working with Files

*   Cutting, copying, and pasting within a document, across documents, and across applications.

*   Creating a duplicate/backup document in another location.

Basic Operations and Concepts: Vermont Standards 1.18, 1.19, 1.20; National Educational Technology Standards (NETS-S—See Introduction)

Grades 9-12	
IT9-12:1 Students demonstrate proficiency in the effective use of technology by …	

Organization and Navigation

- Copying and moving files and folders.

Working with Files

- Creating a duplicate/backup document in another location.

Grades PreK-K	Grades 1-2
ITPreK-K:2 Students demonstrate responsible use of technology systems, information, and software by…	**IT1-2:2 Students demonstrate responsible use of technology systems, information, and software by…**
Intellectual Property	**Intellectual Property**
No ITPK-K:2 at this level	**No IT1-2:2 at this level**
Acceptable Use	**Acceptable Use**
• Describing and practicing responsible use of technology (e.g., don't bang on the keyboard).	• Describing and practicing responsible use of technology (e.g., taking turns using technology equipment).
Working with Content/Information	**Working with Content/Information**
No ITPK-K:2 at this level	**No IT1-2:2 at this level**

Social, Ethical and Human Issues: Vermont Standards 5.14 Students interpret and evaluate a variety of types of media, including audio, graphic images, film, television, video, and on-line resources; National Educational Technology Standards (NETS-S — See introduction)

Grades 3-4	Grades 5-6
IT3-4:2 Students demonstrate responsible use of technology systems, information, and software by…	**IT5-6:2 Students demonstrate responsible use of technology systems, information, and software by…**

Intellectual Property

Grades 3-4:
- Documenting sources of information obtained through electronic resources (e.g., identifying author and URL).

Grades 5-6 — **Intellectual Property**
- Documenting sources of information obtained through electronic resources using acceptable formats.

- Demonstrating an understanding of copyright and fair use guidelines for educational purposes.

Acceptable Use

Grades 3-4:
- Describing basic issues related to the responsible and safe use of technology (e.g., appropriate use of email, respect for others' electronic property, maintaining confidentiality).

- Describing personal consequences of inappropriate use.

Grades 5-6 — **Acceptable Use**
- Exhibiting safe, legal and ethical behaviors when using technology.

- Describing personal and interpersonal consequences of inappropriate use.

Working with Content/Information

Grades 3-4:
No IT3-4:2 at this level

Grades 5-6 — **Working with Content/Information**
- Articulating and providing examples of relevant, reliable and unreliable Internet resources.

Technology—Social, Ethical & Human Issues

Grades 5-6	Grades 7-8
IT5-6:2 Students demonstrate responsible use of technology systems, information, and software by…	**IT7-8:2 Students demonstrate responsible use of technology systems, information, and software by…**

Grades 5-6

IT5-6:2 Students demonstrate responsible use of technology systems, information, and software by…

Intellectual Property

- Documenting sources of information obtained through electronic resources using acceptable formats.

- Demonstrating an understanding of copyright and fair use guidelines for educational purposes.

Acceptable Use

- Exhibiting safe, legal and ethical behaviors when using technology.

- Describing personal and interpersonal consequences of inappropriate use.

Working with Content/Information

- Articulating and providing examples of relevant, reliable and unreliable Internet resources.

Grades 7-8

IT7-8:2 Students demonstrate responsible use of technology systems, information, and software by…

Intellectual Property

- Documenting sources of information obtained through electronic resources using acceptable formats.

- Applying copyright and fair use guidelines in student work.

- Explaining the accuracy and relevancy of the content.

Acceptable Use

- Exhibiting safe, legal and ethical behaviors when using technology.

- Describing societal consequences of inappropriate use.

Working with Content/Information

- Comparing and contrasting information found on the internet for relevancy, accuracy, and reliability.

Grades 9-12

IT9-12:2 Students demonstrate responsible use of technology systems, information, and software by…

Intellectual Property

- Documenting sources of information obtained through electronic resources using acceptable formats.

- <u>Comparing and contrasting</u> copyright and fair use guidelines for education <u>and other purposes</u>.

- Explaining the accuracy and relevancy of the content.

Acceptable Use

- <u>Defining, defending and demonstrating</u> safe, legal and ethical behaviors <u>among peers and community regarding the use of technology and information</u>.

Working with Content/Information

- Comparing and contrasting information found on the internet for relevancy, accuracy, and reliability.

Technology—Social, Ethical & Human Issues

Grades PreK-K	Grades 1-2
ITPreK-K:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…	**IT1-2:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…**
Word Processing	**Word Processing**
No ITPK-K:3 at this level	• <u>Entering, selecting, deleting text</u>.
	• <u>Manipulating styles</u> (e.g., bold face, italicize and underline).
Databases	**Databases**
No ITPK-K:3 at this level	**No IT1-2:3 at this level**
Spreadsheets	**Spreadsheets**
No ITPK-K:3 at this level	**No IT1-2:3 at this level**

Grades 3-4	Grades 5-6

IT3-4:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…

Word Processing

- Combining text with pictures on a single page (e.g., inserting clipart).

- Adding non-textual elements (e.g., arrows, lines, shapes, etc.).

- Manipulating styles (e.g., fonts, style, size, color of text, alignment).

- Using spell check.

Databases

- Entering data into and manipulating an existing database by browsing, sorting and searching/finding/querying.

Spreadsheets

- Entering data into a spreadsheet template.

- Explaining the relationship between data and visual representation (graph).

- Creating a graphical representation of numerical data (e.g., bar line, and pie).

IT5-6:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…

Word Processing

- Embedding an original piece of art, applying text wrap and resizing.

- Adding non-textual elements (e.g., arrows, lines, shapes, etc.).

- Manipulating styles and formats (e.g. header, footer, borders, page breaks, lists).

- Using spell check, and thesaurus.

- Creating a table.

Databases

- Identifying components of database including field/category, record, file.
- Identifying single and multiple record formats.

- Entering data into an existing database.

- Creating, entering and manipulating a database using ascending and descending sorting, and searching/finding/querying, using a single criterion.

Spreadsheets

- Creating a spreadsheet from a blank page, including simple formulas and simple functions (SUM and AVG).

- Creating a graphical representation of multiple series of numerical data.

- Manipulating format (e.g., resizing rows and columns, font, colors, hiding grid).

Technology—Productivity Tools

Grades 5-6

IT5-6:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…

Word Processing

- Embedding an original piece of art, applying text wrap and resizing.

- Adding non-textual elements (e.g., arrows, lines, shapes, etc.).

- Manipulating styles and formats (e.g. header, footer, borders, page breaks, lists).

- Using spell check, and thesaurus.

- Creating a table.

Databases

- Identifying components of database including field/category, record, file.

- Identifying single and multiple record formats.

- Entering data into an existing database.

- Creating, entering and manipulating a database using ascending and descending sorting, and searching/finding/querying, using a single criterion.

Spreadsheets

- Creating a spreadsheet from a blank page, including simple formulas and simple functions (SUM and AVG).

- Creating a graphical representation of multiple series of numerical data.

- Manipulating format (e.g., resizing rows and columns, font, colors, hiding grid).

Grades 7-8

IT7-8:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…

Word Processing

- Manipulating styles and formats (e.g., headers, footers, borders, page breaks, tabs and margins, multiple columns, text boxes) linking text blocks, span multiple columns, masthead).

- Using spell check, thesaurus and grammar check.

- Creating a table.

Databases

- Generating a report.

- Creating and manipulating a database, by entering, sorting, searching/finding/querying and using multiple criteria.

Spreadsheets

- Creating a spreadsheet from a blank page, including formulas and functions (MIN, MAX MEDIAN, MODE, ROUND), formatting cells (e.g. numeric, monetary, percent, values).

- Creating a graphical representation appropriate to the numerical data (e.g., scatter plot, x-y)

- Manipulating format (e.g., resizing rows and columns, font, colors, hiding grid).

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Grades 9-12

IT9-12:3 Students use technology/ productivity tools to en-hance learning, increase productivity, and promote creativity by…

Word Processing

- <u>Applying</u> styles and formats (e.g., headers, footers, foot-notes/endnotes, borders, page breaks, tabs and margins, multiple columns, text boxes, section breaks, pagination, linking text blocks, span multiple columns to create a com-plex document).

- Using spell check, thesaurus and grammar check.

- <u>Merging from external data source</u>.

Databases

- Generating a report.

- Creating and manipulating a data base, by entering, sorting, searching/finding/querying and using multiple criteria.

Spreadsheets

- Creating a spreadsheet from a blank page, including formu-las and functions (MIN, MAX, ROUND), formatting cells (e.g., numeric, monetary, percent, values).

- <u>Documenting spreadsheets with named cells and comments</u>.

- Creating a graphical representation appropriate to the nu-merical data (e.g., scatter plot, x-y).

- Manipulating format (e.g., resizing rows and columns, font, colors, hiding grid).

- <u>Referencing formulas from other worksheets</u>.

Technology—Productivity Tools

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Grades PreK-K	Grades 1-2
ITPreK-K:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…	**IT 1-2 :3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…**
Paint/Draw	**Paint/Draw**
No ITPK-K:3 at this level	• Illustrating a simple concept using a paint application.
Visual Organizer	**Visual Organizer**
No ITPK-K:3 at this level	• Entering information into a teacher created template (e.g. concept map).
Calculators	**Calculators**
No ITPK-K:3 at this level	No IT1-2:3 at this level

Grades 3-4	Grades 5-6

IT 3-4:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…

Paint/Draw

- Illustrating a simple concept using a paint application <u>showing evidence of the following</u>:
    - paint brush
    - line
    - rectangle
    - oval
    - flood fill
    - line thickness
    - brush shapes
    - colors

Visual Organizer

- <u>Illustrating a simple concept</u> (e.g., concept map, web, bubble, etc.).

Calculators

- <u>Using grade appropriate calculator and applications/functions</u> (e.g., basic operations).

IT 5-6:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…

Paint/Draw

- <u>Creating original illustrations</u> using paint and <u>draw</u> applications.

- <u>Comparing and contrasting the uses of a paint and a draw application</u>.

- <u>Modifying a digital image using flip, rotate, resize, crop</u>.

- <u>Saving graphic images in multiple formats</u> (e.g., .jpg, tif, gif).

Visual Organizer

- Illustrating a concept <u>with topic and sub-topics, selecting different shapes and colors to differentiate various levels or processes</u> (e.g., concept map, web, bubble, flowchart).

Calculators

- Using grade appropriate calculator and applications/functions (e.g., basic operations, fraction-decimal conversion, percentage).

Technology—Productivity Tools

Productivity Tools: Vermont Standards 1.19, 1.20, 1.21, 1.25; National Educational Technology Standards (NETS‑S—See introduction)

Grades 5-6	Grades 7-8

IT 5-6:3 Students use technology/ productivity tools to enhance learning, increase productivity, and promote creativity by…

Paint/Draw

- Creating original illustrations using paint and draw applications.

- Comparing and contrasting the uses of a paint and a draw application.

- Modifying a digital image using flip, rotate, resize, crop.

- Saving graphic images in multiple formats (e.g., .jpg, tif, gif).

Visual Organizer

- Illustrating a concept with topic and sub-topics, selecting different shapes and colors to differentiate various levels or processes (e.g., concept map, web, bubble, flowchart).

Calculators

- Using grade appropriate calculator and applications/ functions (e.g., basic operations, fraction-decimal conversion, percentage).

IT 7-8:3 Students use technology/productivity tools to enhance learning, increase productivity, and promote creativity by…

Paint/Draw

- Importing/Inserting objects from other sources.

- Selecting and using a draw or paint application appropriate for the task.

- Modifying a digital image using flip, rotate, resize, crop, select, copy and paste.

- Selecting and saving images in the appropriate format (e.g., jpg, tif, gif).

Visual Organizer

- Illustrating a variety of relationships, ideas and topics (e.g. cause and effect, Venn diagram, organizational charts, flow chart).

- Importing an illustration.

- Linking an element to appropriate files and URL(s).

Calculators

- Using a graphing calculator and grade appropriate applications/ functions (e.g., graphing, statistics, tables).

Grades 9-12

IT 9-12:3 Students use technology/productivity tools to enhance learning, increase productivity, and promote creativity by…

Paint/Draw

- Selecting and using a draw or paint application appropriate for the task.

- Modifying a digital image using flip, rotate, resize, crop, select, copy, paste.

- Selecting, saving and <u>converting</u> images in the appropriate format (e.g., jpg, tif, gif).

Visual Organizer

- <u>Choosing and creating effective</u> visual organizer to illustrate a variety of relationships, ideas and topics (e.g. cause and effect, Venn diagram, organizational charts, flow chart).

- Importing an illustration .

- Linking an element to appropriate files and URL(s).

Calculators

- Using a graphing calculator and grade appropriate applications/ functions (e.g., graphing, statistics, tables, equations, matrix).

Technology—Productivity Tools

Communication: Vermont Standards 1.17, 1.19, 1.11. 5.15; National Educational Technology Standards (NETS-S —See introduction)

Grades PreK-K	Grades 1-2
ITPreK-K:4 Students demonstrate the use a variety of media and formats to communicate information and ideas effectively to multiple audiences by…	**IT1-2:4 Students demonstrate the use a variety of media and formats to communicate information and ideas effectively to multiple audiences by…**
Multi-Media	**Multi-Media**
No ITPK-K:4 at this level	• <u>Identifying components of multi-media presentations</u> (e.g., title, transitions, sound effects, animation, text and graphics).
World Wide Web	**World Wide Web**
No ITPK-K:4 at this level	**No IT1-2:4 at this level**
Email	**Email**
No ITPK-K:4 at this level	**No ITPreK-K:4 at this level**

Grades 3-4	Grades 5-6

IT3-4:4 Students demonstrate the use a variety of media and formats to communicate information and ideas effectively to multiple audiences by…

Multi-Media

- Creating a slide presentation including title slide, graphics, text, voice, sound related to topic and documentation of sources.

World Wide Web

- Describing a web page, home page and website.

Email

- Sending an email message to another local user.

- Sending an email message to a remote user (i.e., using address with @).

- Differentiating between an email and web address.

IT5-6:4 Students demonstrate the use a variety of media and formats to communicate information and ideas effectively to multiple audiences by…

Multi-Media

- Creating a linear or non-linear presentation including title slide, graphics, text, voice, sound related to topic, scanned or digital photo, animation, bibliography and table of contents.

World Wide Web

- Describing the components of a web address (e.g. ~, /, .edu, .com, .gov, etc.).

- Creating a web page including text, graphics, tables and internal and external links.

Email

- Sending and receiving an email attachment.

- Including the text of the original message in their reply (using quote).

- Forwarding mail.

- Using cc: to copy a message to another individual.

- Using reply options (e.g., reply sender, reply group, reply conference).

Technology—Communication

Grades 5-6	Grades 7-8

IT5-6:4 Students demonstrate the use a variety of media and formats to communicate information and ideas effectively to multiple audiences by…

Multi-Media

- Creating a <u>linear or non-linear presentation</u> including title slide, graphics, text, voice, sound related to topic, <u>scanned or digital photo, animation, bibliography and table of contents</u>.

World Wide Web

- <u>Describing the components of a web address</u> (e.g. ~, /, .edu, .com, .gov, etc.).

- <u>Creating a web page including text, graphics, tables and internal and external links</u>.

Email

- <u>Sending and receiving an email attachment</u>.

- <u>Including the text of the original message in their reply (using quote)</u>.

- <u>Forwarding mail</u>.

- <u>Using cc: to copy a message to another individual</u>.

- <u>Using reply options (e.g., reply sender, reply group, reply conference)</u>.

IT7-8:4 Students demonstrate the use a variety of media and formats to communicate information and ideas effectively to multiple audiences by…

Multi-Media

- Creating a linear <u>and</u> non-linear presentation including title slide, graphics, text, voice, sound related to topic, scanned or digital photo, animation, bibliography and table of contents, <u>video clip</u>.

World Wide Web

- Creating a web page including text, graphics, tables and <u>relative and absolute</u> links.

Email

- <u>Adding an entry into address book and using to send a message</u>.

- <u>Attaching a file to an email message and noting in the body the file format</u>.

- <u>Creating a mailing list</u>.

- Combining and compressing multiple files and sending as an attachment.

- <u>Creating a signature</u>.

Grades 9-12

IT9-12:4 Students demonstrate the use a variety of media and formats to communicate information and ideas effectively to multiple audiences by…

Multi-Media

- Creating a linear and non-linear presentation including title slide, graphics, text, voice, sound related to topic, scanned or digital photo, animation, bibliography and table of contents, video clip.

World Wide Web

- Creating a web page including text, graphics, tables and relative and absolute links, sound elements, graph imported from a spreadsheet, original digital pictures.

- Optimizing graphics for web pages for loading over slow Internet connections.

Email

No IT9-12:4 at this level

Technology—Communication

Grades PreK-K	Grades 1-2
ITPreK-K:5 Students demonstrate use of technology for research by…	**IT1-2:5 Students demonstrate use of technology for research by…**
Digital Resources	**Digital Resources**
No ITPK-K:6 at this level	**No IT1-2:6 at this level**
Searching & Search Engines	**Searching & Search Engines**
No ITPK-K:6 at this level	**No IT1-2:6 at this level**
Browser	**Browser**
No ITPK-K:6 at this level	**No ITPreK-K:6 at this level**
Problem Solving and Decision Making	**Problem Solving and Decision Making**
No ITPK-K:6 at this level	**No ITPreK-K:6 at this level**

Grades 3-4	Grades 5-6

IT3-4:5 Students demonstrate use of technology for research by…

IT5-6:5 Students demonstrate use of technology for research by…

Digital Resources

- Accessing information from a workstation, LAN or Internet-based electronic encyclopedia.

- Using multiple resources including:

  - Library catalog

  - Electronic resources

  - Internet web pages

Digital Resources

- Locating information that is accurate, relevant and appropriate, using a variety of electronic resources including digital encyclopedias, specialized CDs and the Internet.

Searching & Search Engines

- Preparing a search off-line using a teacher-prepared form/strategy.

- Using a search engine predetermined by the teacher, implementing the search strategy developed and locating pertinent information.

Searching & Search Engines

- Preparing a search off-line without using a teacher-prepared form/strategy.

- Implementing a search strategy using Boolean logic (e.g., and, or, not).

Browser

- Navigating to various websites by typing a URL into a browser or using a list of links identified by the teacher.

- Navigating using forward, back, home, and refresh.

- Using hyperlinks to navigate the world wide web.

Browser

- Bookmarking sites relevant to their research and organizing sites into categories.

Problem Solving and Decision Making

- Identifying decisions made (e.g. representing data, formatting, criteria for search, visual organizer).

  Example: What key words did you use in your internet search?

Problem Solving and Decision Making

- Identifying and justifying decisions made, (e.g. representing data, formatting, setting up formula, selecting criteria for search, visual organizer).

  Example: What key words did you make and why? Are there other words that might have worked better?

- Selecting the appropriate tools and technology resources to address a variety of tasks and problems (e.g., spread sheet vs. data base, word processing vs. presentation program).

- Applying technology skills to learning unfamiliar technologies (e.g., digital cameras, scanners, probes).

  Example: What are the first steps you would take to figure out how to use a new technology?

- Using electronic Help to solve a problem.

Technology—Research, Problem Solving & Decision Making

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Research, Problem Solving and Decision Making: Vermont Standards 1.12, 1.13, 2.2, 2.3, 5.14; National Educational Technology Standards (NETS-S—See introduction)

Grades 5-6

IT5-6:5 Students demonstrate use of technology for research by…

Digital Resources

- Locating information that is accurate, relevant and appropriate, using a variety of electronic resources including digital encyclopedias, specialized CDs and the Internet.

Searching & Search Engines

- Preparing a search off-line without using a teacher-prepared form/strategy.

- Implementing a search strategy using Boolean logic (e.g., and, or, not).

Browser

- Bookmarking sites relevant to their research and organizing sites into categories.

Problem Solving and Decision Making

- Identifying and justifying decisions made, (e.g. representing data, formatting, setting up formula, selecting criteria for search, visual organizer).

  Example: What key words did you make and why? Are there other words that might have worked better?

- Selecting the appropriate tools and technology resources to address a variety of tasks and problems (e.g., spread sheet vs. data base, word processing vs. presentation program).

- Applying technology skills to learning unfamiliar technologies (e.g., digital cameras, scanners, probes).

  Example: What are the first steps you would take to figure out how to use a new technology?

- Using electronic Help to solve a problem.

Grades 7-8

IT7-8:5 Students demonstrate use of technology for research by…

Digital Resources

- Locating information that is accurate, relevant, appropriate and identifying possible bias (opinion vs. fact) using a variety of electronic resources.

Searching & Search Engines

- Comparing and contrasting: directories, search engines, and meta-search engines.

- Implementing a search strategy using Boolean logic (e.g., and, or, not, near).

Browser

- Exporting and importing bookmarks/favorites and organizing sites into categories.

Problem Solving and Decision Making

- Justifying decisions made, (e.g., representing data, formatting, setting up formula, selecting criteria for search).

  Example: How did the bar graph represent the data better than a pie chart?

- Selecting and justifying the appropriate tools and technology resources to address a variety of tasks and problems (e.g., spread sheet vs. data base, word processing vs. presentation program).

- Applying technology skills to learning unfamiliar technologies (e.g., digital cameras, scanners, probes).

  Example: What are the first steps you would take to figure out how to use a new technology?

- Using electronic Help to solve a problem or to learn something new.

- Identifying and using a defensible troubleshooting process.

- Creating and using simulations or models, e.g., spreadsheet to design "what if" scenarios.

  Example: What would be the possible effects on the environment of extending the moose-hunting season another week?

Grades 9-12

IT9-12:5 Students demonstrate use of technology for research by…

Digital Resources

• Locating information from <u>specialized online databases (e.g. post-secondary resources, virtual libraries, periodical databases, and others</u>).

Searching & Search Engines

• <u>Selecting an appropriate tool for locating information on the Internet</u>.

• Implementing a search strategy using <u>full </u>Boolean logic <u>with parentheses</u>, (e.g., behavior and cats or felines).

Browser

No IT9-12:6 at this level

Problem Solving and Decision Making

• Justifying decisions made, e.g. representing data, formatting, setting up formula, selecting criteria for search.

• Justifying the appropriate tools and technology resources to address a variety of tasks and problems (e.g., spread sheet vs. data base, word processing vs. presentation program).

• Identifying and <u>successfully</u> using a defensible troubleshooting process.

• Creating and using simulations or models, e.g., spreadsheet to design "what if" scenarios.

Technology—Research, Problem Solving & Decision Making