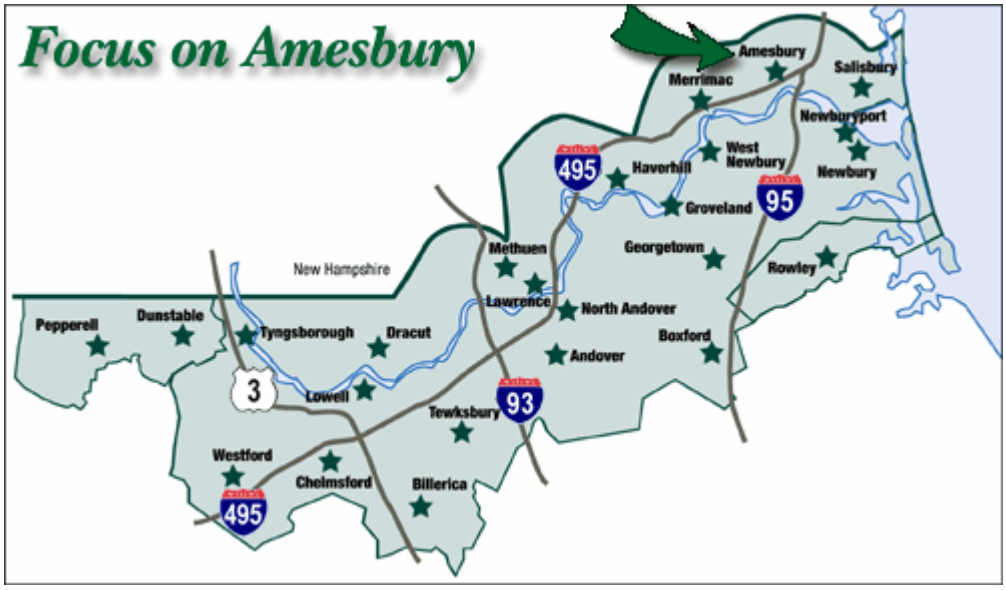
Amesbury Public Schools Local Technology Plan 2009-2012



Amesbury, MA

Amesbury Public Schools
Local Technology Plan: 2009 – 2012

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Technology Planning Committee Members 2009

Anne Verret-Speck - MIS Director
Martine Fabre - Network Manager
Kathy Fowler - Technician
Susan Lang - Technician
Bruce McBrien- Educational Technology Teacher
Leslie Barnaby- Educational Technology Teacher
Stan Froncki - Educational Technology Teacher
James Queenan - Educational Technology Teacher
Joe Stanley - Educational Technology Teacher
Mia Rowlands – Library Teacher/Media Specialist
Ann Hebert- AEFI Board Member, retired APS teacher
Telena Imel - Curriculum Director
Cynthia Yetman - Director of Educational Technology

Benchmark 1
Commitment to a Clear Vision and Implementation Strategies

A. The mission of Educational Technology in the Amesbury Public Schools is to provide learners with unlimited creative capabilities to effectively and efficiently access, analyze and communicate information and ideas. This mission is aligned with the Mission Statement of Amesbury Public Schools. Innovative and increased use of instructional technologies that are tailored to our educational needs will result in substantial improvements in the quality and productivity of our educational system.

B. The technology team that has developed this plan consists of members of the community, teaching faculty, retired faculty members, MIS Department members, Educational Technology staff members.

C. Amesbury Public Schools uses a variety of methods to assess technology products and services that are used for teaching, learning and productivity. These include:

1. Informal observation
2. Staff/student surveys
3. District Directors' meetings
4. Administrative Team meetings

The technology staff works closely with users of each technology to obtain feedback about how well each one serves the intended purpose. Modifications to the hardware, software and processes are made on an ongoing basis in order to fine-tune the technology. Recent research is reviewed on a continual basis to determine new technologies that will address curriculum and productivity needs. Pilot programs are run and new technologies are adopted for wider use depending upon the results of the pilots. Adoption of new technologies is reported on an annual basis in the technology plan implementation reports filed with the state Department of Elementary and Secondary Education.

D. The Acceptable Use policy available in Amesbury Public Schools is shared in appropriate versions for elementary, middle and high school students. Every new staff member is asked to read the Network and Internet Acceptable Use policy and sign agreement on the form provided before beginning employment. Employees and students acknowledge the AUP while logging on to the network on any PC in the district. Each new student is given the form upon registration and continues to receive the new version as he moves into each succeeding school level. Updated verification by students and employees of knowledge of the AUP is required annually by administration. The AUP is printed in each Faculty Handbook and Student Handbook in the district. The Amesbury Public Schools' Internet Safety and Responsibility Policy is available at the following link:
http://www.amesburyma.gov

E. Annual budget preparation and presentation will be based upon the goals of this plan and submitted by the Director of Educational Technology and MIS Director to be

reviewed directly with the Curriculum Director and presented as district-wide budget proposals within the review cycle established by the Superintendent of Schools and Amesbury School Committee. The following grant opportunities are applied for each year to support the technology plan: Amesbury Education Foundation grants, PTA, PAG, Enhancing Curriculum Using Technology Grant and the ERATE Universal Service Fund grant.

F. Evaluation

1. Individual technologies will be evaluated using tools specific to the function of the technology. Each technology will be reviewed by a joint process of technology staff and users who will plan for, and implement improvements.

2. New recommendations for the technology plan are collected from staff on an ongoing basis through e-mail and district wide Directors meetings. All requests from faculty are considered seriously. Personnel from the technical side collaborate with technology integration specialists to identify technology solutions for challenges that teachers face while meeting their curriculum goals.

3. Data analysis is conducted throughout the school system and is supported by the technology department. Student progress is measured by a variety of instruments and the data is gathered and stored on servers to allow efficient access for staff members to locate and use the data as it pertains to their departments. For example the following online assessments and data systems are utilized: DIBELS, Scott-Foresman *Reading Street*, ESPED, Test Wiz.

4. Emerging technologies will be continually examined to determine whether they would offer value to Amesbury Public Schools.

5. Continuous improvement in educational achievement of the students of APS requires a comprehensive strategic planning process to insure our ability to manage the educational system of a rapidly changing, information/knowledge driven society. The Technology Plan is aligned with the goals and objectives of our districts Strategic Plan. Improving technology resources for staff and students will facilitate the district's ability to:

- Create and communicate a system-wide technology vision that supports the district's mission and maximizes available resources
- Make possible the achievement of educational goals for students in our schools using the appropriate technology
- Develop the necessary support systems, for staff and equipment
- Design, implement and evaluate significant technology professional development opportunities for all staff
- Develop necessary plans to take advantage of local, state, national and/or private funding

- The Amesbury Public Schools Technology Plan is implemented and reviewed annually and modified where appropriate for attainment of our educational goals

Action Goals Related to Benchmark #1

FY 2009-2010- Promote the use of online data analysis to interpret test data and improve student achievement and to research new tools to perform this analysis.

FY2010-2011- Research, review and potential revisions of the Amesbury Public Schools Acceptable Use and Networking Policy as new technologies develop.

FY2011-2012- Update Technology plan benchmarks to align with newly adopted district strategic plan.

Benchmark 2
Technology Integration and Literacy

A. Technology Integration[1]

1. Outside Teaching Time – 100% of teachers use technology every day, including some of the following areas: lesson planning, administrative tasks, communications, and collaboration. Teachers share information about technology uses with their colleagues.

2. For Teaching and Learning – Our goal will be for 85% of teachers to use technology appropriately with students every day to improve student learning of the curriculum. Activities include some of the following: research, multimedia, simulations, data interpretation, communications, and collaboration (See the Massachusetts Recommended K-12 Instructional Technology Standards[2]).

B. Technology Literacy

1. At least 85% of eighth grade students show proficiency in all the Massachusetts Recommended PreK-12 Instructional Technology Standards for grade 8 annually.

2. 100% of teachers are working to meet the proficiency level in technology as determined by the Amesbury Technology Committee. (See *APS Teacher Technology Skill Benchmarks And Demonstration of Achievement* next page)

    - By the school year 2010-2011, 60% of teachers will have reached the proficiency level

    - By the school year 2011-2012, 100% of teachers will have reached the proficiency level.

C. Staffing

1. The district has a district-level technology director/coordinator.

2. The district provides one FTE instructional technology teacher per 60-120 instructional staff.

3. The district has staff whose duties include student and staff data management and is working on developing a process of managing student assessment data.

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[1] The Massachusetts Department of Education defines technology integration as the daily use of technology in classrooms, libraries, and labs to improve student learning.

[2] The Massachusetts Recommended K-12 Instructional Technology Standards are available on the Department's web site (http://www.doe.mass.edu/edtech/standards.html).

Amesbury Public Schools
Teacher Technology Skill Benchmarks and Demonstration of Achievement

Teachers will understand and be able to:

1. Utilize basic functions of a computer operating system/file usage.
    - ✓ Identify components of a computer system and use appropriate terminology when speaking about them.
    - ✓ Identify and use basic features of a computer operating system and file saving options.

2. Utilize a variety of software to develop new documents that support teaching and learning.
    - ✓ Identify and use editing and formatting features of a word processing program including the insertion of images.

3. Create spreadsheet workbooks.
    - ✓ Creates an original spreadsheet including simple formulas.

4. Knows how to use a web browser to access and use Internet resources in applications
    - ✓ Can use and identify features of a web browser.
    - ✓ Can bookmark a website.
    - ✓ Can capture and use an image from a web site.

5. Uses draw/paint programs.
    - ✓ Creates a graphic using a drawing program and places within another application.

6. Uses slide presentation programs.
    - ✓ Creates a slide show that includes proper formatting, text, graphics and sound to share information with a target audience.

7. Knows safe and ethical behavior when accessing technology resources.
    - ✓ Writes correct citations for text and images from electronic resources.
    - ✓ Demonstrates awareness of ergonomics and how to use equipment safely.
    - ✓ Demonstrates awareness of classroom/school rules governing the use of technology.

Action Goals Related to Benchmark#2

FY2009-2010

- To expect that teachers use technology every day in their lesson planning
- To expect that teachers will come to use technology every day in their collaboration
- To expect that teachers will share information about technology uses, integration and innovation with their colleagues
- Improve the use of appropriate technology in research and application
- Improve the use of appropriate technology through application of multimedia
- Improve the use of appropriate technology in data interpretation

FY2010-2011,

- 60% of teachers will have reached the proficiency level as defined by the Massachusetts Technology Self-Assessment Tool (TSAT)[3] or similar tool as approved by the District. The results of the survey which we administered shall be the guiding tool in planning our professional development so that we may exceed that goal

FY2011-2012

- 80 % of teachers will have reached the proficiency level as defined by the Massachusetts Technology Self-Assessment Tool (TSAT)[4] or similar tool as approved by the District. Staff will continue to work to meet 100%proficiency level by 2014
  To reach this goal, we must:
- Establish what the District expectations are for technology proficiency
- Prioritize the areas of weakness as identified by our survey
- Prioritize technology professional development within the district so that we can achieve our goal of 100% proficiency

[3] The Technology Self-Assessment Tool is available as an interactive tool on MassONE, as well as a printable PDF checklist (http://www.doe.mass.edu/edtech/standards/sa_tool.html).

[4] The Technology Self-Assessment Tool is available as an interactive tool on MassONE, as well as a printable PDF checklist (http://www.doe.mass.edu/edtech/standards/sa_tool.html).

Benchmark 3
Technology Professional Development

Technology Professional Development continues in Amesbury Public Schools as we offer a series of directed workshops for teachers, mentor trainings, co-teaching support, onsite and online graduate-level courses, as well as on-going training with administrative reporting tasks and curriculum enhancement. All offerings are designed so that staff members meet the basic skills identified in the ISTE standards for teachers and will include software tools provided for and supported by the district. Programs will incorporate the use of technology to facilitate learning to develop 21st Century Skills in Technology. Professional development will address skills necessary to help students achieve the Massachusetts Recommended Instructional Technology Standards for Students PreK-12. Each school, as well as the district, will identify technology-training needs by collecting data generated by the completion of the Amesbury Public Schools Technology Use Survey. Based on collected survey data and feedback, offerings will be both building based and district wide. Amesbury Public Schools has recently developed a new Professional Development Model, which is included in this report. Our training will be framed within its parameters and will be offered in the form of onsite and online graduate level courses and workshops. See appendix for Professional Development Model documents.

FY 2012 District Goal for Teachers: All teachers will meet or exceed the Amesbury Public Schools Teacher Technology Skill Benchmarks and Demonstration of Achievement

To meet this goal the following professional development opportunities will be offered FY 2009-2012:

<u>Elementary Schools</u>
Framework: Professional Development Days and After-School User Groups

- Monthly tech users group to meet at CES/AES in the afternoons
- Teachers will avail themselves of graduate opportunities offered through Northeast Consortium, Lesley, Salem State, Endicott, Gordon, UMass Lowell, and Moodle Generated Trainings.
- District Professional Development Day: Technology in the Elementary Classroom: Reading Street, Read Naturally, X2, and related assessment software and tools. Wii Remote Training where applicable
- Webinars
- Video training modules available for personal professional development

Middle School
Framework: Professional Development Days and In-Service Courses

- Overhead Projector and Smart Board / Smooth Board (Nintendo Wii)- Part of a course or professional training
- Data Literacy training
- Common Data Assessment tools such as Inspire Data training and Excel- In-service Credit
- Video training modules available for personal professional development

High School
Framework: Professional Development Days and In-Service Courses

- Using Internet Resources
- Developing Online Resources
- Smart Board Technology
- Turnitin Anti Plagiarism Training
- Multimedia Slide Show Teaching and Learning Tools
- Video training modules available for personal professional development

Over the next three years, our technology team will begin developing a professional library of training videos for teacher use. A variety of skills and procedures in regards to classroom technology will be recorded and stored in library and on a designated drive for easy access to teachers. The self-guided module will provide training and professional development points for staff. Professional development points will be given upon completion of training set.

Benchmark 4
Accessibility of Technology

A. Hardware Access

1. The district, as of June 2008, had an average ratio of 27.57 students per high-capacity[5], Internet-connected computer. Our goal, over the next three years, is to bring that down to 5 students per Type A computer, and 2-3 students per Type A/B computer.

2. Because of nearly constant use of the one open lab at Amesbury Middle School for assessment and tutoring, the District plans to add a fourth computer lab to that school. This will allow teachers to bring classes to work on classroom-specific projects.

3. The Amesbury District already currently employs one set of interactive hand-held learning devices at one elementary school. We plan to increase that number to two sets (each set quantity should be enough for a typical class size) for each school in the district, to be shared among teachers via their respective Library/Media Center.

4. Amesbury Public Schools maximizes access to the general education curriculum for all students, including students with disabilities, using technology in classrooms with universal design principles and assistive technology devices, where appropriate.

5. The Amesbury District has a centralized MIS Department that specifies, purchases, and maintains all computer equipment to ensure usability, equivalent access, and interoperability. We are currently in the process of establishing a centralized inventory of hardware and software.

6. Each school in the Amesbury District has at least one projector and interactive whiteboard. Our new high school includes projectors in most classrooms, with interactive whiteboards installed in all computer labs, plus two installed in areas that can be scheduled by teachers. In addition, there is a portable interactive whiteboard available for teachers to schedule for their classrooms. Our goal is to increase the presentation tools available to all teachers.

> (a) We plan, eventually, to acquire projectors and interactive whiteboard technology for all classrooms, prioritized by need in alignment with school improvement plans. In addition, we have begun beta-testing the use of Nintendo *Wii* remotes with open-source software to extend interactive whiteboard technology in classrooms where we cannot provide commercial ones.
>
> (b) All teachers currently have televisions or projectors in their classrooms. We will provide them with one of the following remote device types to control their computers so that they can walk around their rooms while using their projectors

[5] "Type A" computers, defined by DESE for the 2007-2008 school year as having greater than 1G of RAM and greater than 2.0 GHz processor. "Type B" computers have greater than 256MB of RAM and processors faster than 1.0 GHz.

(in descending order of preference and price): a *Smart Active Slate*, or something comparable, which allows for complex writing and drawing from remote areas of the classroom; a "presentation remote" that feels like a remote control and acts as a pointer, as well as a remote mouse; or a wireless mouse. To achieve our student-to-computer ratio goals, we plan to use leasing programs to replace desktops in labs and libraries every 3 years; and to replace most teacher, administrator, and classroom student computers every 5-6 years.

B. Internet Access

1. The district provides connectivity to the Internet in all classrooms in all schools including wireless connectivity, if possible.

2. The district provides bandwidth of at least 1Gb to each classroom. At peak, the bandwidth at each computer is at least 100 kbps. The network card for each computer is at least 100 kbps, but most are 1Gb.

C. Networking (LAN/WAN)

1. The district provides at least a 1 GB switched network in each building. In addition, there are wireless networks available to limited computers in three of the four school buildings, running on 802.11g. We plan to add limited guest access to wireless networks over the next three years, beginning this year with Amesbury High School.

2. The district provides access to servers for secure file sharing, backups, scheduling, email, and web publishing, either internally or through contracted services.

D. Staffing

1. The district provides an MIS staff comprising a Director (shared between the schools and town government), a network administrator, and two technical specialists. These 3½ staff members provide network, hardware, and administrative software support, in addition to data management functions.

2. The MIS Department provides timely in-classroom technical support with clear information about how to access the support, so that technical problems will not cause major disruptions to curriculum delivery.

3. The district provides at least one FTE person to support 308 computers. We would like to be able to improve that ratio, but it is not likely we will do so within the next few years. However, we have begun to improve technical support by providing training videos on shared network servers, on our website, or via other resources such as *Moodle* sites.

D. Access to the Internet Outside the School Day

1. The district maintains an up-to-date web site that includes information for parents found at http://www.amesburyma.gov.

2. The district works with community groups to ensure that students and staff have access to the Internet outside of the school day. Community groups that have access to the Internet outside of the school day include: Parent Advisory Group, - Parent Teacher Organizations, Amesbury Adult Learning Center, Northern Essex Community College GED and Adult Basic Education programs, New England League of Middle Schools, Massachusetts Destination Imagination, Lesley University Off Campus Masters Programs, Salem State College Graduate School, Northeast Consortium, Town of Amesbury After School Program.

3. The district web site includes an up-to-date list of places where students and staff can access the Internet before and after school hours. This includes the Public Library as well as the schools (see policies / hours below).

4. Any student involved in an after-school activity can access the Internet in the computer labs or library media center under the supervision of a staff member. The following is the schedule of days/times when staff and students can access the Internet after school:

Amesbury Public Library	Monday and Wednesday Tuesday, Thursday and Friday Saturday	2:30 P.M. to 9:00 P.M 2:30 P.M. to 5:00 P.M. 10:00 A.M. to 5:00 P.M. (Summer 10:00 A.M.- 1:00 P.M.)
AHS Library Media Center	Monday - Friday	7:00 A.M. to 7:30 P.M 2:30 P.M. to 3:30 P.M
AMS Library Media Center	Monday - Thursday	2:30 P.M. to 3:30 P.M
AES Library Media Center	Not Staffed	
CES Library Media Center	Not Staffed	

Action Goals Related to Benchmark #4

FY 2009-2010:

- Add a general, shared-use computer lab at Amesbury Middle School, including interactive whiteboard and projector.
- Complete implementation of school hardware inventory and software licensing management system.
- Ensure that each classroom in the district is equipped with some type of remote device that will allow a teacher to control his/her computer while moving around within the room.

FY 2010-2011:

- Provide each school in the district with two classroom-size sets of interactive hand-held learning devices.
- Ensure that each elementary school in the district has at least one interactive whiteboard/projector setup per grade level; and that the middle and high schools have at least two per grade level.

FY 2011-2012:

- Bring ratios down to 5 students per Type A computer, and 2-3 students per Type A/B computer by replacing lab and library lab computers every three years.

Benchmark 5
E-Learning and Communications

A. Amesbury Public Schools possess a multitude of technology resources to utilize in the standard classroom and in specialized courses. Training is offered to staff to encourage the use of technology and expand teaching strategies across the curriculum. These resources include:

- Keyboarding courses throughout elementary and middle school
- Use of educational on-line games in the classroom
- Early software that teaches business and money management
- Early literacy tools
- Use of productivity and organizational software for classroom projects and presentations
- Use of professional level web and graphics development software
- Integrating state-of-the-art computers across the curriculum
- A television studio with professional video and sound equipment
- Practical activities relevant to today's world, such as participating in on-line investing and building computers
- Webinars
- Video Training

B. The district deploys IP-based connections for access to web-based and/or interactive video learning on the local, state, regional, national and international level.

C. Classroom applications for students include on-line and off-line based educational software, access to on-line research resources and information databases, creation of multimedia projects, computer based art creation, business and stock market simulators, and access to on-line college courses.

For staff, courses are being developed to give them hands-on training with new hardware and software. Plans are also in the works to expand the use of Moodle, secure on-line collaboration tools and other sites that will allow both student and parent easy access to course materials and open up dialog between staff, parent and student.

With this training and access to new technologies it is anticipated that the use of technology district-wide across the curriculum will increase greatly. The goal is to have e-learning projects become an integral part of the teaching and learning process

D. The district maintains an up-to-date website that includes information for parents and community members. We are currently in the process of evaluating website management applications to replace our current platform with one that will include more tools for secure online communication and collaboration tools for teachers, students, and parents.

E. The district complies with federal and state law and local policies for archiving electronic communications produced by its staff and students. The district informs staff and students that any information distributed over the district or school network may be a public record. (See Technology and Email Policy included in Appendix.)

Action Goals Related to Benchmark #5

FY 2009-2010:

- Open "Parent Portal" function of student information management system.
- Expand training for staff in advanced uses of X2 Student Information package.
- Offer training to support use of interactive whiteboard and Microsoft Office upgrade.

FY 2010-2011:

- Have new website implemented, including functionality for teacher blogs, podcasts, rss feeds, and secure messaging with parents and students.
- Start creating a district-wide network utilizing secure on-line collaboration tools.

FY 2011-2012:

- Revisit Acceptable Use policy and update based upon Web 2.0 tools usage.
- Start integrating more interactive and open source software into the curriculum such as Google Earth.
- Utilize the Internet and programs like *Skype* to be able to conduct question and answer sessions and have professional guest speakers from around the globe in the classroom via webcam and microphone.

Appendix Documents

- Technology Use Survey Results
- A.P.S Educational Technology Curriculum
- District Acceptable Use Policy
- Massachusetts Technology Standards
- A.P.S Professional Development Approval Process

District Technology Assessment FY 2009

1. Are you able to manage files: save, locate, and organize files on a local computer and remote network spaces?
Rating
Average Response
Count
Advanced **96.0% (24)** 0.0% (0) 0.0% (0) 4.0% (1) 1.12 25
Proficient **97.0% (32)** 3.0% (1) 0.0% (0) 0.0% (0) 1.03 33
Needs Improvement **88.2% (15)** 5.9% (1) 0.0% (0) 5.9% (1) 1.24 17
Answered question **75**
Skipped question **1**

2. Are you able to back up your files in multiple formats, such as remote drives, flash drive and CD/DVD for protection against loss?
Rating
Average Response
Count
Advanced **94.4% (17)** 0.0% (0) 0.0% (0) 5.6% (1) 1.17 18
Proficient **92.0% (23)** 8.0% (2) 0.0% (0) 0.0% (0) 1.08 25
Needs Improvement **90.3% (28)** 3.2% (1) 0.0% (0) 6.5% (2) 1.23 31
Answered question **74**
Skipped question **2**

3. Are you able to burn files to a disc (CD or DVD)?
Rating
Average Response
Count
Advanced **91.7% (11)** 0.0% (0) 0.0% (0) 8.3% (1) 1.25 12
Proficient **96.0% (24)** 4.0% (1) 0.0% (0) 0.0% (0) 1.04 25
Needs Improvement **97.3% (36)** 2.7% (1) 0.0% (0) 0.0% (0) 1.03 37
Answered question **74**
Skipped question **2**
Page 1
4. Are you able to resolve commonly occurring technology problems (e.g. printer jam, ink cartridge replacement, and frozen computer screen)?

Rating
Average Response
Count
Advanced **94.1% (16)** 0.0% (0) 0.0% (0) 5.9% (1) 1.18 17
Proficient **95.5% (42)** 2.3% (1) 0.0% (0) 2.3% (1) 1.09 44
Needs Improvement **68.8% (11)** 25.0% (4) 0.0% (0) 6.3% (1) 1.44 16
Answered question **76**

***Skipped question* 0**

5. Are you able to operate and connect peripheral devices, such as cameras, printers and projectors?
Rating
Average Response
Count
Advanced **90.9% (10)** 0.0% (0) 0.0% (0) 9.1% (1) 1.27 11
Proficient **95.2% (20)** 4.8% (1) 0.0% (0) 0.0% (0) 1.05 21
Needs Improvement **90.7% (39)** 2.3% (1) 2.3% (1) 4.7% (2) 1.21 43
***Answered question* 75**
***Skipped question* 1**

6. Are you able to use the editing and formatting features of a word processing program (e.g., centering, spacing, fonts, margins, copy and paste, spell check)?
Rating
Average Response
Count
Advanced **95.0% (38)** 2.5% (1) 0.0% (0) 2.5% (1) 1.10 40
Proficient **89.3% (25)** 10.7% (3) 0.0% (0) 0.0% (0) 1.11 28
Needs Improvement **50.0% (4)** 12.5% (1) 0.0% (0) 37.5% (3) 2.25 8
***Answered question* 76**
***Skipped question* 0**

7. Are you able to create an original spreadsheet, entering simple formulas (e.g. various number formats, sums, and percentages)?
Rating
Average Response
Count
Advanced **85.7% (6)** 0.0% (0) 0.0% (0) 14.3% (1) 1.43 7
Proficient **92.9% (13)** 7.1% (1) 0.0% (0) 0.0% (0) 1.07 14
Needs Improvement **92.7% (51)** 1.8% (1) 1.8% (1) 3.6% (2) 1.16 55
***Answered question* 76**
***Skipped question* 0**

8. Are you able to use functions of a spreadsheet such as sum, sort, chart, find, and calculate?
Rating
Average Response
Count
Advanced **80.0% (4)** 0.0% (0) 0.0% (0) 20.0% (1) 1.60 5
Proficient **94.1% (16)** 0.0% (0) 5.9% (1) 0.0% (0) 1.12 17
Needs Improvement **92.6% (50)** 1.9% (1) 1.9% (1) 3.7% (2) 1.17 54
***Answered question* 76**

***Skipped question* 0**

9. Are you able to perform simple operations in a database (e.g. browse, sort, search, delete, add data, and define field formats)?

Rating
Average Response
Count

Advanced **85.7% (6)** 0.0% (0) 14.3% (1) 0.0% (0) 1.29 7
Proficient **92.6% (25)** 7.4% (2) 0.0% (0) 0.0% (0) 1.07 27
Needs Improvement **94.9% (37)** 0.0% (0) 2.6% (1) 2.6% (1) 1.13 39

***Answered question* 73**
***Skipped question* 3**

10. Are you able to create a simple multimedia presentation using a design template?

Rating
Average Response
Count

Advanced **92.9% (13)** 0.0% (0) 7.1% (1) 0.0% (0) 1.14 14
Proficient **96.7% (29)** 3.3% (1) 0.0% (0) 0.0% (0) 1.03 30
Needs Improvement **93.5% (29)** 3.2% (1) 0.0% (0) 3.2% (1) 1.13 31

***Answered question* 75**
***Skipped question* 1**

11. Are you able to create and send email messages: open, save, print, and delete messages?

Rating
Average Response
Count

Advanced **91.8% (45)** 6.1% (3) 0.0% (0) 2.0% (1) 1.12 49
Proficient **96.2% (25)** 0.0% (0) 0.0% (0) 3.8% (1) 1.12 26
Needs Improvement 0.0% (0) 0.0% (0) 0.0% (0) 0.0% (0) 0.00 0

***Answered question* 75**
***Skipped question* 1**

12. Are you able to send, receive, open, and save files attached to email messages. Understand the risks associated with opening attachments from unknown sources?

Rating
Average Response
Count

Advanced **90.7% (39)** 7.0% (3) 0.0% (0) 2.3% (1) 1.14 43
Proficient **96.4% (27)** 0.0% (0) 0.0% (0) 3.6% (1) 1.11 28
Needs Improvement **100.0% (3)** 0.0% (0) 0.0% (0) 0.0% (0) 1.00 3

***Answered question* 74**
***Skipped question* 2**

13. Are you able to create and edit an address book in an email program?
Rating
Average Response
Count
Advanced **87.5% (21)** 8.3% (2) 0.0% (0) 4.2% (1) 1.21 24
Proficient **96.3% (26)** 0.0% (0) 0.0% (0) 3.7% (1) 1.11 27
Needs Improvement **92.0% (23)** 0.0% (0) 4.0% (1) 4.0% (1) 1.20 25
Answered question **76**
Skipped question **0**

14. Are you able to access the Internet and use search strategies and search engines to locate information such as curriculum standards, grant information, educator licensing (ELAR), Virtual Education Space (VES), MCAS data, Thinkfinity, etc?
Rating
Average Response
Count
Advanced **91.3% (21)** 4.3% (1) 0.0% (0) 4.3% (1) 1.17 23
Proficient **91.4% (32)** 5.7% (2) 0.0% (0) 2.9% (1) 1.14 35
Needs Improvement **84.2% (16)** 5.3% (1) 5.3% (1) 5.3% (1) 1.32 19
Answered question **76**
Skipped question **0**

15. Are you able to bookmark web sites or add them to Favorites and organize them into folders for future reference?
Rating
Average Response
Count
Advanced **96.9% (31)** 3.1% (1) 0.0% (0) 0.0% (0) 1.03 32
Proficient **100.0% (28)** 0.0% (0) 0.0% (0) 0.0% (0) 1.00 28
Needs Improvement **78.6% (11)** 7.1% (1) 7.1% (1) 7.1% (1) 1.43 14
Answered question **74**
Skipped question **2**

16. Are you able to download a report or complete a form and save it in a format that can be used offline?
Rating
Average Response
Count
Advanced **95.8% (23)** 0.0% (0) 0.0% (0) 4.2% (1) 1.13 24
Proficient **93.1% (27)** 6.9% (2) 0.0% (0) 0.0% (0) 1.07 29
Needs Improvement **86.4% (19)** 0.0% (0) 4.5% (1) 9.1% (2) 1.36 22
Answered question **75**
Skipped question **1**

17. Are you able to use email distribution lists to communicate with students, staff, parents, and the community?

Rating
Average Response
Count

Advanced **87.5% (14)** 6.3% (1) 0.0% (0) 6.3% (1) 1.25 16
Proficient **96.9% (31)** 0.0% (0) 0.0% (0) 3.1% (1) 1.09 32
Needs Improvement **92.3% (24)** 3.8% (1) 3.8% (1) 0.0% (0) 1.12 26

Answered question **74**
Skipped question **2**

18. Are you able to use databases and spreadsheets for analysis and decision-making?

Rating
Average Response
Count

Advanced **85.7% (6)** 0.0% (0) 0.0% (0) 14.3% (1) 1.43 7
Proficient **100.0% (25)** 0.0% (0) 0.0% (0) 0.0% (0) 1.00 25
Needs Improvement **90.7% (39)** 4.7% (2) 2.3% (1) 2.3% (1) 1.16 43

Answered question **75**
Skipped question **1**

19. Are you able to use online resources such as distance learning for professional development?

Rating
Average Response
Count

Advanced **93.3% (14)** 0.0% (0) 0.0% (0) 6.7% (1) 1.20 15
Proficient **96.0% (24)** 4.0% (1) 0.0% (0) 0.0% (0) 1.04 25
Needs Improvement **91.2% (31)** 2.9% (1) 0.0% (0) 5.9% (2) 1.21 34

Answered question **74**
Skipped question **2**

20. Do you feel that you have access to professional development necessary to help you utilize the technology tools available to? you?

Rating
Average Response
Count

Advanced **75.0% (6)** 12.5% (1) 12.5% (1) 0.0% (0) 1.38 8
Proficient **93.1% (27)** 3.4% (1) 0.0% (0) 3.4% (1) 1.14 29
Needs Improvement **91.4% (32)** 2.9% (1) 2.9% (1) 2.9% (1) 1.17 35

Answered question **72**
Skipped question **4**

21. Are you able to use presentation tools to communicate with students,

staff, parents and the community?
Rating
Average Response
Count
Advanced **91.7% (11)** 0.0% (0) 0.0% (0) 8.3% (1) 1.25 12
Proficient **100.0% (34)** 0.0% (0) 0.0% (0) 0.0% (0) 1.00 34
Needs Improvement **82.1% (23)** 7.1% (2) 3.6% (1) 7.1% (2) 1.36 28
Answered question **74**
Skipped question **2**

22. How would you rate your understanding of the District technology acceptable use policies, addressing issues such as online safety, access to inappropriate sites on the Internet, copyright law, etc?
Rating
Average Response
Count
Advanced **92.9% (13)** 0.0% (0) 0.0% (0) 7.1% (1) 1.21 14
Proficient **92.2% (47)** 5.9% (3) 0.0% (0) 2.0% (1) 1.12 51
Needs Improvement **81.8% (9)** 18.2% (2) 0.0% (0) 0.0% (0) 1.18 11
Answered question **76**
Skipped question **0**

23. Do you feel that the District Technology Plan provides equitable access to technology resources so that every student engages in technology-rich learning experiences?
Rating
Average Response
Count
Yes **96.2% (50)** 1.9% (1) 0.0% (0) 1.9% (1) 1.08 52
No **82.4% (14)** 5.9% (1) 11.8% (2) 0.0% (0) 1.29 17
Comments 15
Answered question **68**
Skipped question **8**

24. Do you feel that you have access to the technology tools necessary for your instruction?
Response
Percent Response
Count
Yes 69.0% 49
No 31.0% 22
Comments 25
Answered question **71**
Skipped question **5**

Amesbury Public Schools Instructional Technology Curriculum Units

Revised: Thursday, December 11, 2008

INDEX

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) • *Launch/Open* • *Exit, Quit* • *Click/Drag* • *Delete* • *Log on* • *Password* • *Domain* • *Left Click* • *Save As* • *Trash* • *Frozen* • *Restart* • *Control Alt Delete* • *Text* • *Draw* • *Font* • *Size* • *Erase* • *New* • *Print* *Key Resources;* *Kid Pix 4* *Keyskills: ELA and Math* *I Spy:Spooky, Treasure Hunt* *Math Essentials* *Math Missions* *Type to Learn Jr.* *Starfall.com* *Enchanted Learning.com* *Sheppard Software on line* *Numbers Undercover* *Numbers Recovered*	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Knows how to turn on a computer and launch program 2. Knows how to use a keyboard and other common input and output devices (including adaptive devices when necessary) 3. Knows accurate terminology to communicate about technology. 4. Understands that media and technology resources can take many forms. 5. Understands that multimedia incorporates sound and images. 6. Knows how to access and use multimedia resources. 7. Knows what a draw and paint program is, and can identify and use basic draw and paint tools.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. Student can move selections using a pointing device including scrolling. 2. Students can close/exit programs using point and click and/or printer. 3a. Students can output images to screen and/or printer. 3b. Students can demonstrate major parts of the computer. 4. Students can use the available media and technology resources in the classroom. 5. Student can demonstrate understanding of and is able to produce a simple multimedia slide 6. Student can demonstrate understanding of basic draw and paint creativity tools.	***(What state frameworks are we addressing in this unit?)*** ***Massachusetts Technology Literacy Standards: Technology Exploratory Skills and Expectations April 2008*** K-2: 1.1 Demonstrate beginning steps in using available hardware and applications (e.g., turn on a computer, launch a program, use a pointing device such as a mouse). K-2: 1.2 Explain that icons (e.g., recycle bin/trash, folder) are symbols used to signify a command, file, or application. K-2: 1.3 Identify, locate, and use letters, numbers, and special keys (e.g., space bar, Shift, Delete) on the keyboard. K-2: 1.10 Demonstrate the ability to use tools in painting and/or drawing programs. K-2: 3.4 Use a variety of age-appropriate technologies (e.g., drawing program, presentation software) to communicate and exchange ideas.

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) Software Kid Pix Studio Draw Tools Text Sound File Insert Slideshow Transition Text Box Use	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Understands basic computer components and can use basic input devices. 2. Uses a variety of media and technology resources in directed and independent learning activities. 3. Creates a simple multimedia product combining sound and images 4. Uses Interactive Software to support learning. 5. Works cooperatively and collaboratively with peers in the use of technology. 6. Knows technology can solve problems.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1a. Students can identify basic components of a computer and demonstrates appropriate use.. 1b. Students can access and navigate folder hierarchy (opening sand saving to desired location). 1c. Students can navigate basic software applications. 1a. Student will be able to open/ save file from/to a location, demonstrating understanding of file structure. 1b. Demonstrates use of proper hand position on the keyboard. 2a. Student will communicate using word processing program. 2b. Student will demonstrates the ability to combine sound and pictures with text. 3. Communicates a problem, design or solution using appropriate technology tools. 4. Students will demonstrate the ability develop a technology product working cooperatively with teachers.	***(What state frameworks are we addressing in this unit?)*** ***K-2: 1.1, "Demonstrates beginning steps in using available hardware nad applications, (e.g. launch a program and use a mouse)"*** ***K-2; 1.2 "Identify, locate and use letters, numbers and special keys on the keyboard"*** ***K-2: 1.5 "Use a word processing application to write, edit, print and save simple assignments."*** ***K2-; 1.7 "Explain that computers can store and organize information so that it can be searched"*** ***K-2; 1.10 "Demonstrate the ability to use tools in painting and/or drawing programs"***

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) • *Multimedia* • *Slides* • *Transitions* • *Sound* • *Record* • *Field* • *Cell* • *Format* • *Margin* • *Text box* • *Graphic* • *Home keys* • *WPM (words per minute)* • *Internet safety* • *Logo* • *Command* • *Procedure* • *Programming* • *Instructions* • *Insert* • *Page Set up* • *Accuracy* • *Simple Machines* Key Resources: Micorsoft Word Powerpoint Excel Appleworks Database/Spreadsheet Keyboarding (TTL 4) Logo (Microworlds) Scratch Math Essentials Keyskills: +/_ Simple Machines Interactive Web Sites: Timez Attack Grolier's Online (here and library)	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. 1. Is able to correctly identify basic computer components, and navigate software applications. 2. Knows how to create a three card multimedia presentation with text, images and transitions. 3. Knows how to properly format and save a word processing document. 4. Knows home row and can identify other keys on the keyboard. 5. Knows the rules for responsible use of school computers. 6. Knows how to apply simple programming language and commands to create simple geometric shapes (Logo).	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1a. Students can identify basic components of a computer. 1b. Students can access and navigate folder hierarchy. 1c. Students can navigate basic software applications. 2a.Students can distinguish between a card/slide and a stack/presentation. 2b. Can place text and images on a card/slide. 2c. Can create 3 slide show presentation with text, images, and transitions. 3. Student will demonstrate functional understanding of a WP application and ability to create properly formatted document. 4a.Student will be able to navigate the home row and keyboard with 70% accuracy. 4b. Student can demonstrate understanding of responsible technology use. 5. Student will create simple shapes and patterns using Logo programming language	***(What state frameworks are we addressing in this unit?)*** G3-5: 1.1 Demonstrate basic steps in using available hardware and applications (e.g., log into a computer, connect/disconnect peripherals, upload files from peripherals). G3-5: 1.2 Select a printer, use print preview, and print a document with the appropriate page setup and orientation. G3-5: 1.3 Use various operating system features (e.g., open more than one application/program, work with menus, use the taskbar/dock). G3-5: 1.4 Demonstrate intermediate[1] keyboarding skills G3-5: 1.5 Use menu/tool bar functions in a word processing program (i.e., font size/style, line spacing, margins) to format, edit, and print a document. G3-5: 1.6 Copy and paste text and images within a document, as well as from one document to another. G3-5: 1.7 Proofread and edit writing using appropriate resources (e.g., dictionary, spell-checker, grammar resources). G3-5: 1.8 Define the term "database" and provide examples from everyday life (e.g., library catalogues, school records, telephone directories). (library) G3-5: 1.9 Define terms related to databases, such as "record," "field," and "search." (library) G3-5: 1.10 Do simple searches of existing databases (e.g., online library catalog, electronic (library) G3-5: 1.14 Explain and use age-appropriate online tools and resources (e.g., tutorial, assessment, Web browser). G3-5: 1.16 Explain terms related to the use of networks (e.g., username, password, network, domain, file server). G3-5: 1.18 Use age-appropriate Internet-based search engines to locate and extract information, selecting appropriate key words. G3-5: 3.2 Perform basic searches on databases (e.g., library card catalogue, encyclopedia) to locate information, using two or more key words and techniques to refine and limit such searches

[1] By the end of eighth grade, students should have keyboarding skills between 25-30 wpm with fewer than 5 errors. In this grade span, districts determine the intermediate level such that students will reach this standard by the end of eighth grade.

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) Browser (Internet Explorer/Firefox) Format Edit Select Words per minutes Database Spreadsheet Home row Digital portfolio Formatting Multimedia ***Resources*** *Appleworks* *Key Skills* *KidsTyping* *Math Essentials* *Microsoft Word* *Microsoft Excel* *Microsoft PowerPoint* *Microworlds* *Scratch*	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Knows how to identify correct technology tools to solve particular technology problems. 2 Knows how to create a six card multimedia presentation with transitions, animations and sound. 3. Knows how to properly format and save a word processing document, spreadsheet and database. 4. Knows home row and can identify other keys on the keyboard. 5. Displays responsible use of school computers and the Internet.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1a. Students can identify basic components of a computer. 1b. Students can access and navigate folder hierarchy (opening sand saving to desired location). 1c. Students can navigate basic software applications. 2. Student will develop an understanding of how the computer is used as a tool for learning 3a. Students can distinguish between a slide and a presentation. 3b. Can place text, images and recorded sound on a slide. 3c. Can create at least a 6 slide presentation that includes text, sound and images. 4. Student will demonstrate functional understanding of a DB, SS, and WP applications and ability to create properly formatted documents within each. 5. Student will effectively navigate the alphabetical keys and keyboard with 90% accuracy with keys covered.	***(What state frameworks are we addressing in this unit?)*** ***G3-5: 1.3 Use various operating system features (e.g. open more than one application/program, work with menus, use taskbar/dock)*** ***G3-5: 1.5 Use menu/tool bar function's in a word processing program (i.e. font size,/style, line spacing margins) to format, edit and print a document.*** ***G3-5: 1.9 Define terms related to database such as record field and search.*** ***G3-5: 1-13 Enter edit data in spreadsheet*** ***G3-5: 1.18 Use age appropriate Internet-based search engines to locate and extract information, selecting appropriate key words.*** ***G3-5; 1.19 Create, edit and format text on a slide*** ***G3-5: Create a series of slides and organize them to present research or convey an idea.*** ***G3-5: 1.21 Copy and paste or import graphics, change their size and position on slide.***

Key Terms	Essential Understandings	Essential Skills	Strand/Standard*
(What terms do students need to know in order to understand key concepts?) • AUP • Browser • Copy and Paste • Copyright • CPU • Desktop • Download • Edit • File • Flash drive • Hardware • Identity theft • Internet Safety • LAN • Logging-In • Menu • Network • Network Folder • Operating System • Password • Print Setup • Software • Spell Check • URL • USB • Virus • WAN • WWW • Thesaurus	(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?) Student will understand that: 1. Knows how to operate peripheral equipment 2. Knows how to create a multimedia presentation for a target audience that includes text, graphics, sounds, animations and transitions 3. Knows what a draw and paint program is, and can use draw and paint tools. 4. Knows how to select the appropriate technology tools to perform tasks and to solve problems 5. Knows how to use all keys on the keyboard. 6. Uses digital resources collaboratively and responsibly in problem solving. 7. Know how to use the internet safely and responsibly.	(What skills do you want your students to practice and develop through this unit?) Student will be able to: 1. Student is able to create a multimedia product for a target audience that includes text, graphics, sounds, animations and transitions. 2. Student will develop proficiency with basic draw and paint creativity tools 3. Student will be able to insert files from other documents and sources into word processing documents, such as tables, images, etc. 4. Student will keyboard with 90% accuracy on the entire keyboard with keys covered. 5. a. Students will develop skills for accessing web resources b. Students will develop skills for the evaluating of web resources. c. Students will demonstrate an understanding of the District AUP (Acceptable Use Policy).	(What state frameworks are we addressing in this unit?) *Massachusetts Technology Literacy Standards and Expectations April 2008 G3-5:1.1 G3-5:1.2 G3-5:1.3 G3-5:1.4 G3-5:1.5 G3-5:1.6 G3-5:1.7 G3-5:1.8 G3-5:1.14 G3-5:1.15 G3-5:1.16 G3-5:1.17 G3-5:1.18 G3-5:1.19 G3-5:1.20 G3-5:1.21 G3-5:1.22 G3-5:2.1 G3-5:2.2 G3-5:2.3 G3-5:2.4 G3-5:2.5 G3-5:2.6 G3-5:2.7 G3-5:2.8 G3-5:2.9 G3-5:2.10 G3-5:2.11 G3-5:2.12 G3-5:2.13 G3-5:3. G3-5:3.2 G3-5:3.3 G3-5:3.4 G3-5:3.5 G3-5:3.6 G3-5:3.7 G3-5:3.8 G3-5:3.9 G3-5:3.10

Key Terms	Essential Understandings	Essential Skills	Strand/Standard*
(What terms do students need to know in order to understand key concepts?) • AUP (Acceptable Use Policy) • Cell • Copy and paste • Cyber bullying • Database • Domains • DVD • Exact search • Extensions • Firewall • Formula • Hacking • Html • Identity theft • intellectual property • Internet Safety • Networks • Peripherals • Plagiarism • Privacy • Server • Spam • Spreadsheet • Storage • Troubleshooting	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Knows how to operate peripheral equipment 2. a. Knows how to create a simple database, defining fields and adding records. b. Knows how to create a simple spreadsheet, including structure and function, and is able to enter simple formulas. 3. Knows how to select the appropriate technology tools to perform tasks and to solve problems 4. Knows how to use all keys on the keyboard. 5. Uses digital resources collaboratively and responsibly in problem solving. 6. Knows how to identify and stop cyber bullying 7. Know how to use the internet safely and responsibly.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. Student is able to integrate the use scanners/digital cameras etc. 2. Student is able to a. Knows how to create a simple database, defining fields and adding records. b. Student is able to create a simple spreadsheet, including structure and function, and is able to enter simple formulas. 3. a. Student will be able to organize information collected from a variety of sources. b. Student will be able to manipulate data using appropriate technology tools. 4. Student will develop efficient keyboard technique with 90% accuracy on the entire keyboard including keypad with keys covered. a. Students will develop skills for utilizing search engines for the acquisition of relevant information to support learning. b. Student will be able to identify and cite a variety of electronic sources	***(What state frameworks are we addressing in this unit?)*** *Massachusetts Technology Literacy Standards and Expectations April 2008 G6-8: 1:1 G6-8: 1.2 G6-8: 1.4 G6-8: 1.6 G6-8: 1.7 G6-8: 1.12 G6-8: 1.13 G6-8: 1.14 G6-8: 1.15 G6-8: 1.16 G6-8: 1.17 G6-8: 1.18 G6-8: 1.19 G6-8: 1.20 G6-8: 1.22 G6-8: 1.23 G6-8: 1.24 G6-8: 1.25 G6-8: 2.1 G6-8: 2.2 G6-8: 2.3 G6-8: 2. G6-8: 2.5 G6-8: 2.6 G6-8: 2.7 G6-8: 2.10 G6-8: 2.11 G6-8: 2.12 G6-8: 2.13 G6-8: 2.14 G6-8: 3.1 G6-8: 3.2 G6-8: 3.3 G6-8: 3.4 G6-8: 3.5 G6-8: 3. G6-8: 3.7 G6-8: 3.8 G6-8: 3.9

Course: AMS Grade 6 *Unit: Whole Year* *Thursday, December 11, 2008*

Key Terms	Essential Understandings	Essential Skills	Strand/Standard*
(What terms do students need to know in order to understand key concepts?) • .com • .net • .org • .gov • .edu • bookmark • collaboration • Database • file sharing • filter • HTML • Identity theft • intellectual property • Internet Safety • Plagiarism • Sort • Spreadsheet • Troubleshooting • WPM • audio • video • animations	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Knows to select a printer and can print a document to a page, including setup and orientation. 2. Knows how to perform simple operations in a database. 3. Knows how to chart in a spreadsheet. 4. Knows how to use draw and paint programs. 5. Knows how to touch type 6. Knows how to use a browser and bookmark a web site. 7. Knows the schools acceptable use policy. 8. Know how to use the internet safely and responsibly.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. Prints in both landscape and portrait. 2. Can browse, sort, search and add data to a database. 3. Charts data in a spreadsheet. 4. Can save paint or draw files and use in appropriate programs paint programs. 5. Uses home row and top row with 20 WPM and 90% accuracy. 6. Web: a. Uses navigation features of a browser. b. Bookmarks c. Copies images from a website to a file and cites resources properly. 7. Demonstrates safe and ethical use of computer resources. 8. Creates a multimedia presentation.	***(What state frameworks are we addressing in this unit?)*** *Massachusetts Technology Literacy Standards and Expectations April 2008 G6-8: 1:1 G6-8: 1.2 G6-8: 1.3 G6-8: 1.4 G6-8: 1.5 G6-8: 1.6 G6-8: 1.7 G6-8: 1.8 G6-8: 1.9 G6-8: 1.10 G6-8: 1.11 G6-8: 1.12 G6-8: 1.13 G6-8: 1.14 G6-8: 1.15 G6-8: 1.16 G6-8: 1.17 G6-8: 1.18 G6-8: 1.19 G6-8: 1.20 G6-8: 1.21 G6-8: 1.22 G6-8: 1.23 G6-8: 1.24 G6-8: 1.25 G6-8: 2.1 G6-8: 2.2 G6-8: 2.3 G6-8: 2. G6-8: 2.5 G6-8: 2.6 G6-8: 2.7 G6-8: 2.10 G6-8: 2.11 G6-8: 2.12 G6-8: 2.13 G6-8: 2.14 G6-8: 3.1 G6-8: 3.2 G6-8: 3.3 G6-8: 3.4 G6-8: 3.5 G6-8: 3. G6-8: 3.7 G6-8: 3.8 G6-8: 3.9

Key Terms	Essential Understandings	Essential Skills	Strand/Standard*
(What terms do students need to know in order to understand key concepts?) • Attachment • blogs • bookmark • collaboration • database • digital information • effective search • field • file sharing • Identity theft • intellectual property • Internet Safety • IP Address • Plagiarism • record • RTF • security • telecommunications • Troubleshooting • wikis • WPM • DSL • T1 • access links • security	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Knows basic functions of a computer operating system/file usage. 2. Knows home row and finger reaches on a QWERTY keyboard. 3. Knows how to develop new word processing documents. 4. Knows how to develop new database files. 5. Knows how to create spreadsheet workbooks. 6. Knows how to use a web browser to access and use Internet resources in applications 7. Uses draw/paint programs. 8. Uses slide presentation programs. 9. Knows safe and ethical behavior when accessing technology resources.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. a. Identifies components of a computer system and uses appropriate technology when speaking about them. b. Identifies and uses basic features of a computer operating system and file saving options 2. a. Uses touch typing techniques to access home row and top/bottom row reaches 90% accuracy with at least 25 WPM. 3. a. Identifies and uses editing and formatting features of a word processing program including the insertion of images. 4. Creates and original database defining field formats and adding records. 5. Creates an original spreadsheet including simple formulas. 6. a. Can use and identify features of a web browser. b. Can bookmark a website. c. Can capture and use an image from a web site. 7. Creates a graphic using a drawing program and places within another application. 8. Creates a slide show that includes proper formatting, text, graphics and sound to share information with a target audience. a. Writes correct citations for text and images from electronic resources. b. Demonstrates awareness of ergonomics and how to use equipment safely. c. Demonstrates awareness of classroom/school rules governing the use of technology.	***(What state frameworks are we addressing in this unit?)*** *Massachusetts Technology Literacy Standards and Expectations April 2008 G6-8: 1:1 G6-8: 1.2 G6-8: 1.3 G6-8: 1.4 G6-8: 1.5 G6-8: 1.6 G6-8: 1.7 G6-8: 1.8 G6-8: 1.9 G6-8: 1.10 G6-8: 1.11 G6-8: 1.12 G6-8: 1.13 G6-8: 1.14 G6-8: 1.15 G6-8: 1.16 G6-8: 1.17 G6-8: 1.18 G6-8: 1.19 G6-8: 1.20 G6-8: 1.22 G6-8: 1.23 G6-8: 1.24 G6-8: 1.25 G6-8: 2.1 G6-8: 2.2 G6-8: 2.3 G6-8: 2. G6-8: 2.5 G6-8: 2.6 G6-8: 2.7 G6-8: 2.10 G6-8: 2.11 G6-8: 2.12 G6-8: 2.13 G6-8: 2.14 G6-8: 3.1 G6-8: 3.2 G6-8: 3.3 G6-8: 3.4 G6-8: 3.5 G6-8: 3. G6-8: 3.7 G6-8: 3.8 G6-8: 3.9

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) • *Modeling* • *Texturing* • *Shaders* • *Animation* • *Animation principles* • *Vertex* • *Surface* • *Render* • *Lighting* • *Export* • *Target Audience* • *Compositing*	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Understands the application and use of 3 dimensional computer models in media. 2. Knows how to develop and animate 3 dimensional models using a variety of techniques including texturing and shading. 3. Knows how to develop and animate short 3D features for a target audience.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. Sites the application of computer generated 3D models in media. 2. Can view and construct 3D models using a modeling program. 3. Changes models dimensions and attributes including surfaces, shaders and use of texture maps. 4. Place 3 dimensional objects in realistic scenes. 5. Can set various render and export, import values. 6. Effectively applies the principles of animation to 3D animations. 7. Can create stand-alone film products for a variety of outputs using 3D models.	***(What state frameworks are we addressing in this unit?)*** ***Massachusetts Technology Literacy Standards*** ***Grades 9 through 12 – Technology Standards and Expectations,*** ***April 2008*** Standard 1, 2

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) • *Business Plan* • *Cost of Goods Sold* • *Market Research* • *Demographics* • *Advertising and Publicity* • *Unit of Sale* • *Income Statement* • *Target Market* • *Market Segment* • *Opportunity and Recognition* • *Entrepreneur*	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Knows how to set personal and business goals 2. Knows how to recognize a business opportunity. 3. Knows the unit of sale. 4. Knows how to conduct market research. 5. Knows how to develop advertising campaign and logo. 6. Knows how to create a marketing plan. 7. Knows how to develop a financing and networking strategy. 8. Knows how to forecast a 6 month income statement and calculation of operating costs.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. Defines an entrepreneur including characteristics. 2. Explains the power of positive thinking 3. Explains opportunity recognition. 4. Is able to select a business type. 5. Lists the steps needed in product development. 6. Lists the costs of starting and operating a new business. 7. Completes market research for their own service or product based small business. 8. Utilizes spreadsheets to calculate the costs to operate a small business. 9. Is able to complete cost/benefit analysis using spreadsheets. 10. Utilizes appropriate formulas for business calculations. 11. Utilizes desktop publishing tools to develop marketing materials for a small business. 12. Utilizes PowerPoint to develop a marketing plan. 13. Designs a web page to promote their own business. 14. Presents Business plan using effective communication skills and technology tools.	***(What state frameworks are we addressing in this unit?)*** ***Massachusetts Technology Literacy Standards and Expectations April 2008*** ***Standards 1,2,3***

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) • *Graphic design* • *Layers* • *Principles of Animation* • *Storyboard* • *Raw Image Acquisition* • *Preparation for output* • *Rendering* • *Pixels* • *Resolution* • *Cropping* • *Transformations*	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Understands the principles of animation. 2. Knows how to develop actors/props/scenes and uses audio effectively to develop a 2 D computer animation for a target audience. 3. Understands desktop video production and digital video editing. Understands the RAW image acquisitions, scan, digital camera, draw, Internet. 4. Understands how to prepare digital images for output in a variety of applications. 5. Understands the use of file converters for graphics, sounds and video. 6. Understands standard digital image corrections for image type and how to perform image corrections.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. Communicates and applies the principles of animation. 2. Utilizes cell and frame based 2 D Animation effectively. 3. Uses all media available to enhance 2 D animation creations. 4. Student storyboards animation and desktop video topics/projects. 5. Students use slide show technologies effectively and include the use of digital and video resources. 6. Student can convert media into several different formats depending upon need. 7. Selects topic and creates frame animation for a target audience that includes actors, props, path animation, and audio. 8. Selects, edits, transitions and filters video for a digital video project to teach or entertain a target audience 9.Creates a multi graphic collage demonstrating basic photo editing techniques and special effects. Uses multiple layers, channels and file converters 10. Students can alter a digital image and prepare it for appropriate output. Students can digitize and hard copy media for use in a digital format.	***(What state frameworks are we addressing in this unit?)*** ***Massachusetts Technology Literacy Standards and Expectations April 2008*** ***Standards 1,2***

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) • *Layers* • *Masking* • *Graphic Design* • *Advertising* • *Target Demographics* • *Photomanipulation* • *Perspective* • *Lighting/Shadows* • *Compositing* • *Thumbnails* • *Storyboarding* • *Concepts* • *Rotoscoping* • *Keyframing* • *Composition* • *Green Screening* • *Chromakeying* • *Workflow* • *Animation Principles*	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Understand how basic art principles apply to other mediums such as 2D animation and video editing. 2. Understand why the aspects of lighting, perspective and composition are important in digital art. 3. Understand the professional creative process and see a project through from concept to completion. 4. Understands how to properly setup up a photo shoot as well as a video shoot. 5. Understands the fundamental principles of animation as well as advanced techniques, such as rotoscoping. 6. Understand how in-school projects relate to big real world projects. 7. Understand how the professional graphics industry works.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. Understand basic principles of art and apply it to their own work with nontraditional digital mediums. 2. Identify common advertising techniques and target demographics. 3. Create advertisements using professional standards of graphic design. 4. Create advanced and realistic images by combining 2 or more images. 5. Effectively utilize advanced tools included with software packages the course covers. 6. Fully plan and execute a project from start to finish. This includes concept art, storyboards, assigning duties, resources gathering, filming, and post-production. 7. Use advanced professional tools such as green screens, stage lights and video cameras. 8. Create frame-by-frame animation utilizing flash. 9. Create rotoscoped animation utilizing flash.	***(What state frameworks are we addressing in this unit?)*** ***Massachusetts Technology Literacy Standards*** ***Grades 9 through 12 – Technology Standards and Expectations, April 2008*** Standard 1, 2

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) • *Computers* • *Hardware* • *Software* • *Memory* • *Internet* • *ARPAnet* • *Operating System* • *Graphical User Interface* • *Search Engines* • *Spiders* • *Internet Protocol* • *Research* • *Validation* • *Citation* • *HTML* • *Coding* • *Tags* • *Design* • *Thumbnail* • *JAVA* • *CSS* • *Bandwidth*	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Understand the history of computers from ancient times to the modern world. 2. Understand the history and infrastructure of the Internet. 3. Understand how technology has impacted the modern world and how it influences the world everyday. 4. Understand Internet ethics. 5. Understand how to properly research, validate, and cite online sources. 6. Understand how to design a website with HTML code. 7. Understand basic principles of web design. 8. Understand how to utilize photo-editing software to design websites. 9. Understand how to create a website utilizing Dreamweaver.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. Gain knowledge of the history of computers and the Internet. 2. Understand how the Internet works. 3. Utilize methods to keep their computer and themselves safe when online. 4. Validate and cite websites properly when using them as sources for research. 5. Create a webpage using HTML code. 6. Create a webpage template in Photoshop. 7. Turn a template into a functioning website. 8. Create a website utilizing Dreamweaver. 9. Identify good web design techniques and target demographics.	***(What state frameworks are we addressing in this unit?)*** ***Massachusetts Technology Literacy Standards*** ***Grades 9 through 12 – Technology Standards and Expectations,*** ***April 2008*** Standard 1, 2, 3

Key Terms	Essential Understandings	Essential Skills	Strand/Standard
(What terms do students need to know in order to understand key concepts?) 1. *Virtual World* 2. *Design* 3. *Storyboard* 4. *Storytelling* 5. *Characters* 6. *Coding/Scripting* 7. *Importing/Exporting* 8. *Target Audience* 9. *Console* 10. *Packaging*	***(What do you want your students to understand about this topic/theme? What are the most important concepts, issues, and principles?)*** **Student will understand that:** 1. Knows basic Game design principles. 2. Knows how to import 3 D Models as characters and virtual worlds created in 3D Modeling programs 3. Knows how to storyboard for game design. 4. Knows how to program various game controls, ie ,console, mouse, keyboard 5. Knows how to script world events. 6. Knows how to use conditional statements in programming 7. Understands basic programming structure. 8. Understands how to test and debug programs. 9. Knows how to create interactive objects. 10. Knows how to package game for professional promotion.	***(What skills do you want your students to practice and develop through this unit?)*** **Student will be able to:** 1. Students will plan, storyboard and create a video game for a target audience. 2. Student creates 3 D Models as characters in world with 3 D modeling program for use in video game. 3. Students will use Alice programming language to program video game. 4. Students will test video game with test group in class and complete assessment documents. 5. Students will create welcome menu and help areas for game.	***(What state frameworks are we addressing in this unit?)*** ***Massachusetts Technology Literacy Standards And Expectations April 2008*** ***Standards 1,2,3***

AMESBURY PUBLIC SCHOOLS

TECHNOLOGY AND EMPLOYEE EMAIL POLICY
IJNDB

TECHNOLOGY USE

Introduction

The Amesbury Public Schools shall provide access for employees, students and others to the District's electronic networks, including connections to external networks, for limited educational purposes. Educational purposes shall be defined as classroom activities, career and professional development, and high quality self-discovery activities of an educational nature. The purpose of the network is to assist in preparing students for success in life and work by providing access to a wide range of information and the ability to communicate with others. The network will also be used to improved productivity and to increase communication among staff, parents, the community, governmental organizations, and businesses.

The Superintendent or designee shall implement, monitor, and evaluate the district's network for instructional and administrative purposes.

Access to the network is a privilege, not a right. All users shall be required to acknowledge receipt and understanding of all regulations and procedures governing acceptable use of the network and shall agree, in writing, to comply with such regulations. Noncompliance with these policies and procedures may result in suspension or termination of user privileges and may be subject to restitution for costs associated with hardware, software, and system restoration, as well as other disciplinary actions consistent with the policies of the Amesbury Public Schools. Violations of law may result in criminal prosecution as well as in disciplinary action by the Amesbury Public Schools.

ACCEPTABLE USE

As members of a networked community, users have specific responsibilities with regard to the efficient, ethical and legal utilization of computer devices, as well as all networked and Internet resources. All users must strictly adhere to the following guidelines and conditions of use.

Security

Users are responsible for the proper use of accounts issued to them, such as email, Internet or access to software, and must not provide or display their passwords and login information to anyone, nor leave an application open when unattended. Users should change their passwords regularly and make efforts to use passwords that are unique and not easily guessed.

Users are responsible for all activity under their account.

Attempts to compromise the security, integrity, or functionality of the system, or possession of tools, while on school or district property, designed to do so, is a

violation of this policy. This includes, but is not limited to:

intentional uploading or creation of computer viruses
unauthorized use of another user's credentials
deletion or alteration of another user's files or applications
removing protection to gain access to restricted areas
unauthorized blocking of access to information, applications, or areas of the network

Any user identified as a security risk may be subject to severe restriction of, or cancellation of, privileges.

It is a federal offense to break into any security system. Financial and legal consequences of such actions are the responsibility of the user.
If you feel you have identified a security problem on the network, notify the MIS Department. Do not demonstrate the problem to other users.
It is a violation of this policy to introduce or attach any software or hardware that is not owned by the Amesbury Public Schools, or specifically authorized by the MIS Department, to technology used in the Amesbury Public Schools.
No modification to any hardware or software owned or managed by Amesbury Public Schools may be made without specific authorization by the MIS Department.

System Resources

System resources are limited and are intended to support the educational objectives of the Amesbury Public Schools.

The use of technology systems must be consistent with and support educational objectives. Therefore activity on the network, such as Internet sites accessed, communications via email, listservs, forums or chat rooms must support the District's objectives.
File space has its limits and users should regularly review and delete unnecessary files and email messages on the network.
Users should make a conscientious effort to conserve district resources. Use of high-bandwidth resources, such as video-conferencing, online music, or streaming video must be related to educational goals and authorized by the MIS Department at the school or district level.
Users are responsible for backing-up copies of documents that are important to their jobs. The District will not be responsible for loss of data.

Privacy

Communications, including voicemail messages, email, attached documents and images are not private. In theory, all records (except those specifically excluded by law), whether in electronic or hardcopy form, are subject to the Freedom of Information Act and open to public inspection.

- Amesbury Public Schools reserves the rights to examine, restrict, or remove any material that is on or passes through its communication systems.
- Users are asked to use judgment and caution in communications concerning students and staff to ensure that personally identifiable information remains

confidential.
- Users may not reveal home addresses, personal e-mail addresses or personal phone numbers of colleagues or students.

Internet

The Internet provides access to schools, people and informational sites all over the world. The educational potential is limitless; however, users must understand that neither the Amesbury Public Schools nor any Amesbury Public Schools employee controls the content of the information available on the systems. The school district does not condone the use of controversial or offensive materials and cannot be held responsible for such use. The Amesbury Public Schools is in compliance with the Children's Internet Protection Act (CIPA). Filtering services are in use on all computers with access to the Internet.

- Users are expected to take individual responsibility for their appropriate use of the Internet
- Student use of the Internet must be supervised and adults must be aware that filtering does not guarantee that students will not access inappropriate sites
- All communications must be polite and use appropriate language. Swearing and vulgar language are considered inappropriate and are a violation of this agreement.
- Messages relating to, or in support of, illegal activities may be reported to local law enforcement authorities.
- Employees and students, under the direction of a teacher, may publish materials on the Internet on District approved sites that support the school district's objectives and are relevant to school-related activities. In publishing information on the Internet, users must adhere to all previously stated conditions and guidelines as well as the following:
    - An Internet web page may include pictures of students or items of student work, provided that (a) the students are not identifiable or (b) if permission from the students' parents/guardians has been received.
    - No web page will be linked to a personal web address on another server without permission from the respective employee's or students principal.
    - Copyright laws must be adhered to. Permission to copy or use materials must be obtained from the copyright owner and must be cited. The failure of a site to display a copyright notice may not be interpreted as permission to copy the materials.
    - The unauthorized installation, use, storage, or distribution of copyrighted software or materials on district systems is prohibited.
- Some examples of unacceptable use of district systems include:
    - Conducting commercial activities, product advertisement, political lobbying, or unethical/illegal solicitation.
    - Supporting illegal activities, such as the illegal sale or use of drugs or alcohol, criminal gang activity or threats, intimidation or harassment of any other person or for any activity prohibited by district policy.
    - Accessing, distributing or selling files or web sites that contain pornographic or obscene pictures, videos, stories, or other material; or

exposing others to such material.

- Purchasing goods or services, without authorization, that requires one to submit a credit card number, or obligates the school or district to another party. The School District will not be held responsible for any financial obligations for goods or services purchased over the Internet or via telephone conversation without appropriate authorization.
- Responding to any messages, files, or web sites that solicit personal information about you or someone else, or request a personal contact with you or another user.

Email

The Amesbury Public School District (*Amesbury Public Schools*) provides electronic mail resources (*email system*) to its staff members. Email is defined as any document created, transmitted and/or received through the Amesbury Public Schools' email system using either a personally owned electronic device or a device owned by the school district. It is the intent of the Amesbury Public School District to maintain the privacy and integrity of email created using the email system. However, employees should be aware that any and all email transmitted or received by any staff member is considered public record, and subject to the Massachusetts Public Records law, M.G.L. Chapter 66. (For more information, go to: http://www.sec.state.ma.us/arc/arcrmu/rmubul/bul199.htm)

Email correspondence may be subject to public inspection and may be requested during evidentiary discovery in legal actions. Employees should also know that while every attempt will be made to secure the email system, Amesbury Public Schools does not guarantee the privacy of email sent, received, or stored.

Acceptable Use of the Email System

The purpose of the email system is to provide Amesbury Public Schools' authorized users with the ability to communicate through email for educational purposes and other school business. Communication with peers for academic or school-related business purposes is acceptable, as well as email to students, parents, and the community. Employees should be aware, however, that any written communication is considered to be a legal document and is subject to M.G.L. Chapter 66 above.

Unacceptable Use of the Email System

Allowing an unauthorized user to access the system. This includes sharing of email passwords that allows another person to access your account.
Using email for personal monetary gain.
Harassing other authorized users or generating harassing email to anyone.
Sending information that violates copyright laws, such as copied images, documents and music files.
On-line gambling, including sports pools.
Distribution of pornographic or other offensive materials or images.
Advocating for products or services
Advocating for political issues and/or candidates
Generation of email using a false identity, or pretending to be someone else

(spoofing).
Generation of junk emails, chain letters, or SPAM.
Forwarding of jokes, prayers, etc.
Any unauthorized use of the system, including but not limited to, attempt of disruption of services, interception of other users' emails, or attempt to breach the security of the mail system.

Rights of Amesbury Public School District
The Amesbury Public School District, as owner of the email system, has the right to obtain, copy, and archive all documents or communications created using the system. These documents may be subject to public inspection under the Massachusetts Public Records Law. Deleting a document from a personal mailbox only removes the electronic pointer to the document stored on the server. Even if documents are deleted from users' mailboxes, they continue to be stored on the mail system and are retrievable from the archive.

Amesbury Public Schools may also monitor any email communication at any time for the purpose of maintaining the integrity and continued operation of the email system without providing notification to the employee. To the extent of the law, Amesbury Public Schools also retains the right to disclose the contents of an employee's mail without the consent of the employee. Disclosure of email would occur if requested by authorized personnel or law enforcement officials, as a response to a request for information in an investigation of unacceptable use or misconduct. All users should be aware that the content of their email is subject to review at any time by authorized personnel.

Confidentiality
Notwithstanding the Amesbury Public Schools' right to retrieve and read any electronic mail or Internet messages or material, such messages or material should be treated as confidential by other users and accessed only by the intended recipient. Users are responsible for maintaining the confidentiality of material on the systems. Certain departments may have additional confidentiality obligations regarding records, for which additional policies will be implemented. Without prior management authorization, users are not permitted to retrieve or read email messages that are not sent to them; with prior management authorization, the contents of such electronic mail, Internet access, voicemail messages or materials are subject to being accessed and/or disclosed to others.

Warranty
The Amesbury Public Schools makes no warranties of any kind, whether expressed or implied, for the service it is providing. The Amesbury Public Schools will not be responsible for any damages you suffer. This includes loss of data resulting from delays, non-deliveries, misdirected deliveries, or service interruptions caused by system upgrade or repair, its own negligence, or your errors or omissions. Use of any information obtained via the Internet is at your own risk. The Amesbury Public Schools specifically denies any responsibility for the accuracy or quality of information obtained through its services.

The guidelines and conditions outlined in this policy in no way limit the school district's prerogative to manage its technology systems as it sees fit, or restrict its authority to take any actions it deems necessary to adequately supervise, protect, and, if necessary, discipline its users. The district reserves the right to revise this policy at any time, and all revisions will take effect immediately as per district governance.

The signing of this Acceptable Use Policy indicates the party who has signed has read the terms and conditions carefully and understands their significance.

Signature
I have read and understand the Amesbury Public Schools Technology Systems Acceptable Use Policy. I am aware that district technology, including the Internet and network access, is designed for educational purposes. However, I also recognize it is impossible for the Amesbury Public Schools to restrict access to all controversial materials, and I will not hold the District responsible for materials acquired on the network. I further understand that the provisions of this policy are subordinate to local, state and federal statute and those violations are unethical and may constitute a criminal offense. Should I commit a violation my access privileges may be revoked and I may be subject to other disciplinary actions prescribed by law or other school policies.

Name **Position/Building**

Date

Massachusetts Technology Literacy Standards and Expectations

April 2008

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This document was prepared by the
Massachusetts Department of Elementary and Secondary Education

Jeffrey Nellhaus
Acting Commissioner

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Jeffrey Nellhaus
Acting Commissioner of Education

April 2008

Dear Colleagues,

I am pleased to present the *Massachusetts Technology Literacy Standards.* This document updates and defines what K–12 students should know and be able to do in order to use technology for learning. The Board of Elementary and Secondary Education voted to approve these standards on April 29, 2008.

I want to thank the Massachusetts Technology Leadership Council (MTLC) for convening a group of educators and business leaders to help the Department review and update our 2001 technology standards and expectations. I also want to thank the many educators across the state who provided their expertise and guidance.

In this revised document we have

- grouped specific technology skills under four grade spans;
- focused on 21st century skills; and
- devoted more attention to digital citizenship, ethics, society, and safety.

The goal of this document is to help students develop technology literacy skills to learn the content of the curriculum, as well as to be able to succeed and thrive in their adult lives. These skills will help them function effectively in a world where new technologies continue to emerge and information grows ever more abundant.

The teaching and learning of these skills should be integrated into the general curriculum, not taught in isolation. As students develop technology skills, they should apply these skills in their classroom, school, and life so that they will understand why these skills are important. An essential benefit of integrating the appropriate use of technology into the curriculum is that it can enhance the learning of the content without overburdening an already full curriculum.

We will continue our work with schools and districts to prepare students for the world of work, higher education, and lifelong learning using multiple technology tools. Thank you for your ongoing support and for your commitment to achieving the goals of education reform.

Sincerely,

Jeffrey Nellhaus
Acting Commissioner of Education

Contents

Massachusetts Technology Literacy Standards

Introduction

In announcing our participation in the Partnership for 21st Century Skills, a national network of states, Governor Deval Patrick said, "Throughout its history, the Commonwealth has been a leader in education. But our world is changing and so we, too, must change in order to ensure our place at the top for the next generation. The vision our administration has laid out will guarantee that Massachusetts students graduate with the tools to allow them to compete not just on the national stage, but with their peers across the globe."[1]

The Partnership for 21st Century Skills states in its *Policymakers' Guide*, "To thrive in the world today, students need higher-end skills, such as the ability to communicate effectively beyond their peer groups, analyze complex information from multiple sources, write or present well-reasoned arguments about nuanced issues and develop solutions to interdisciplinary problems that have no one right answer. In this light, technology is a powerful springboard to higher-level learning."[2]

This publication is designed to help today's students take advantage of the power of technology. It provides a set of guidelines for schools, describing what students should know and be able to do in order to use technology effectively for learning. These guidelines represent realistic, attainable activities that link to the content standards of the *Massachusetts Curriculum Frameworks*.

The Massachusetts Technology Literacy Standards incorporate the Information and Communication Technology (ICT) Literacy skills developed by the Partnership for 21st Century Skills; the National Educational Technology Standards for Students (NETS•S) developed by the International Society for Technology in Education (ISTE); as well as ISTE's 2007 draft NETS Refresh.[3] The Massachusetts Technology Literacy Standards fall into three broad categories:

Standard 1. Demonstrate proficiency in the use of computers and applications, as well as an understanding of the concepts underlying hardware, software, and connectivity.

This standard includes:

- proficiency in basic productivity tools such as word processing, spreadsheet, database, electronic research, e-mail, and applications for presentations and graphics;
- conceptual understandings of the nature and operation of technology systems; and
- learning and adapting to new and emerging technology tools.

[1] The announcement is available online at http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=328&Itemid=64

[2] *The Road to 21stCentury Learning: A Policymaker's Guide to 21stCentury Skills* (2003) is available online at http://www.21stcenturyskills.org/images/stories/otherdocs/p21up_Policy_Paper.pdf

[3] See Appendix C and Appendix D.

Standard 2. Demonstrate the responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school, and in society.

This standard

- relates to social, ethical, and human issues. It promotes positive attitudes toward the uses of technology, as well as responsible use of information. This standard also includes recognition of technology's impact on civic participation, the democratic process, and the environment;
- aims to ensure that students understand general rules for safe Internet practices, including how to protect their personal information on the Internet;
- is to help students develop an awareness of the personal image that they convey through the information they post on the Internet;
- aims to ensure that students understand federal and state laws regarding computer crimes; and
- supports students in exhibiting leadership for digital citizenship.

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation.

This standard:

- focuses on applying a wide range of technology tools to student learning and everyday life;
- aims to ensure that students will be able to use technology to process and analyze information;
- is to help students develop skills for effective technology-based communication;
- includes the use of technology to explore and create new ideas, identify trends, and forecast possibilities; and
- aims to provide students with an awareness of how technology is used in the real world.

Overview of Grade Spans

Although technology opens up exciting avenues for learning, computers should complement, rather than replace successful methods that teachers use to help students develop basic skills and understanding. The Massachusetts Department of Elementary and Secondary Education encourages the use of a wide range of tools, both traditional and technological, to help students gain those understandings. For example, although students may become fluent in keyboarding on a computer, they need to continue developing legible handwriting. By the same token, even though students might become highly skilled in electronic research, they should know how to find a book in the library. Throughout their school years, students will grow to regard technology as one of the many tools they can use to help them solve problems and improve their productivity and their capacity to learn as they move through life.

In this publication, specific technology skills are listed for each grade span. Although these proficiency expectations are recommended by the Department, local school districts make their own decisions about their students' technology proficiency. Local decisions should be based on the accessibility and availability of technology, as well as the developmental readiness of a district's students.

Based on the developmental readiness of the students, this document groups the technology skills in four grade spans:

- Grades K–2
- Grades 3–5
- Grades 6–8
- Grades 9–12

Skills/Knowledge Acquisition

Students can acquire the skills/knowledge enumerated in this document in a variety of ways:

- everyday classroom activities (gaining technology skills while learning the content of the curriculum – see page 18 to page 22)
- specific course work (e.g., taking a Web design course)
- independent study (e.g., supporting a specific project)
- an after-school activity (e.g., publishing a school newsletter)
- peer tutoring (e.g., a high school student coaching a middle school student)
- work at home (Although concerns regarding access to technology by less affluent families are well founded, Department surveys indicate a much higher presence of computers in the homes of low income and limited English proficient families than many educators presume; such surveys at the classroom and school level can be instructive.)

The teaching of technology literacy skills should not be separate from the curriculum. Integrating the appropriate use of technology into the curriculum should enhance the learning of the content. The example on page 23 is a good demonstration of how a school district provides students the technology skills they need, not as a discrete subject, but as "flowing through the curriculum."

In this document, we focus on educational/instructional technology rather than on computer science or engineering standards.

Massachusetts Technology Literacy Standards

Grades K through 2 – Technology Exploratory Skills and Expectations

In the early grades, technology should not replace the manipulatives, pencil-and-paper, and other manual methods through which children acquire basic skills. The *Mathematics Curriculum Framework*, for example, stresses the importance of understanding basic arithmetic operations in elementary school. Given this context, the technology literacy standards for the earliest grade span allow the teacher flexibility in deciding when students are ready to use technology. For this reason, the competencies listed for K–2 are described as exploratory concepts and skills. These are skills that will be introduced and, in some cases, developed in elementary grades and mastered in middle and high school.

Standard 1. Demonstrate proficiency in the use of computers and applications, as well as an understanding of the concepts underlying hardware, software, and connectivity.

Exploratory Skills and Expectations

Basic Operations

K-2: 1.1 Demonstrate beginning steps in using available hardware and applications (e.g., turn on a computer, launch a program, use a pointing device such as a mouse).

K-2: 1.2 Explain that icons (e.g., recycle bin/trash, folder) are symbols used to signify a command, file, or application.

K-2: 1.3 Identify, locate, and use letters, numbers, and special keys (e.g., space bar, Shift, Delete) on the keyboard.

K-2: 1.4 Recognize the functions of basic file menu commands (e.g., New, Open, Close, Save, Print).

Word Processing and Desktop Publishing

K-2: 1.5 Use a word processing application to write, edit, print, and save simple assignments.

K-2: 1.6 Insert and size a graphic in a word processing document.

Database and Spreadsheet (Tables/Charts and Graphs)

K-2: 1.7 Explain that computers can store and organize information so that it can be searched.

K-2: 1.8 Use a simple computer graphing application to display data.

Internet and Multimedia

K-2: 1.9 Explain that the Internet links computers around the world, allowing people to access information and communicate.

K-2: 1.10 Demonstrate the ability to use tools in painting and/or drawing programs.

Standard 2. Demonstrate the responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school, and in society.

Exploratory Skills and Expectations

Ethics

K-2: 2.1 Follow classroom rules for the responsible use of computers, peripheral devices, and resources.

K-2: 2.2 Explain the importance of giving credit to media creators when using their work in student projects.

Classroom/Society

K-2: 2.3 Explain why there are rules for using technology at home and at school.

K-2: 2.4 Identify the purpose of a media message (to inform, persuade, or entertain).

K-2: 2.5 Describe how people use many types of technologies in their daily lives.

Health and Safety

K-2: 2.6 Follow the school rules for safe and ethical Internet use. (Use of Internet in this grade span is determined by district policy.)

K-2: 2.7 Demonstrate knowledge of ergonomics and electrical safety when using computers.

K-2: 2.8 Explain that a password helps protect the privacy of information.

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation.

Exploratory Skills and Expectations

Research (Gathering and Using Information)

K-2: 3.1 Use various age-appropriate technologies to locate, collect, and organize information.

K-2: 3.2 Review teacher-selected Internet resources and explain why each resource is or is not useful.

Problem Solving

K-2: 3.3 Use age-appropriate technologies (e.g., a simple graphing application) to gather and analyze data.

Communication & Collaboration

K-2: 3.4 Use a variety of age-appropriate technologies (e.g., drawing program, presentation software) to communicate and exchange ideas.

Massachusetts Technology Literacy Standards

Grades 3 through 5 – Technology Standards and Expectations

By the end of fifth grade, all students should have the opportunity to become familiar with the tools they will be expected to use with proficiency. Through this exposure, they will have gained a positive view of technology as a tool for learning. For example, electronic sources such as multimedia encyclopedias and teacher-previewed Web sites can be used to gather information for a report. Additionally, there are many developmentally appropriate applications for children: interactive books, graphic organizers, and writing assistants, as well as mathematical and scientific tools. Such tools can enhance learning for all children, including those with disabilities; for example, multimedia reading software reinforces literacy skills by providing visual and auditory feedback to early readers. These tools can be integrated appropriately in an effective lesson plan.

Standard 1. Demonstrate proficiency in the use of computers and applications, as well as an understanding of the concepts underlying hardware, software, and connectivity.

Basic Operations

G3-5: 1.1 Demonstrate basic steps in using available hardware and applications (e.g., log into a computer, connect/disconnect peripherals, upload files from peripherals).

G3-5: 1.2 Select a printer, use print preview, and print a document with the appropriate page setup and orientation.

G3-5: 1.3 Use various operating system features (e.g., open more than one application/program, work with menus, use the taskbar/dock).

G3-5: 1.4 Demonstrate intermediate[4] keyboarding skills and proper[5] keyboarding techniques.

Word Processing/Desktop Publishing

G3-5: 1.5 Use menu/tool bar functions in a word processing program (i.e., font size/style, line spacing, margins) to format, edit, and print a document.

G3-5: 1.6 Copy and paste text and images within a document, as well as from one document to another.

G3-5: 1.7 Proofread and edit writing using appropriate resources (e.g., dictionary, spell-checker, grammar resources).

Database

G3-5: 1.8 Define the term "database" and provide examples from everyday life (e.g., library catalogues, school records, telephone directories).

G3-5: 1.9 Define terms related to databases, such as "record," "field," and "search."

G3-5: 1.10 Do simple searches of existing databases (e.g., online library catalog, electronic encyclopedia).

[4] By the end of eighth grade, students should have keyboarding skills between 25-30 wpm with fewer than 5 errors. In this grade span, districts determine the intermediate level so that students will reach this standard by the end of eighth grade.
[5] It is a district's decision to determine whether touch-typing skills are needed. However, students should know the proper ergonomics when using the keyboard.

Spreadsheet

G3-5: 1.11 Demonstrate an understanding of the spreadsheet as a tool to record, organize, and graph information.

G3-5: 1.12 Identify and explain terms and concepts related to spreadsheets (i.e., cell, column, row, values, labels, chart, graph).

G3-5: 1.13 Enter/edit data in spreadsheets and perform calculations using simple formulas (+, -, *, /), observing the changes that occur.

Internet, Networking, and Online Communication

G3-5: 1.14 Explain and use age-appropriate online tools and resources (e.g., tutorial, assessment, Web browser).

G3-5: 1.15 Save, retrieve, and delete electronic files on a hard drive or school network.

G3-5: 1.16 Explain terms related to the use of networks (e.g., username, password, network, file server).

G3-5: 1.17 Identify and use terms related to the Internet (e.g., Web browser, URL, keyword, World Wide Web, search engine, links).

G3-5: 1.18 Use age-appropriate Internet-based search engines to locate and extract information, selecting appropriate key words.

Multimedia and Presentation Tools

G3-5: 1.19 Create, edit, and format text on a slide.

G3-5: 1.20 Create a series of slides and organize them to present research or convey an idea.

G3-5: 1.21 Copy and paste or import graphics; change their size and position on a slide.

G3-5: 1.22 Use painting and drawing applications to create and edit work.

Standard 2. Demonstrate the responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school, and in society.

Ethics

G3-5: 2.1 Explain and demonstrate compliance with school rules (Acceptable Use Policy) regarding responsible use of computers and networks.

G3-5: 2.2 Explain responsible uses of technology and digital information; describe possible consequences of inappropriate use.

G3-5: 2.3 Explain Fair Use Guidelines for the use of copyrighted materials (e.g., text, images, music, video) in student projects.

Society

G3-5: 2.4 Identify ways in which technology is used in the workplace and in society.

G3-5: 2.5 Work collaboratively online with other students under teacher supervision.

G3-5: 2.6 Analyze media messages and determine if their purpose is to inform, persuade, or entertain.

G3-5: 2.7 Explain that some Web sites and search engines may include sponsored commercial links.

G3-5: 2.8 Explain how hardware and applications can enable people with disabilities to learn.

Health and Safety

G3-5: 2.9 Recognize and describe the potential risks and dangers associated with various forms of online communications.

G3-5: 2.10 Identify and explain the strategies used for the safe and efficient use of computers (e.g., passwords, virus protection software, spam filters, popup blockers).

G3-5: 2.11 Demonstrate safe e-mail practices, recognition of the potentially public exposure of e-mail and appropriate e-mail etiquette (if the district allows student e-mail use).

G3-5: 2.12 Identify cyber bullying and describe strategies to deal with such a situation.

G3-5: 2.13 Recognize and demonstrate ergonomically sound and safe use of equipment.

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation.

Research

G3-5: 3.1 Locate, download, and organize content from digital media collections for specific purposes, citing sources.

G3-5: 3.2 Perform basic searches on databases (e.g., library card catalogue, encyclopedia) to locate information, using two or more key words and techniques to refine and limit such searches.

G3-5: 3.3 Evaluate Internet resources in terms of their usefulness for research.

G3-5: 3.4 Use content-specific technology tools (e.g., environmental probes, sensors, measuring devices, simulations) to gather and analyze data.

G3-5: 3.5 Use online tools (e.g., e-mail, online discussion forums, blogs, and wikis) to gather and share information collaboratively with other students, if the district allows it.

Problem Solving

G3-5: 3.6 With teacher direction, use appropriate technology tools (e.g., graphic organizer) to define problems and propose hypotheses.

G3-5: 3.7 Use spreadsheets and other applications to make predictions, solve problems, and draw conclusions.

Communication

G3-5: 3.8 Create projects that use text and various forms of graphics, audio, and video (with proper citations) to communicate ideas.

G3-5: 3.9 Use teacher-developed guidelines to evaluate multimedia presentations for organization, content, design, presentation, and appropriate use of citations.

G3-5: 3.10 Communicate with other students and other classes using appropriate technology, including e-mail if the district allows it.

Massachusetts Technology Literacy Standards

Grades 6 through 8 – Technology Standards and Expectations

By the completion of eighth grade, students should demonstrate competencies in using tools such as word processing, database, spreadsheet, Web browser, presentation, and graphics applications. Students should be familiar enough with the purpose and function of these technologies to enable them to select the appropriate tool for a task. Students should be able to identify various components of a computer system and be able to explain basic concepts of networking. Students should practice good file management skills and operate peripheral equipment independently.

Students should understand the legal, ethical, and safety issues concerning the use of e-mail, the Internet, and other online tools. Students should understand how to protect their personal identification and information on the Internet and be knowledgeable about general rules for safe Internet practices. In addition, students should develop an awareness of how they present themselves on the Internet.

By the end of eighth grade, students should have had ample opportunity to become fluent in the use of technology tools for research, problem solving, and communication across all curriculum areas. They should know how to communicate their learning with peers and other audiences through multimedia presentations, desktop-published reports, and other electronic media. They should have learned effective strategies for locating and validating information on the Internet. Moreover, students should understand why it is important to use multiple Web sites for their research, rather than relying on a single site for information.

In summary, when students enter the ninth grade, they should be able to use technology to learn and enhance their understanding of academic subjects and the world around them. Technology should be incorporated into their everyday learning activities, both inside and outside the classroom.

Standard 1. Demonstrate proficiency in the use of computers and applications, as well as an understanding of the concepts underlying hardware, software, and connectivity.

Basic Operations

G6-8: 1:1 Use features of a computer operating system (e.g., determine available space on local storage devices and remote storage resources, access the size and format of files, identify the version of an application).

G6-8: 1.2 Identify successful troubleshooting strategies for minor hardware and software issues/problems (e.g., “frozen screen”).

G6-8: 1.3 Independently operate peripheral equipment (e.g., scanner, digital camera, camcorder), if available.

G6-8: 1.4 Identify and use a variety of storage media (e.g., CDs, DVDs, flash drives, school servers, and online storage spaces), and provide a rationale for using a certain medium for a specific purpose.

G6-8: 1.5 Demonstrate keyboarding skills between 25-30 wpm with fewer than 5 errors. (For students with disabilities, demonstrate alternate input techniques as appropriate.)

Word Processing/Desktop Publishing

G6-8: 1.6 Demonstrate use of intermediate features in word processing applications (e.g., tabs, indents, headers and footers, end notes, bullet and numbering, tables).

G6-8: 1.7 Create, save, open, and import a word processing document in different file formats (e.g., RTF, HTML).

Database

G6-8: 1.8 Describe the structure and function of a database, using related terms appropriately.

G6-8: 1.9 Create a simple database, defining field formats and adding new records.

G6-8: 1.10 Perform simple operations in a database (i.e., browse, sort, filter, search on selected criteria, delete data, enter data).

G6-8: 1.11 Plan and develop database reports to organize and display information.

Spreadsheet

G6-8: 1.12 Describe the use of spreadsheets to calculate, graph, organize, and present data in a variety of real-world settings.

G6-8: 1.13 Create an original spreadsheet, using formulas.

G6-8: 1.14 Use various number formats (e.g., scientific notation, percentages, exponents) as appropriate.

G6-8: 1.15 Produce simple charts and graphs from a spreadsheet.

G6-8: 1.16 Distinguish among different types of charts and graphs, and choose the most appropriate type to represent given data.

G6-8: 1.17 Apply advanced formatting features to customize tables, charts, and graphs.

Internet, Networking, and Online Communication

G6-8: 1.18 Use Web browsing to access information (e.g., enter a URL, access links, create bookmarks/favorites, print Web pages).

G6-8: 1.19 Identify probable types and locations of Web sites by examining their domain names, and explain that misleading domain names are sometimes created in order to deceive people (e.g., .edu, .com, .org, .gov, .au).

G6-8: 1.20 Explain and correctly use terms related to networks (e.g., LANs, WANs, servers, and routers) and Internet connectivity (e.g., DSL, T1, T3).

G6-8: 1.21 Explain and correctly use terms related to online learning (e.g., IP address, post, thread, Intranet, discussion forum, drop box, account, password).

G6-8: 1.22 Explain that some Web sites require the use of plug-ins and specific browser versions to access content.

G6-8: 1.23 Use e-mail functions and features (e.g., replying, forwarding, attachments, subject lines, signature, and address book.) The use of e-mail is at the school district's discretion and may be a class-wide activity if students do not have individual accounts.

Multimedia

G6-8: 1.24 Create a multimedia presentation using various media as appropriate (e.g., audio, video, animations, etc.).

G6-8: 1.25 Use a variety of technology tools (e.g., dictionary, thesaurus, grammar-checker, calculator) to maximize the accuracy of work.

Standard 2. Demonstrate the responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school, and in society.

Ethics

G6-8: 2.1 Explain ethical issues related to privacy, plagiarism, spam, viruses, hacking, and file sharing.

G6-8: 2.2 Explain how copyright law protects the ownership of intellectual property, and explain possible consequences of violating the law.

G6-8: 2.3 Explain fair use guidelines for using copyrighted materials (e.g., images, music, video, text) in school projects.

G6-8: 2.4 Describe appropriate and responsible use of communication tools (e.g., chats, instant messaging, blogs, and wikis).

Society

G6-8: 2.5 Identify and discuss the technology proficiencies needed in the workplace, as well as ways to prepare to meet these demands.

G6-8: 2.6 Identify and describe the effect technological changes have had on society.

G6-8: 2.7 Explain how technology can support communication and collaboration, personal and professional productivity, and lifelong learning.

G6-8: 2.8 Analyze and explain how media and technology can be used to distort, exaggerate, and misrepresent information.

G6-8: 2.9 Give examples of hardware and applications that enable people with disabilities to use technology.

Health and Safety

G6-8: 2.10 Explain the potential risks associated with the use of networked digital information (e.g., Internet, mobile phones, wireless, LANs).

G6-8: 2.11 Provide examples of safe and unsafe practices for sharing personal information via e-mail and the Internet.

G6-8: 2.12 Explain why computers, networks, and information need to be protected from viruses, intrusion, and vandalism.

G6-8: 2.13 Explain terms associated with the safe, effective, and efficient use of telecommunications/Internet (e.g., password, firewalls, spam, security, Acceptable Use Policy).

G6-8: 2.14 Describe how cyber bullying can be blocked.

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation.

Research

G6-8: 3.1 Explain and demonstrate effective searching and browsing strategies when working on projects.

G6-8: 3.2 Collect, organize, and analyze digital information from a variety of sources, with attribution.

G6-8: 3.3 Use a variety of computing devices (e.g., probeware, handheld computers, digital cameras, scanners) to collect, analyze, and present information for curriculum assignments.

Problem Solving

G6-8: 3.4 Independently use appropriate technology tools (e.g., graphic organizer) to define problems and propose hypotheses.

G6-8: 3.5 Use and modify databases and spreadsheets to analyze data and propose solutions.

G6-8: 3.6 Develop and use guidelines to evaluate the content, organization, design, use of citations, and presentation of technologically enhanced projects.

Communication

G6-8: 3.7 Plan, design, and develop a multimedia product to present research findings and creative ideas effectively, citing sources.

G6-8: 3.8 Identify differences between various media and explain issues associated with repurposing information from one medium to another (e.g., from print to the Web).

G6-8: 3.9 Use a variety of telecommunication tools (e.g., e-mail, discussion groups, Web pages, blogs, Web conferences) to collaborate and communicate with peers, experts, and other audiences (at district's discretion).

Massachusetts Technology Literacy Standards

Grades 9 through 12 – Technology Standards and Expectations

Throughout high school, as students take courses to prepare themselves for college and the world of work, they should acquire increasingly sophisticated technology skills. Depending on the pathways and courses they choose to take, high school students will become more adept with certain technology tools than others. Moreover, as the curriculum demands more complicated learning tasks, students will discover advanced capabilities in tools such as database and spreadsheet applications.

Starting in high school, students are selecting specific courses to prepare themselves for college and/or entry into the world of work. To accommodate the needs of high school students and teachers better, this publication lists technology skills for all the high school years together, rather than listing the skills by individual grade levels. Teachers should integrate the appropriate technology skills into their courses to help their students learn those subject areas and/or prepare for those careers.

During high school, students should have the opportunity to use more specialized technology tools that enhance their learning. These might include simulation software, geographic information systems, computer-aided design software, or any of a wide variety of content-specific tools. In addition, students should have the opportunity to learn how to write code in a commonly used programming language.

By the completion of high school, students should have developed an appreciation for the capabilities and capacities of technology, as well as an understanding of how these tools can be used for lifelong learning. In addition, students should be knowledgeable about the role technology plays in various fields of work, enabling them to better plan for their careers in the 21st century.

Standard 1. Demonstrate proficiency in the use of computers and applications, as well as an understanding of the concepts underlying hardware, software, and connectivity.

Basic Operations

G9-12: 1.1 Identify the platform, version, properties, function, and interoperability of computing devices including a wide range of devices that compute and/or manage digital media.

G9-12: 1.2 Use online help and other support to learn about features of hardware and software, as well as to assess and resolve problems.

G9-12: 1.3 Install and uninstall software; compress and expand files (if the district allows it).

G9-12: 1.4 Explain effective backup and recovery strategies.

G9-12: 1.5 Explain criteria for evaluating hardware and software appropriate for a given task (e.g., features, versions, capacity).

G9-12: 1.6 Demonstrate keyboarding techniques,[6] including the use of keyboard shortcuts, to complete assignments efficiently and accurately. (For students with disabilities, demonstrate alternate input techniques as appropriate.)

G9-12: 1.7 Identify and assess the capabilities and limitations of emerging technologies.

[6] By the end of eighth grade, students should have keyboarding skills between 25-30 wpm with fewer than 5 errors.

Word Processing/Desktop Publishing

G9-12: 1.8 Apply advanced formatting and page layout features when appropriate (e.g., columns, templates, and styles) to improve the appearance of documents and materials.

G9-12: 1.9 Use editing features appropriately (e.g., track changes, insert comments).

G9-12: 1.10 Identify the use of word processing and desktop publishing skills in various careers.

Database

G9-12: 1.11 Explain the importance of designing the structure of a database to meet its intended goals.

G9-12: 1.12 Duplicate the structure of a database without data.

G9-12: 1.13 Save database files in various formats.

G9-12: 1.14 Manipulate non-alphanumeric digital data (e.g., geospatial data from MassGIS[7], images, audio) within a database.

G9-12: 1.15 Define the term "metadata," and explain how metadata describes the structure and workings of an organization's use of information.

G9-12: 1.16 Use database features to create mailing labels, form letters, and perform mail merges.

G9-12: 1.17 Identify the use of database skills in various careers.

Spreadsheet

G9-12: 1.18 Define and use functions of a spreadsheet application (e.g., sort, filter, find).

G9-12: 1.19 Enter formulas and functions; use the auto-fill feature in a spreadsheet application.

G9-12: 1.20 Explain and use advanced formatting features of a spreadsheet application (e.g., reposition columns and rows, add and name worksheets).

G9-12: 1.21 Differentiate between formulas with absolute and relative cell references.

G9-12: 1.22 Use multiple sheets within a workbook, and create links among worksheets to solve problems.

G9-12: 1.23 Import and export data between spreadsheets and other applications.

G9-12: 1.24 Create and use pivot tables.

G9-12: 1.25 Explain how various formatting options are used to convey information in charts or graphs.

G9-12: 1.26 Identify the use of spreadsheet skills in various careers.

Internet, Networking, and Online Communication

G9-12: 1.27 Use search engines and online directories. Explain the differences among various search engines and how they rank results.

G9-12: 1.28 Explain and demonstrate effective search strategies for locating and retrieving electronic information (e.g., using syntax and Boolean logic operators).

G9-12: 1.29 Describe good practices for password protection and authentication.

G9-12: 1.30 Demonstrate a basic understanding of addressing schemes (e.g., IP addresses, DHCP, DNS).

G9-12: 1.31 Identify career options in network technologies.

[7] For more information, see MassGIS's Web page, GIS in Education, at http://www.mass.gov/mgis/gisedu.htm.

Multimedia

G9-12: 1.32 Identify technology tools (e.g., authoring tools) that can be used to create a multimedia product.

G9-12: 1.33 Use a variety of applications to plan, create, and edit multimedia products (e.g., slide presentations, videos, animations, simulations, podcasts).

G9-12: 1.34 Link information residing in different applications (e.g., linking a chart in a word-processing document to the spreadsheet where it was created).

G9-12: 1.35 Identify career options in multimedia and software development.

Web Authoring

G9-12: 1.36 Distinguish between effective and ineffective Web site designs; explain the reasons.

G9-12: 1.37 Explain terminology related to Web page authoring (e.g., HTML, URL, links, browsers, plug-ins, Web servers).

G9-12: 1.38 Use HTML or Web-authoring tools to create, edit, and publish well organized Web sites with effective navigation.

G9-12: 1.39 Explain basic practices that contribute to a Web site's accessibility to people with disabilities (e.g., using alternative text, captioning, consistent structure).

G9-12: 1.40 Explain how to test and debug Web files for quality assurance.

G9-12: 1.41 Identify career options in Web design, development, and management.

Standard 2. Demonstrate the responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school, and in society.

Ethics

G9-12: 2.1 Demonstrate compliance with the school's Acceptable Use Policy.

G9-12: 2.2 Explain issues related to the responsible use of technology (e.g., privacy, security).

G9-12: 2.3 Explain laws restricting the use of copyrighted materials.

G9-12: 2.4 Identify examples of plagiarism, and discuss the possible consequences of plagiarizing the work of others.

G9-12: 2.5 Write correct in-text citations and reference lists for text and images gathered from electronic sources.

G9-12: 2.6 Give examples of the appropriate and responsible use of communication tools (e.g., chats, instant messaging, blogs, wikis).

G9-12: 2.7 Discuss misuse of technology for personal and commercial reasons (e.g., software piracy, unauthorized file sharing/downloading, virus spreading, and hacking); explain possible consequences.

Society

G9-12: 2.8 Design and implement a personal learning plan that includes the use of technology to support lifelong learning goals.

G9-12: 2.9 Evaluate the authenticity, accuracy, appropriateness, and bias of electronic resources, including Web sites.

G9-12: 2.10 Analyze the values and points of view that are presented in media messages.

G9-12: 2.11 Describe devices, applications, and operating system features that offer accessibility for people with disabilities.

Health and Safety

G9-12: 2.12 Evaluate school and work environments in terms of ergonomic practices.

G9-12: 2.13 Describe and use safe and appropriate practices when participating in online communities (e.g., discussion groups, blogs, social networking sites).

G9-12: 2.14 Explain and use practices to protect one's personal safety online (e.g., not sharing personal information with strangers, being alert for online predators, reporting suspicious activities).

G9-12: 2.15 Explain ways individuals can protect their technology systems and information from unethical users.

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation.

Research

G9-12: 3.1 Devise and demonstrate strategies for efficiently collecting and organizing information from electronic sources.

G9-12: 3.2 Compare, evaluate, and select appropriate electronic resources to locate specific information.

G9-12: 3.3 Select the most appropriate search engines and directories for specific research tasks.

G9-12: 3.4 Search for information within an electronic source (e.g., using the find command).

Problem Solving

G9-12: 3.5 Explain and demonstrate how specialized technology tools can be used for problem solving, decision making, and creativity in all subject areas (e.g., simulation software, environmental probes, computer-aided design, geographic information systems, dynamic geometric software, graphing calculators, art and music composition software).

Communication

G9-12: 3.6 Use a variety of media to present information for specific purposes (e.g., reports, research papers, presentations, newsletters, Web sites, podcasts, blogs), citing sources.

G9-12: 3.7 Demonstrate how the use of various techniques and effects (e.g., editing, music, color, rhetorical devices) can be used to convey meaning in media.

G9-12: 3.8 Use online communication tools to collaborate with peers, community members, and field experts as appropriate (e.g., bulletin boards, discussion forums, listservs, Web conferencing).

G9-12: 3.9 Plan and implement a collaborative project with students in other classrooms and schools using telecommunications tools (e.g., e-mail, discussion forums, groupware, interactive Web sites, videoconferencing).

G9-12: 3.10 Complete at least one online credit or non-credit course or tutorial; discuss the benefits and disadvantages of this method of learning.

Gaining Technology Skills
While Learning the Content of the Curriculum

Anyone who has taken a training course in the use of a spreadsheet, for example, knows how quickly we forget the skills unless we can apply them in our work on a regular basis. Whether technology instruction takes place in the classroom or in the computer lab, it is important that students be able to apply their newly acquired skills to subject matter learning. For example, a student who has gathered data for a science project and needs to organize the data in a database will see a reason for learning about the features and function of a database. This is context-sensitive learning in which technology skills instruction is centered on the curriculum.

Initial technology skills instruction needs to be provided by someone who is proficient in the use of that technology tool. Although some teachers are skilled enough with technology to teach their students to use the tools within the context of the curriculum content, other teachers may not be prepared to do this. A possible solution is for a staff person with technology expertise (such as an instructional technology specialist, library teacher, or another classroom teacher acting as a mentor) to provide mentoring or to co-teach alongside the teacher.

As technology tools become an integral part of the learning environment, and as students gain the knowledge and skills to use them appropriately, new opportunities for learning open up. Dynamic geometric applets, for example, can help students visualize and understand complex mathematics concepts. Simulation software enables students to investigate models of real-world problems such as climate change and population growth. Basic tools such as spreadsheet and database applications can be applied across the curriculum to analyze and solve problems. Even basic word processing software can encourage students to organize their thoughts and revise their work.

The following scenarios show how technology can be applied in the classroom so that students acquire these skills while addressing the standards of the curriculum frameworks. The scenarios, which were originally published by the Massachusetts Department of Elementary and Secondary Education in its technology toolkit, were drawn from school districts that participated in Project MEET, from districts that received instructional technology grants from the Department, and from award-winning teachers.

Each scenario features a lesson unit on a specific curriculum topic. Several criteria were used to select these lesson units. First, the lesson needed to have a clear curriculum focus that was aligned with the state's *Curriculum Frameworks*. Second, the lesson had to integrate learning technology skills with learning the curriculum content. Third, the lesson also had to address the fact that students have varying abilities, backgrounds, and interests. Finally, the lesson needed to have a way to evaluate how much students had learned.

All of these scenarios, plus more, are available on the Department's Web site (http://www.doe.mass.edu/edtech/practices/). The online version includes links to sample student work, classroom photographs, videos, multimedia presentations, and digital artwork.

Integrated Learning Scenario #1

Reciprocating Art[8]
Grades 1-4 Art

Instructional objective: The student will be able to use the principles and elements of design to create artwork collaboratively with students in another country.

Project description: In this art project the teacher worked with a school in Japan so that American and Japanese students could collaborate to create unique artwork. A translator helped the teacher use e-mail and language translation software to communicate with the Japanese principal and determine the exchange process. Thirty-nine Japanese students and thirty-nine American students each created a background for a painting. They then exchanged artwork through regular mail and finished each other's paintings. The American students used technology to communicate with the Japanese students, creating a video to send messages in English and Japanese. The teachers communicated through e-mail. The completed artwork was sent back to the original schools through regular mail.

Evaluation: To evaluate the students' work, the teacher used peer review, artwork critique, and evaluation of the finished products.

Evidence of effectiveness: The students were deeply involved in the process of critiquing, comparing, and contrasting the artwork. Their families also valued the students' participation in the project. Many American families framed their child's work from this art exchange project. In fact, some have framed the correspondence from this project as well as the artwork and have placed them next to each other. Of course, all of the vocabulary had to be translated. The Japanese writing next to the American writing is a piece of art onto itself. Many families thought so as well. The idea of accepting cultural differences and knowing that one culture is not better than the next but can be learned from is important for the students to understand. This was accomplished through discussion and student activities.

Technology standards addressed

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity and innovation.

K-2: 3.4 Use a variety of age-appropriate technologies (e.g., drawing program, presentation software, etc.) to communicate and exchange ideas.

[8] Robert Wilson at the Floral Street School in Shrewsbury Public Schools developed Reciprocating Art.

Integrated Learning Scenario #2

Becoming Scientists[9]
Grade 4 Science and Technology/Engineering

Instructional objective: At the conclusion of this unit, students will be able to demonstrate their understanding of the properties of light and sound through classroom instruction and authentic data collection activities.

Project description: This project involved the development of two science units that address the curriculum standards for the study of light and sound. Each unit followed the same format, integrating the use of science probes with the teaching unit. To ensure that students were highly motivated to conduct the investigations, the students were given fictitious scenarios presenting problems that could only be solved after sound and light data had been collected and analyzed. The result of integrating technology in this way was that students became deeply engaged in this authentic learning experience.

Evaluation: Student learning of the science content standards was evaluated using classroom quizzes and rubric scoring of their works. The technology benchmarks were evaluated by observation of student use of Palm handhelds and sensor use, the accuracy and organization of graphed information, and the use of word processing tools.

Evidence of effectiveness: The integration of data collection into the study of physics brings authenticity to the learning experience. The teachers and students have expressed overwhelming enthusiasm for these learning activities. At the conclusion of both units it became clear to the teaching staff that when learning becomes authentic, deeper understanding of the content is achieved.

Technology standards addressed

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation.

G3-5: 3.4 Use content-specific technology tools (e.g., environmental probes, sensors, measuring devices, simulations) to gather and analyze data.

G3-5: 3.6 Use spreadsheets and other applications to make predictions, solve problems, and draw conclusions.

G3-5: 3.8 Create projects that use text and various forms of graphics, audio, and video (with proper citations) to communicate ideas.

[9] Becoming Scientists was developed by a team of educators at the Bernardston Elementary School in the Pioneer Valley Regional School District: Mary Leyden, Marge Bruno, Chris Hershiser, and Wendy Abramson.

Integrated Learning Scenario #3

SELECT Math[10]
Grade 7 Mathematics

Instructional objective: Students will be able to identify and distinguish between part-to-part and part-to-whole ratios and recognize situations in which ratios are a useful form of comparison.

Project description: This investigation focused on the part-to-part and part-to-whole meaning of fractions. Students informally explored rates and ratios using proportional reasoning to determine how to combine orange juice concentrate and water to make enough orange juice for a given number of people. The students used virtual manipulatives, such as online fraction circles and visual models, to help them solve problems and check their solutions.

Evaluation: To evaluate students' progress in meeting the mathematics standards, the teacher assessed the students' ability to represent a ratio graphically and to write part-to-part and part-to-whole ratios from a graphical representation. To evaluate the students' progress in meeting the technology standards, the teacher checked whether the students were able to independently access the Web site, use the mouse, and enter the data. The teacher also evaluated how efficiently the students were able to use Microsoft Word's drawing tools to represent each given mixture.

Evidence of effectiveness: The students were excited about using the technology, and they were focused on how they could use the technology to evaluate the orange juice recipes. In their minds the technology was doing the work for them. The teacher made references throughout the year to the orange juice problems because the strategies students used truly stayed with them. Every student felt successful solving these problems when they used the technology.

Technology standards addressed

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation.

G6-8: 3.3 Use a variety of computing devices (e.g., probeware, handheld computers, digital cameras, scanners) to collect, analyze, and present information for curriculum assignments.

[10] SELECT Math was developed by Susan Young and Jim Coffey of Boston Public Schools.

Integrated Learning Scenario #4

Africa[11]
Grade 6 Social Studies

Instructional objective: The students will be able to determine, through research and comparison, which African countries are developed and which are developing.

Project description: This Africa unit integrated research, technology, art, and music to reach its goals. After studying the continent of Africa, each student chose a country to study in depth. Students researched their countries and entered their data into a shared spreadsheet, which the class used to sort and rank the countries by various attributes. The students used what they learned to create PowerPoint projects, which were shared using SMARTBoard technology. During the time that students were researching Africa, the art and music teachers provided activities to help make students more aware of African customs. In art class, students discussed and constructed African masks, while in music class they explored African drumming.

Evaluation: The PowerPoint presentations and spreadsheets were graded first as rough copy outlines and later as finished products. The teacher informally assessed each student's ability to judge which stage of development a country was in and used data to argue the case for the country he or she studied. The teacher also evaluated each student's ability to collect data on a specific country, add the data to a spreadsheet, and sort the data across several fields.

Evidence of effectiveness: The use of technology for this unit allowed students to produce higher quality work in a shorter period of time. Having computers available at virtually any time allowed the students to work on their projects during periods of down time. The fact that the projects would be presented to the class motivated the students to do their most careful work. Some of the PowerPoint presentations were shared with parents as well. Having the ability to burn CDs and take digital pictures allowed teachers to share the students' works with their parents.

Technology standards addressed

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation.

G6-8: 3.2 Collect, organize, and analyze digital information from a variety of sources, citing sources.

G6-8: 3.5 Use and modify databases and spreadsheets to analyze data and propose solutions.

G6-8: 3.7 Plan, design, and develop a multimedia product to effectively present research findings and creative ideas, citing sources.

[11] Africa was developed by a team of educators in the Manchester-Essex Regional School District: Paul B. Clark, Becky Baun, Anne Wood, and Kathleen Lorenzo.

Integrated Learning Scenario #5

The Greyhound® Bus Depot[12]
Grades 10-12 English Language Arts

Instructional objective: Students will use the Web to research the historical and cultural contexts for the literature they are studying and then write a travelogue or travel brochure presenting their findings.

Project description: In this online lesson, students were asked to take an imaginary bus trip to the time and place in which the story, poem, or play they were studying was written. When the students read a Kabuki play, for example, they ventured back to seventeenth-century Japan; when they read the stories of Isaac Bashevis Singer, they toured late nineteenth- and early twentieth-century Poland. Students were first asked to find as much information online as they could on their own; however, search sites were provided for students who were having trouble finding the information. Students were asked to look for historical events, cultural events, and movements, and to pay attention to the food and fashions of the time. The students were then asked to write a travelogue or travel brochure to present their findings and make a connection to the work of literature the class was reading. The unit also included a short lesson on assessing the validity of Web sites and online information.

Evidence of effectiveness: Students often commented that this assignment helped them understand the literature a bit more deeply and that it added to their appreciation of the text. In their written analysis of the literature, the teacher found references to details learned in this assignment and an appreciation for nuances in the text that required an understanding of the historical and cultural contexts.

Technology standards addressed

Standard 2. Demonstrate the responsible use of technology and an understanding of ethics and safety issues in using electronic media at home, in school, and in society.

G9-12: 2.5 Write correct in-text citations and reference lists for text and images gathered from electronic sources.

G9-12: 2.9 Evaluate the authenticity, accuracy, appropriateness, and bias of electronic resources, including Web sites.

Standard 3. Demonstrate the ability to use technology for research, critical thinking, problem solving, decision making, communication, collaboration, creativity, and innovation.

G9-12 3.1 Devise and demonstrate strategies for efficiently collecting and organizing information from electronic sources.

G9-12 3.3 Select the most appropriate search engines and directories for specific research tasks.

G9-12: 3.6 Use a variety of media to present information for specific purposes (e.g., reports, research papers, presentations, newsletters, Web sites, podcasts, blogs), citing sources.

[12] The Greyhound Bus Depot was developed by J.W. Wilson of Wareham High School and Virtual High School.

District-Wide Implementation of the Standards

Teaching the Technology Standards[13]
Grades PreK-12

District Goals: Nauset does not view technology as a separate subject, but “flowing through the curriculum.” The district's goal is to provide students the skills they need to be able to determine and use the appropriate technology for the task at hand, to be able to locate and evaluate information that targets the purpose of their task, and to be able to communicate effectively both the process and content of their research to a specific audience.

Standards Implementation and Assessment: Nauset teachers use a unit-design process called an "Effective Teaching Unit Design" to develop their curriculum units. The Instructional Technology Specialists (ITS) in the district select units that target the age-appropriate technology standards, develop project-based assessments, and plug them into the unit-design format. The classroom teacher then has access to a unit with the technology and information literacy standards already populated, the learning experiences outlined, resources identified, and both an exemplar and a rubric for assessment of the project-based assessment included. In this way, Nauset is moving towards its goal of having an appropriate technology component in each unit. Doing so helps ensure that students are attaining the technology and information literacy skills they need in the content areas.

Nauset is comprised of four elementary school districts and one grade 6-12 regional school district. Each elementary school has an ITS, who co-plans with the classroom teacher and co-delivers the technology-infused portion of the lesson. Students meet either once a week or once every two weeks formally with the two teachers. Also, there are open computer lab times in which classroom teachers can provide additional enhancements to the lesson. At the middle school, students in each grade receive technology instruction from the ITS for one full term each school year. At the high school, there are required courses in electronic research in the freshman year, a tech-investigation class during sophomore year, and a variety of other technology-specific courses, as well as the widespread use of technology to support the subject areas.

Grades K-8 ITS have traditionally reported student’s mastery of the standards using a spreadsheet. In the 2007-2008 school year, because of the draft update of the Massachusetts technology standards, Nauset has implemented three student self-assessments. There will be more formal assessment of the technology skills for students in grades 5, 8, and 12 by the ITS.

[13] This piece was written by Kathleen Schrock, Administrator for Technology in Nauset Public Schools.

Appendix A

Acknowledgments

This document was developed with the support of many experts.

Technology Standards Update Committee		
Name	**Title**	**Organization**
Deborah Boisvert	Director	BATEC, UMass Boston
Donna Boivin	CIO	Springfield Public Schools
Anita Greenwood	Director	School of Education, UMass Lowell
Susan Hargrave	Instructional Technology Specialist	Massachusetts Department of Elementary and Secondary Education
Heather Johnson	Vice President	Massachusetts Technology Leadership Council
Connie Louie	Instructional Technology Director	Massachusetts Department of Elementary and Secondary Education
Joyce L. Plotkin	President	Massachusetts Technology Leadership Council
G'Tanya Small	Technology Director	Boston Public Schools
Jim Stanton	Director	The Technology Initiative Metro South/West REB
Carol A. Vallone	Chairman	Massachusetts Technology Leadership Council, Education Foundation
Isa Zimmerman	Senior Fellow	STEM, Donahue Institutes, UMass President Office

The following organizations and educators provided input to this document:

- CAST, Inc.
- Educational Technology Advisory Council (ETAC)
- Educators from Massachusetts Public Schools who attended the roundtable meetings on January 16, 2007 at Blackstone Valley Regional Vocational High School
- Educators from Massachusetts Public Schools who attended the roundtable meeting on January 19, 2007 at the Meline Kasparian Professional Development Center, Springfield
- MassCUE, Inc. (Massachusetts Computer Using Educators)
- BATEC (Boston Area Advanced Technological Education Connections)
- Representatives from the Board of the Massachusetts Technology Leadership Council

Appendix B

Development of this Document

In October 2001, the Massachusetts Department of Education published the *Massachusetts Recommended PreK-12 Technology Literacy Standards* to define what Massachusetts K-12 students should know and be able to do in order to use technology for learning. Since then, continuing technological advances have led to new opportunities, new challenges, and new risks. As a result, the Department has updated the original document to include the knowledge and skills that students are likely to need now and in the future.

Another reason the Department has revised the document is that, under No Child Left Behind's Title IID, Enhancing Education Through Technology Program, every state is required to include the following performance measure in its data collection from local school districts:

> "The percentage of eighth-grade students that meet their state's technology literacy standards." (According to Sec. 2402 of NCLB)

Beginning in 2007, Massachusetts reported the number of students who have met the technology standards as part of the Annual Mandatory Collection of Elementary and Secondary Education Data for the Education Data Exchange Network (EDEN).

In May 2006, the Massachusetts Technology Leadership Council (MTLC) brought together a group[14] of educators from higher education, K-12 school districts, and educational organizations to help the Department review and update the original document.

The working group reviewed, compared, and evaluated a number of national, state, and local standards documents in order to ensure that the Massachusetts standards would be as comprehensive as possible. The group first looked at the 2001 Massachusetts standards, which were based on those published in 1998 by the National Educational Technology Standards (NETS) Project.[15] Next the group examined standards from other states. The group also studied the newly updated standards developed by the Boston and Springfield Public Schools. Because technology and media are closely intertwined, the group looked at recommendations from the Center for Media Literacy and the Massachusetts School Library Association. A draft of the revised *Massachusetts Technology Literacy Standards* was developed in September 2006.

In October 2006, the Department shared the draft of the updated standards with a small number of business representatives from the Massachusetts Technology Leadership Council. In addition, educators across the Commonwealth had an opportunity to review and comment on the draft at two roundtable discussion meetings in January of 2007. Educators also submitted additional comments and suggestions to the Department using electronic feedback forms and e-mail. The Massachusetts Department of Elementary and Secondary Education has incorporated these recommendations into this current version.

In January 2007, ISTE announced a draft of its updated NETS standards, called the "Refreshed ISTE NETS for Students,"[16] which describes "what students should know and be able to do to learn effectively and live productively in an increasingly digital world." The Department has incorporated the new NETS standards into the state standards.

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[14] See Appendix A for a list of the members of the working group and other contributors, e.g. CAST.
[15] NETS is an initiative of the International Society for Technology in Education (ISTE) and the U.S. Department of Education
[16] See Appendix C for the alignment of the *Massachusetts Technology Literacy Standards* with Refreshed ISTE NETS Draft.

Appendix C

Comparing the Updated K-12 State Standards to the Refreshed ISTE NETS•S

As a general frame of reference for developing these standards, we continue to use the *Technology Foundation Standards for Students*, developed by the National Educational Technology Standards (NETS) Project. In January 2007, ISTE announced a draft revision of the NETS. We have incorporated the "Refreshed ISTE NETS" into this document.

The goal of the NETS Project is to develop national standards for educational technology. The framework for the Refreshed ISTE NETS includes:

1. Creativity and Innovation
2. Communication and Collaboration
3. Research and Information Fluency
4. Critical Thinking, Problem Solving, and Decision Making
5. Digital Citizenship
6. Technology Operations

In 2001, the Massachusetts Department of Education collapsed the six NETS standards into three standards. In this document, the Department once again incorporated the new NETS•S standards into the three standards of the *Massachusetts Technology Literacy Standards and Expectations* as follows:

UPDATED MASSACHUSETTS TECHNOLOGY LITERACY STANDARDS	CORRESPONDING NETS FOUNDATION STANDARDS	CORRESPONDING REFRESHED ISTE NETS
Standard 1	**Standards 1 and 3**	**Standards 1, 2, 3, and 4**
Standard 2	**Standard 2**	**Standard 5**
Standard 3	**Standards 3, 4, 5, and 6**	**Standard 6**

Appendix D

21st Century Skills

In addition to the *National Educational Technology Standards (NETS*) and the models of other states, this updated version of the Massachusetts K-12 Technology Literacy Standards also incorporates the recommendations of the Partnership for 21st Century Skills.[17] The Partnership's *Framework for 21st Century Learning* includes six key elements:

1. Core subjects as identified by the No Child Left Behind Act of 2001.

2. 21st century content that includes global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; and health and wellness awareness.

3. Learning and thinking skills that include critical thinking and problem solving, communication skills, creativity and innovation skills, collaboration skills, contextual learning skills, and information and media literacy skills.

4. Information and communications technology (ICT) literacy, enabling students to learn, think critically, solve problems, use information, communicate, innovate, and collaborate.

5. Life skills that include leadership, ethics, accountability, personal productivity, personal responsibility, people skills, self-direction, and social responsibility.

6. 21st century assessments that measure the core subjects, 21st century content, learning and thinking skills, ICT literacy, and life skills. The use of modern technologies in assessment is recommended to "increase efficiency and timeliness."

[17] The Partnership for 21stCentury Skills (http://www.21stcenturyskills.org/index.php) is a tax-exempt 501 (c) 3 organization that includes approximately 26 member organizations. The Partnership's original work was supported by a two-year grant from the U.S. Department of Education.

PROFESSIONAL DEVELOPMENT COURSE PROPOSAL APPROVAL PROCESS

On the next page there is a chart that outlines for you the proposal approval process. At first glance, it may appear complicated. However, it's really very easy. Just follow the step-by-step instructions listed below:

Making a Proposal:
Things to consider:
1) As always, it starts with a great idea!!
2) What type of activity is involved?
3) Who will participate? (Limited to your building or open to others in the district)
4) When would you like this activity to take place?
5) If you're proposing a course or workshop, who will facilitate the group?
6) Contact appropriate support staff (MIS) to make sure technology specifications can be met.

Filling out the proposal form:
1) Please provide all the required information. Although it may seem obvious to you, it's important that you identify the school/district goals that support this activity and the connection(s) to the Principles of Effective Teaching.

2) When describing the activity, please be as descriptive as possible and avoid the overuse of educational jargon. A person not familiar with your discipline should be able to read your proposal and get a clear picture of the activities and outcomes.

3) If you are proposing a course or a series of workshops that will require a facilitator, it's important that you include a definitive schedule. This is important for the district's budget process.

4) When you've completed the form, submit it to your building principal or Central Office. They will forward it to the appropriate committee.

Approval Process: (please see Tech Model)

The Professional Development Committees will review and approve proposals three times a year; September, December and May. The goal of the committees is to encourage a broad spectrum of high quality professional development opportunities in the district. When the committee receives a proposal it can 1) accept the proposal as written, or 2) send the proposal back to you with suggestions for modifications. The committee will not simply reject a proposal. We want to work with you to help make the activity happen.

Stipends/Honorarium
The district is unable to fund stipends for participation in all activities. However, a stipend will be provided for any staff person engaged in teaching a course or facilitating a workshop.

Record Your Event: Once approved, be sure to fill out a building use form, if applicable, and have the event put on the Master Calendar through the office where the event will occur.

Equipment Request: If you will need AV or technology equipment/software, it is important to contact your building AV person ahead of time (48 hours notice) to arrange for equipment usage. In regards to software or additional peripherals, be sure to always run spec through MIS tech staff to ensure compatibility with existing equipment. Test your set-up before the event to ensure success

PROFESSIONAL DEVELOPMENT PROPOSAL CRITERIA

Curriculum Development
Engages participants in the development of materials, programs, and products that focus on district or school improvement goals and reflects best practice
Proposal must:
• Identify content knowledge needed to develop curriculum unit
• Identify student learning goals
• Create a timeline for the development of the product
• Include student assessment strategies

Professional Study Group
A group of participants who come together to collaborate and study problems and issue that arise in the teaching and learning process
Proposal must:
• State the topic, problem or issue to be studied
• Identify link(s) to school/district improvement goals
• Define the collaborative process to be used
• Project how new learning will be integrated into professional practices
• Explain how the information will be disseminated

In-Service Workshop
Engages participants in activities that will broaden and expand knowledge and expertise in specified areas
Proposal must:
• Identify participant learning goals
• Create a timeline for sustained professional learning which incorporates a minimum of 15 contact hours
• Outline research-based content and practices that support student and professional learning
• Explain how the training will directly benefit professional practices
• Project material costs

On-line Courses

Graduate level course work available from on-line providers focused on expanding content knowledge or pedagogy
Proposal must:
• Identify target group
• Describe impact on student/teacher learning
• Provide course description and timeline
• Identify link(s) to school/district improvement goals
• Explain how the course relates to professional responsibilities

Independent Study
Designed to expand professional knowledge and skill through participation in a variety of activities
Proposal must:
• Identify need(s)
• Outline plan to meet stated need(s)
• Determine scope and duration of activities
• Propose a product that will be used as evidence of completion of independent study

Action Research
A methodical evaluation of topics or issues about professional practice and student performance
Proposal must:
• Identify the problem/issue related to professional practice
• Identify the research format: i.e. individual professional research, collaborative research, school-wide research, and district-wide research
• Determine a structure for areas of focus for research, for gathering data, and for writing a summary report that describes observations and findings
• Explain how results will be disseminated to the school/district

Peer Coaching/Mentor/Observation
A professional development strategy that provides one-on-one learning opportunities for participants focused on improving professional practice
• Define the nature of the relationship: i.e.- collegial mentor/coaching: pairs teacher with similar expertise/experience- mentor: pairs experienced practitioner with a less experienced teacher
• Identify the setting for the coaching experience and projected timeline
• Determine how the data will be collected and for what purpose
• Describe the benefits to participants and the reflective practices that will provide evidence of professional development focused on coaching techniques

National Board Certification for Professional Teaching Standards

A national voluntary system to certify teachers who meet the standards of the NBPTS to improve student learning in American schools
Proposal must:
• Assemble a portfolio that includes videotapes of classroom interactions and student work samples.
• Reflective commentary on classroom instruction and student learning
• Documented education-related work outside of the classroom
• Demonstration of knowledge of teaching in a specific subject area
• Peer review of all components of the assessments

Portfolio
A collection of meaningful and focused content that allows educators to demonstrate, examines, and assesses their work. This content can represent the work of a classroom teacher or specialist
The portfolio must include the following components:

• Portfolio Title

• Table of Contents

• Project- for example: professional development plan, project announcements, etc.

• Participants- for example: teacher or participant profiles, digital photos, etc.

• Activities- for example: agendas, teacher notes, group processes, or activities that you are using in your initiative

• Journal Entries- teacher and student reflections and summaries of significant participants' learning as entries

• Teacher Artifacts- for example: teacher baseline data, tools/templates used or created during sessions, and other evidence of significant learning

• Student Artifacts- for example: baseline data and other evidence of student learning

• Resource Lists- provide the title(s) or URL(s) of any research and/or best practices
resources used in the sessions

• Communications- any other important project communication

PROFESSIONAL DEVELOPMENT PROPOSAL

Name: _____ Position: _____

Type of Activity:

_ Curriculum/Unit development _ Action research
_ Professional study team/critical friends _ Peer coaching/observations
_ In-service Workshop _ Portfolio
_ On-line Courses _ National Board Certification
_ Independent study _ Other

Connections to School and/or District Improvement Plan:
Connections to Principles of Effective Teaching

Domain(s):_____
Element(s):_____
Timeline:_____ Suggested # of PDP's_____
Participants:_____
Instructor(s) Facilitator(s) (if any)**:**_____
Goal(s):
Describe the following:

Activity: *(What topic/concepts/content will be the focus of this work? How will participants engage in this work? How many contact hours will this activity include: Please be as descriptive as possible and include sufficient detail so that the committee reviewing this proposal can develop a clear understanding of the proposal.)*

Final Product: *(How will participants demonstrate their understanding of the concepts or mastery of the new skills developed through participation in the proposed professional development activity? How will this work be connected to or implemented in the classroom/position?)*

Approval: (to be filled out by committee and central office staff)

Prof. Development Committee:_____
Date:_____
Supt. or Designee:_____ PDP's:____
Date:_____

Adopted; June 09