New Bedford Public Schools

Technology Plan

School Committee
Honorable Jonathan F. Mitchell, Chairman Ex-officio
Mr. Joaquim “Jack” B. Livramento, Jr., Vice-Chairperson
Ms. Marlene Pollock
Dr. Lawrence J. Finnerty
Mr. Joaquim “Jack” Nobrega
Mr. Joshua Amaral
Mr. Bruce J. Oliveira

Central Administration
Dr. Pia Durkin, Superintendent of Schools
Dr. Heather D. Larkin, Asst. Supt./Student Services
Ms. Jane Daly, Asst. Supt./Accountability & School Improvement
Ms. Ann M. Bradshaw, Asst. Supt./Human Resources Manager
Mr. R. Patrick Murphy, Business Manager

District Technology Committee
R. Patrick Murphy
Robert Tetreault
Cynthia Tougas
Dr. Heather D. Larkin
Jane Daly
Lori Weider
Kevin Sullivan
Stephen Farrell
Daniel Souza
Cynthia Sylvia
Jennifer Carling
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision</td>
<td>1</td>
</tr>
<tr>
<td>Goals</td>
<td>1</td>
</tr>
<tr>
<td>Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Benchmark Overview</td>
<td>2</td>
</tr>
<tr>
<td>I: Commitment to a Clear Vision and Implementation Strategies</td>
<td>2</td>
</tr>
<tr>
<td>II: Technology Integration and Literacy</td>
<td>4</td>
</tr>
<tr>
<td>III: Technology Professional Development</td>
<td>4</td>
</tr>
<tr>
<td>IV: Accessibility of Technology</td>
<td>6</td>
</tr>
<tr>
<td>V: E-Learning and Communications</td>
<td>8</td>
</tr>
<tr>
<td>Current and Proposed Initiatives</td>
<td>10</td>
</tr>
<tr>
<td>Appendices</td>
<td>26</td>
</tr>
<tr>
<td>Appendix A Massachusetts School Technology Readiness Awareness (STAR) Chart</td>
<td>27</td>
</tr>
<tr>
<td>Appendix B Massachusetts Local Technology Benchmark Standards</td>
<td>46</td>
</tr>
<tr>
<td>Appendix C Massachusetts Recommended K-12 Instructional Technology</td>
<td>53</td>
</tr>
<tr>
<td>Appendix D Massachusetts Teacher Self-Assessment Tool</td>
<td>85</td>
</tr>
<tr>
<td>Appendix E Massachusetts Recommended Criteria for Evaluating Instructional Technology Materials</td>
<td>93</td>
</tr>
<tr>
<td>Appendix F New Bedford Public School’s Internet Safety &amp; Technology Usage Policy</td>
<td>100</td>
</tr>
</tbody>
</table>
**Vision**

The vision of New Bedford Public Schools is to provide all students with the resources, knowledge, and skills to succeed in an ever growing and evolving technological society.

**Goals**

Technology-supported classrooms must be equipped with up-to-date equipment and must be managed by knowledgeable, skilled, and motivated educators who are both comfortable and creative with technology in order to support student learning.

In envisioning the future, we are committed to the following goals:

**Goal I**
To provide all students and staff with equitable access to diverse instructional technology resources

**Goal II**
To provide educators with a variety of high quality on-going professional development opportunities that will advance curriculum technology integration in all learning environments

**Goal III**
To seamlessly integrate technology into the curriculum to enhance student learning through both teacher preparation and student activities
Introduction

Over the next three years, New Bedford Public Schools will continue to work on objectives held over from the previous technology plan along with those that arise from newly identified needs, in particular those aligned to our district Turnaround Plan.

Benchmark Overview

I: Commitment to a Clear Vision and Implementation Strategies

New Bedford has a district technology committee formed to create, implement, and oversee the long-range technology plan. The plan is aligned to the district’s vision of preparing all students with the skills necessary to succeed in an ever-changing global society by providing equitable access to up-to-date technology resources.

Needs Assessment

New Bedford Public Schools relies on multiple forms of data in guiding its technology planning. This includes input from administrators, teachers, parents, and students.

AUP

The district has a CIPA-compliant Acceptable Use Policy (AUP) regarding Internet and network use. The policy has been updated to help ensure safe and ethical use of resources by teachers and students, in accordance with the Protecting Children in the 21st Century Act.

Budget

The district recognizes the importance of supporting academic achievement through the use of various technologies and in preparing our students for a future in which these technologies are a part of their everyday lives. This support requires a significant financial commitment from New Bedford Public Schools and any successful implementation of the district Technology Plan will be dependent upon the coordination of other district initiatives and budgetary resources. This will be even more significant as our high school prepares for its upcoming Accreditation Visit by the New England Association of Schools and Colleges (NEASC) in 2014. According to Standard Seven of the NEASC 2011 Standards, “The achievement of the school’s 21st century learning expectations requires dependable and adequate funding.” Some of the funding resources used to support implementation of the plan, include, but are not limited to the district’s operational budget, E-Rate, Federal Entitlement Grants, and other various grant initiatives. Potential funding sources could include business and private donations.
Under E-Rate, New Bedford Public Schools has been eligible to apply for between 83-90% reimbursement for telecommunications, Internet access, and internal connection expenses. Money is budgeted in the local operational budget to cover costs for the non-discounted portions for services procured through E-Rate.

**Planned E-Rate Materials and Services**

- Services for Switched Ethernet Service (SES) connections for all schools, including increased Internet bandwidth.
- Services for telecommunication costs for the district
- Services for re-wiring Internet Access for schools
- Services for the wiring of school construction projects
- Services for Wi-Fi Internet Access for schools
- Services for Internet Firewall Protection
- Services for Web Hosting

**Monitoring and Evaluation Process**

In an attempt to improve the district’s efforts toward regularly and systematically evaluating the effectiveness of our technology resources, the following evaluation processes will be implemented.

**Monitoring and Evaluation**

A process for monitoring and evaluating the progress of the Technology Plan has been developed. Data from multiple sources is reviewed annually and the plan is updated for reporting purposes.

Specifically, the Technology Committee will:

- Monitor progress of the Technology Plan in November, March, and June
- Seek input from the schools as a means of collecting data
- Review and edit the plan according to changes with technology and the needs of the district
- Prepare a yearly progress report of the Technology Plan aligned to the district’s Three-Year Strategic Plan
- Meet at the end of each year to review the past year’s technology progress toward meeting the goals and objectives. They will then make recommendations for adjustments to the plans goals and objectives for the next year through an action plan aligned to the district’s Three-Year Strategic Plan

The technology committee will meet at the end of each year to evaluate and discuss any new technology or advancements that have been introduced during the past year. The committee will then make recommendations to adjust this plan if necessary to incorporate any of these new technologies for the subsequent academic school year.
A review of information provided from schools, technology committee members, and other available data will be used to evaluate progress. The committee will then decide the direction and next action steps.

In addition to evaluating the effectiveness of our technology resources, the district will continue to review our Technology Acceptable Use Policy annually in order to keep pace with the technology advances that continue to challenge our schools.

**II: Technology Integration and Literacy**

Successful technology integration requires harnessing the power of various technologies to address the standards outlined in the Massachusetts Curriculum Frameworks and to ensure that all students are prepared for success in a 21st century economy.

In New Bedford Public Schools, technology professional development is often integrated in with other district instructional priorities. In order to support technology integration, we continue to see a need to provide access to modern hardware, a strong network infrastructure, and proper technical support.

We will continue to work towards moving all of our teachers to the state established proficiency as measured by the Technology Self Assessment Tool (TSAT). A data collection process concerning student usage and proficiency levels as defined by the *Massachusetts Technology Literacy Standards and Expectations* also needs to be established.

**III: Technology Professional Development**

New Bedford Public Schools acknowledges the need to provide professional development that is ongoing and relevant to teacher’s needs. Therefore, the district provides opportunities for technology professional development through the district’s instructional priorities, especially those aligned to our district Turnaround Plan.

Technology training continues to be integrated into various instructional initiatives. Training continues to be provided to teachers across the district on how to use the formative assessment tools such as Galileo to assist teachers in targeting instruction to meet their students’ needs. Similarly, educators have had training on using ExtraLearning Online, DIBLES Next, Promethean Interactive WhiteBoards, Symphony Math, Lexia, Read 180 and Systems 44, Apex Learning, Achieve 3000, Galileo, the state’s Educational DataWarehouse tool, Edwin T&L, and Baseline Edge, our educator evaluation software which was funded via a RTTP Educator Evaluation Technology Innovation Grant.
Assistive technologies provide opportunities for many students to gain access to the general education curriculum. The Special Education office has provided training on several different types of assistive technology software including Boardmaker, Speaking Dynamically Pro, and IntelliTools, and Kurzweil. iPads use and training has been expanded in the district to further assist with the instructional needs of our special education students. Presently there are approximately 250 iPads in use in classrooms and offices within the district.

Professional development has continued to be provided on professional development days, Saturdays, after-school, and during the summer. Online workshops/courses and distance learning opportunities also contribute to our professional development offerings when funding is available. Often these opportunities are offered as part of a grant. In addition to the outside trainers, in-house district-based staff provides professional development. Also, Webinars have been growing as a cost-effective means for providing training.

Funding for most of our professional development comes from a variety of grant sources. With limited budgets, the district has also looked to leverage free training resources, particularly those available online.

The district utilizes several sources of data to assist in planning for its professional development needs. Surveys continue to provide the district with data for planning, along with observations, and meetings with the principals and other district administrators.

Some of the technology professional development objectives are as follows:

Objective I: Provide training to cohorts of Kindergarten teachers in the WorkSampling Assessment program
Objective II: Provide additional training on the use of DIBELS NEXT for K-2 Teachers and principals
Objective III: Provide training on the states’ Educational DataWarehouse
Objective IV: Provide training on the use of Galileo to Support Student Interventions and Stds Based Assessments
Objective V: Provide training on Internet Safety issues through the Olweus Bullying Prevention Program.
Objective VI: Provide training on MCAS-ALT
Objective VII: Provide training on iPads for use with Special Needs Students and for general curriculum and staff management.
Objective VIII: Provide training on Interactive Whiteboards
Objective IX: Provide training on Apex Learning for secondary teachers
Objective X: Provide training on iPass
Objective XI: Provide training on Munis
Objective XII: Provide professional development opportunities to support teaching and learning utilizing educational technology resources (e.g. Scratch Programming.)

Objective XIII: Provide training on Achieve 3000 to differentiate reading and writing assignments to help students reach literacy proficiency levels

Objective XIV: Provide training on Read 180 & Systems 44 for struggling readers

Objective XV: Provide training on PARRC testing

Objective XVI: Provide training on Baseline Edge – Educator Evaluation

Objective XVII: Provide training on Edwin T&L

IV: Accessibility of Technology

Each year, the Massachusetts Department of Education relies on student-to-computer ratios as one factor in which to measure a district’s technology progress. Currently, New Bedford Public Schools’ computer to student ratio is approx. 3.5 students to each computer.

Schools still need to replace or update systems that are close to ten years old. All three of the middle schools are relatively new and therefore have access to some of the newest technology in the district. As the middle schools age, attention will have to be given to replacing or updating their equipment. In addition, needs assessment responses indicated that many middle school teachers have expressed a desire to have additional access to computers for instruction. However, it is unclear from this information if the need is for additional lab access or classroom computers and further investigation by each school is recommended.

Like other schools, New Bedford High School still struggles with the issue of older equipment and has recently acquired machines to provide network access for all homeroom faculty members. In addition, the High School has received update equipment in their computer labs. Statistics show that these labs are used regularly and that usage increases each year. While providing well-maintained labs has proven to be an effective strategy towards successful integration in the school, needs assessment data also revealed that many teachers and students desire to have classroom access to computers so to utilize the technology for instruction on a more frequent basis. For the classrooms that have computers, many of these are not capable of running most of the current software. As the district seeks to attract and retain quality teachers, providing them with the tools to do the job is one way to prepare our teachers and students for success. Providing new or re-allocated equipment based on documented needs is one way that this can be accomplished.

In addition to computers, portable computing devices are in place in the district. Most of the district’s wireless laptop carts are located at the middle schools, since new construction has enabled the district to provide these resources. The high school has
one wireless cart, while only a few elementary schools have them. Of the few that exist at the elementary level, several of them have begun to experience problems due to their age. Some of these are wireless Apple carts and with the district’s focus on standardization, we will no longer provide support for them once they fail to operate. Netbooks and iPads are being used to collect and analyze student data using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) to measure early literacy development. The Special Education department has embraced iPads to support students, especially those students in our Autistic program. As portable computing devices become more affordable to schools, the district will consider their potential toward the attainment of educational goals prior to purchasing.

Most schools have digital projectors, and many have document cameras to assist with whole-group instruction. Interactive White Boards are also present in 50% of our schools. If funding becomes available, the district will consider the possibility of assisting schools in purchasing these types of hardware.

As the district provides a continuum of services for all students, it is essential that all teachers have an understanding of Universal Design principles. When teachers practice Universal Design principles, they increase access to the general education curriculum for all students, including students with disabilities. Although teachers can incorporate Universal Design into their teaching without the use of technology, these tools allow teachers to make the curriculum more accessible to a variety of student needs. Kurzweil software is one example of what the district is providing to assist teachers toward this effort.

Another example is its decision to participate in the National Instructional Materials Access Center (NIMAC). Participating in NIMAC ensures that students with print disabilities will be provided with accessible textbooks when purchasing textbooks from publishers.

Assistive Technology is provided to students with documented needs throughout the district. This can range from adaptive materials such as enlarged print to augmentative speech devices and computerized programs. The chart below lists some of the Assistive Technology tools that students utilize within New Bedford Public Schools.

<table>
<thead>
<tr>
<th>New Bedford Public Schools Assistive Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking Dynamically Pro</td>
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<tr>
<td>IntelliTools</td>
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<tr>
<td>Kurzweil</td>
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<tr>
<td>Boardmaker</td>
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<td>Writing with Symbols</td>
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<td>Discover Software</td>
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Over the next three years, the district will continue the push for standardization of both hardware and software. Standardization assists the district in dealing with both compatibility and technology support issues.

New Bedford Public Schools has struggled to improve our technical support across the district due to funding constraints. Though we strive to improve our technician to computer support ratio, we are currently at approximately 1,300 computers to one technician.

V: E-Learning and Communications

The district recognizes the need to make improvements with our infrastructure if we are to support the type of computing needs that the technology of the 21st Century is requiring.

Upgrading of the district’s infrastructure will eventually lay the foundation for dramatic gains in functionality, use, and learning impact. Presently, the district provides connectivity to the Internet in 98% of all classrooms. There is a minimum of 100 MB bandwidth at all schools in the district. The district has been implementing managed wireless connectivity and currently provides this Wi-Fi access at 75% of the schools. Over the next three years, the district hopes to complete the deployment of wireless connectivity to every school. This, of course, is contingent upon available of funding both locally and via the E-Rate program.

Currently, there is a 1Gb fiber circuit in place at the administration building connecting to all school buildings through a Switched Ethernet Service (SES) line. All of our schools, except the High School, currently are part of a switched Ethernet services (SES) infrastructure. New Bedford High School now has a 10Gb, direct fiber connection back to the administration building. As the district’s infrastructure continues to improve, along with its bandwidth capabilities, the district will continue to promote the use of more robust uses of online teaching and learning, such as those that utilize interactive video. An example of this is the Safari Montage system currently in use by all of our district schools.

Through grants, numerous online learning opportunities have been provided to teachers in the district. These courses have supported technology integration efforts in the district particularly in the areas of mathematics, history/social studies, English/Language Arts, and science.

Since 2004, student e-learning has been present in New Bedford Public Schools. Originally, Virtual High School provided online learning opportunities for students at New Bedford High School, but since then, many more schools and students are participating in some form of blended learning in the district. Programs such as
ExtraLearning Online and Apex Learning are providing alternative formats for reaching a variety of learners.

New Bedford Public Schools continues to seek improvement of its telecommunications systems by pursuing eRate funding. This funding allows the district to provide additional phone lines to its schools and classrooms. In addition, the district continues its efforts to implement the use of VoIP (Voice over Internet Protocol) telephony at the schools, which helps to provide a cost savings to the district.

Information to students, faculty, parents, and community members is provided through access to the district Web site. The district recognizes that the Website as an important means of communication and will continue to keep it up-to-date, informative, secure, and professional in appearance. During the 2013-2014 school year, the district will be releasing a newly designed web site.

The implementation of Microsoft Exchange Server and an external email archival appliance, MailArchiver, has enabled the district to ensure that its electronic communications complies with federal and state laws regarding email archival and FOIA requests. During the 2013-2014 school year, the district plans to upgrade the MS Exchange Server to the latest version available.
# Current and Proposed Initiatives 2013-2016

<table>
<thead>
<tr>
<th>DOE Benchmark 1: Commitment to a Clear Vision and Implementation Strategies</th>
<th>Current</th>
<th>Proposed</th>
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<tbody>
<tr>
<td><strong>A.</strong> The district’s technology plan contains a clearly stated and reasonable set of goals and implementation strategies that align with the district-wide school improvement plan. The district is committed to achieving its vision by the end of the school year 2015-2016.</td>
<td>The current vision and goals are clearly stated, realistic, and aligns with the district-wide improvement plan.</td>
<td>The proposed vision is aligned to the district-wide turnaround plan and represents a clear picture of the future providing implementation strategies and objectives.</td>
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<td><strong>B.</strong> The district has a technology team with representatives from a variety of stakeholder groups, including school committee members, administrators, and teachers. The technology team has the support of the district leadership team.</td>
<td>NBPS has a District Technology Committee in place that includes a variety of stakeholders and district leaders.</td>
<td>The District Technology Committee will continue to include a variety of stakeholders, including representation from the central administrative team.</td>
</tr>
<tr>
<td><strong>C. Needs Assessment</strong></td>
<td>In preparing the technology plan, the district conducts a needs assessment of the hardware, software, and other services that will be needed to improve education.</td>
<td>The district will review the procedures used in conducting a needs assessment of its products and services to improve the data collection process.</td>
</tr>
<tr>
<td><strong>C.1 The district assesses the technology products and services that will be needed to improve teaching and learning.</strong></td>
<td>The technology plan has included an assessment of some of its services, such as network reliability.</td>
<td>The district will improve its efforts by including an assessment of all services and products that are currently being used and plans to acquire in its technology plan.</td>
</tr>
<tr>
<td><strong>C.2.</strong> The technology plan includes an assessment of the services and products that are currently being used and that the district plans to acquire.</td>
<td></td>
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<td><strong>D.</strong> The district has a CIPA-compliant Acceptable Use Policy (AUP) regarding Internet and network use. The policy is updated as needed to help ensure safe and ethical use of resources by teachers and students.</td>
<td>The district has an Acceptable Use Policy in place, as well as CIPA compliant Internet filtering.</td>
<td>The district will review its AUP annually and revise as needed to help ensure safe and ethical use of resources by teachers and students.</td>
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<td><strong>E. Budget</strong></td>
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<td><strong>E.1</strong> The district has a budget for its local technology plan with line items for technology in its operational budget.</td>
<td>The district budgets for technology in its operational budget.</td>
<td>The district will continue to budget for technology in its operational budget.</td>
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<tr>
<td><strong>E.2</strong> The budget includes staffing, infrastructure, hardware, software, professional development, support, and contracted services (including telephone services).</td>
<td>The budget includes staffing, infrastructure, hardware, support, and contracted services. Other funding sources, such as grants, supplement our technology services. (See also, <strong>E.3</strong>)</td>
<td>The district’s operational budget will continue to include staffing, infrastructure, hardware, support, and contracted services. The district plans to continue seeking additional funding to supplement its services.</td>
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<td><strong>E.3</strong> The district leverages the use of federal, state, and private resources.</td>
<td>The district leverages the use of federal, state, and private resources.</td>
<td>The district will consider using local funds to sustain successful grant initiatives. Additional E-Rate funding will be pursued. Funding from private sources will be investigated.</td>
</tr>
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<td><strong>E.4</strong> For districts that plan to apply for E-Rate reimbursement, the technology plan specifies how the district will pay for the non-discounted portion of their costs for the services procured through E-Rate.</td>
<td>The district currently budgets within its Technology Services budget for the non-discounted portion of their costs for the services procured through E-Rate.</td>
<td>The district tech plan will specify how it will budget for the non-discounted portion of their costs for the services procured through E-Rate in the technology plan.</td>
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<td><strong>F. Evaluation</strong></td>
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<tr>
<td><strong>F.1</strong> The district evaluates the effectiveness of technology resources toward attainment of educational goals on a regular basis.</td>
<td>The district evaluates the effectiveness of technology resources toward attainment of educational goals inconsistently.</td>
<td>In an effort to improve the evaluation of technology resources toward educational goals, the district will seek input from principals, directors, supervisors, and teachers in a more consistent process.</td>
</tr>
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</table>
F.2 The district’s technology plan includes an evaluation process that enables it to monitor its progress in achieving its goals and to make mid-course corrections in response to new developments and opportunities as they arise.

The technology plan has an evaluation process in place that allows the district to monitor its progress in achieving its technology goals and to make mid-course corrections in response to new developments and opportunities as they arise.

The district will continue to monitor the technology plan and will seek to improve its data collection efforts.

| DOE Benchmark 2: Technology Integration and Literacy |
|----------------------------------------|-------------------|-------------------|
| **A. Technology Integration**¹         | **Current**       | **Proposed**      |
| **A.1 Outside Teaching Time** - At least 85% 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. | NBPS collects some data to assess the percentage of teachers using technology or the frequency of use outside of the classroom. | The district will continue to evaluate teacher use of technology by collecting and analyzing data from the Technology Usage Survey, which is distributed along with the Technology Self Assessment Tool (TSAT). It will also look for ways of improving its data collection. |
| **A.2 For Teaching and Learning** - At least 85% of teachers 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 Standards²). | NBPS collects some data to assess the percentage of teachers using technology or the frequency of use inside of the classroom. | The district will continue to evaluate teacher use of technology by collecting and analyzing data from the Technology Usage Survey, which is distributed along with the Technology Self Assessment Tool (TSAT). It will also look for ways of improving its data collection. |

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).
### B. Technology Literacy

#### B.1 At least 85% of eighth grade students show proficiency in all the Massachusetts Recommended PreK-12 Instructional Technology Standards for grade 8.
- NBPS does not formally assess student technology proficiency as outlined in the Massachusetts Recommended PreK-12 Instructional Technology Standards.
- NBPS will develop a process in which to collect data on student technology proficiency for grades 4 to 8. Communicate the newly adopted changes made to the Massachusetts Recommended K-12 Instructional Technology Standards to all teachers.

#### B.2 100% of teachers are working to meet the proficiency level in technology, and by the school year 2014-2015, 60% of teachers will have reached the proficiency level as defined by the Massachusetts Technology Self-Assessment Tool (TSAT).³
- The district expects all of its teachers to be working toward technology proficiency and annually assesses teacher proficiency levels using the TSAT.
- The district will continue to administer the TSAT to all teachers and provide various professional development opportunities to assist them in improving their skill levels.

### C. Staffing

#### C.1 The district has a district-level technology director/coordinator.
- The district has a full-time equivalent (FTE) district-level technology director. This position oversees and manages hardware, infrastructure, information, support of instructional technology.
- The district plans to maintain this position and plans to add an Instructional Technology Manager.

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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](http://www.doe.mass.edu/edtech/standards/sa_tool.html)).
| C.2 The district provides one FTE instructional technology teacher per 60-120 instructional staff. | The district provides a limited number of instructional technology teachers to support its staff.  

The high school has one full-time instructional technology position with a flexible schedule in which to support instructional staff. This full-time position supports approximately 220 instructional staff. Some additional assistance is provided on a part-time basis by a media assistant.  

The middle schools have a total of nine ITS positions; however, these are full-time classroom teaching positions.  

The elementary level does not have Instructional Technology Specialist positions dedicated to assisting them.  

The Director of Instructional Technology assists individual teachers and schools with their use of technology, and has tried to focus on the elementary level where there seems to be the greatest need. Some of this assistance is in the form of consulting, one-on-one instruction, and whole-group trainings.  

Given the size of the district, and data obtained from surveys, there remains a real need to support teachers in using technology on a regular basis. | The district will consider the hiring of additional instructional technology support staff if funding becomes available. |
C.3 The district has staff dedicated to data management and assessment.

The district has a director who oversees data and assessment. The district also divides the tasks of data management and assessment to several other positions to perform data management and assessment functions.

The district plans to maintain these positions.

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DOE Benchmark 3: Technology Professional Development

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<td>A. At the end of three years, at least 85% of district staff will have participated in 45 hours of high-quality professional development that includes technology skills and the integration of technology into instruction.</td>
<td>Continue to leverage free training resources, particularly those available online.</td>
</tr>
<tr>
<td>The district relies on grant monies to provide technology professional development and since grant monies have been reduced in recent years, there has been an impact on the amount of technology professional development that can be offered. Although data is collected regarding professional development, there is no process in place to collect accurate data that shows at least 85% of the district staff has participated in 45 hours of high-quality technology professional development. Data is collected through the professional development office; however, we have found that there is still technology professional development that is embedded with other initiatives that is not reflected in the data collected.</td>
<td>Look to incorporate technology professional development into other professional development initiatives. Improve the technology professional development data collection.</td>
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As part of a fiber network upgrade, the district will explore Professional Development opportunities via on-line access to the Internet.

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4 High quality professional development is described in the Massachusetts 2001 State Plan for Professional Development (http://www.doe.mass.edu/pd/stateplan/).
| B. Technology professional development is sustained and ongoing and includes coaching, modeling best practices, district-based mentoring, study groups, and online professional development. The professional development includes concepts of universal design and scientifically based researched models. | The district relies on grant monies to provide technology professional development. Every attempt is made to provide sustained and on-going professional development that considers the needs of all learners and is scientifically-based. | Instructional Performance Specialists and other district-wide lead teachers will be trained so they are knowledgeable of technology resources and are able to model best practices for teachers to support student learning in those disciplines. NBPS will continue to promote awareness on the effective use of Universal Design/Assistive Technology to teachers so that they may assist students with disabilities to access the general curriculum and related services. In addition, we will continue to bring together curriculum, SPED, and technology staff in planning professional development when applicable. |

| C. Professional development planning includes an assessment of district and teachers' needs. The assessment is based on the competencies listed in the Massachusetts Technology Self-Assessment Tool.⁵ | The district annually administers the TSAT and the Technology Usage Survey to assess needs. | TSAT data will be used to evaluate district and teacher needs regarding teacher skill and usage levels. The district will also collect data from directors and principals in order to assess needs and align various academic initiatives. The district will also seek input from school faculty advisory committees. |

⁵ Details are available on the Department’s web site (http://www.doe.mass.edu/edtech/standards/sa_tool.html).
D. Administrators and teachers consider their own needs for technology professional development, using the technology self-assessment tools provided by the Massachusetts Department of Education or similar tools. The district annually administers the TSAT and the Technology Usage Survey to assess needs. The district will promote using the TSAT as a tool for individuals to gauge their own needs for technology professional development.

### DOE Benchmark 4: Accessibility of Technology

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Hardware Access</td>
<td>Through new building construction at the middle schools and an elementary school, and new equipment purchases at the elementary level, the district has increased the number of high-capacity, Internet-connected computers. Currently, the district has an average ratio of fewer than 3.5 students per modern computer. Computer inventories are done on an annual basis.</td>
</tr>
</tbody>
</table>

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6 A sample administrator technology self-assessment tool is available on the Department’s web site ([http://www.doe.mass.edu/edtech/standards/tsat_sampadmin.html](http://www.doe.mass.edu/edtech/standards/tsat_sampadmin.html)). The Technology Self-Assessment Tool (TSAT) for teachers is also available as a printable document and as an interactive tool on MassONE ([http://www.doe.mass.edu/edtech/standards/sa_tool.html](http://www.doe.mass.edu/edtech/standards/sa_tool.html)).

7 The Department defines a high-capacity computer as a computer that has at least 256 RAM and either a Pentium 4 processor or a Macintosh G4 processor (or equivalent). The Department also refers to these as Type A computers.
<table>
<thead>
<tr>
<th>A.2 The district provides students with access to portable and/or handheld electronic devices appropriate to their grade level.</th>
<th>The district has wireless laptop carts in place at many of the schools. In addition, the district has Wi-Fi enabled laptops, tablets and iPads in use at several schools. To support this initiative, the district has been implementing building-wide Wi-Fi access to the schools. Currently, 75% of the schools have Wi-Fi access to the Internet.</th>
<th>The district will strive to provide access to portable electronic devices to support academic needs and to expand portable wireless technology to allow computer access where needed. The district plans to continue wireless internet access installation in the schools until every school has full access.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.3 The district 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.</td>
<td>Through the implementation of Kurzweil, NBPS has promoted awareness of Universal Design/Assistive Technology to teachers so that they may assist all students, but especially those with disabilities, gain access to the general education curriculum. In doing so, curriculum, SPED, and technology staff have collaborated in providing professional development and in the implementation process. In addition, the district has begun making use of iPads for some special needs students.</td>
<td>The district will continue to promote universal design and assistive technology to assist all students in accessing the general education curriculum. Furthermore, in order to ensure that each child who requires instructional materials in an alternate format will receive them in a timely manner, the district has opted to participate with the National Instructional Materials Access Center (NIMAC). In doing so, the district plans to include language in all future contracts with publishers of textbooks and other core materials to include a provision that requires the publisher to produce NIMAS source files.</td>
</tr>
<tr>
<td>A.4 The district has procurement policies for information and instructional technologies that ensure usability, equivalent access, and interoperability.</td>
<td>Presently, New Bedford Public Schools has a procedure in place that allows the Technology Services Director to review all technology procurements prior to approval.</td>
<td>The district will work toward development of policies that ensure usability, equivalent access, and interoperability when procuring technologies.</td>
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</tr>
<tr>
<td>A.5 The district provides classroom access to devices such as digital projectors and electronic whiteboards.</td>
<td>The district has been working with the schools to assist them with procuring and making accessible digital projectors and interactive electronic whiteboards. Currently, every school has access to digital projectors and 60% of the schools have interactive electronic whiteboards available within some of their classrooms.</td>
<td>The district recognizes from its needs assessment data the need to provide teachers with access to various technology devices. As funding permits, the district will consider the purchase of additional devices such as digital projectors and electronic whiteboards. However, each school has a budget that enables them to purchase some of these devices if the school chooses to do so, and therefore, the district encourages each school to develop a process for their own technology planning needs.</td>
</tr>
<tr>
<td>A.6 The district has established a computer replacement cycle of five years or less.</td>
<td>The district does not currently have a computer replacement cycle of five years or less.</td>
<td>The district will explore the possibility of a computer replacement cycle of five years or less depending on funding.</td>
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</tr>
<tr>
<td><strong>B. Internet Access</strong></td>
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</tr>
</tbody>
</table>
| **B.1 The district provides connectivity to the Internet in all classrooms in all schools including wireless connectivity, if possible.** | Presently, 100% of all classrooms are wired to the Internet.  
In addition, 75% of the district’s schools have Wi-Fi access to the network infrastructure and the Internet. | The district will continue to provide 100% of its classrooms with Internet connectivity.  
NBPS will develop and use a district-wide, standardized process and format. Wiring diagrams and technology asset inventories are being updated regularly for every school.  
Wireless technology will continue to be implemented with a goal of attaining Wi-Fi accessibility in every school building and classroom. |
<table>
<thead>
<tr>
<th>B.2 The district provides bandwidth of at least 10/100/1 Gb to each classroom. At peak, the bandwidth at each computer is at least 100 kbps. The network card for each computer is at least 10/100/1 Gb.</th>
<th>Currently the district provides a minimum of 100 MB bandwidth at all schools levels. The district currently provides a fiber-based Switched Ethernet Service (SES) wide-area-network to all district school buildings. The minimum bandwidth provided to these schools is 100 MB. This allows sufficient bandwidth for Internet access and on-line programs.</th>
<th>The district will continue to improve its infrastructure to align with DOE standards. The district plans to continue to monitor the bandwidth requirements of our schools and will adjust any areas that merit change.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C. Networking (LAN/WAN)</strong></td>
<td><strong>C.1 The district provides a minimum 100 Mb Cat 5 switched network and/or 802.11b/g/n wireless network.</strong></td>
<td>The district currently provides a fiber-based Switched Ethernet Service (SES) wide-area-network to all district school buildings. The minimum bandwidth provided to these schools is 100 MB. This allows sufficient bandwidth for Internet access and on-line programs. The district currently also has provided wireless network infrastructures to 75% of the schools. The district will continue to increase the level of wireless connectivity to the school buildings. Toward this goal, the district has applied for E-Rate monies to upgrade the LAN and wireless connectivity throughout 3 schools during the 2013-2014 school year. In addition, the district is working with the MSBA to approve plan to replace the LAN and wireless infrastructure at New Bedford High School.</td>
</tr>
<tr>
<td>C.2 The district provides access to servers for secure file sharing, backups, scheduling, email, and web publishing, either internally or through contracted services.</td>
<td>The district provides access to servers for email and Web publishing services to staff at every school. The district hosts storage arrays that are made available to schools for secure file storage. The district has implemented an internal backup system to protect the integrity of its data.</td>
<td>The district is working on a project to implement a redundant back-up system that will be off-premise from the school district campus. New Bedford Public Schools is also working on a plan to secure the use of an off-site disaster recovery center.</td>
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<tr>
<td>D. Access to the Internet Outside the School Day</td>
<td>D.1 The district works with community groups to ensure that students and staff have access to the Internet outside of the school day. Presently, the district schools provide internet access to students following the end of the school day. In addition, the City’s five public libraries all provide computers with access to the Internet for the public.</td>
<td>The district will post on its Website locations where students have access to the Internet outside of the school day. It will continue to work with community groups to keep this information up-to-date.</td>
</tr>
<tr>
<td>D.2 The district web site includes an up-to-date list of places where students and staff can access the Internet after school hours. The district does post a listing of places where students and staff can access the Internet after school hours on the district Web site.</td>
<td>Information about existing and potential out-of-school computer facilities will continue to be posted on the district Web site, kept current, and revised as new locations are identified.</td>
<td></td>
</tr>
<tr>
<td>E. Staffing</td>
<td>E. 1 The district provides a network administrator. Presently, there is a full-time network administrator.</td>
<td>The district will continue funding a full-time network administrator.</td>
</tr>
<tr>
<td>E. 2 The district 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.</td>
<td>There are procedures in place for the reporting of technical problems. The district has an automated service request system in place and a call-in help desk. The district continues to provide support and instruction in the proper use of these tools to ensure timely notification of technical issues.</td>
<td>The district is continuously striving to find ways to increase technology support for its staff, so to provide timely in-classroom technical support with clear information on how to access the support, so that technical problems will not cause major disruptions to curriculum delivery.</td>
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<tr>
<td>E.3 The district provides at least one FTE person to support 200 computers. Technical support can be provided by dedicated staff or contracted services.</td>
<td>Currently district technology support is 1 technician for 1,300 computers, including the associated network infrastructure. Network level tech support is supplemented by as-needed, outsourced technology services. In addition, limited tech support services are provided by technology education staff at some of the schools.</td>
<td>The district will continue to provide tech support through local technicians and contracted services. The ability of the district to meet DOE standards will depend on funding.</td>
</tr>
</tbody>
</table>

**DOE Benchmark 5: E-Learning and Communications**

<p>| Current | Proposed |</p>
<table>
<thead>
<tr>
<th>A. The district encourages the development and use of innovative strategies for delivering specialized courses through the use of technology.</th>
<th>The district offers online professional development courses through the Educational Development Corporation (EDC) to all professional staff.</th>
<th>The district will continue to provide online professional development courses and training opportunities, such as Webinars. It will also continue to provide specialized courses for students through technology programs like Apex.</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>The district network infrastructure does provide IP-based connections for access to web-based and/or interactive video learning opportunities on a limited basis.</td>
<td>As the district infrastructure improves and its bandwidth capabilities increase, NBPS will look to expand the use of Web-based and/or interactive video as a tool for learning.</td>
</tr>
<tr>
<td>C. Classroom applications of e-learning include courses, cultural projects, virtual field trips, etc</td>
<td>The district has been involved with the Virtual High School program since 2004. Online Professional Development on creating Virtual Field Trips has been offered to teachers in the district, and as a result, many of these teachers have used these activities with their students.</td>
<td>NBPS will continue the Virtual High School program at the secondary level. The district provides an educational, video hosting service via Safari Montage device.</td>
</tr>
<tr>
<td>D. The district maintains an up-to-date web site that includes information for parents and community members.</td>
<td>The district maintains a Web site that includes information for parents, teachers, and administration.</td>
<td>NBPS will continue to improve and expand the district’s Web site to provide additional information to parents. During the 2013-2014 school year, the district is releasing a completely redesigned and state of the art web site.</td>
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<tr>
<td>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.</td>
<td>The district has implemented an email archival appliance that enables it to be in full compliance with federal and state law, and local policies for archiving electronic communications produced by its staff. The Internet Safety and Technology Acceptable Use Policy informs users that there is no expectation of privacy when using the district’s network.</td>
<td>The district complies with federal and state law, and local policies for archiving electronic communications produced by its staff. The district will educate staff about the risks of information being distributed over the network and the potential for information being considered a public record.</td>
</tr>
</tbody>
</table>

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8 Information about state regulations is available from the state’s Record Management Unit ([http://www.sec.state.ma.us/arc/arcrmu/rmuidx.htm](http://www.sec.state.ma.us/arc/arcrmu/rmuidx.htm)).
Appendices
Appendix A Massachusetts School Technology Readiness Awareness (STAR) Chart

Massachusetts School Technology and Readiness Chart (STaR Chart)

Massachusetts Education Technology Advisory Council’s (ETAC’s) School Technology and Readiness Chart (STaR Chart) is designed to promote best practices in the use of technology in the Commonwealth’s schools. Districts can use it to find suggested next steps along the technology continuum to improve teaching, learning, and educational management. It can also be used to inform decision/policy makers about the complexity of the issue and how multiple elements must be addressed simultaneously to ensure the effectiveness of technology implementation and use.

The STaR Chart is organized to address the impact of technology in four broad realms. Each realm contains multiple focus areas that describe a typical progression from early through advanced technology use. Each level builds upon the capabilities of the earlier level. The focus areas recommended for use in the Massachusetts Local Technology Plan Benchmarks are indicated below by an "*.") For these identified focus areas, ETAC recommends the STaR Chart’s "Proficient Tech" level as the targeted “Level of Progress.”

1. Teaching and Learning
   - Impact of Technology on Teacher Role
   - Patterns of Teacher Use*
   - Design of Instructional Setting
   - Curriculum Areas
   - Patterns of Student Use*

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9 Educational Technology Advisory Council to the Massachusetts Board of Education and the Commissioner, [http://www.doe.mass.edu/boe/sac/edtech/](http://www.doe.mass.edu/boe/sac/edtech/)
2. Educator Preparation and Development

- Content of Training
- Capabilities of Educators*
- Leadership of Principals, Teacher Leaders, and District Administrators
- Models of Professional Development
- Levels of Understanding
- Universal Access: Integration of Universal Design and Assistive Technology

3. Administration and Support Services

- Vision and Planning
- Technical Support (hardware, operating system, network)*
- Technology Integration Specialist*
- Budget Levels
- Budget Allocated for Technology (Total Cost of Ownership)*

4. Infrastructure for Technology

- Universal Design and Accessible Technology Considerations (e.g. Section 508)
- Students Per Instructional Computer*
- Internet Access Connectivity/Speed*
- E-learning Environments*
- LAN/WAN *
- Other Technologies
- Safety and Security*
The STaR Chart was derived from the Texas chart\textsuperscript{10} of the same name several years ago. The Massachusetts STaR Chart has subsequently been updated several times. This is the first update since November 2006.\textsuperscript{11} Note that the axes of the 2006 STaR chart have been transposed for the 2010 version.

**WHY A STAR CHART**

There are several reasons why ETAC maintains this chart:

1. ETAC believes that any strategic technology plan for the Commonwealth should reflect the best practices incorporated in the chart. All plans should consider these expectations for schools, teachers, students, and infrastructure as goals to strive for over time.

2. ETAC believes it is important to have clear standards for every school district. We recommend that Massachusetts Local Technology Plan Benchmarks be defined by the Proficient Tech level of the following focus areas:

   - Patterns of Teacher Use (Row B)
   - Patterns of Student Use (Row E)
   - Capabilities of Educators (Row G)
   - Technical Support (Row M)
   - Curriculum Integration Staffing (Row N)
   - Budget Allocated for Technology (Row P)
   - Students per Instructional Computer (Row R)
   - Internet Access (Row S)
   - E-Learning Environments (Row T)

\textsuperscript{10} Texas School Technology and Readiness (STaR) Chart, \url{http://starchart.esc12.net/}. The Texas Teacher STaR Chart is intended to assist all classroom teachers in assessing needs and setting goals for the use of technology in the classroom to support student achievement.

\textsuperscript{11} Massachusetts STaR Chart (School Technology and Readiness Chart), November 2006
- LAN/WAN (Row U)
- Safety and Security (Row W)

3. The STaR chart provides a common set of goals for guidance to the Massachusetts Department of Elementary and Secondary Education when distributing technology grants. This guidance is part of ETAC's charge from the Commissioner.

**STaR Chart Assumptions**

There are several assumptions built into this work:

1. Technology should be integrated into teaching and learning so that its use extends opportunities and potential for all students.

2. The effective use of technology involves the many elements specified by the focus areas. Technology in education, used appropriately and effectively, is a complex set of interactions of people, materials, infrastructure and continuous support. It is not a single investment at one time.

3. The chart will be reviewed annually and updated as needed.

4. The chart is "forward looking" because technology constantly changes and educators need to consider how these changes impact teaching and learning and educational management.

The chart strikes a balance between what is reasonable in schools given the current funding and what is desirable given our goals for student learning and each community's expectations.
## TEACHING AND LEARNING

### Levels of Progress

<table>
<thead>
<tr>
<th>Row</th>
<th>Focus Areas</th>
<th>Early Tech</th>
<th>Developing Tech</th>
<th>Proficient Tech</th>
<th>Advanced Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>Impact of Technology on Teacher Role</td>
<td>Mostly teacher-centered lectures. Minimal student use of technology in instruction.</td>
<td>Mostly teacher directed learning. Students use technology to work on individual projects.</td>
<td>Mostly teacher-facilitated learning. Students use technology for cooperative projects in their own classroom.</td>
<td>Mostly student-centered learning, teacher as mentor/facilitator. Students use technology to communicate and collaborate outside the classroom.</td>
</tr>
<tr>
<td>(B)</td>
<td>Patterns of Teacher Use</td>
<td>85% of teachers use technology as a productivity tool (e.g., email, grades) and/or as a classroom supplement (e.g. drill and practice).</td>
<td>85% of teachers explore using technology to support curriculum goals (e.g. research, lesson planning).</td>
<td>85% of teachers use technology for research, lesson planning, multimedia and graphical presentations, and simulations. Teachers share technology uses with colleagues.</td>
<td>85% of teachers integrate evolving technologies that transform the teaching process by allowing for greater levels of access, interest, inquiry, analysis, collaboration, creativity, and content production.</td>
</tr>
<tr>
<td>(C)</td>
<td>Design of Instructional Setting</td>
<td>Mostly computer labs or libraries; scheduled use only.</td>
<td>Labs, libraries, many classrooms; flexible scheduling.</td>
<td>Lab, libraries, all classrooms, and portable technology (e.g. wireless laptops or handheld electronic devices); flexible scheduling.</td>
<td>Seamlessly integrated throughout classes and all content areas. Technology is available anytime both in school and within the community.</td>
</tr>
<tr>
<td>Row</td>
<td>Focus Areas</td>
<td>Levels of Progress</td>
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</tr>
<tr>
<td>(D)</td>
<td>Curriculum Areas</td>
<td>Early Tech</td>
<td>Developing Tech</td>
<td>Proficient Tech</td>
<td>Advanced Tech</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Limited to teaching technology skills at different grade levels.</td>
<td>Use of technology is minimal in a few curricular areas across grade levels.</td>
<td>Integrated into most Curriculum Framework areas and activities at all grade levels.</td>
<td>Integral to all curricular areas at all grade levels.</td>
</tr>
<tr>
<td>(E)</td>
<td>Patterns of Student Use</td>
<td>Less than half of students show proficiency in all Massachusetts Technology Literacy Standards and Expectations (^{12}) for their grade.</td>
<td>More than half of students show proficiency in all Massachusetts Technology Literacy Standards and Expectations for their grade.</td>
<td>Almost all of students show proficiency in all Massachusetts Technology Literacy Standards and Expectations for their grade.</td>
<td>All students show proficiency in all Massachusetts Technology Literacy Standards and Expectations for their grade.</td>
</tr>
<tr>
<td>(F)</td>
<td>Content of Training</td>
<td>Technology skills (email, word processing, Internet browser use, etc.) for teachers' professional use.</td>
<td>Training encompasses more complex professional uses (district applications such as attendance and report cards, scanners, cameras) and curriculum integration strategies.</td>
<td>Training directly ties technology to its use in content areas and how to effectively manage it in the classroom.</td>
<td>Training focuses on modeling, mentoring, and adopting new technologies as well as the integration of Universal Design and access considerations for all students.</td>
</tr>
</tbody>
</table>

\(^{12}\) Massachusetts Technology Literacy Standards and Expectations, Massachusetts Department of Elementary and Secondary Education, approved by the Massachusetts Board of Education on April 29, 2008, [http://www.doe.mass.edu/edtech/standards/itstand.pdf](http://www.doe.mass.edu/edtech/standards/itstand.pdf)
<table>
<thead>
<tr>
<th>Row</th>
<th>Focus Areas</th>
<th>Levels of Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>(G)</td>
<td>Capabilities of Educators</td>
<td>Early Tech</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100% meet TSAT and/or local district teacher technology competencies and implement them into the school environment.</td>
</tr>
<tr>
<td>(H)</td>
<td>Leadership of Principals, Teacher Leaders and District Administrators</td>
<td>Recognizes benefits of technology in instruction to improve learning outcomes for all students. Minimal personal use (email, word processing, Internet browser use, etc.). Awareness of national standards for administrators.</td>
</tr>
<tr>
<td>Row</td>
<td>Focus Areas</td>
<td>Levels of Progress</td>
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</tr>
<tr>
<td>(I)</td>
<td>Models of Professional Development</td>
<td>Whole group, skill-based training with minimal follow-up.</td>
</tr>
<tr>
<td>(J)</td>
<td>Levels of Understanding</td>
<td>Most at entry or adoption stage (Students learning to use technology; teachers use technology to support traditional instruction).</td>
</tr>
<tr>
<td>Row</td>
<td>Focus Areas</td>
<td>Early Tech</td>
</tr>
<tr>
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</tr>
<tr>
<td>(K)</td>
<td><strong>Universal Access: Integration of Universal Design and Assistive Technology</strong></td>
<td>Emerging awareness of universal design and assistive technologies (hardware/software) limited to special educators; few examples across the district of universal design strategies or assistive technology used to promote access to the general curriculum.</td>
</tr>
<tr>
<td>Row</td>
<td>Focus Areas</td>
<td>Levels of Progress</td>
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<tr>
<td></td>
<td></td>
<td><strong>Early Tech</strong></td>
</tr>
<tr>
<td>(L)</td>
<td>Vision and Planning</td>
<td>Minimal technology plan; technology used mainly for administrative tasks such as word processing, budgeting, attendance, grade book.</td>
</tr>
<tr>
<td>Row</td>
<td>Focus Areas</td>
<td>Early Tech</td>
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</tr>
<tr>
<td>(M)</td>
<td>Technical Support (hardware, operating system, network)</td>
<td>Some technical support and minimal support tools to resolve 95% of problems in greater than five days. Problems cause major disruptions to curriculum delivery using technology.</td>
</tr>
<tr>
<td>(N)</td>
<td>Technology Integration Specialist</td>
<td>No district level Technology Director. Local instructional technology support is inconsistent.</td>
</tr>
<tr>
<td>Row</td>
<td>Focus Areas</td>
<td>Levels of Progress</td>
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<tr>
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<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>(O)</td>
<td>Budget Levels</td>
<td>Early Tech: Budget for hardware and software purchases and professional development.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Developing Tech: Budget for hardware and software purchases (new and replacement) and professional development, minimal staffing support, and some ongoing costs.</td>
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<td></td>
<td></td>
<td>Proficient Tech: Budget for purchases, professional development, adequate staffing support, and ongoing costs. Other state, federal, and local programs directed to support technology funding. Business partnerships, donations, and other local funding designated for technology.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advanced Tech: Budget for purchases, incentives for professional development, sufficient staffing support, and ongoing costs. Appropriate budget to support district technology plan.</td>
</tr>
<tr>
<td>(P)</td>
<td>Budget Allocated for Technology (Total Cost of Ownership)</td>
<td>Less than $175 per student.</td>
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<td></td>
<td>Between $175- $300 per student.</td>
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<td>Between $300 - $425 per student.</td>
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<td></td>
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<td>$425 or more per student</td>
</tr>
<tr>
<td>Row</td>
<td>Focus Areas</td>
<td>Levels of Progress</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>(Q)</td>
<td>Universal Design and Accessible Technology Considerations</td>
<td>Considerations for universal design and accessible technologies are limited to the</td>
</tr>
<tr>
<td></td>
<td>(e.g., Section 508)</td>
<td>Individual Education Program (IEP) process for students with disabilities. Procurement</td>
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<tr>
<td></td>
<td></td>
<td>policies for information and instructional technologies do not ensure usability,</td>
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<td></td>
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<td>equivalent access, or interoperability.</td>
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<tr>
<td></td>
<td></td>
<td>Considerations for universal design and accessible technologies are established in</td>
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<tr>
<td></td>
<td></td>
<td>areas of high student use (e.g., libraries, computer labs); inconsistent implementation</td>
</tr>
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<td></td>
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<td>of procurement policies for information and instructional technologies that ensure</td>
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<td>usability, equivalent access, and interoperability.</td>
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<tr>
<td>Row</td>
<td>Focus Areas</td>
<td>Levels of Progress</td>
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<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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<tr>
<td></td>
<td><strong>Early Tech</strong></td>
<td>Fewer than 10 students per Type A and B computer; replacement policy established; one computer per teacher.</td>
</tr>
<tr>
<td>(R)</td>
<td><strong>Students Per Instructional Computer</strong></td>
<td>10 or more students per Type A or B computer; no firm computer replacement policy established by district.</td>
</tr>
<tr>
<td></td>
<td><strong>Developing Tech</strong></td>
<td>Fewer than 5 students per Type A and B computer; replacement cycle established for 6 years or less; one computer per teacher—possibly a laptop for working at home. Most students have access to handheld electronics. Maintains a list of places students can use technology outside of school.</td>
</tr>
<tr>
<td></td>
<td><strong>Proficient Tech</strong></td>
<td>One student per Type A and B computer or other electronic device. Replacement cycle established for 5-6 years or less; one computer per teacher—possibly a laptop for working at home. 75% of computers meet Massachusetts A/B standards. School works with community to provide equitable access to technology for students and community members after school hours.</td>
</tr>
<tr>
<td></td>
<td><strong>Advanced Tech</strong></td>
<td></td>
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</tbody>
</table>
## INFRASTRUCTURE FOR TECHNOLOGY

<table>
<thead>
<tr>
<th>Row</th>
<th>Focus Areas</th>
<th>Early Tech</th>
<th>Developing Tech</th>
<th>Proficient Tech</th>
<th>Advanced Tech</th>
</tr>
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<tbody>
<tr>
<td>(S)</td>
<td>Internet &amp; WAN Access, Connectivity, and Speed</td>
<td>Dial-up connectivity to the Internet available only on a few computers.</td>
<td>Direct connectivity to the Internet available at each school and in most rooms. Adequate bandwidth to the school to avoid most delays.</td>
<td>District Internet connection of 10 Mbps per 1,000 students and staff district-wide. School connection to district WAN of 100 Mbps per 1,000 students/staff to avoid most delays. Easy access for students and teachers, including some wireless.</td>
<td>District Internet connection of 100 Mbps per 1,000 students and staff district-wide. School connection to district WAN of 1,000 Mbps per 1,000 students/staff. Easy access for students and teachers including most wireless connectivity to enable interactive presentations and video.</td>
</tr>
</tbody>
</table>

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14 Based on recommendations the State Education Technology Directors Association (SETDA) in *High-Speed Broadband Access for All Kids: Breaking Through the Barriers* for network speeds in “5-7 years” for a technology-rich learning environment, June 2008, [http://www.setda.org/web/guest/2020/broadband](http://www.setda.org/web/guest/2020/broadband)
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<th>Proficient Tech</th>
<th>Advanced Tech</th>
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<tbody>
<tr>
<td>(T)</td>
<td>E-Learning Environments</td>
<td>Web- and/or satellite-based interactive learning opportunities delivered synchronously or asynchronously, on a scheduled or unscheduled basis, primarily for professional development on a limited basis.</td>
<td>Expanded web- and/or satellite-based interactive learning opportunities with the possible addition of asynchronous video streaming or synchronous videoconferencing. The addition of courses for professional development for teachers and student courses at the high school and college level (K-16).</td>
<td>Building upon Developing Tech, development of connections for improved access to web-based and/or interactive IP-based video learning on the local, state, regional, national, and international level (school to school, district to district, school/district to state, state to state, country to country). Applications to include courses, cultural projects, virtual field trips, etc.</td>
<td>Seamless IP-based infrastructure expanded to K-16 to allow development of high-quality web- and video-based content. Content distribution available for all students and teachers. Archives allow for content review asynchronously and sharing/distribution of these resources.</td>
</tr>
<tr>
<td>Row</td>
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<tr>
<td>(U)</td>
<td>LAN</td>
<td>Limited print/file sharing network at each school for lab, administration, and some classrooms. Some shared resources and some secure storage space. Minimum 10/100 Mbps Cat 5 hubbed network.</td>
<td>Most rooms connected to Internet via WAN and wireless connectivity where possible at each school with student access. Minimum 10/100 Mbps Cat 5 switched network. Basic servers for sharing some resources at each school.</td>
<td>All rooms connected to Internet with significant wireless connectivity at each school with sufficient bandwidth for effective student access. Minimum 100 Mbps Cat 5e switched network. District-owned servers or cloud computing provides secure storage, backups, applications, schedule, email, and website. Students, teachers and parents have easy access to educational resources from home and school (e.g., web portal).</td>
<td>All rooms connected to Internet with significant wireless connectivity at each school with sufficient bandwidth for effective student access. Minimum 100 Mbps/1 Gbps Cat 5e/6 switched network to classroom. Different services (data, phone, video, guest access, etc.) on different virtual LANs. All schools have sufficient bandwidth for content delivery through resources such as video streaming and conferencing. Students, teachers and parents have easy access to educational resources from home and school (e.g., web portal).</td>
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<tr>
<td>Row</td>
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<tr>
<td>(V)</td>
<td>Other Technologies</td>
<td>Shared teacher use of resources such as telephone, TVs, VCRs, DVD players, and classroom sets of programmable calculators.</td>
<td>Shared use of resources such as telephone, computer video projectors, or interactive white boards, classroom sets of programmable calculators, digital cameras, and scanners.</td>
<td>Dedicated and assigned use of common technologies such as telephone, computer video projectors, or interactive white boards. Programmable calculators assigned to each student as needed. In each school, there is shared use of specialized technologies, digital cameras, scanners, handheld electronic devices.</td>
<td>Readily available fully equipped classrooms with computer/video projectors, interactive whiteboard, and other technology to enhance student instruction. Use of new and emerging technologies.</td>
</tr>
<tr>
<td>(W)</td>
<td>Safety and Security</td>
<td>Backup and restoration procedures and virus protection to guard individual computers. District-wide acceptable use policy in place.</td>
<td>Basic firewall protection and diligent upgrading of network vulnerabilities added to protect against external threats. Protection against a wide range of malware (viruses, worms, Trojans, rootkits), adware, and spyware. District-wide responsible use policy in place, as well as policy on connecting student/staff-owned devices to school network.</td>
<td>To Developing Tech, add adequate network and server availability protection for expanded capabilities and to ensure dependable access. Protection of workstations from internal network attacks. Encryption of sensitive personal data on local networks. Network supports board policy on connecting student/staff-owned devices (guest devices) on the network.</td>
<td>Usage authentication added for mobile computer and home/external access requirements. Use of virtual LANs (VLANs) to protect network infrastructure and sensitive data. If guest devices are allowed on the network, guest traffic is on an isolated VLAN and/or guest devices are checked for currency of anti-virus software and operating system security patches.</td>
</tr>
</tbody>
</table>
End Notes

1 Educational Technology Advisory Council to the Massachusetts Board of Education and the Commissioner, http://www.doe.mass.edu/boe/sac/edtech/

1 Texas School Technology and Readiness (STaR) Chart, http://starchart.esc12.net/. The Texas Teacher STaR Chart is intended to assist all classroom teachers in assessing needs and setting goals for the use of technology in the classroom to support student achievement.

1 Massachusetts STaR Chart (School Technology and Readiness Chart), November 2006


1 Based on recommendations the State Education Technology Directors Association (SETDA) in High-Speed Broadband Access for All Kids: Breaking Through the Barriers for network speeds for “next 2-3 years” for a technology-rich learning environment, June 2008, http://www.setda.org/web/guest/2020/broadband

1 Based on recommendations the State Education Technology Directors Association (SETDA) in High-Speed Broadband Access for All Kids: Breaking Through the Barriers for network speeds in "5-7 years" for a technology-rich learning environment, June 2008, http://www.setda.org/web/guest/2020/broadband
These guidelines are designed to help districts develop purposeful long-range technology plans. While not mandated, the guidelines represent recommended conditions for effectively integrating technology into teaching and learning.

There are several reasons that a school district should develop and maintain a technology plan. First, comprehensive planning helps the district take advantage of technology’s power to improve teaching and learning. Technology has the power to engage and challenge students. Applications such as formative assessment tools can help teachers ensure that students are meeting the standards. By allowing teachers to access information about student learning, information systems make it possible for teachers to support individual students better. Virtual learning programs can increase the range of learning opportunities available to students, enabling them to study with experts and other students around the globe. Technology can also play a role in ensuring students’ safety, by facilitating communication among school personnel and parents.

Funding is another reason technology planning is important. Every school district must have a long-range strategic technology plan approved by the Department of Elementary and Secondary Education in order to be eligible for E-Rate discounts and federal and state technology grants. Each school district is required to develop a 3- to 5-year plan, which should be kept on file locally. Each year, as part of the technology plan approval process, the Department asks districts to report on the progress they have made in implementing their plans through the Department’s security portal. The Department reviews this data, along with the district’s long-range plan, to approve the district’s plan. To facilitate this process, the Department asks the district to post its long-range plan on its web site or to email a copy of the plan to the Department.

These guidelines are based on the School Technology and Readiness (STaR) Chart1 developed by the state’s Educational Technology Advisory Council (ETAC). Using the STaR Chart, along with advice from stakeholders across the Commonwealth, the Department has developed this new set of guidelines for schools to use in technology planning. These guidelines are not mandated but rather recommended benchmarks for districts to meet by the end of the school year 2014-2015. The Department will use these guidelines to gauge the progress of districts' implementation in order to approve their technology plans annually.

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1 The StaR Chart is available on the Department’s website (http://www.doe.mass.edu/boe/sac/edtech/?section=star).
Benchmark 1
Commitment to a Clear Vision and Implementation Strategies

A. The district's technology plan contains a clearly stated and reasonable set of goals and implementation strategies that align with the district-wide school improvement plan. The district is committed to achieving its vision by the end of the school year 2014-2015.

B. The district has a technology team with representatives from a variety of stakeholder groups, including school committee members, administrators, and teachers. The technology team has the full support of the school superintendent to implement the plan.

C. Needs Assessment
   1. The district assesses the technology products and services that will be needed to improve teaching and learning.
   2. The technology plan includes an assessment of the services and products that are currently being used and that the district plans to acquire.

D. Budget
   1. The district recognizes that technology plays a critical role in achieving its goals. The district has a budget that will ensure the implementation of its long-range technology plan.
   2. The budget includes staffing, infrastructure, hardware, software applications, professional development, support, and contracted services.
   3. The district seeks funding for technology programs from federal, state, and private resources, as well as from academic departments that are supported by technology. The district explores ways that technology can reduce costs and create efficiencies in other areas of the district budget.
   4. For districts that plan to apply for E-rate reimbursement, the technology plan specifies how the district will pay for the non-discounted portion of their costs for the services procured through E-rate.

E. Evaluation
   1. The district routinely consults with technology staff before purchasing technologies items, to ensure that the items are appropriate, cost-effective, and sustainable.
2. The district's technology plan includes an evaluation process that enables it to monitor its progress in achieving its goals and to make mid-course corrections in response to new developments and opportunities as they arise.

Benchmark 2
Technology Integration and Literacy

A. Technology Integration

1. Outside Teaching Time - At least 90% of teachers use technology every day, including some of the following areas: research, lesson planning, organization, administrative tasks, communications, and collaboration. Teachers explore evolving technologies and share information about technology uses with their colleagues.

2. For Teaching and Learning - At least 90% of teachers use technology appropriately with students every day to improve student learning of the curriculum. Activities include some of the following: research, multimedia, simulations, data analysis, communications, and collaboration. Teachers integrate evolving technologies that enhance student interest, inquiry, analysis, collaboration, and creativity.

B. Technology Literacy

1. At least 90% of eighth grade students show proficiency in all the Massachusetts Technology Literacy Standards and Expectations for grade eight.

2. 100% of teachers are working to meet the proficiency level in technology, and by the school year 2014-2015, 90% of teachers will have mastered 90% of the skills in the Massachusetts Technology Self-Assessment Tool (TSAT).

C. Staffing

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2 The Massachusetts Department of Elementary and Secondary Education defines technology integration as the daily use of technology in classrooms, libraries, and labs to improve student learning.

3 The Massachusetts Technology Literacy Standards and Expectations are available on the Department’s website (http://www.doe.mass.edu/edtech/standards.html).

4 The Technology Self-Assessment Tool is available on the Department’s website (http://www.doe.mass.edu/edtech/standards/sa_tool.html).
1. The district has a district-level technology director/coordinator.

2. The district provides one FTE instructional technology specialist per 60-120 instructional staff to coach and model.

3. The district has staff specifically dedicated to data management and assessment.

**Benchmark 3**

**Technology Professional Development**

A. At the end of five years, at least 90% of district staff will have participated in high-quality, ongoing professional development that includes emerging technology issues, technology skills, universal design, and research-based models of technology integration.

B. Technology professional development is sustained and ongoing and includes coaching, modeling best practices, district-based mentoring, study groups, and online professional development.

C. Professional development planning includes an assessment of district and teachers’ needs. The assessment is based on the competencies listed in the Massachusetts Technology Self-Assessment Tool.\(^5\)

D. Administrators and teachers consider their own needs for technology professional development.\(^6\)

**Benchmark 4**

**Accessibility of Technology**

A. Hardware Access

1. By 2014-2015, the district has an average ratio of one high-capacity, Internet-connected computer for each student. (The Department will work with stakeholders on a regular basis to review and define high-capacity

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\(^5\) The *Technology Self-Assessment Tool* is available on the Department’s website (http://www.doe.mass.edu/edtech/standards/sa_tool.html).

2. The district provides students with emerging technologies appropriate to their grade level.

3. The district maximizes access to the general education curriculum for all students, including students with disabilities, using universal design principles and assistive technology devices.

4. The district has procurement policies for information and instructional technologies that ensure usability, equivalent access, interoperability and SIF compliance.

5. The district provides technology-rich classrooms, with access to devices such as digital projectors, electronic whiteboards, and student response systems.

6. The district has established a computer replacement cycle of five years or less.

B. Internet Access

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

2. The district provides an external Internet connection to the Internet Service Provider (ISP) of 100 Mbps per 1,000 students/staff.

3. The district provides bandwidth of at least 10/100/1 Gb to each classroom. At peak, the bandwidth at each computer is at least 100 kbps. The network card for each computer is at least 10/100/1 Gb.

C. Networking (LAN/WAN)

1. The district provides internal wide area network (WAN) connections from the district to each school between schools of at least 1 Gbps per 1,000 students/staff.

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

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7 For more information, see the website for the SIF Association (http://www.sifinfo.org/us/index.asp).

8 For more information, see the 2008 report High-Speed Broadband Access for All Kids: Breaking through the Barriers published by the State Educational Technology Directors Association (SETDA), available on SETDA’s website (http://www.setda.org/web/guest/2020/broadband).
contracted services.

D. Access to the Internet Outside the School Day

1. The district provides access to its computer labs before and after school to ensure that students and staff have adequate access to the Internet outside of the school day.

2. The district disseminates a list of up-to-date list of places where students and staff can access the Internet after school hours.

E. Staffing

1. The district provides staff or contracted services to ensure that its network is functioning at all times.

2. The district provides resolves technical problems within 24 hours, so that they do not cause major disruptions to curriculum delivery. The district provides clear information about how to access technical support, which can be provided in person or remotely.

3. The district provides at least one FTE person to support 400 computers. Technical support can be provided by dedicated staff or contracted services.

**Benchmark 5**

**Virtual Learning and Communications**

A. The district encourages the development and use of innovative strategies for delivering high-quality courses through the use of technology.

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 of virtual learning include courses, collaborative projects, field trips, and discussions.

D. The district maintains an up-to-date website that includes information for parents and community members.
Benchmark 6
Safety, Security, and Data Retention

A. The district has a CIPA-compliant Acceptable Use Policy (AUP) regarding Internet and network use. The policy is updated as needed to help ensure safe and ethical use of resources by teachers and students.

B. The district educates teachers and students about appropriate online behavior. Topics include cyberbullying, potential risks related to social networking sites and chat rooms, and strategies for dealing with these issues.\(^9\)

C. The district has a plan to protect the security and confidentiality of personal information of its students and staff.\(^10\)

D. The district complies with federal and state law\(^11\), 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.

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\(^9\) To learn more about teaching students about safety and the Internet, see Net Cetera: Chatting with Kids About Being Online, a free guidebook produced through a partnership of federal agencies and the technology industry (http://www.edgovblogs.org/duncan/2009/12/online-safety-guidebook-for-parents/).

\(^10\) To find out how state agencies in the Executive Branch must protect personal information, as well as to find training tools related to this effort, see the Commonwealth’s website (http://www.mass.gov/?pageID=afsubtopic&L=6&L0=Home&L1=Research+%26+Technology&L2=IT+Policies%2c+Standards+%26+Guidance&L3=Legal+Guidance&L4=Privacy+%26+Security&L5=Executive+Order+504&sid=Eoaf).

\(^11\) Information about state regulations is available from the state’s Record Management Unit (http://www.sec.state.ma.us/arc/arcrmu/rmuidx.htm).
Massachusetts Technology Literacy Standards and Expectations

April 2008
This document was prepared by the
Massachusetts Department of Elementary and Secondary Education

Jeffrey Nellhaus
Acting Commissioner

Board of Elementary and Secondary Education Members
Mr. Paul Reville, Chairman, Worcester
Ms. Ann Reale, Vice-Chair, Commissioner, Early Education and Care, Boston
Mr. Christopher Anderson, Westford
Ms. Harneen Chernow, Jamaica Plain
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Jeffrey Nellhaus, Acting Commissioner

and Secretary to the Board

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Massachusetts Department of Elementary and Secondary Education
350 Main Street, Malden, MA 02148-5023
Phone 781-338-3000 TTY: N.E.T. Relay 800-439-2370
www.doe.mass.edu
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

Introduction ........................................................................................................................................ 1  
Overview of Grade Spans .................................................................................................................. 3  
Grades K through 2 – Technology Exploratory Skills and Expectations ......................................... 4  
Grades 3 through 5 – Technology Standards and Expectations ....................................................... 6  
Grades 6 through 8 – Technology Standards and Expectations ....................................................... 9  
Grades 9 through 12 – Technology Standards and Expectations .................................................... 13  
Gaining Technology Skills While Learning the Content of the Curriculum ...................................... 18  
Integrated Learning Scenarios ........................................................................................................ 19  
  Grades 1-4 Art .................................................................................................................................. 19  
  Grade 4 Science and Technology/Engineering ................................................................................. 20  
  Grade 7 Mathematics ....................................................................................................................... 21  
  Grade 6 Social Studies ..................................................................................................................... 22  
  Grades 10-12 English Language Arts .............................................................................................. 23  
  District-Wide Implementation of the Standards ............................................................................. 24  
Appendix ........................................................................................................................................... 25  
  Acknowledgments ............................................................................................................................. 25  
  Development of this Document ......................................................................................................... 26  
  Comparing the Updated K-12 State Standards to the Refreshed ISTE NETS•S .................................. 27  
  21st Century Skills ........................................................................................................................... 28
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.

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

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\(^4\) 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**

<table>
<thead>
<tr>
<th>G6-8: 3.1</th>
<th>Explain and demonstrate effective searching and browsing strategies when working on projects.</th>
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</thead>
<tbody>
<tr>
<td>G6-8: 3.2</td>
<td>Collect, organize, and analyze digital information from a variety of sources, with attribution.</td>
</tr>
<tr>
<td>G6-8: 3.3</td>
<td>Use a variety of computing devices (e.g., probeware, handheld computers, digital cameras, scanners) to collect, analyze, and present information for curriculum assignments.</td>
</tr>
</tbody>
</table>

**Problem Solving**

<table>
<thead>
<tr>
<th>G6-8: 3.4</th>
<th>Independently use appropriate technology tools (e.g., graphic organizer) to define problems and propose hypotheses.</th>
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<tbody>
<tr>
<td>G6-8: 3.5</td>
<td>Use and modify databases and spreadsheets to analyze data and propose solutions.</td>
</tr>
<tr>
<td>G6-8: 3.6</td>
<td>Develop and use guidelines to evaluate the content, organization, design, use of citations, and presentation of technologically enhanced projects.</td>
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</tbody>
</table>

**Communication**

<table>
<thead>
<tr>
<th>G6-8: 3.7</th>
<th>Plan, design, and develop a multimedia product to present research findings and creative ideas effectively, citing sources.</th>
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<tbody>
<tr>
<td>G6-8: 3.8</td>
<td>Identify differences between various media and explain issues associated with repurposing information from one medium to another (e.g., from print to the Web).</td>
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<tr>
<td>G6-8: 3.9</td>
<td>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).</td>
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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, 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.

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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.

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

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**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.

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\(^8\) Robert Wilson at the Floral Street School in Shrewsbury Public Schools developed Reciprocating Art.
Integrated Learning Scenario #2

Becoming Scientists
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.

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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\textsuperscript{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.

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\textsuperscript{10} SELECT Math was developed by Susan Young and Jim Coffey of Boston Public Schools.
**Integrated Learning Scenario #4**

**Africa**

**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.

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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
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\textsuperscript{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.

\textsuperscript{13} This piece was written by Kathleen Schrock, Administrator for Technology in Nauset Public Schools.

80
Appendix A

Acknowledgments

This document was developed with the support of many experts.

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

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\(^4\) 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.\(^5\) 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,”\(^6\) 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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\(^4\) See Appendix A for a list of the members of the working group and other contributors, e.g. CAST.

\(^5\) NETS is an initiative of the International Society for Technology in Education (ISTE) and the U.S. Department of Education

\(^6\) 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:

<table>
<thead>
<tr>
<th>UPDATED MASSACHUSETTS TECHNOLOGY LITERACY STANDARDS</th>
<th>CORRESPONDING NETS FOUNDATION STANDARDS</th>
<th>CORRESPONDING REFRESHED ISTE NETS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard 1</td>
<td>Standards 1 and 3</td>
<td>Standards 1, 2, 3, and 4</td>
</tr>
<tr>
<td>Standard 2</td>
<td>Standard 2</td>
<td>Standard 5</td>
</tr>
<tr>
<td>Standard 3</td>
<td>Standards 3, 4, 5, and 6</td>
<td>Standard 6</td>
</tr>
</tbody>
</table>
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.”

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¹⁷ The Partnership for 21st Century Skills ([http://www.21stcenturyskills.org/index.php](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.
Welcome to the Massachusetts Technology Self-Assessment Tool

The technology instrument has been designed for:

1. **Teachers:** to determine their own levels of technology proficiency and to identify personal technology needs.
2. **Schools/Districts:** to assess their professional development needs and to plan professional development activities that will help all teachers become proficient in technology.
3. **The State:** to gather and report data on technology competencies and technology professional development.

**Using the Technology Self-Assessment Tool**

There are two ways you can use the TSAT. You can read through the entire document, checking off skills that you have attained, or you can complete one level at a time, stopping when you reach a level you have not yet mastered. Although some levels do not require that you complete all of the skills to attain mastery, you can go back at any time to check off new skills when you learn them.

**Mastery Levels**

The TSAT has four mastery levels, as shown in the table below. The table shows the percentage of skills that you should complete in order to move to the next level. Although some levels do not require that you complete all of the skills, you can go back at any time to check off new skills you have learned.

<table>
<thead>
<tr>
<th>Level</th>
<th>Technology Operations &amp; Concepts</th>
<th>Ethics &amp; Safety</th>
<th>Teaching &amp; Learning with Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Technology</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Developing Technology</td>
<td>80%</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>Proficient</td>
<td>80%</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>Advanced</td>
<td>80%</td>
<td>100%</td>
<td>80%</td>
</tr>
</tbody>
</table>

If this is the first time you are taking this assessment, you should begin at Early Technology. The assessment presents a list of skills with check boxes. Check a skill if you are able to do all of the examples given. You can take the assessment as many times as you wish. When you have completed a skill level, proceed to the next higher level. For example, once you master the skills in Early Technology, you should begin working on the Developing Technology level.
## A. Early Technology

<table>
<thead>
<tr>
<th>I know How To</th>
<th>Standard 1 – Technology Operations and Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1.1</td>
<td>Identify components of a computer system and its operating system (e.g., drives, memory, window). Explain the functions of the components, and use appropriate terminology in speaking about them.</td>
</tr>
<tr>
<td>A1.2</td>
<td>Connect the cables and cords correctly so that a computer is functional. Reduce the risk of hardware failure through proper care of the components.</td>
</tr>
<tr>
<td>A1.3</td>
<td>Demonstrate basic skills for using hardware and applications (e.g., start up and shut down computer system and peripherals, open and close a file, start an application and create a document).</td>
</tr>
<tr>
<td>A1.4</td>
<td>Follow the proper district/school procedures in the event of technical difficulties.</td>
</tr>
<tr>
<td>A1.5</td>
<td>Navigate using scroll bars, arrow keys, special keys, trackpads/touchpads, and mice.</td>
</tr>
<tr>
<td>A1.6</td>
<td>Save/backup and retrieve a file to/from local hard drive, portable disk/device, and/or online storage location.</td>
</tr>
<tr>
<td>A1.7</td>
<td>Select a printer and print a document with appropriate resolution and orientation (portrait or landscape).</td>
</tr>
<tr>
<td>A1.8</td>
<td>Use basic editing and formatting features of a word processing program (e.g., centering, spacing, fonts, enter text, edit, copy and paste, and insert graphics).</td>
</tr>
<tr>
<td>A1.9</td>
<td>Explain the concept of a database, and provide examples from everyday life (e.g., library catalogs, school records, telephone directories).</td>
</tr>
<tr>
<td>A1.10</td>
<td>Use correct terminology in speaking about Internet communications (e.g., browser, search engine, website, URL, domain, links).</td>
</tr>
<tr>
<td>A1.11</td>
<td>Explain terms related to the use of networks (e.g., username, password, network, server, domain).</td>
</tr>
<tr>
<td>A1.12</td>
<td>Select a strong (secure) password and keep it safe.</td>
</tr>
<tr>
<td>A1.13</td>
<td>Access the Web and identify and use navigation features of an Internet (e.g., “home,” “back,” “forward,” hyperlinks, and multiple tabs).</td>
</tr>
<tr>
<td>A1.14</td>
<td>Add a website to <strong>Favorites</strong> or <strong>Bookmark</strong> it for future reference.</td>
</tr>
<tr>
<td>A1.15</td>
<td>Create and send a message using email. Retrieve and read email. Reply to sender and forward an email and attach a file. Save, print and delete an email. Differentiate between “reply” and “reply to all.”</td>
</tr>
<tr>
<td>I Know How To</td>
<td>Standard 2 – Ethics and Safety</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>A1.16</td>
<td>Send an email attachment. Receive an attachment, open it, and save it to an appropriate location.</td>
</tr>
<tr>
<td>A2.1</td>
<td>Explain and comply with the Acceptable Use Policy in your district and describe the consequences of failing to comply.</td>
</tr>
<tr>
<td>A2.2</td>
<td>Explain and apply classroom/lab rules for responsible and equitable use of technology.</td>
</tr>
<tr>
<td>A2.3</td>
<td>Explain potential problems viruses and other malware create and practical methods of prevention (including exercising caution in opening email attachments and installing software).</td>
</tr>
<tr>
<td>A2.4</td>
<td>Identify key intellectual property issues that apply to technology use in education, the workplace and society (e.g., fair use, copyright, software licensing, plagiarism).</td>
</tr>
<tr>
<td>A2.5</td>
<td>Follow appropriate licensing for all software and content used.</td>
</tr>
<tr>
<td>A2.6</td>
<td>Discuss the basic concept of assistive technologies and Universal Design for Learning (UDL).</td>
</tr>
<tr>
<td>A2.7</td>
<td>Evaluate the proper physical setting for technology use (ergonomics).</td>
</tr>
<tr>
<td>A2.8</td>
<td>Explain how media and technology can be used to distort or exaggerate information.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I Know How To</th>
<th>Standard 3 – Teaching &amp; Learning with Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3.1</td>
<td>Discuss current best practices on teaching and learning with technology in order to plan rich learning environments and experiences.</td>
</tr>
<tr>
<td>A3.2</td>
<td>Use technology to gather curriculum-specific information from online and/or local digital sources.</td>
</tr>
<tr>
<td>A3.3</td>
<td>Integrate technology into the curriculum of one’s subject and/or grade level with assistance of a coach, mentor or other staff member.</td>
</tr>
<tr>
<td>A3.4</td>
<td>Use digital and online tools to communicate with teachers, parents, and other stakeholders and to create/distribute classroom materials.</td>
</tr>
<tr>
<td>A3.5</td>
<td>Identify your personal technology professional development needs.</td>
</tr>
<tr>
<td>I Know How To</td>
<td>Standard 1 – Technology Operations and Concepts</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>B1.1</td>
<td>Connect a computer to peripheral equipment (e.g., scanner, printer, projector).</td>
</tr>
<tr>
<td>B1.2</td>
<td>Identify and use a variety of storage media (e.g., CD/DVD, flash drives, network servers, online storage spaces). Explain why a particular medium is or is not suited for a particular storage task.</td>
</tr>
<tr>
<td>B1.3</td>
<td>Resolve basic technical difficulties (e.g., reboot computer, clear paper jam, replace ink cartridge replacement).</td>
</tr>
<tr>
<td>B1.4</td>
<td>Use built-in help and other available support resources to learn about hardware and software features and to troubleshoot problems.</td>
</tr>
<tr>
<td>B1.5</td>
<td>Use proper terminology to communicate commonly occurring technology problems (e.g., frozen screen, disk error, printing problems).</td>
</tr>
<tr>
<td>B1.6</td>
<td>Use editing and formatting features (margins, spelling, and tabs) in a word processing application. Insert images (e.g., downloaded from the Web or copied from a removable device) into documents.</td>
</tr>
<tr>
<td>B1.7</td>
<td>Create a report or newsletter using word-processing or desktop publishing software.</td>
</tr>
<tr>
<td>B1.8</td>
<td>Describe the structure and function of spreadsheet (e.g., cells, rows, columns, and formulas).</td>
</tr>
<tr>
<td>B1.9</td>
<td>Create an original spreadsheet, entering simple formulas (various number formats, equations, percentages,). Reposition columns and rows; apply formatting features.</td>
</tr>
<tr>
<td>B1.10</td>
<td>Interpret spreadsheet information, and produce simple charts from data.</td>
</tr>
<tr>
<td>B1.11</td>
<td>Perform basic searches (including multiple key words) on digital and online databases (e.g., library card catalog, encyclopedia). Use available tools to refine and limit the results of a search.</td>
</tr>
<tr>
<td>B1.12</td>
<td>Create and manipulate graphics using a drawing or painting program (e.g., adjust scale, size, shape, resolution).</td>
</tr>
<tr>
<td>B1.13</td>
<td>Create a simple multimedia presentation and explain the terminology (e.g., slide, transition, build.)</td>
</tr>
<tr>
<td>B1.14</td>
<td>Organize Bookmarks or Favorites into folders for future reference.</td>
</tr>
<tr>
<td>B1.15</td>
<td>Identify and use basic search strategies on the Internet.</td>
</tr>
<tr>
<td>B1.16</td>
<td>Create an address book in an e-mail program.</td>
</tr>
<tr>
<td>I Know How To</td>
<td>Standard 2 – Ethics and Safety</td>
</tr>
<tr>
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</tr>
<tr>
<td>B2.1</td>
<td>Ensure equitable access to technology resources for all students in the class.</td>
</tr>
<tr>
<td>B2.2</td>
<td>Use basic assistive technology features of operating systems and applications. For example, change text size in a word processor, use text-to-speech features, change mouse controls, use on-screen calculators.</td>
</tr>
<tr>
<td>B2.3</td>
<td>Cite electronic sources correctly in accordance with academic standards (e.g., APA); explain and model this in the classroom.</td>
</tr>
<tr>
<td>B2.4</td>
<td>Explain and demonstrate ethical and legal behavior (including fair use guidelines) in copying/downloading files, applications, and media.</td>
</tr>
<tr>
<td>B2.5</td>
<td>Evaluate a website’s validity as a source of information (e.g., find site sponsor, author, date the site was last updated, etc.).</td>
</tr>
<tr>
<td>B2.6</td>
<td>Explain the safe, responsible use of email, instant messaging, chat rooms, and other electronic communications (including strategies for avoiding and responding to cyberbullying and for avoiding malware/phishing schemes).</td>
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</tbody>
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<table>
<thead>
<tr>
<th>I Know How To</th>
<th>Standard 3 – Teaching &amp; Learning with Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3.1</td>
<td>Design and develop lessons and activities that integrate technology in a variety of instructional settings for all students.</td>
</tr>
<tr>
<td>B3.2</td>
<td>Use appropriate technology to differentiate instruction (e.g., multimedia presentations, concept maps) for all learners.</td>
</tr>
<tr>
<td>B3.3</td>
<td>Identify and locate technology resources including online curriculum resources (Massachusetts Curriculum Frameworks and/or district curriculum guides) for planning.</td>
</tr>
<tr>
<td>B3.4</td>
<td>Manage student technology activities to optimize learning with available resources (e.g., in a one-computer classroom, a computer lab, or with portable/wireless technology).</td>
</tr>
<tr>
<td>B3.5</td>
<td>Use applications (spreadsheets, databases, etc.) to organize curriculum-specific information into charts, tables and diagrams.</td>
</tr>
<tr>
<td>B3.6</td>
<td>Create multimedia presentations to communicate curriculum content.</td>
</tr>
<tr>
<td>B3.7</td>
<td>Integrate results of electronic research into classroom instruction with proper citations as appropriate to the grade level.</td>
</tr>
<tr>
<td>B3.8</td>
<td>Locate and participate in appropriate technology professional development activities offered by the district, local college/university, or online provider.</td>
</tr>
<tr>
<td>I Know How To</td>
<td>Standard 1 – Technology Operations and Concepts</td>
</tr>
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<td>--------------</td>
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</tr>
<tr>
<td>C1.1</td>
<td>Recognize and work with a variety of different multimedia and document formats (e.g., jpg, html, mp3, pdf, doc, odt).</td>
</tr>
<tr>
<td>C1.2</td>
<td>Determine the size and format of files, to identify the storage space remaining on drives, and to identify the version of an application in use.</td>
</tr>
<tr>
<td>C1.3</td>
<td>Install new software from a variety of sources (e.g., CD, DVD and the Internet) per district policies.</td>
</tr>
<tr>
<td>C1.4</td>
<td>Resolve commonly occurring technology problems (e.g., frozen screen, disk error, printing problems).</td>
</tr>
<tr>
<td>C1.5</td>
<td>Demonstrate intermediate word processing skills (e.g., indents, headers and footers, end notes, bullets and numbering, tables, track changes, insert comments).</td>
</tr>
<tr>
<td>C1.6</td>
<td>Use built-in calculating functions (e.g., sum, average) in a spreadsheet application.</td>
</tr>
<tr>
<td>C1.7</td>
<td>Customize formatting of charts or graphs created in spreadsheet. Define and use built-in data functions of a spreadsheet such as sort, filter, find.</td>
</tr>
<tr>
<td>C1.8</td>
<td>Differentiate between formulas with absolute cell references and relative cell references in a spreadsheet.</td>
</tr>
<tr>
<td>C1.9</td>
<td>Use multiple sheets within a spreadsheet and link cells together across sheets.</td>
</tr>
<tr>
<td>C1.10</td>
<td>Define terms (field, table, record, query, etc.) and functions related to databases.</td>
</tr>
<tr>
<td>C1.11</td>
<td>Perform simple operations in a database (e.g., browse, sort, search, delete, add data, define field formats).</td>
</tr>
<tr>
<td>C1.12</td>
<td>Create a multimedia presentation that includes a design template, tables, imported audio, and graphics.</td>
</tr>
<tr>
<td>C1.13</td>
<td>Demonstrate advanced search strategies to locate and retrieve electronic information (e.g., use syntax and Boolean logic operators such as “and/or”) correctly.</td>
</tr>
<tr>
<td>C1.14</td>
<td>Share links among users via a variety of technologies (e.g., email, instant messaging, social networks, message boards).</td>
</tr>
<tr>
<td>I Know How To</td>
<td>Standard 2 – Ethics and Safety</td>
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<tr>
<td>--------------</td>
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</tr>
<tr>
<td>C2.1</td>
<td>Use assistive technology software (e.g., text-to-speech, word prediction, voice recognition, word-symbol, communication software).</td>
</tr>
<tr>
<td>C2.2</td>
<td>Address situations where inappropriate technology use occurs, and contact proper district personnel to take action.</td>
</tr>
<tr>
<td>C2.3</td>
<td>Demonstrate and teach students the principals of ergonomics (e.g., avoiding repetitive stress injuries maintaining proper posture) as well as how to use equipment safely.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I Know How To</th>
<th>Standard 3 – Teaching &amp; Learning with Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3.1</td>
<td>Plan for the management of technology resources within the context of learning activities (e.g., schedule use of computer lab, wireless laptops, whiteboard).</td>
</tr>
<tr>
<td>C3.2</td>
<td>Evaluate technology resources, including online resources for accuracy and suitability for your curriculum area and the students you teach.</td>
</tr>
<tr>
<td>C3.3</td>
<td>Identify and discuss the technology proficiencies needed in the workplace, as well as strategies for acquiring these proficiencies.</td>
</tr>
<tr>
<td>C3.4</td>
<td>Use appropriate technology tools to enhance your curriculum (e.g., digital projectors, wireless laptops, handhelds, environmental probes).</td>
</tr>
<tr>
<td>C3.5</td>
<td>Facilitate technology-enhanced lessons that address content standards and student technology literacy standards, while addressing a variety of learning styles.</td>
</tr>
<tr>
<td>C3.6</td>
<td>Use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning.</td>
</tr>
<tr>
<td>C3.7</td>
<td>Identify and evaluate developing technologies as they relate to your subject area, grade level and student population.</td>
</tr>
<tr>
<td>C3.8</td>
<td>Assess student learning using a variety of district, school or individual technology tools and strategies (e.g., the state Data Warehouse, progress spreadsheets, or commercial gradebook applications).</td>
</tr>
<tr>
<td>C3.9</td>
<td>Provide assistance to colleagues in using multimedia presentations, WebQuests, and other technology-rich lessons in the classroom.</td>
</tr>
<tr>
<td>C3.10</td>
<td>Manipulate data using charting tools and graphic organizers (e.g., concept mapping, and outlining software) to connect ideas and organize information.</td>
</tr>
</tbody>
</table>
### Standard 1 – Technology Operations and Concepts

<table>
<thead>
<tr>
<th>I Know How To</th>
<th>D1.1</th>
<th>Install and troubleshoot new hardware.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D1.2</td>
<td>Understand the differences between common file types, and identify the appropriate use of each. Identify methods of converting one file to another type. Use different graphic file formats where appropriate (e.g., jpg to png, wav to mp3).</td>
</tr>
<tr>
<td></td>
<td>D1.3</td>
<td>Import/export and link data between spreadsheet, databases and other applications, including presentation applications.</td>
</tr>
<tr>
<td></td>
<td>D1.4</td>
<td>Explain and demonstrate effective strategies for backing up and restoring personal computer data.</td>
</tr>
<tr>
<td></td>
<td>D1.5</td>
<td>Design, create, modify and manipulate an original database.</td>
</tr>
<tr>
<td></td>
<td>D1.6</td>
<td>Be able to do queries and create reports from a database.</td>
</tr>
<tr>
<td></td>
<td>D1.7</td>
<td>Explain and properly use terms related to networks and Internet infrastructure (e.g., LAN, WAN, DSL, T1, router, firewall, IP address, DHCP, DNS, POP, IMAP).</td>
</tr>
</tbody>
</table>

### Standard 2 – Ethics and Safety

<table>
<thead>
<tr>
<th>I Know How To</th>
<th>D2.1</th>
<th>Manage assistive technology equipment and install peripherals for diverse learners (e.g., alternative keyboards, point devices, and scanners with OCR software).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D2.2</td>
<td>Explain basic practices that contribute to a website's accessibility to people with disabilities (e.g., use of alternative text to describe graphics, providing captions for audio, maintaining consistency in the interface).</td>
</tr>
<tr>
<td></td>
<td>D2.3</td>
<td>Discuss how copyright law and fair use is affected by, and affects, the use of the Internet.</td>
</tr>
<tr>
<td>I Know How To</td>
<td>Standard 3 – Teaching and Learning with Technology</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>D3.1</td>
<td>Routinely and rigorously identify, evaluate, and apply emerging technologies as they relate to teaching and learning.</td>
<td></td>
</tr>
<tr>
<td>D3.2</td>
<td>Use specialized technology tools for problem solving, decision-making, and creativity (e.g., simulation software, geographic information systems, dynamic geometric software, art and music composition software).</td>
<td></td>
</tr>
<tr>
<td>D3.3</td>
<td>Develop tools and online content (e.g., web pages, blogs, wikis, mailing lists) for instruction and communication among students and faculty.</td>
<td></td>
</tr>
<tr>
<td>D3.4</td>
<td>Use technology (e.g., applets that require the use of logic to solve problems) to challenge students to develop higher order thinking skills and creativity.</td>
<td></td>
</tr>
<tr>
<td>D3.5</td>
<td>Plan and implement collaborative projects with other classrooms or schools using interactive tools (e.g., email, discussion forums, groupware, interactive websites, VoIP, videoconferencing).</td>
<td></td>
</tr>
<tr>
<td>D3.6</td>
<td>Present ideas using the most appropriate communications technologies (e.g., multimedia presentations, web pages, desktop-published documents).</td>
<td></td>
</tr>
<tr>
<td>D3.7</td>
<td>Distinguish between effective and ineffective design and presentation in electronic format (e.g., websites, multimedia, charts).</td>
<td></td>
</tr>
<tr>
<td>D3.8</td>
<td>Explain and demonstrate the use of metadata (e.g., tagging, EXIF) to help students and teachers organize information on their computers and/or the Internet.</td>
<td></td>
</tr>
<tr>
<td>D3.9</td>
<td>Design and deliver effective staff development in technology and its integration into the curriculum.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix E Massachusetts Recommended Criteria for Evaluating Instructional Technology Materials
Massachusetts Department of Education

Recommended Criteria for Evaluating Instructional Technology Materials

Evaluating instructional technology materials can be a challenging task. A wide variety of products is available. These products are constantly evolving, and it can sometimes be difficult to find materials that match the state’s curriculum frameworks and the district’s local curricula. This checklist provides some guidelines to aid in the evaluation and selection of instructional technology materials.

To make successful decisions about what to purchase, districts are encouraged to involve in the selection process those who will be using the products. This includes teachers, students, parents, heads of the curriculum development, technology, and business departments, and others. By doing so, districts can ensure that the materials meet educational needs while also fitting within the local budget and infrastructure.

In addition to the attached checklist, there are many resources available that can be accessed free of charge through the Internet to help in making decisions. It is recommended that this guide be used in conjunction with the other Massachusetts Department of Education documents and standards listed below.

- "Criteria for Evaluating Instructional Materials and Programs in Reading"
  http://www.doe.mass.edu/read/mrfp/criteria.pdf

- Criteria for Evaluating Instructional Materials and Programs
  http://www.doe.mass.edu/frameworks/math/2000/append2.html

- Criteria for Evaluating Instructional Materials and Programs in Science and Technology/Engineering
  http://www.doe.mass.edu/frameworks/scitech/2001/Appendices/ap7.html

- Massachusetts Recommended PreK-12 Instructional Technology Standards
  http://www.doe.mass.edu/edtech/standards/itstand.pdf

- Massachusetts Curriculum Frameworks
  http://www.doe.mass.edu/frameworks/current.html
<table>
<thead>
<tr>
<th>I. Academic Content</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aligns with the English Language Arts Strands and Standards</td>
<td></td>
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<tr>
<td>Aligns with the Mathematics Strands and Standards</td>
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<tr>
<td>Aligns with the Science and Technology/Engineering Strands and Standards</td>
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<tr>
<td>Aligns with the History and Social Science Strands and Standards</td>
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<tr>
<td>Aligns with the Arts Framework Strands and Standards</td>
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<tr>
<td>Aligns with the Foreign Language Strands and Standards</td>
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<tr>
<td>Aligns with the Comprehensive Health Strands and Standards</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>II. Materials Development or Usage</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is based on scientific research</td>
<td></td>
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<td></td>
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<tr>
<td>Rates highly in current peer usage or local studies</td>
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<tr>
<td>Rates highly in published, professional reviews</td>
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<tr>
<td>Demonstrates increased student achievement according to scientific research</td>
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<tr>
<td>Facilitates learning that could not otherwise be achieved</td>
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<tr>
<td>Facilitates learning that is difficult without technology</td>
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<tr>
<td>Provides learning opportunities otherwise unavailable in current educational settings</td>
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<thead>
<tr>
<th>III. Instructional Features</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contain easily understandable directions for teacher and student</td>
<td></td>
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<tr>
<td>Are easily accessible for auditory learners</td>
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<tr>
<td>Are easily accessible for visual learners</td>
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<tr>
<td>Are easily accessible for hands-on learners</td>
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<tr>
<td>Are easily accessible for English language learners and fit within state and federal laws and regulations</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Are easily accessible for students with disabilities and fit within state and federal laws and regulations</td>
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<tr>
<td>Use assessments to tailor the presentation to each student’s skill level</td>
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<tr>
<td>Allow/encourage students to exhibit previously learned material by recalling facts, terms, basic concepts, and answers</td>
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<tr>
<td>Contain a variety of exercises to improve comprehension and knowledge of content</td>
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<tr>
<td>Include effective feedback for students</td>
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<tr>
<td>Include appropriate adjustment to grade level of the student</td>
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<tr>
<td>Include view and print in-depth analysis of student progress</td>
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<tr>
<td>Align with the Massachusetts Professional Standards for Teachers (603 CMR 7.08)</td>
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<tr>
<td>Meet recommended Instructional Technology Standards</td>
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</tr>
</tbody>
</table>
## IV. Product specifications, qualities, and/or costs

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allow for review of a fully functional demo version for testing of product capability, usability, and compatibility within current infrastructure</td>
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<td></td>
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<tr>
<td>Demonstrate proven industry record for product reliability and value</td>
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</tr>
<tr>
<td>Take into consideration cost of the product over its useful lifetime, including but not limited to software licenses, updates, training materials, maintenance, and other options that may be needed</td>
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</tr>
<tr>
<td>Allow for easy installation on Windows, Macintosh, or whatever operating system the district, school, or classroom uses</td>
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<tr>
<td>Show no known conflicts with current software in use</td>
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<tr>
<td>Are compatible with hardware and peripherals that the district, school, or classroom uses</td>
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</tr>
<tr>
<td>Allow for easy maintenance or updates through patches or upgrades</td>
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<tr>
<td>Do not pose any security issues or compromise any sensitive or confidential data (keep in mind cookie settings in browsers, server setting changes, and port or security requirements)</td>
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<tr>
<td>Comply with CIPA requirements (if product requires online usage)</td>
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<tr>
<td>Are free of inappropriate or derogatory material</td>
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<tr>
<td>Are fully compatible with the major browsers available and current installed versions, if application is browser dependent</td>
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<td>Demonstrate reliable accessibility through a Local Area Network (LAN)</td>
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<td>Demonstrate reliable accessibility through dial-up connection</td>
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<td>Demonstrate reliable accessibility through broadband connection</td>
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<tr>
<td>Demonstrate reliable and full accessibility to content and services in students’ or teachers’ homes via networking or affordable home edition of software</td>
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<td>Demonstrate accessibility through CD-ROM, DVD-ROM, hard drive, or other media in case of Internet or network failure</td>
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<td>V. Vendor supplemental services</td>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
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<td>Show high level of reliability in customer support</td>
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<td>Facilitate easy integration into the districts’ local curriculum</td>
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<tr>
<td>Include high-quality orientation or professional development free of charge or at an affordable price</td>
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<td>Include effective, periodic train-the-trainer opportunities so that district or school staff can provide ongoing, high quality professional development</td>
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<tr>
<td>Include ongoing, high quality professional development or other help through the vendors’ or other websites</td>
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<td>Include other supplementary professional development materials (e.g., training manuals, videos, etc.)</td>
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<tr>
<th>Include effective training in usage of the materials for students and parents</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Not Applicable</th>
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<tr>
<td>Include effective user help within a tutorial or other troubleshooting features in the product</td>
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<td>Include other help or troubleshooting free of charge or at an affordable price by person, website, e-mail, or phone during class hours and while teachers work offsite</td>
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<td>Include effective tracking of the level of usage of the materials by teachers</td>
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<tr>
<td>Include effective tracking of the level of usage of the materials by students</td>
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<td>Allow for feedback on quality and effectiveness of the product that can be easily gathered and analyzed</td>
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Appendix F

New Bedford Public School’s Internet Safety and Technology Usage Policy

Internet Safety and Technology Acceptable Usage Policy

All users of New Bedford Public Schools’ technology resources are expected to act in a spirit of mutual respect and cooperation, while following the regulations for their use as described in this policy. Any violation may result in loss of access, as well as other disciplinary or legal action. Users are considered subject to all local, state, and federal laws.

District technology resources are provided to all students and employees to conduct research, enhance productivity, and to communicate with others for professional and educational purposes. Use of these resources is open to those who agree to abide by the terms of this policy and to act in a considerate and responsible manner. Any abuse or violation of the policy may result in a suspension or cancellation of user privileges, as well as other disciplinary or legal action. The appropriate district and/or school administrator will determine the consequences of any inappropriate use as defined by student handbook and/or district disciplinary policies. Usage is a privilege, not a right.

New Bedford Public Schools reserves the right to monitor, under appropriate conditions, all computer usage and electronic information transmitted using its computer/network resources. The purpose of any monitoring would be to protect the integrity of the district’s equipment and networked information systems and to ensure compliance with the policies, rules, and regulations governing the use of these resources. Users do not have an expectation of privacy, since email messages are public communication. Monitoring includes access to non-district commercial Web-based email accounts via the equipment and network resources of New Bedford Public Schools.

Responsibilities as a User of New Bedford Public School's Technology Resources

Regarding Access:

1. Students are required to have teacher permission and a curriculum related activity to use any of New Bedford Public School’s technology or network resources. Students may use only those resources that they have been specifically allowed to use. Students and employees are to use these resources for purposes that support the educational mission of New Bedford Public Schools.

2. Instructional research and computing, including assigned work, research projects and other subject-related activities have priority over all other activities. Employees are expected to utilize these resources for professional and educational purposes.

3. Computing is accessible to all students and employees in the New Bedford Public Schools. Students are not permitted to check personal email, however, students may, with direct supervision and permission of a teacher, use personal e-mail to attach a file to send or get an attached file that has been uploaded from home when related to an assignment.
The district expects its employees to utilize district email accounts for all professional communications. If you are provided with any type of school/district account (email, Web, administrative), it is your responsibility to take all necessary precautions to protect access to the account by not sharing your password(s) with others.

As increasingly more data is collected to guide decision-making, employees with access to any confidential information must make every effort to keep this information secure to protect against unauthorized disclosure, use, and dissemination of personal identifiable information, especially regarding minors.

Students in particular need to be reminded about the dangers of giving out any personal information online such as a home address or telephone number for themselves or others, since people can use e-mail, instant messaging, chat rooms, and social networking sites to threaten, harass, or entice children.

**Regarding Network and Equipment Resources:**

4. Users may not intentionally circumvent network or computer security safeguards.

5. Electronic tampering with technology resources is not permitted. Users may not by any means intentionally attempt to disrupt the district’s computer systems, corrupt system performance, or destroy information contained within these systems, including the spreading of computer viruses.

6. Users may not engage in unauthorized duplication, installation, alteration, or destruction of data, programs, or software. Users may not send or disclose data, programs, or software belonging to others. This includes, but is not limited to, any attempt to access files belonging to other users without their permission. Users must respect all copyright laws that protect software owners, artists, and writers. Plagiarism in any form will not be tolerated.

7. Users may not engage in abusive or improper use of technology resources, which includes, but is not limited to, misuse of computer or network access privileges, tampering with equipment and unauthorized removal of equipment components.

**Regarding Information Resources:**

8. Users are expected to follow generally accepted rules of network etiquette and conduct oneself in a responsible and ethical manner while on-line. Users are not permitted to send, receive, submit, or publish any defamatory, inaccurate, racist, abusive, obscene, profane, sexually harassing, threatening, bullying, offensive, or illegal material within or outside of New Bedford Public Schools using the district’s network facilities.

9. Users are not permitted to use New Bedford Public Schools’ technology resources for private and/or commercial purposes that include, but are not limited to, buying and selling merchandise, product advertising, political lobbying, political campaigning, gambling, or any profit-making or illegal purposes.

10. Filtering software, as required by the Children’s Internet Protection Act (CIPA), is in place to help block or filter Internet, or other forms of electronic communications being received that are obscene, pornographic, harmful to minors, and inappropriate in an educational setting. However, no filtering system is 100% effective at blocking inappropriate material.
Procedures are in place for disabling or modifying our technology protection measures for legitimate educational purposes. It is the responsibility of the Informational Technology Manager, and in some cases, the Director of Instructional Technology and Professional Development, or designated representative to review all requested modifications.

The best way to protect our students is to educate them in developing the 21st century skills needed to navigate the Internet safely and responsibly. It is the responsibility of all members of the New Bedford Public Schools’ staff to assist in educating, supervising, and monitoring appropriate online behavior in accordance with this policy, CIPA, and the Protecting Children in the 21st Century Act, and all other NBPS’ policies. Every effort will be made to supervise students and to direct them to suitable informational resources while using the Internet. Still, it is impossible to preview the content of all materials available online, and a user may discover controversial information unintentionally. If any user mistakenly accesses inappropriate material, it is their responsibility to report this to a teacher or administrator immediately.

Limitation of Liability

Users assume all risk and New Bedford Public Schools makes no guarantee that the functions or the services provided by or through the district’s network information systems will be error-free or without defect. The district specifically denies any responsibility for any damage you may suffer, including, but not limited to, loss of data, interruptions of service, or exposure to inappropriate material or people. The district is not responsible for the accuracy or quality of the information obtained through or stored on its system. The district will not be held responsible for financial or legal obligations arising from the authorized or unauthorized use of its network information systems.

Penalties for Inappropriate Use

The appropriate district and/or school administrators will determine the consequences of any inappropriate use by a student or employee. All users will be afforded due process. Disciplinary actions will be appropriate to meet specific concerns related to the violation, and when applicable, refer to student handbook and/or district disciplinary policies. Any abuse or violation of this policy will result in a range of disciplinary actions that might include suspension or cancellation of user privileges, as well as other disciplinary or legal action. All users are considered subject to all local, state, and federal laws.

Adopted: 6/30/97
Amended: 6/25/07
Amended: 7/09/07
Amended: 11/14/11
Additional Technology Usage Guidelines

New Bedford Public Schools takes student safety very seriously. In a digital world, account password security is critical to protect against unauthorized disclosure, use, and dissemination of personal identifiable information, especially regarding minors.

Students in particular need to be reminded about the dangers of giving out any personal information online such as a home address or telephone number for themselves or others, since people can use e-mail, instant messaging, chat rooms, and social networking sites to threaten, harass, or entice children.

The Children’s Internet Protection Act (CIPA) requires filtering software to be in place to help block or filter inappropriate Internet content, or other forms of electronic communications. However, on occasion valid educational sites become inaccessible to educators and their students. In those instances, procedures are in place for disabling or modifying our technology protection measures for legitimate educational purposes. It is the responsibility of the Informational Technology Manager, and in some cases, the Director of Instructional Technology and Professional Development, or designated representative to review all requested modifications.

The best way to protect our students is to educate them in developing the 21st century skills needed to navigate the Internet safely and responsibly. It is the responsibility of all members of the New Bedford Public Schools’ staff to assist in educating, supervising, and monitoring appropriate online behavior in accordance with this policy, CIPA, and the Protecting Children in the 21st Century Act, and all other NBPS’ policies.
New Bedford Public School Secondary Technology User Agreement

I have read the Internet Safety and Technology Acceptable Usage Policy and understand that I am responsible for all of my actions when using the technology resources of New Bedford Public Schools. I agree to follow the rules contained in this policy and that the use of these resources will be for educational purposes only. I also understand that if I break any of the rules, I can lose my privilege to use these resources and may face other disciplinary action as determined by New Bedford Public Schools or its agent.

I agree to follow all of the rules for using the technology resources of New Bedford Public Schools. This includes, but is not limited to the following:

- I will not check personal email unless my teacher has allowed me to when it is related to an assignment
- I will not use chat or instant messaging programs
- I will not use the computers to cyberbully or hurt others, including making any threats or sending electronic text or images that could be potentially damaging or hurtful to others.
- I will not intentionally write on or damage any computer parts
- I will not intentionally damage the computer systems or computer network
- I will never attempt to bypass the school’s computer security system
- I will not change any computer settings such as: screen saver, desktop background, screen resolution, or icons.
- I will not download or install programs into the school’s computers.
- I will never trespass into another’s folder or files
- I will not share any computer passwords that might be given to me.
- I will only use educational games, programs, or Websites approved by my teacher.
- I will only listen to music or watch videos that are assignment related and teacher approved.
- I will only do a Web search with the teacher’s permission and guidance.
- I will not plagiarize by using the ideas or work of others without proper citation or the owner’s permission of copyrighted material
- If I open an unacceptable Website by accident, I will turn off the monitor and notify the teacher immediately
- I will not give out personal information about myself, or others (such as real name, address, or telephone number) on the Internet, which might allow a person to locate me.
- I will not arrange to meet someone I meet online without my parent’s knowledge. If someone asks me to meet them, I will notify my parent or other trusted adult.
- I will tell my parent or other trusted adult if something or someone online makes me feel uncomfortable or threatened, or if I receive inappropriate electronic content that could potentially be damaging or hurtful to others.

In signing, I agree to follow the Internet Safety and Technology Acceptable Usage Policy of New Bedford Public Schools and understand the penalties that have been described in this policy.

----------------------------------    ----------------------------------
Student’s Name                     Date

A parent or guardian must sign below.

I__________________________________, parent/guardian of __________________________________________, have read and understand the Internet Safety and Technology Acceptable Usage Policy, which my child has signed in order to use New Bedford Public Schools’ technology resources. I agree with the contents of this agreement and that my child will be bound by the terms of the agreement. I accept full responsibility and liability, both legal and financial, for my child’s actions, whether foreseen or not. I release New Bedford Public Schools, its staff, administrators, and/or its agents, from liability and/or consequences resulting from my child’s use and/or misuse of these resources.

----------------------------------    ----------------------------------
Parent/Guardian Name                Date
New Bedford Public Schools Elementary Technology User Agreement

I know that I am responsible for all of my actions when using the technology resources of New Bedford Public Schools. I agree to follow the rules contained in the Internet Safety and Technology Acceptable Usage Policy and that the use of these resources will be for educational purposes only. I also understand that if I break any of the rules, I can lose my privilege to use these resources and may face other disciplinary action as determined by New Bedford Public Schools or its agent.

I agree to follow all of the rules for using the technology resources of New Bedford Public Schools. This includes, but is not limited to the following:

- I will not check personal email unless my teacher has allowed me to when it is related to an assignment
- I will not use chat or instant messaging programs
- I will not use the computers to cyberbully or hurt others, including making any threats or sending electronic text or images that might be damaging or hurtful to others.
- I will not intentionally write on or damage any parts of the computer
- I will not touch any of the computer's wires or cables.
- I will not change any computer settings such as; the screen saver, desktop background, screen resolution, or icons.
- I will not download or install programs into the school’s computers.
- I will never open or change another student's files.
- I will not share any computer passwords that might be given to me.
- I will only use educational games, programs, or Websites approved by my teacher.
- I will only listen to music or watch videos that are assignment related and teacher approved.
- I will only do a Web search with the teacher's permission and guidance.
- I will not plagiarize by using the ideas or work of others without permission.
- If I open an unacceptable Website by accident, I will turn off the monitor and raise my hand immediately.
- I will not give out personal information about myself, or others (such as my real name, address, or telephone number) on the Internet, which might allow a person to locate me.
- I will never arrange to meet someone I meet online without my parent’s permission. If someone asks me to meet them, I will tell a parent or trusted adult.

My teacher has reviewed and explained the Internet Safety and Technology Acceptable Usage Policy to me.

_________________________________   ______________________
Student’s Name                        Date
A parent or guardian must sign below.

I, ___________________________________, parent/guardian of ___________________________________, have read and understand the Internet Safety and Technology Acceptable Usage Policy, which my child has signed in order to use New Bedford Public Schools’ technology resources. I agree with the contents of this agreement and that my child will be bound by the terms of the agreement. I accept full responsibility and liability, both legal and financial, for my child’s actions, whether foreseen or not. I release New Bedford Public Schools, its staff, administrators, and/or its agents, from liability and/or consequences resulting from my child’s use and/or misuse of these resources.

__________________________________   ______________________
Parent/Guardian Name                 Date
NEW BEDFORD PUBLIC SCHOOLS EMPLOYEE TECHNOLOGY USER AGREEMENT

District technology resources are provided to all employees of New Bedford Public Schools to conduct research, enhance productivity, and to communicate with others for professional and educational purposes. Although the district’s technology resources are meant for school use, personal usage is allowed as long as it is reasonable and does not interfere with work, and falls within the guidelines of the Technology Acceptable Use Policy. Use of these resources is open to those who agree to abide by the terms of this policy and to act in a considerate and responsible manner. Any abuse or violation of the policy may result in progressive disciplinary measures or cancellation of user privileges, as well as other disciplinary or legal action.

I agree to follow all of the rules for using the technology resources of the New Bedford Public Schools. This includes, but is not limited to the following:

- I will use New Bedford Public Schools technology resources primarily for educational and professional activities. Limited personal use is allowed, as long as it does not interfere with my work.
- I will not utilize these resources to perform any illegal or unethical act.
- I will not use technology resources to send offensive, abusive, obscene, harassing, or illegal communications.
- I will not use these resources for commercial purposes.
- I will not use these resources for unauthorized solicitations on behalf of charities or other organizations or persons, for political lobbying, or for illegal activities.
- I will not go anywhere on the system where I am not authorized.
- I will not install software without permission from a supervisor or principal.
- I will not do anything which disrupts the performance of the network, including the streaming of video and/or audio and the sending or forwarding of mass email messages (chain emails and jokes) for non-educational purposes.
- I will abide by “Fair Use” guidelines and not download/use copyrighted materials from the Internet without the permission of the copyright holder. This includes, but is not limited to, music and video files.
- I will not share personal information over the network.
- I will not disclose any passwords belonging to myself or others.
- I will not trespass in the folders or files of others.
- I will not intentionally misrepresent others using district technology resources.
- I will not disclose any confidential or personally identifiable student or employee information.
- I recognize that in a classroom setting, any student using the Internet must be supervised and their use of the Internet should focus on appropriate learning goals and objectives. Non-educational gaming is NOT allowed.

I agree to follow the Technology Acceptable Usage Policy of New Bedford Public Schools and understand the penalties that have been described in this policy.

Signed,

__________________________________________
Employee’s Name

__________________________________________
Date